



**Parvatibai Chowgule College of Arts and Science  
(Autonomous)**

**1.1.3**

**Average percentage of courses having focus on employability/  
entrepreneurship/ skill development**

# **BIOCHEMISTRY**

## SEMESTER II

<b><u>CORE COURSE: PROTEIN CHEMISTRY</u></b>	
<b>COURSE CODE:</b>	<b>BCH-II.C-3</b>
<b>MARKS:</b>	<b>100</b> (75 – Theory; 25 – Practical)
<b>CREDITS:</b>	<b>4</b> (03 – Theory; 01 – Practical)
<b>CONTACT HOURS:</b>	<b>Theory:</b> 45 Hours (03 Lectures per week) <b>Practical:</b> 30 Hours (01 Practical per week)
<b>COURSE OUTCOMES:</b>	On the successful completion of the course, the students will be able to: <b>CO1:</b> Comprehend the various levels of protein structure <b>CO2:</b> Explain the mechanism and significance of membrane proteins. <b>CO3:</b> Correlate the techniques used in studying protein structure <b>CO4:</b> Review enzymes and their classification system. <b>CO5:</b> Assess and compare the various methods employed in protein estimation/concentration and measuring the protein content.

MODULE	TOPICS	CONTACT HOURS	TOTAL HOURS
<b>MODULE 1: Protein Structure</b>	<b>1.1: Protein structure</b> Bonds in protein structure (covalent, non covalent, peptide), importance of primary & secondary structure, tertiary and quaternary structures, bond lengths and configuration, Dihedral angles, psi and phi, helices, sheets and turns, Ramachandran map; techniques used in studying 3-D structures - X-ray diffraction and NMR; motifs and domains; structures of myoglobin and haemoglobin, multimeric proteins and conjugated proteins, diversity of function.	15	15
<b>MODULE 2: Isolation &amp; Analysis of proteins</b>	<b>2.1: Isolation &amp; analysis of protein</b> Techniques to isolate and analyze proteins: salt fractionation, ion-exchange chromatography, gel permeation, HPLC, SDS-PAGE, IEF; Protein primary structure: sequencing by Edman degradation, the use of enzymes and chemical reagents to obtain overlap peptides, synthesis of peptides using Merrifield method  <b>2.2: Characterization of proteins</b> Determination of purity, molecular weight, extinction coefficient, sedimentation coefficient, 2-D electrophoresis	12  03	15
<b>MODULE 3: Enzymes, Membrane and Transport Proteins</b>	<b>3.1 : Enzymes</b> Nature of enzymes: protein and non-protein (ribozyme); cofactor and prosthetic group, apoenzyme, holoenzyme; IUBMB classification of enzymes; mechanism of enzyme activity  <b>3.2: Membrane and Transport proteins</b> Integral and membrane-associated proteins, hydrophathy plots to predict transmembrane domains; the significance of functional proteins - bacteriorhodopsin, myoglobin, and hemoglobin: structure and function (Oxygen binding curves, cooperativity models for hemoglobin)	06  09	15

### BCH-II.C-3: PROTEIN CHEMISTRY (PRACTICAL)

SR. NO.	PRACTICAL	NO. OF PRACTICALS
1.	Determination of absorption maxima and molar extinction coefficient of protein sample	02
2.	Protein Assay (Biuret/Lowry/Bradford method)	02
3.	Ammonium sulfate fractionation of proteins	02
4.	Protein Dialysis	02
5.	The solubility of proteins in distilled water and salt solutions	02
6.	Denaturation of proteins by pH and temperature	01
7.	Separation of proteins by SDS-PAGE (demonstration)	02
8.	Gel filtration chromatography (demonstration)	02
	<b>Total</b>	<b>15</b>

**REFERENCES for BCH-II.C-3 (Latest Editions)**

### **Mandatory Reading**

- Nelson, D. L. and Cox, M. M. Lehninger's Principles of Biochemistry. Worth Publishers, New York, USA.

### **Supplementary Reading**

- Stryer, L., Berg, J., Tymoczko, J. and Gatto, G. Biochemistry. W. H. Freeman and Co., New York, USA.
- Murray, R. K., Granner, D. K., Mayes, P. A. and Rodwell, V. W. Harper's Illustrated Biochemistry. McGraw-Hill Companies.
- Jain, J. L., Jain, S. and Jain, N. Fundamentals of Biochemistry. S. Chand and Company, Ltd., New Delhi.
- Harvey, R.A. and Ferrier, D.R. Lippincott's Illustrated Reviews, Biochemistry. Lippincott Williams and Wilkins.

### **Web References**

- <https://www.khanacademy.org/science/biology/macromolecules/proteins-and-amino-acids/a/orders-of-protein-structure>
- <https://openstax.org/details/books/biology-2e>
- <https://www.nature.com/scitable/topicpage/protein-structure-14122136/>
- <https://courses.lumenlearning.com/introchem/chapter/protein-structure/>
- [https://bio.libretexts.org/Bookshelves/Biochemistry/Supplemental\\_Modules\\_\(Biochemistry\)/4.\\_Biotechnology\\_2/4.1%3A\\_Protein\\_Purification](https://bio.libretexts.org/Bookshelves/Biochemistry/Supplemental_Modules_(Biochemistry)/4._Biotechnology_2/4.1%3A_Protein_Purification)
- [https://bio.libretexts.org/Bookshelves/Cell\\_and\\_Molecular\\_Biology/Book%3A\\_Cells\\_-\\_Molecules\\_and\\_Mechanisms\\_\(Wong\)/3%3A\\_Bioenergetics\\_-\\_Thermodynamics\\_and\\_Enzymes/3.2%3A\\_Enzymes](https://bio.libretexts.org/Bookshelves/Cell_and_Molecular_Biology/Book%3A_Cells_-_Molecules_and_Mechanisms_(Wong)/3%3A_Bioenergetics_-_Thermodynamics_and_Enzymes/3.2%3A_Enzymes)

### SEMESTER III

<b><u>ELECTIVE COURSE: TOOLS AND TECHNIQUES IN BIOCHEMISTRY</u></b>	
<b>COURSE CODE:</b>	<b>BCH-III.E-1</b>
<b>MARKS:</b>	<b>100</b> (75 – Theory; 25 – Practical)
<b>CREDITS:</b>	<b>4</b> (03 – Theory; 01 – Practical)
<b>CONTACT HOURS:</b>	<b>Theory:</b> 45 Hours (03 Lectures per week) <b>Practical:</b> 30 Hours (01 Practical per week)
<b>COURSE OUTCOMES:</b>	On the successful completion of the course, students will be able to: <b>CO1:</b> Comprehend the basic concepts of the principle, working, and applications of different types of chromatography. <b>CO2:</b> Compare, analyze and apply concepts of the principle and working of various types of centrifuges and electrophoretic techniques <b>CO3:</b> Compare, analyze and apply concepts of the principle and working of various types of spectroscopic and microscopic techniques. <b>CO4:</b> Acquire knowledge about different radioisotopes and their applications in biochemistry

**BCH-III.E-1: TOOLS AND TECHNIQUES IN BIOCHEMISTRY (THEORY)**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>	<b>TOTAL HOURS</b>
<b>MODULE 1: Chromatography and Centrifugation Techniques</b>	<b>1.1: Chromatographic techniques</b> Basic principles of chromatography: Partition coefficient, concept of theoretical plates. Various modes of chromatography, Instrumentation and Applications – Plane chromatography (paper, TLC, 2D), Column chromatography - HPLC, Molecular Sieve Chromatography, Ion Exchange Chromatography, Affinity Chromatography, Gas Chromatography.	<b>09</b>	<b>15</b>
	<b>1.2: Centrifugation</b> Basic principle of sedimentation, sedimentation coefficient, various types of centrifuges, different types of rotors, Preparative centrifuge - differential centrifugation, density gradient centrifugation (Rate zonal and Isopycnic), Analytical centrifuge.	<b>06</b>	
<b>MODULE 2: Electrophoretic and Spectroscopic Techniques</b>	<b>2.1: Electrophoretic and Blotting techniques</b> Basic Principle of electrophoresis, Electrophoresis of protein and nucleic acids - Paper electrophoresis, Gel electrophoresis, discontinuous gel electrophoresis, PAGE, SDS-PAGE, Native gels, denaturing gels, agarose gel electrophoresis, Northern Blotting, Southern Blotting and Western blotting techniques – principle and applications	<b>08</b>	<b>15</b>
	<b>2.2: Spectroscopic techniques</b> Basic principle and working of – UV/VIS light spectroscopy, Fluorescence spectroscopy, NMR, IR spectroscopy, X-ray diffraction.	<b>07</b>	
<b>MODULE 3: Microscopy and Radioisotopes</b>	<b>3.1: Microscopic techniques</b> Basic components of the microscope. Working and representation and application of – compound microscope, electron microscope, Scanning electron microscope and confocal microscope, Specimen preparation for electron microscope, scanning electron	<b>08</b>	<b>15</b>



	microscope and confocal microscope.  <b>3.2: Radioisotopes</b> Concept of half-life, decay constant, detection methods - GM counter, solid and liquid scintillation counter, autoradiography; handling and safety of radioisotope, Applications of radioisotopes in biology.	<b>07</b>	
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**BCH-III.E-1: TOOLS AND TECHNIQUES IN BIOCHEMISTRY  
(PRACTICAL)**

SR.NO.	PRACTICAL	NO. OF PRACTICAL
1.	Estimation of proteins by Bradford's method	02
2.	Estimation of carbohydrate by DNSA method	02
3.	Separation and identification of amino acids by paper chromatography	02
4.	Isolation of cell organelle using density gradient centrifugation	02
5.	Demonstration of gel filtration chromatography	02
6.	SDS-PAGE analysis of proteins	03
7.	Lipid isolation by reverse phase chromatography	02
	<b>Total</b>	<b>15</b>

## REFERENCES:

### Mandatory Reading:

- Wilson K and Walker J. 2005. Principles and Techniques of Practical Biochemistry, 6th Edition, Cambridge University Press.

### Additional Reading:

- Upadhyay A, Upadhyay K and Nath N. 2009. Biophysical Chemistry: Principles and Techniques, 3rd Edition, Himalaya Publishing, New Delhi.
- Plummer D. 1988. An introduction to Practical Biochemistry, Tata McGraw Hill Publishing Company, New Delhi.
- Jayraman J. 2011. Laboratory Manual in Biochemistry. New Age International Pvt Ltd Publishers, New Delhi.
- Sadasivam S. and Manickam A. 2007. Biochemical Methods, 3rd edition, New Age International Publishers, New Delhi.

### **Web-links:**

- <https://www.khanacademy.org/science/high-school-biology/hs-human-body-systems/hs-the-reproductive-system/a/hs-the-reproductive-system-review>
- <https://www.khanacademy.org/science/high-school-biology/hs-cells/hs-introduction-to-cells/a/microscopy>
- <https://www.khanacademy.org/test-prep/mcat/physical-processes/atomic-nucleus/a/decay-graphs-and-half-lives-article>
- <https://www.khanacademy.org/science/organic-chemistry/spectroscopy-jay/uv-vis-spectroscopy/v/uv-vis-spectroscopy>

### SEMESTER III

<b><u>ELECTIVE COURSE: ENZYMOLOGY</u></b>	
<b>COURSE CODE:</b>	<b>BCH-III.E-2</b>
<b>MARKS:</b>	<b>100</b> (75 – Theory; 25 – Practical)
<b>CREDITS:</b>	<b>4</b> (03 – Theory; 01 – Practical)
<b>CONTACT HOURS:</b>	<b>Theory:</b> 45 Hours (03 Lectures per week) <b>Practical:</b> 30 Hours (01 Practical per week)
<b>COURSE OUTCOMES:</b>	On the successful completion of the course, students will be able to: <b>CO1:</b> Explain the structure of an enzyme and kinetics of enzyme catalysed reactions <b>CO2:</b> Differentiate between types of enzyme inhibitions <b>CO3:</b> Comprehend the wide applications of enzymes and future potential. <b>CO4:</b> Isolate and purify crude forms of enzyme extract and apply appropriate method for determination of activity of enzyme <b>CO5:</b> Discuss factors that affect enzymatic activity

**BCH-III.E-2: ENZYMOLOGY (THEORY)**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>	<b>TOTAL HOURS</b>
<b>MODULE 1: Introduction to enzymes and Features of enzyme catalysis</b>	<b>1.1: Introduction to enzymes (8 L)</b> Nature of enzymes - protein and non-protein (ribozyme); co-enzymes, cofactor & prosthetic group; apoenzyme; holoenzyme; ribozymes & isoenzymes; multienzyme complex, specificity of enzymes; classification of enzymes.	<b>08</b>	<b>15</b>
	<b>1.2: Features of enzyme catalysis</b> Fischer's lock and key hypothesis; Koshland's induced fit hypothesis; factors affecting the rate of reactions (time, enzyme concentration, substrate concentration, pH and temperature)	<b>07</b>	
<b>MODULE 2: Enzyme Kinetics and Inhibition</b>	<b>2.1: Enzyme kinetics</b> Principles of reaction rates; order of reactions and equilibrium constants; derivation of Michaelis-Menten equation and Lineweaver- Burk plot; significance of $K_m$ and $V_{max}$ , $K_{cat}$ and turnover number	<b>08</b>	<b>15</b>
	<b>2.2: Enzyme inhibition</b> Reversible inhibition (competitive, uncompetitive, non-competitive, mixed and suicide, end product); mechanism-based inhibitors - antibiotics as inhibitors; types of irreversible inhibition; allosteric inhibition	<b>07</b>	
<b>MODULE 3: Mechanism of enzymes, Purification &amp; applications of enzymes</b>	<b>3.1: Mechanisms of enzyme action and regulation</b> Mechanism of action of chymotrypsin; regulation of enzyme activity and its importance - aspartate transcarbamoylase	<b>04</b>	<b>15</b>
	<b>3.2: Enzyme purification</b> Purification of enzymes: salt precipitation; dialysis; molecular exclusion chromatography; PAGE; Molecular weight determination by SDS-PAGE	<b>06</b>	
	<b>3.3: Applications of enzymes</b> Application of enzymes in diagnostics (SGPT, SGOT, creatine kinase, alkaline and acid phosphatases); enzyme immunoassay (HRPO); applications of enzymes in industry – detergents, leather, food	<b>05</b>	

## BCH-III.E-2: ENZYMOLOGY (PRACTICAL)

<b>SR. NO.</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1.	Preparation of buffers and solutions for the study of enzyme activity	01
2.	Effect of pH on enzyme activity	02
3.	Effect of temperature on enzyme activity	02
4.	Effect of substrate concentration and determination of $K_m$ and $V_{max}$	02
5.	Partial purification of an enzyme from a suitable source, ammonium sulphate precipitation, dialysis	03
6.	Assay of enzyme activity and specific activity	01
7.	Native-PAGE	03
8.	Zymogram	01
	<b>Total</b>	<b>15</b>

## REFERENCES for BCH-III.E-2 (Latest Editions)

### Mandatory Reading

- Malcolm, D. and Edwin C. Webb. Enzymes. Academic Press Inc., Publishers, New York

### Supplementary Reading

- Nelson, D. L. and Cox, M. M. Lehninger's Principles of Biochemistry. Worth Publishers, New York, USA.
- Stryer, L., Berg, J., Tymoczko, J. and Gatto, G. Biochemistry. W. H. Freeman and Co., New York, USA.
- Murray, R. K., Granner, D. K., Mayes, P. A. and Rodwell, V. W. Harper's Illustrated Biochemistry. McGraw-Hill Companies.
- Jain, J. L., Jain, S. and Jain, N. Fundamentals of Biochemistry. S. Chand and Company, Ltd., New Delhi.
- Harvey, R.A. and Ferrier, D.R. Lippincott's Illustrated Reviews, Biochemistry. Lippincott Williams and Wilkins.
- Voet, D. and Voet, J. G. Biochemistry. John Wiley & Sons, Inc, USA.

### Web References

- <https://www.khanacademy.org/test-prep/mcat/biomolecules/enzyme-structure-and-function/a/enzyme-structure-and-function>
- <https://www.khanacademy.org/test-prep/mcat/biomolecules/enzyme-kinetics/v/an-introduction-to-enzyme-kinetics>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5956270/>
- [http://web.sungshin.ac.kr/~spark/class/enzchem/EnzChem\\_ch02.pdf](http://web.sungshin.ac.kr/~spark/class/enzchem/EnzChem_ch02.pdf)
- <https://www.chem.wisc.edu/deptfiles/genchem/netorial/modules/biomolecules/modules/enzymes/enzyme3.htm>
- [https://www.creative-enzymes.com/resource/enzyme-definition-and-classification\\_18.html](https://www.creative-enzymes.com/resource/enzyme-definition-and-classification_18.html)
- <https://www.youtube.com/watch?v=OY1WsqlcUdo>
- [https://www.youtube.com/watch?v=Z2ZN\\_9nF11E](https://www.youtube.com/watch?v=Z2ZN_9nF11E)

### SEMESTER III

<b><u>ELECTIVE COURSE: FUNDAMENTALS OF MICROBIOLOGY</u></b>	
<b>COURSE CODE:</b>	<b>BCH-III.E-3</b>
<b>MARKS:</b>	<b>100</b> (75 – Theory; 25 – Practical)
<b>CREDITS:</b>	<b>4</b> (03 – Theory; 01 – Practical)
<b>CONTACT HOURS:</b>	<b>Theory:</b> 45 Hours (03 Lectures per week) <b>Practical:</b> 30 Hours (01 Practical per week)
<b>COURSE OUTCOMES:</b>	<p>On the successful completion of the course, students will be able to:</p> <p><b>CO1:</b> Comprehend the scope and importance of Microbiology, classification schemes, cultivation, preservation, and maintenance of the microbial cultures.</p> <p><b>CO2:</b> Discriminate between various groups of microorganisms using staining techniques.</p> <p><b>CO3:</b> Compare, analyze and apply concepts of the principle and working of various types of microscopes.</p> <p><b>CO4:</b> Adhere to strict laboratory safety measures to be followed in a microbiology laboratory.</p> <p><b>CO5:</b> Acquire basic skills in aseptic techniques and acquaint with various sterilization techniques.</p>

**BCH-III.E-3: FUNDAMENTALS OF MICROBIOLOGY (THEORY)**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>	<b>TOTAL HOURS</b>
<b>MODULE 1: History &amp; Development of Microbiology; Ultrastructure of a bacterial cell, growth curve – types, characteristics</b>	<b>1.1 : History and Scope of Microbiology</b> Contributions of Anton von Leeuwenhoek, Louis Pasteur, Robert Koch, Joseph Lister, Alexander Fleming, Paul Ehrlich, Elie Metchnikoff, Edward Jenner in the fields of microbiology and immunology. Basics of Binomial Nomenclature; Classification systems of Whittaker (five Kingdom) and Carl Woese (three Domain). Tree of Life.	<b>05</b>	<b>15</b>
	<b>1.2: Basics of Microscopy</b> Principle, design and working of light microscope (Bright-field, Dark-field, Phase-contrast, Fluorescence). Preparation of samples.	<b>03</b>	
	<b>1.3: Bacterial cell organization, reproduction and growth curve</b> Bacterial cell: Organization and ultrastructure; Gram characteristics. Reproduction in bacteria - Binary fission Bacterial growth curve- characteristics of growth phases; diauxic growth curve	<b>07</b>	
<b>MODULE 2: Methods of cultivating and preserving bacteria</b>	<b>2.1: Cultivation of microorganisms</b> Sterilization: Principle and methods. Types of culture media: Synthetic/defined, complex, solid, liquid, enrichment, selective, differential. Cultivation of microorganisms: Aerobic and anaerobic, Broth cultures, agar plate, pour plate. Determination of viable count: MPN, Serial dilution, spread plating, pour plating, determination of colony forming units (cfu) and calculation of viable count. Isolation of pure cultures: Streak plate; colony characteristics	<b>10</b>	<b>15</b>
	<b>2.2: Maintenance and preservation of microbial cultures</b> Slant and stab cultures, periodic transfer, storage in sterile soil, overlaying with mineral oil, glycerol stocks, preservation in	<b>05</b>	



	liquid nitrogen, lyophilisation		
<b>MODULE 3: Fungi and Viruses</b>	<b>3.1: Fungi</b> General characteristics of fungi: habitat, nutritional requirements, cell ultra-structure, thallus organization, cell wall structure. Reproduction: sexual and asexual reproduction. Mycotoxins.	<b>08</b>	<b>15</b>
	<b>3.2: Viruses</b> Structure and classification: Bacterial, plant and animal viruses. Bacteriophage multiplication (lytic and lysogenic)	<b>07</b>	

### **BCH-III.E-3: FUNDAMENTALS OF MICROBIOLOGY (PRACTICAL)**

<b>SR. NO.</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1.	Introduction to microbiology laboratory equipments: Autoclave, millipore filters and assembly, incubators, hot air oven, Laminar air flow, Biosafety cabinet, microscope, pH meter.	01
2.	Preparation and sterilization of glasswares	01
3.	Preparation and sterilization of liquid and solid culture media.	01
4.	Preparation of media agar plates, butts and slants.	01
5.	Determination of viable count (soil and water sample): Serial dilution, spread plating, quantification of colony forming units (cfu) and calculation of viable count.	03
6.	Isolation of pure cultures: Streak plate (T-streak, quadrant, radiant); colony characteristics	01
7.	Gram staining and cell morphology.	01
8.	Demonstration of coliphage in water sample.	02
9.	Isolation and staining of Fungi (Rhizopus, Mucor, Aspergillus, Penicillium) by lactophenol cotton blue.	02
10.	Decontamination and disposal of cultures	01
	<b>Total</b>	<b>15</b>

## **REFERENCES for BCH-III.E-3 (Latest Editions)**

### **Mandatory Reading**

- Pelczar, M. J., Chan E, C.S., and Krieg, N.R. Microbiology. McGraw Hill Education.
- Willey, J. M., Sherwood, L., Woolverton, C. J. and Prescott, L. M. Prescott, Harley, and Klein's microbiology. New York, McGraw-Hill Higher Education.

### **Supplementary Reading**

- Atlas, R.M., Anantnaryan, R. and Paniker, C.K.J. Textbook of Microbiology, The Orient Blackswan.
- Madigan, M. T., Martinko. J. M. and Parker J. Brock's Biology of Microorganisms, Prentice Hall College Div.
- Stanier, R.Y. General Microbiology, Cambridge University.

### **Web References**

- <https://openstax.org/details/books/microbiology>
- <https://vlab.amrita.edu/?sub=3&brch=73&sim=1105&cnt=1>
- [http://textbookofbacteriology.net/growth\\_3.html](http://textbookofbacteriology.net/growth_3.html)
- <https://www.khanacademy.org/science/biology/bacteria-archaea/prokaryote-structure/v/bacteria>

## SEMESTER IV

<b><u>CORE COURSE: IMMUNOLOGY</u></b>	
<b>COURSE CODE:</b>	<b>BCH-IV.C-6</b>
<b>MARKS:</b>	<b>100</b> (75 – Theory; 25 – Practical)
<b>CREDITS:</b>	<b>4</b> (03 – Theory; 01 – Practical)
<b>CONTACT HOURS:</b>	<b>Theory:</b> 45 Hours (03 Lectures per week) <b>Practical:</b> 30 Hours (01 Practical per week)
<b>COURSE OUTCOMES:</b>	On the successful completion of the course, students will be able to: <b>CO1:</b> Comprehend the scope of the history of immunological studies <b>CO2:</b> Gain knowledge of the structure and function of the cells and organs of immune systems <b>CO3:</b> Describe the mechanisms of Ag-Ab reaction, hypersensitivity reactions and importance of the complement system <b>CO4:</b> Recognize the importance of Monoclonal Ab and various immunodeficiency diseases <b>CO5:</b> Describe the working principle of various techniques involved in Immunology

**BCH-IV.C-6: IMMUNOLOGY (THEORY)**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>	<b>TOTAL HOURS</b>
<b>MODULE 1: Introduction to the immune system and the cells and organs involved</b>	<b>1.1: The immune system</b> Introduction to the immune system - historical perspective; types of immunity (innate and acquired); barriers of innate immunity – anatomic, physiologic, phagocytic, inflammatory; collaboration between innate and adaptive immunity; introduction to humoral and cell mediated immunity	<b>08</b>	<b>15</b>
	<b>1.2: Cells and Organs of the Immune system</b> Cells (myeloid and lymphoid lineage); immune-reactive cells (macrophages, granulocytes, NK Cells); primary lymphoid organs (bone marrow and thymus); secondary lymphoid organs; (spleen, lymph nodes, GALT and MALT).	<b>07</b>	
<b>MODULE 2: B &amp; T cells, Antigen-antibody interactions and the Complement system</b>	<b>2.1: B and T cells</b> B-cells & T-cells – structure; function and significance; maturation, activation of B-cells and T-cells	<b>04</b>	<b>15</b>
	<b>2.2: Antigen-Antibody Interactions</b> Introduction to antigens and antibodies; structure, types, classes, properties and variants (e.g. immunogens, antigens, haptens, adjuvants); paratope and epitope; antigen – antibody interaction; forces involved in antigen-antibody reaction; concept of affinity, avidity, precipitation, agglutination reactions; immunoelectrophoresis, applications in diagnostics. RIA, ELISA.	<b>08</b>	
	<b>2.3: The complement system</b> The complement system; functions, components and activation pathways (classical, alternate & lectin)	<b>03</b>	
<b>MODULE 3: MHC &amp; Hypersensitivity, Vaccines &amp;</b>	<b>3.1: MHC and Autoimmunity</b> Major histocompatibility complex (MHC); introduction and discovery of human histocompatibility complex; structure of MHC I and II; presence of MHC I and II on different cells and their significance;	<b>05</b>	<b>15</b>

<b>Monoclonal antibodies and Autoimmunity</b>	Introduction to autoimmunity with examples; introduction to immunodeficiency types with examples	<b>05</b>	
	<b>3.2: Hypersensitivity</b> Introduction and types of hypersensitivity		
	<b>3.3: Vaccine and Monoclonal Antibodies</b> Introduction to vaccines and types of vaccines; Polyclonal & Monoclonal antibodies (hybridoma technology)	<b>05</b>	

### **BCH-IV.C-6: IMMUNOLOGY (PRACTICAL)**

<b>SR. NO.</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1.	Study of lymphoid organs and cells of the Immune System	01
2.	Total count of WBC & RBCs using haemocytometer	02
3.	Differential count of WBC	01
4.	Blood grouping & Rh factor	01
5.	Preparation of serum	01
6.	Single Radial Immuno-diffusion	02
7.	Ouchterlony's double diffusion method and antibody titre calculation	02
8.	Immuno-electrophoresis	01
9.	ELISA (Demonstration)	02
10	Serological tests involving precipitations (Pregnancy &Widal)	02
	<b>Total</b>	<b>15</b>

## **REFERENCES for BCH-IV.C-6**

### **Mandatory Reading**

- Richard, A. G., Thomas, J. K. & Barbara A. O., (2018). Kuby Immunology, (7th Edition). W. H. Freeman & Company, New York.

### **Supplementary Reading**

- Punt J., Stranford S., Jones P, Owen, J. A. (2018). Kuby Immunology, (8th Edition). W. H. Freeman & Company, New York.
- Arora, M.P. (2006). Cell Biology, Immunology and Environmental Biology, Himalaya Publishing House.
- Rao, C. V. (2011). Immunology (5th Edition), Narosa Publishing House Pvt. Ltd.
- Roitt, I., Brostoff, J. & Male, D.K. (2012). Immunology, (8th Edition). Elsevier Health, UK

### **Web References**

- <https://www.khanacademy.org/test-prep/nclex-rn/rn-immune-system>
- <https://www.youtube.com/watch?v=yDAGxVxY-L8>
- <https://www.frontiersin.org/articles/10.3389/fimmu.2017.00292/full>
- <https://www.ncbi.nlm.nih.gov/books/NBK459471/>
- <https://www.immunology.org/public-information/bitesized-immunology/immune-dysfunction/autoimmunity-introduction>
- <https://www.youtube.com/watch?v=2-57bqFSJ1E>

## SEMESTER IV

<b><u>ELECTIVE COURSE: NUTRITIONAL BIOCHEMISTRY</u></b>	
<b>COURSE CODE:</b>	<b>BCH-IV.E-6</b>
<b>MARKS:</b>	<b>100</b> (75 – Theory; 25 – Practical)
<b>CREDITS:</b>	<b>4</b> (03 – Theory; 01 – Practical)
<b>CONTACT HOURS:</b>	<b>Theory:</b> 45 Hours (03 Lectures per week) <b>Practical:</b> 30 Hours (01 Practical per week)
<b>COURSE OUTCOMES:</b>	On the successful completion of the course, students will be able to: <b>CO1:</b> Explain the various sources of food and RDA <b>CO2:</b> Apply theoretical and practical knowledge of antioxidants in various food samples. <b>CO3:</b> Correlate various nutritional disorders and the importance of diet <b>CO4:</b> Describe and design diet plans for different age groups.

**BCH-IV.E-6: NUTRITIONAL BIOCHEMISTRY (THEORY)**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>	<b>TOTAL HOURS</b>
<b>MODULE 1: Nutrition &amp; Energy Metabolism, Dietary Carbohydrates and Dietary Lipids</b>	<b>1.1: Nutrition and Energy Metabolism</b> Introduction, role of nutrients, unit of energy; Biological oxidation of foodstuff, calorific value of food, Physiological energy value of foods, antioxidants and their role, Recommended Nutrient Intakes (RNI) and Recommended Dietary Allowances (RDA) for different age groups, Basal Metabolic Index (BMI), Water metabolism, electrolyte imbalance; dehydration, Probiotics and prebiotics: sources and significance in the diet	<b>07</b>	<b>15</b>
	<b>1.2: Dietary Carbohydrates</b> Food sources, RDA, hormonal regulation of blood glucose, Diabetes: types and nutrition intake, Glycemic Index, Fiber; food sources, significance, Problems associated with carbohydrate intake.	<b>03</b>	
	<b>1.3: Dietary Lipids</b> Food sources, RDA, significance of: MUFA, PUFA, Saturated fatty acids, Omega fatty acids, TGs, Cholesterol, Lipoproteins, Phospholipids, deficiency and disorders related to dietary lipids.	<b>05</b>	
<b>MODULE 2: Dietary Proteins, Vitamins and Mineral metabolism</b>	<b>2.1: Dietary proteins</b> Essential and non-essential amino acids, Food source, Protein malnutrition, Nitrogen balance Supplements – risk of imbalance and toxicity of amino acids.	<b>04</b>	<b>15</b>
	<b>2.2: Vitamins</b> Fat soluble vitamins: Types and sources, physiological role, deficiency disorders, toxicity. Water soluble vitamins: Types and sources, physiological role, deficiency disorders, toxicity.	<b>06</b>	
	<b>2.3: Mineral Metabolism</b> Macronutrients – calcium, magnesium, sodium, potassium, phosphorus, sulphur and chlorine; physiological role, deficiency disorders and toxicity.	<b>05</b>	



	Trace elements – essential and non-essential - physiological role, deficiency disorders and toxicity.		
<b>MODULE 3: Food Allergens and Diet Plans</b>	<b>3.1: Food allergens</b> Food allergens: gluten, milk and milk products, nuts, soy products, fish and shellfish. PEM – Marasmus and Kwashiorkar and Bulimia.	<b>05</b>	<b>15</b>
	<b>3.2: Diet Plans</b> Atkin’s Diet, Keto Diet, Paleo Diet, Vegetarian and Veganism, Intermittent fasting and its effects on health. Diet plans for different age groups.	<b>10</b>	

#### **BCH-IV.E-6: NUTRITIONAL BIOCHEMISTRY (PRACTICAL)**

<b>SR. NO.</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1.	Preparation of Probiotics, microscopy and sensory evaluation	02
2.	Assessment of Vitamin constituents in various foods: Lycopene, - $\beta$ carotene	06
3.	Assessment of Nutritional Disorders: Anaemia, Hyperglycemia	02
4.	Formulating a Diet Plan: Diabetes, Sports Persons, Pregnancy	05
	<b>Total</b>	<b>15</b>

## REFERENCES for BCH-IV.E-6

### Mandatory Reading

- Gibson, R. Principles of Nutritional Assessment. Oxford University Press.

### Supplementary Reading

- Frazier, W.C and Westhoff, D.C. Food Microbiology. McGraw Hill Education (India) Private Limited: New Delhi
- Tiwari, R.P., Hoondal, G.S. and Tewari, R. Laboratory Techniques in Microbiology and Biotechnology, Abhishek Publications Chandigarh (India).
- Murray, R.K., Granner, D.K., Mayes, P.A. and Rodwell, V.W. Harper's Illustrated Biochemistry, Twenty-Sixth Edition Lange Medical Publications. New York
- Williams, M.H., Anderson, D.E. and Rawson, E.S. Nutrition for health, fitness and sport; McGraw Hill international edition.

### Web References

- <http://www.biologydiscussion.com/nutrition/nutritional-characteristics-of-a-substance-protein-value/44329>
- <https://www.khanacademy.org/science/high-school-biology/hs-biology-foundations/hs-biological-macromolecules/v/introduction-to-vitamins-and-minerals>
- <https://www.khanacademy.org/test-prep/mcat/biomolecules/enzyme-structure-and-function/v/cofactors-coenzymes-and-vitamins>
- <https://www.khanacademy.org/science/health-and-medicine/gastrointestinal-system-diseases/celiac-disease/v/what-is-gluten>
- <https://www.khanacademy.org/test-prep/mcat/biological-sciences-practice/biological-sciences-practice-tut/e/the-underlying-mechanism-of-milk-allergies->

## SEMESTER IV

<b><u>ELECTIVE COURSE: ENDOCRINOLOGY</u></b>	
<b>COURSE CODE:</b>	<b>BCH-IV.E-7</b>
<b>MARKS:</b>	<b>100</b> (75 – Theory; 25 – Practical)
<b>CREDITS:</b>	<b>4</b> (03 – Theory; 01 – Practical)
<b>CONTACT HOURS:</b>	<b>Theory:</b> 45 Hours (03 Lectures per week) <b>Practical:</b> 30 Hours (01 Practical per week)
<b>COURSE OUTCOMES:</b>	On the successful completion of the course, students will be able to: <b>CO1:</b> Describe and differentiate the structure, receptors, and mechanism of actions of hormones. <b>CO2:</b> Comprehend and study the physiological actions of various hormones on the human body. <b>CO3:</b> Explain how disruptions in cellular signaling may lead to disease, and illustrate with selected examples. <b>CO4:</b> Analyze the correlation of hormones to human disorders and the consequences of under-and over-production of hormones. <b>CO5:</b> Perform pregnancy tests and examine the role of reproductive hormones in relation to pregnancy.

**BCH-IV.E-7: ENDOCRINOLOGY (THEORY)**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>	<b>TOTAL HOURS</b>
<b>MODULE 1: Introduction to endocrinology</b>	<b>1.1 Introduction to endocrine system</b> Overview of organ system and their role in hormone production.	<b>01</b>	<b>15</b>
	<b>1.2: Hormone, Receptor mechanism and Control system</b> Chemical classification of hormones, Pathways of hormone action , Regulation of hormone secretion.	<b>04</b>	
	<b>1.3: Hypothalamic and pituitary hormones</b> Classification of hypothalamic and pituitary hormones. Overview on ADH, GH, MSH, ACTH, Ghrelin, Oxytocin, Prolactin. Feedback regulation. Pathophysiology - gigantism, dwarfism and diabetes insipidus	<b>10</b>	
<b>MODULE 2: Thyroid and Parathyroid Hormone</b>	<b>2.1: Thyroid Hormone</b> Physiology and biosynthesis of thyroid hormone and its regulation; TSH - physiological and biochemical action. Pathophysiology - Goiter, Grave's disease, cretinism	<b>07</b>	<b>15</b>
	<b>2.2: Parathyroid Hormone</b> Bone physiology. Chemistry, physiology and mechanism of role of PTH, Vitamin D and calcitonin in regulation of Ca <sup>+</sup> homeostatis. Pathophysiology - rickets, osteomalacia, osteoporosis	<b>08</b>	
<b>MODULE 3: Pancreatic, Adrenal and Reproductive Hormone</b>	<b>3.1: Pancreatic and GI Hormones</b> Synthesis and regulation of release of insulin and glucagon, gastrin, secretin, CCK Pathophysiology - diabetes type I and type II.	<b>05</b>	<b>15</b>
	<b>3.2: Adrenal Hormones</b>	<b>05</b>	

	<p>Synthesis and mechanism of action of Epinephrine and norepinephrine. Fight or flight response. Pathophysiology – Addison’s disease, Cushing syndrome</p> <p><b>3.3: Reproductive Hormones</b> Synthesis and regulation of male and female sex hormones, Hormones during menstrual cycle, pregnancy, parturition.</p>	<b>05</b>	
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### BCH-IV.E-7: ENDOCRINOLOGY (PRACTICAL)

<b>SR. NO.</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1.	Histology of endocrine structures	03
2.	hCG based pregnancy test	01
3.	Ovulation test	01
4.	Case studies	10

## REFERENCES for BCH-IV.E-7

### Mandatory Reading

- Kovacs, W.J. and Ojeda, S.R. Textbook of Endocrine Physiology. Oxford University Press

### Supplementary Reading

- Sembulingam K. and Sembulingam P. Essentials of Medical Physiology Jaypee Brothers Medical Publishers, New Delhi, India.
- Hadley, M.C. and Levine. Endocrinology J.E. Pearson Education, New Delhi.

### Web References

- <https://www.youtube.com/watch?v=YcPicFL5Jnw>
- <https://www.youtube.com/watch?v=9o2dqeajWsl>
- <https://www.ncbi.nlm.nih.gov/books/NBK279388/>
- <http://www.vivo.colostate.edu/hbooks/pathphys/endocrine/thyroid/physio.html>
- <https://opentextbc.ca/biology/chapter/24-4-hormonal-control-of-human-reproduction/>
- <https://www.youtube.com/watch?v=HZhz-7Grux0>
- <https://www.khanacademy.org/science/health-and-medicine/advanced-endocrine-system/endocrine-system-introduction/v/hypothalamus-and-pituitary-gland>
- <https://www.youtube.com/watch?v=dX1QsJ7e7LI>
- <https://openstax.org/details/books/biology-2e>

## SEMESTER VI

<b><u>CORE COURSE: CLINICAL BIOCHEMISTRY</u></b>	
<b>COURSE CODE:</b>	<b>BCH-VI.C-8</b>
<b>MARKS:</b>	<b>100</b> (75 – Theory; 25 – Practical)
<b>CREDITS:</b>	<b>4</b> (03 – Theory; 01 – Practical)
<b>CONTACT HOURS:</b>	<b>Theory:</b> 45 Hours (03 Lectures per week) <b>Practical:</b> 30 Hours (01 Practical per week)
<b>COURSE OUTCOMES:</b>	On the successful completion of the course, the students will be able to: <b>CO1:</b> Identify the metabolic factors of common diseases and multifactorial disorders. <b>CO2:</b> Determine various diagnostic tests associated with lipid, carbohydrate metabolism. <b>CO3:</b> Define complex genetic and metabolic traits and molecular and cellular therapies for the same <b>CO4:</b> Critique the current screening programmes in various countries. <b>CO5:</b>

**BCH-V.C-8: CLINICAL BIOCHEMISTRY (THEORY)**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>	<b>TOTAL HOURS</b>
<b>MODULE 1: Laboratory Analysis of clinical samples</b>	<p><b>1.1: Analysis of Blood, Serum and Urine</b> Composition of Blood, Serum, Cerebrospinal Fluid and Urine. Collection, Preservation and Handling of clinical samples.</p>	<b>02</b>	<b>15</b>
	<p><b>1.2: Analysis of Blood, Serum and Urine</b> <b>Blood:</b> Haemoglobin, Total cell and Differential cell (TC/DC) counts, Erythrocyte sedimentation Rate (ESR); Clotting time, Glucose tolerance test, Urea; Gases: Oxygen and Carbon dioxide levels; pH. <b>Serum:</b> Proteins, Albumin/Globulin Ratio; Bilirubin; Creatinine; Uric acid; Electrolytes. <b>Urine:</b> Colour, Odour, Sediment, Crystals, Glucose; Protein/Albumin</p>	<b>13</b>	
<b>MODULE 2: Congenital and Autoimmune diseases</b>	<p><b>2.1: Inborn errors of metabolism</b> Disorders associated with carbohydrate metabolism- Glycogen storage diseases, Galactosemia. Protein metabolism – Phenylketonuria, Alkaptonuria. Lipid metabolism – Niemann – Pick disease, Tay- Sach’s disease. Disorders due to chromosomal aberrations –Down syndrome Skin – Xeroderma pigmentosum Purine/pyrimidine – Lesch-Nyhan Syndrome Porphyrins – acute intermittent porphyria</p>	<b>09</b>	<b>15</b>
	<p><b>2.2 : Metabolic disorders</b> Carbohydrate – Diabetes mellitus Type I and Type II; Ketosis. Lipids – Dyslipidemia. Proteins – Albuminuria Blood – Anaemia: Haemolytic, Pernicious, Sickle cell anaemia; Iron deficiency. Heart – Hypertension, Arteriosclerosis Liver – Hepatitis. Kidney –Diabetes insipidus</p>	<b>06</b>	
<b>MODULE 3:</b>	<b>3.2: Tests for Diseases</b>	<b>15</b>	<b>15</b>



<b>Diagnostic Tests</b>	<p>Blood: Total and differential blood count, Blood groups and Rh factor incompatibility.</p> <p>Liver disorders and Liver function tests: Bilirubin metabolism, Types of jaundice and clinical assessment, Acute and chronic liver diseases, Cirrhosis, Viral, Metabolic and Drug induced/toxic liver diseases, Liver function tests</p> <p>Kidney disorders and Renal function tests: Glomerular filtration rate, Renal threshold and clearance values, Disorders of kidney, Renal failure and proteinuria, Renal tubular disorders and renal stones, Renal function tests.</p> <p>Heart: Role of enzymes and other proteins in assessment of myocardial infarction.</p>		
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### **BCH-VI.C-8: CLINICAL BIOCHEMISTRY (PRACTICAL)**

SR. NO.	PRACTICAL	NO. OF PRACTICALS
1.	Bleeding and Clotting time	01
2.	Blood Grouping	01
3.	Erythrocyte Sedimentation Rate	01
4.	Glucose Tolerance Test	01
5.	Measurement of Blood Pressure	01
6.	Physical & Chemical Examination of Urine	03
7.	RBC & WBC count	02
8.	PCV Test	01
9.	Case Studies	04
	<b>Total</b>	<b>15</b>

#### **REFERENCES for BCH-V.C-8**

### **Mandatory Reading**

- Pattabiraman R. N. Text book of Biochemistry, All India Publisher distribution.

### **Supplementary Reading**

- Chatterjee M. N., Shinde, R. Text book of Medical Biochemistry, Jaypee Publishers.
- Vasudevan, D. M., Sreekumari S., Text book of Biochemistry for Medical Students, Jaypee Publishers.
- Berg, Jeremy M., Tymoczko, John L., Stryer Lubert. Biochemistry, W.H. Freeman, N. York.
- David, L. N., Michael, M. C., Lehninger, Albert, Biochemistry, Kalyani Publications, N.

### **Web References:**

- George, F. Hoffmann., Johannes, Z., William, L. Nyhan. Inherited Metabolic Disorders: A clinical approach, Springer.
- Fernandes, J., Saudubray, J.M., van Den Berghe, G. Inborn Metabolic Diseases. Springer.

## SEMESTER VI

<b><u>ELECTIVE COURSE: GENETIC ENGINEERING AND BIOTECHNOLOGY</u></b>	
<b>COURSE CODE:</b>	<b>BCH-VI.E-15</b>
<b>MARKS:</b>	<b>100</b> (75 – Theory; 25 – Practical)
<b>CREDITS:</b>	<b>4</b> (03 – Theory; 01 – Practical)
<b>CONTACT HOURS:</b>	<b>Theory:</b> 45 Hours (03 Lectures per week) <b>Practical:</b> 30 Hours (01 Practical per week)
<b>COURSE OUTCOMES:</b>	On the successful completion of the course, the students will be able to: <b>CO1:</b> Describe the concept of genetic engineering and its importance to biotechnology <b>CO2:</b> Summarize the various tools/requirements for carrying out genetic manipulations <b>CO3:</b> Explain the processes of transformation as well as principles governing DNA separation, amplification and sequencing techniques <b>CO4:</b> Illustrate the applications of genetic engineering in current use <b>CO5:</b> Carry out experiments such as transformation, DNA and RNA isolation

**BCH-VI.E-15: GENETIC ENGINEERING AND BIOTECHNOLOGY (THEORY)**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>	<b>TOTAL HOURS</b>
<b>MODULE 1: Introduction of Genetic Engineering &amp; the basic Tools required for it</b>	<p><b>1.1: Introduction to Genetic Engineering and Biotechnology</b> General features and mechanisms of genetic engineering, Concept of biotechnology, Applications and ethical issues of recombinant DNA technology, Gene cloning</p>	<b>03</b>	<b>15</b>
	<p><b>1.2: DNA Modifying enzymes and Vectors for Gene Cloning</b> Nucleases- Endonucleases (Restriction enzymes recognition sequences, Cleavage pattern), Exonucleases, Host control restriction and modification, DNA ligases, Reverse Transcriptases, Polynucleotide kinases, Alkaline phosphatases, Nucleotidyl transferases Vectors, Properties of ideal cloning vectors, Types of cloning vectors; Plasmid vectors: Properties, Classification, pBR322, pUC 18 Bacteriophage vectors, Lambda phage: Features, Insertional vectors and Replacement vectors, M13 Bacteriophage Hybrid vectors: Cosmids, Phagemids and Phasmids; Shuttle vectors; Plant vectors</p>	<b>12</b>	
<b>MODULE 2: Transformation methods and Blotting techniques for DNA &amp; RNA</b>	<p><b>2.1: Transformation methods and identification of recombinants</b> DNA insertion into vectors: Ligation, Use of linkers and Adaptors, Homopolymer tailing Competence (transformation in bacteria): Microinjection, Lipofection, Electroporation, Macroinjection, Sonication, Silicon carbide fibre vortex, DNA co-precipitation, Ultrasonication, Laser induced Identification of Recombinants: Principle and importance of identification of recombinants: Antibiotic resistance (amp, tet resistance), lac Z selection, Colony hybridization</p>	<b>10</b>	<b>15</b>
	<p><b>2.2: Blotting Techniques for DNA and RNA</b> Isolation of Genomic DNA and RNA,</p>	<b>05</b>	

	<p>Agarose gel electrophoresis, Southern blotting: Blotting of DNA from agarose gel by capillary action onto nitrocellulose membrane, Denaturing of DNA, Hybridisation with radiolabelled P 32 , Autoradiography</p> <p>Northern blotting: Blotting of RNA from agarose gel onto nitrocellulose membrane, Hybridisation with radiolabelled probe, Autoradiography</p>		
<b>MODULE 3:</b>	<p><b>3.1: DNA Amplification and Sequencing</b>  DNA amplification: Polymerase chain reaction (PCR) – Principle, Components, Method and Applications  DNA sequencing: Significance and importance, Basic methods: Maxam Gilbert’s method, Sanger’s method. Advanced method: Shotgun method, Automatic DNA sequencer</p> <p><b>3.2: Genomic and cDNA libraries</b>  Preparation of genomic library, cDNA library, Screening of Libraries</p> <p><b>3.3: Genetic Engineering in Biotechnology</b>  Genetic engineering applications:  In agriculture – Flavr Savr tomato, Golden rice, Plant resistance to desiccation, cold, heat, pests  In pharmaceuticals – Recombinant insulin, Blood clotting factor VIII, Edible vaccines  In environment – Superbug</p>	<p><b>08</b></p> <p><b>02</b></p> <p><b>05</b></p>	<b>15</b>

**BCH-VI.E-15: GENETIC ENGINEERING AND BIOTECHNOLOGY  
(PRACTICAL)**

<b>SR. NO.</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1.	Isolation of plasmid DNA by alkaline lysis and boiling prep method, and molecular weight determination by gel electrophoresis	04
2.	Restriction digestion of plasmid DNA and analysis by gel electrophoresis	02
3.	Preparation of competent cells in bacteria	02
4.	Transformation in bacteria using plasmid vector (pUC 18)	02
5.	Screening of transformants	02
6.	Deciphering the DNA sequence from a sequencing gel photograph by Maxam and Gilbert's method and Sanger's method	02
7.	Blotting techniques (virtual laboratory)	01
	<b>Total</b>	<b>15</b>

## REFERENCES for BCH-VI.E-15

### Mandatory Reading

- Singh, B. D. (2008). Biotechnology: Expanding Horizons, Kalyani Publishers.

### Supplementary Reading

- Primrose, S. B. and Twyman, R. M. (2009). Principles of Gene Manipulation and Genomics, Blackwell Publishing.
- Jogdand, S. N. (2008). Gene Biotechnology, 2nd edition, Himalaya Publishing House, Mumbai.
- Purohit, S. S. (2009). Biotechnology: Fundamentals and Applications, Student Edition.
- Watson, J. D., Tooze, J. and Kurtz, D. T. (1983). Recombinant DNA: A short Course, Scientific American Books (WH Freeman), New York.

### Web References:

- <https://www.khanacademy.org/science/high-school-biology/hs-molecular-genetics/hs-biotechnology/v/introduction-to-genetic-engineering>
- [https://bio.libretexts.org/Bookshelves/Microbiology/Book%3AMicrobiology\\_\(Bruslind\)/18%3AGenetic\\_Engineering](https://bio.libretexts.org/Bookshelves/Microbiology/Book%3AMicrobiology_(Bruslind)/18%3AGenetic_Engineering)
- [https://bio.libretexts.org/Bookshelves/Microbiology/Book%3AMicrobiology\\_\(Boundless\)/7%3AMicrobial\\_Genetics/7.23%3AGenetic\\_Engineering\\_Products/7.23B%3A\\_Applications\\_of\\_Genetic\\_Engineering](https://bio.libretexts.org/Bookshelves/Microbiology/Book%3AMicrobiology_(Boundless)/7%3AMicrobial_Genetics/7.23%3AGenetic_Engineering_Products/7.23B%3A_Applications_of_Genetic_Engineering)
- <https://www.slideshare.net/gnsk143/gene-transformation-methods>
- [https://www.brainkart.com/article/Identification-of-Recombinants---Recombinant-DNA-Technology\\_21278/](https://www.brainkart.com/article/Identification-of-Recombinants---Recombinant-DNA-Technology_21278/)

## SEMESTER V

<b><u>CORE COURSE: MOLECULAR BIOLOGY</u></b>	
<b>COURSE CODE:</b>	<b>BCH-V.C-7</b>
<b>MARKS:</b>	<b>100</b> (75 – Theory; 25 – Practical)
<b>CREDITS:</b>	<b>4</b> (03 – Theory; 01 – Practical)
<b>CONTACT HOURS:</b>	<b>Theory:</b> 45 Hours (03 Lectures per week) <b>Practical:</b> 30 Hours (01 Practical per week)
<b>COURSE OUTCOMES:</b>	On the successful completion of the course, the students will be able to: <b>CO1:</b> Explain the structure of DNA and its properties. <b>CO2:</b> Distinguish between DNA, RNA and Proteins. <b>CO3:</b> Understand basic concepts in molecular biology <b>CO4:</b> Describe the method of DNA replication <b>CO5:</b> Master skills in isolating genetic material from prokaryotes and eukaryotes.



**BCH-V.C-7: MOLECULAR BIOLOGY (THEORY)**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>	<b>TOTAL HOURS</b>
<b>MODULE 1: Chemical Nature of Genetic Materials</b>	<p><b>1.1: Nucleic Acids, bonds, types of DNAs, DNA packaging and model organisms</b> Structural components of nucleic acid: Sugar, Phosphate, Nucleosides and Nucleotides; Structure of DNA: Watson – Crick Model, Different forms of DNA (B, Z), Forces stabilizing the structure of DNA, Unusual structures of DNA (palindromic, mirror repeat, hairpin bent, cruciform); Structure of RNA, Different forms of RNA (mRNA, rRNA, tRNA); Differences between DNA and RNA</p> <p><b>1.2: Chromosome</b> Fundamental functions of DNA. Chromosomal DNA and its packaging in the chromatin fibre. Chromatin structure, structural features (Telomere, Centromere and Repetitive sequences) of chromosomes and their functions.</p>	<p><b>10</b></p> <p><b>05</b></p>	<b>15</b>
<b>MODULE 2: Experiments proving DNA/RNA a genetic material and DNA Replication</b>	<p><b>2.1: Basic Concepts in Molecular Biology</b> DNA/RNA as genetic material: S. F. Griffith's transforming principle, and Avery, Hershey and Chase Experiment proving DNA as genetic material; RNA as the genetic material of some viruses, Chargaff's experiments and Law</p> <p><b>2.2: DNA Replication</b> Experimental evidence for semi-conservative DNA replication in E.coli - Messelson and Stahl's experiment The basic requirements of DNA replication: DNA template; DNA polymerases: Structure and function, Ancillary proteins associated with replication Mechanism of replication: Initiation, Elongation and Termination</p>	<p><b>08</b></p> <p><b>07</b></p>	<b>15</b>
<b>MODULE 3: DNA damage, repair and recombination</b>	<p><b>3.1: DNA Damage and its Repair</b> Types of DNA damage (spontaneous and induced DNA damage). Mechanisms/pathways to remove damaged DNA: Excision repair, mismatch repair, recombination repair in E. coli and SOS</p>	<b>08</b>	<b>15</b>

	<p>Repair. Role of RecA in DNA damage repair, Photoreactivation repair in E.coli involving photolyase.</p> <p><b>3.2: Mechanisms of Genetic Recombination</b>  General and site specific recombination.  Heteroduplex DNA formation (Homologous recombination).  Synaptonemal Complex, Bacterial RecBCD system and its stimulation of chi sequences.  Role of RecA protein, homologous recombination, Holliday junctions.</p>	07	
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### BCH-V.C-7: MOLECULAR BIOLOGY (PRACTICAL)

SR. NO.	PRACTICAL	NO. OF PRACTICALS
1.	Isolation of genomic DNA from prokaryotes	02
2.	Isolation of genomic DNA from eukaryotes	02
3.	Isolation of RNA from prokaryotes	02
4.	Purity of DNA by spectrophotometric method	01
5.	Agarose gel electrophoresis of genomic DNA	03
6.	Elution of DNA from agarose gel	02
7.	Mutagenesis in E.coli cells – UV or Chemical mutagens	03
	<b>Total</b>	<b>15</b>

## REFERENCES for BCH-IV.E-7

### Mandatory Reading

- Nelson, D. L. & Cox, M.M. (2017). Lehninger's Principles of Biochemistry (7th Edition). Worth Publishers, New York, USA.

### Supplementary Reading

- Stryer, L; Berg, J; Tymoczko, J & Gatto, G. (2019). Biochemistry (9th Edition). W. H. Freeman and Co., New York, USA.
- Murray, R. K, Granner, D. K., Mayes, P. A. & Rodwell, V. W. (2018). Harper's Illustrated Biochemistry (31st Edition). McGraw-Hill Companies.
- Jain, J. L.; Jain S. & Jain N. (2016). Fundamentals of Biochemistry (7th Edition). S.Chand and Company, Ltd., New Delhi.
- Verma, P. S. and Agarwal, V. K. (2013). Cell Biology, Genetics, Molecular Biology, Evolution and Ecology, S. Chand and Company Pvt. Ltd.
- Harvey, R.A. & Ferrier, D.R. (2017). Lippincott's Illustrated Reviews, Biochemistry (7th Edition). Lippincott Williams and Wilkins.
- Voet, D. & Voet, J. G. (2004). Biochemistry (4th Edition). John Wiley & Sons, Inc, USA.

### Web References:

- <https://www.khanacademy.org/science/high-school-biology/hs-molecular-genetics>
- <https://vlab.amrita.edu/?sub=3&brch=73&sim=1105&cnt=1>.
- [http://textbookofbacteriology.net/growth\\_3.html](http://textbookofbacteriology.net/growth_3.html)
- <https://openstax.org/details/books/biology-2e>
- [https://bio.libretexts.org/Bookshelves/Introductory\\_and\\_General\\_Biology/Book%3A\\_Concepts\\_in\\_Biology\\_\(OpenStax\)/9%3A\\_Molecular\\_Biology](https://bio.libretexts.org/Bookshelves/Introductory_and_General_Biology/Book%3A_Concepts_in_Biology_(OpenStax)/9%3A_Molecular_Biology)

## SEMESTER V

<b><u>ELECTIVE COURSE: BIOINFORMATICS</u></b>	
<b>COURSE CODE:</b>	<b>BCH-VE.-1</b>
<b>MARKS:</b>	<b>100</b> (75 – Theory; 25 – Practical)
<b>CREDITS:</b>	<b>4</b> (03 – Theory; 01 – Practical)
<b>CONTACT HOURS:</b>	<b>Theory:</b> 45 Hours (03 Lectures per week) <b>Practical:</b> 30 Hours (01 Practical per week)
<b>COURSE OUTCOMES:</b>	On the successful completion of the course, the students will be able to: <b>CO1:</b> Understand the importance of computers and networking in the field of biology <b>CO2:</b> Use various tools and techniques for deriving information stores <b>CO3:</b> Utilize various biological databases that contain genetic information of various organisms <b>CO4:</b> Describe the importance and significance of the Human Genome Project

**BCH-V.E-11: BIOINFORMATICS (THEORY)**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>	<b>TOTAL HOURS</b>
<b>MODULE 1: Introduction to Bioinformatics; Information resources</b>	<b>1.1: Introduction to Bioinformatics</b> Definition, Scope of bioinformatics Introduction to use of computers in biology, Internet and software in biology, Medicine and research, Historical developments in biology Bioinformatics: Components and applications	<b>10</b>	<b>15</b>
	<b>1.2: Information resources</b> Introduction, Aim and objectives (NCBI, NLM, NIH, EBI and SRS)	<b>05</b>	
<b>MODULE 2: Types of Databases</b>	<b>2.1: Types of Databases</b> Biological databases: Primary databases – Gen Bank and EMBL, DDBJ; Secondary databases - Swiss-PROT, PDB and PIR; Composite databases – OWL and PROSITE Structural databases: PDB, MMDB, CATH and SCOP; Visualization of proteins – Cn3D and Rasmol Literature databases: Pubmed, MedLINE and OMIM		<b>15</b>
<b>MODULE 3: Sequence Alignment tools &amp; phylogeny; HGP</b>	<b>3.1: Sequence Alignment Tools and Phylogeny</b> Introduction to sequence alignment and phylogeny; BLAST and FASTA, and their types; ORF Pairwise sequences alignment, Multiple sequence alignment using Clustal-W Omega Phylogenetic tree: Introduction, Definition, Structure, Types and Construction Cladogram and differences with phylogenetic tree	<b>10</b>	<b>15</b>
	<b>3.2: Human Genome Project</b> Introduction to Human Genome Project (HGP), Objectives, Ethical and social issues	<b>05</b>	

## BCH-V.E-12: BIOINFORMATICS (PRACTICAL)

SR. NO.	PRACTICAL	NO. OF PRACTICALS
1.	Usage of NCBI resources for biological databases – Protein or amino acid sequences – DNA or gene sequences	05
2.	Usage of NCBI resources for – Structure databases – Literature databases	03
3.	Database search and Pairwise sequence alignment using NCBI BLAST: BLASTp, BLASTn	02
4.	Multiple sequence alignment using Clustal-W	01
5.	Construction of phylogenetic tree using Clustal-W	01
6.	DNA sequence analysis to find restriction enzymes sites using NEB cutter	01
7.	Visualization of protein structures using Cn3D/ Rasmol	02
	<b>Total</b>	<b>15</b>

## **REFERENCES for BCH-V.E-12**

### **Mandatory Reading**

- Harisha, S. (2007). Fundamentals of Bioinformatics, I. K. International Publishing House, Mumbai.

### **Supplementary Reading**

- Ignacimuthu, S. (2005). Basic Bioinformatics, Narosa Publishing House, New Delhi.
- Mount, D. W. (2004). Bioinformatics – sequence and Genome analysis, CBS Publishers.
- Murthy, C. S. V. (2003). Bioinformatics, Himalaya Publishing House, Mumbai.
- Rastogi, S. C., Mendiratta, N. and Rastogi, P. (2004). Bioinformatics: Concepts, Skills and Applications, CBS Publishers.
- Xiong, J. (2006). Essential Bioinformatics, Cambridge University Press.

### **Web References:**

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## SEMESTER V

<b><u>ELECTIVE COURSE: INDUSTRIAL BIOCHEMISTRY</u></b>	
<b>COURSE CODE:</b>	<b>BCH-VE.-11</b>
<b>MARKS:</b>	<b>100</b> (75 – Theory; 25 – Practical)
<b>CREDITS:</b>	<b>4</b> (03 – Theory; 01 – Practical)
<b>CONTACT HOURS:</b>	<b>Theory:</b> 45 Hours (03 Lectures per week) <b>Practical:</b> 30 Hours (01 Practical per week)
<b>COURSE OUTCOMES:</b>	On the successful completion of the course, the students will be able to: <b>CO1:</b> Demonstrate the understanding of the various industrial product development <b>CO2:</b> Correlate various industrial products to the types of media and organisms used <b>CO3:</b> Explain and analyze biological sources various assays <b>CO4:</b> Describe the working of industrial-based equipment



**BCH-V.E-11: INDUSTRIAL BIOCHEMISTRY (THEORY)**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>	<b>TOTAL HOURS</b>
<b>MODULE 1: Introduction to Industrial Biochemistry</b>	<b>1.1: Introduction</b> Overview of industrial fermentation technology, scope and applications.	<b>01</b>	<b>15</b>
	<b>1.2: Industrial bioreactor</b> Fermenters: Structure of an Ideal fermentor Parts of the fermentor and their uses – Impellers, Spargers, Baffles, Headspace, Controls and Sensors (temperature, pH, antifoam) Types of reactors (definition, description, diagram and uses) - Bubble columns, Airlift, Fluidized bed, Packed bed, Tray bioreactors, Photo-bioreactors	<b>08</b>	
	<b>1.3: Fermentation Media</b> Characteristics of an ideal fermentation medium, types of media – crude and synthetic, composition of fermentation media.	<b>06</b>	
<b>MODULE 2: Types of Fermentation and Screening of microorganisms</b>	<b>2.1: Types of fermentation</b> Submerged, Surface/Solid state, Batch, Fed-batch, Continuous and Pilot Scale fermentors	<b>07</b>	<b>15</b>
	<b>2.2: Screening of microorganisms</b> Characteristics of microorganisms, strain improvement, Screening procedures: Primary screening: Definition, Methods of primary screening – Crowded plate, Auxanography, Enrichment, Indicator dye Secondary screening: Definition and features, Example of secondary screening (giant colony method)	<b>08</b>	
<b>MODULE 3: Detection &amp; assays of products; Industrial production of products</b>	<b>3.1: Detection and Assays of products</b> Physical and Chemical assays - Titration and gravimetric assay, Turbidity analysis and Cell determination, Spectrophotometric assay Biological assays - Diffusion assays, Turbidometric and Growth assay	<b>08</b>	<b>15</b>
	<b>3.2: Industrial production of economically important products</b> Citric acid, Vinegar, Industrial alcohol	<b>07</b>	

	(Ethanol), SCP, Beer, Wine Indian fermented foods: Dosa, idli		
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### **BCH-V.E-11: INDUSTRIAL BIOCHEMISTRY (PRACTICAL)**

<b>SR. NO.</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1.	Study of a fermentor	01
2.	A study on the phases of growth of microorganisms during fermentation	02
3.	Media preparation for batch fermentation process	01
4.	Decontamination and sterilization of the fermentor	01
5.	Primary screening of antibiotic producing bacteria by crowded plate technique	02
6.	Secondary screening for antibiotic producers by giant colony technique	01
7.	Production of wine (from fruit) using yeast	02
8.	Production of vinegar	02
9.	Estimation of total reducing sugars and acidity (total and volatile) in wine and vinegar before and after fermentation	01
10.	MIC of an antibiotic	02
	<b>Total</b>	<b>15</b>

## REFERENCES for BCH-V.E-11

### Mandatory Reading

- Stanbury P. F, Whitaker A. and Hall. (1997). Principles of fermentation technology, 2<sup>nd</sup> Edition, Aditya Books Pvt. Ltd, New Delhi.
- Casida L. E. (2009). Industrial Microbiology, New Age International (P) Ltd. New Delhi.

### Supplementary Reading

- Okafor N. (2007). Modern Industrial Microbiology and Biotechnology, Science Publishers Enfield, NH, USA.
- Patel A. H. (2012). Industrial Microbiology, MacMillan Publishers India Ltd.
- Prescott and Dunn. (1982). Industrial Microbiology, 4th edition, AVI Publishing Co.
- Ratlege C. and Kristiansen B. (2001). Basic Biotechnology, 2nd edition. Cambridge university press.

### Web References:

- <http://www.biologydiscussion.com/fermentation/fermentation-technology-meaning-methodology-types-and-procedure/17492>
- <https://study.com/academy/lesson/bacterial-fermentation-process-products.html>
- <https://study.com/academy/lesson/alcohol-fermentation-definition-equation-process.html>
- <http://www.biologydiscussion.com/biotechnology/bioprocess-technology/media-used-for-the-growth-of-microorganisms/10096>
- <http://www.biologydiscussion.com/industrial-microbiology-2/fermentation-industrial-microbiology-2/production-of-ethanol-microbiology/66072>

# **BIOTECHNOLOGY**

## BIO-I.C-1: BASIC MICROBIOLOGY

### Theory (75 marks)

**COURSE OBJECTIVE:** The main aim of this paper is to introduce the students to the vast world of Microbiology. This course covers a range of topics in Basic Microbiology from the historical perspective to the structure and composition of microorganisms, their interactions with the environment and their impact on humans.

**LEARNING OUTCOME:** On completion of this module, students will be able to understand the scope and importance of Microbiology, classification schemes, cultivation, preservation and maintenance of the microbial cultures.

Sr.no.	Topics	Sub Topics	No. of hours
1.	History & Scope of Microbiology	- Historical Account from 16 <sup>th</sup> – 18 <sup>th</sup> century	2
2.	Basics of Microscopy	- Principle of working of Light microscope (Bright-field, Dark-field, Phase-contrast, Fluorescence)	3
3.	Bacterial Taxonomy	- Introduction to Archaea - Taxonomic ranks - Classification Systems (Phenetic, Numerical, Phylogenetic) - Bergey's Manual of Systematic/ Determinative Bacteriology and rDNA sequencing	8
4.	Organization and Ultrastructure of a Bacterial cell	- Cell wall: structure and chemical composition in gram positive and gram negative bacteria. - Introduction to Cell membrane, pili, fimbriae and capsule - Flagella structure and function. - Nucleoid and plasmids: nature and function. - Endospore: structure, sporulation and germination. - Reserve materials	8
5.	Reproduction in bacteria	- Binary fission - Definitions: cell growth, growth rate, generation time. - Bacterial growth curve, characteristics of growth phases; diauxic, continuous, continuous & synchronous growth.	4
6.	Bacteria in Extreme Environments	- Thermophiles, barophiles, halophiles, acidophiles and alkaliphiles	4
7.	Viruses	- Basic Classification and Structure of Viruses (Prokaryotic and Eukaryotic) - Characteristic features of $\lambda$ phage - Viral replication (lytic and lysogenic)	7
8.	Algae	- General Characteristic Features (cyanobacteria)	3
9.	Fungi	- General Characteristic Features (yeast)	3
10.	Protozoa	- General Characteristic Features ( <i>Plasmodium</i> )	3
<b>Total</b>			<b>45</b>

### Practical (25 marks)

Sr. no.	Practical topics	Practical hours
1.	Introduction to microbiology laboratory: Concepts of sterilization	1
2.	Introduction to Laminar Air Flow, Autoclave, pH meter, Incubator, Microwave	2
3.	Preparation and Sterilization of Glassware	1
4.	Preparation of media and autoclaving	1
5.	Pour Plate Technique and Open Air Cultures	1
6.	Bacterial Isolation Techniques: Streaking Methods - Simple continuous, T-streak, Quadrant, Radiant.	1
7.	Introduction to Microscope Preparation and Staining of specimen	2
8.	Isolation and Staining of Fungi by Lactophenol cotton blue	1
9.	Study of Algal specimens & Protozoans in pond water.	1
10.	Preparation for Biochemical tests for Bacterial Identification	1
11.	Use of biochemical tests for bacterial identification: IMViC test, carbohydrate test	2
12.	Cleaning and Decontamination	1
<b>Total</b>		<b>15</b>

### References

1. Prescott, Harley, Klein .2008. Microbiology. McGraw-Hill Higher Education, Boston.
2. Pelczar M.J., Chan E.C.S., Krieg N.R., Microbiology, 1993, Fong and sons printers Pvt. Ltd.
3. Dubey R.C., Maheshwari D.K., A textbook of Microbiology, 2008. S. Chand and Company Ltd, Delhi.
4. Powar, C.B. & Dagainawala, H.F. 1982, General Microbiology – Volume-II, Himalaya Publishing, Bombay.
5. Anantnaryan, R. & Paniker. Text book of microbiology.
6. Stanier R. Y. General Microbiology. 1993. Cambridge University.
7. Madigan M., Martinko., Parker J. Brock's Biology of microorganisms, 2007, Pearson Prentice Hall.
8. Tauro, P. Kapoor, K.K Yadav, K.S. Introduction to Microbiology.
9. Mckane, L. & Kandel, J. Microbiology essentials and applications.
10. Gunasekaran, P. Laboratory Manual in Microbiology.
11. Aneja, K. R. Experiments in microbiology.
12. Dubey, R.C & Maheshwari, D.K. 2002. Practical Microbiology. S. Chand & Comapany Ltd, New Delhi.

## FUNDAMENTALS OF BIOCHEMISTRY

**PAPER TITLE: FUNDAMENTALS OF BIOCHEMISTRY**

**PAPER CODE: BIO-I.C-2**

**MARKS: 75 MARKS THEORY + 25 MARKS PRACTICAL**

**CREDITS: 3 (THEORY) + 1 (PRACTICAL)**

**COURSE OBJECTIVES:** The aim of this paper is to apply chemistry to the study of living organisms and the atoms and molecules which comprise them. For example, biomolecules like nucleic acids, proteins and components of cells are composed of various elements and interact using different types of bonds. Biochemistry analyzes and demonstrates the complexity of these contents and the pathways of various reactions in cells.

**LEARNING OUTCOME:** On completion of this module, students will be able to understand the chemical nature of different biomolecules, their structures and their importance in metabolic pathways. They will be equipped with the knowledge, skills and understanding of spectrophotometric estimation of these biomolecules and the effect of various factors on the functioning of enzymes.

### **BIO-I.C-2: Fundamentals of Biochemistry Theory (75 marks)**

<b>Sr. No</b>	<b>Topic</b>	<b>Sub –Topics</b>	<b>No. of hours</b>
1	Introduction and Scope of Biochemistry	-Historical aspects (2 or 3 scientists)	2
2	Urey -Miller's experiment  Molecular interactions Water	Urey -Miller's experiment  Covalent, hydrogen, ionic, hydrophobic and Vander waal's interactions.  structure and unique properties	3
3	Bio-molecules	Definition , structure ,function, Biological Significance ,Classification of <b>Carbohydrate :</b> <ul style="list-style-type: none"><li>• Monosaccharide</li><li>• Disaccharide (Lactose, Sucrose and Maltose)</li><li>• Reducing and non reducing sugars</li></ul>	5

		<ul style="list-style-type: none"> <li>Polysaccharides: (Structural and storage)</li> </ul> <p><b>Lipids:</b></p> <ul style="list-style-type: none"> <li>Fatty acids (saturated &amp; unsaturated)</li> <li>Simple Lipids: Fats, oils, waxes</li> <li>Compound Lipids: Phospho lipids, glycolipids</li> <li>Derived Lipids: Steroids</li> </ul> <p><b>Amino Acids:</b></p> <ul style="list-style-type: none"> <li>Structure and nomenclature, General properties, Zwitter ions</li> </ul> <p><b>Proteins:</b> Structural Levels of protein , peptide bond formation, Ramchandran plot</p> <p><b>Nucleic acids:</b></p> <ul style="list-style-type: none"> <li>Structural components of nucleic acid, Nucleotides &amp; nucleosides.</li> <li>Structure of DNA &amp; Types of DNA (A, B, C, D, E, Z) &amp; RNA and its types,</li> <li>Differences between DNA and RNA,</li> <li>Forces stabilizing the structure of DNA.</li> </ul> <p><b>Vitamins</b></p> <ul style="list-style-type: none"> <li>Deficiencies symptoms.</li> <li>Co-enzymes(Thiamine, riboflavin, niacin, PLP, Lipoic acid, Pantothenate, Folic acid, Cyanocobalamine.)</li> </ul> <p><b>Hormones</b></p> <ul style="list-style-type: none"> <li>Classification and functions</li> </ul>	4
			5
			4
			3
4	<b>Enzymology</b>	<p><b>Basic concepts</b></p> <ul style="list-style-type: none"> <li>Classification of enzymes</li> <li>Mechanism of enzyme action ,Lock &amp; key theory &amp; Induced fit theory</li> <li>Factors affecting enzymes activity (time, enzyme conc., substrate concentration, pH, temperature)</li> <li>Enzyme Inhibition and its types</li> <li>MM equation, Lineweaver-Burk plot.</li> <li>Ribozymes &amp; Isoenzymes</li> </ul>	8
5	<b>Metabolism</b>	<p>(Outlines of pathway and structures of intermediates, name of the enzymes and their regulatory aspects)</p> <ul style="list-style-type: none"> <li>Definition of metabolism; energy relationship between catabolic and anabolic pathways.</li> <li>ATP as the energy currency of the cell.</li> </ul> <p>Generalized concept of</p> <ul style="list-style-type: none"> <li>Carbohydrate metabolism: Glycolysis, tricarboxylic acid cycle, pentose-phosphate pathway, gluconeogenesis, glycogen synthesis and breakdown.</li> <li>Oxidative degradation of proteins: Urea cycle.</li> <li>Lipid metabolism: Synthesis and degradation of fatty acids</li> <li>Nucleic-acid metabolism: <i>de novo</i> and salvage pathways.</li> </ul>	11
		<b>Total</b>	<b>45</b>



**Practical (25 marks)**

<b>Fundamentals of Biochemistry</b>	
Preparation of 1 N/M solutions / buffers (Any 2)	1
Principle and working of a colorimeter and spectrophotometer, Concept of complementary colors.	1
Determination of $\lambda_{\max}$ and Molar extinction coefficient of a given compound	2
Preparation of solutions for estimation of reducing sugar and proteins	1
Estimation of reducing sugar -DNSA method.	1
Estimation of protein – Folin-Lowry's method.	1
Estimation of protein – Biuret/Bradford method	1
Determination of peroxide value of oil.	1
Effect of pH and temperature on amylase activity.	2
Titration curve of any 2 amino acids	2
<b>Total</b>	<b>12</b>

**REFERENCES:**

1. Nelson D.L. and Cox M.M. 2000. Lehninger Principles of Biochemistry (3d Edition). Worth Publishers, New York, USA.
2. Stryer L. 1995. Biochemistry. W.H. Freeman and Co., New York, USA.
3. Zubay G. 1993. Biochemistry (3d Edition). WCB Publishers, Iowa, USA.
4. Gupta P.K. 1999. A Text-book of Cell and Molecular Biology. Rastogi Publications, Meerut, India.
5. Jain J.L 1999. "Fundamentals of Biochemistry" S.Chand and Company

## APPLIED BIOPHYSICS

**PAPER TITLE: APPLIED BIOPHYSICS**

**PAPER CODE: BIO-IV.E-6**

**MARKS: 75 MARKS (THEORY) + 25 MARKS (PRACTICAL)**

**CREDITS: 3 (THEORY) + 1 (PRACTICAL)**

**COURSE OBJECTIVE:** This paper aims at introducing the importance of the basic concepts of biophysics and their applications and its importance in the field of biotechnology.

**LEARNING OUTCOME:** On completion of this paper the students will be able to understand the scope of applied biophysics, as they would be studying about the various molecular interactions between biological systems, principles and applications of separation & spectroscopic techniques along with the uses of radioactivity and various physical methods of imaging of the biological structures which have wide applications in biomedical research which could address an interesting and novel problem.

**BIO-IV.E-6: APPLIED BIOPHYSICS****Theory (75 marks)**

Sr.No.	Topics	Sub Topics	No. of hours
1	Thermodynamics	- Concept of Thermodynamics for Biological systems: free energy, entropy, enthalpy	3
2	Understanding Biomolecules	- Structure and Measurement of different structural attributes of biomolecules - Biomolecular Interactions	3
3	Spectroscopic techniques – Principle & Applications	- Absorption spectroscopy (Beer-Lambert's law), circular dichroism spectroscopy, colorimetry, light scattering -Ultraviolet-Visible Spectroscopy - Fluorescence spectroscopy, Steady-state and life time - Infrared Spectroscopy, FTIR - Raman spectroscopy - Atomic Absorption Spectroscopy	9
4	Physical methods in Structure Determination – Principle & applications	- X-ray Crystallography - Crystallographic Elucidation of Molecules - Nuclear Magnetic Resonance (NMR)	5
5	Separation techniques- Principle & Applications	- Sedimentation – types of centrifugation: g and rpm, ultracentrifugation - Diffusion : Dialysis, Immunodiffusion & its importance - Separation of proteins: native and SDS PAGE - Principles of Chromatography - Types of chromatography - ion-exchange, GC and HPLC, affinity, gel filtration	10
6	Radio Isotopes techniques	- Radiation – Sources, Types and applications of isotopes - Radioactive decay – alpha, beta, gamma & x-rays. - Rate of radioactive decay & radioactive units	5

		- Geiger Muller Counter & Scintillation counter	
7	Physical methods in Imaging Biological structure – Principle & applications.	<ul style="list-style-type: none"> <li>- Ultrasound</li> <li>- Doppler technique</li> <li>- X-ray</li> <li>- CT/CAT Scan</li> <li>- Echo-ophthalmoscope</li> <li>- Electrocardiogram (ECG)</li> <li>- Echoencephalograph (EEG)</li> <li>- Electroencephalogram (EEG)</li> <li>- Magnetic Resonance Imaging (MRI)</li> </ul>	10
<b>TOTAL</b>			<b>45</b>

**Practical (25 marks)**

<b>APPLIED BIOPHYSICS</b>	
Comparison of absorption curves of any two coloured compounds.	2
Determination of structure of bio-molecules using RASMOL	1
Isolation of plant chloroplasts by density gradient centrifugation	1
Dialysis technique	1
Separation of proteins by SDS-PAGE	1
Preparation of TLC plates & separation of plant pigments	1
Separation of proteins using ion-exchange chromatography	2
Review of HPLC technique	1
Study of Atomic Absorption Spectroscopy	1
Problem solving on radioactivity	1
Visit to a X-ray & Ultrasound clinic	1
Case studies; Use of EEG,ECG,MRI/CT Scan and their applications	2
<b>TOTAL</b>	<b>15</b>

## REFERENCES:

1. MAHESH, S. (2003) *Biotechnology-3 Including Molecular Biology and Biophysics*, New Age International Private Limited, Publishers New Delhi.
2. ARORA, M.P. (2006) *Biophysics*, Himalaya Publishing House, New Delhi.
3. BAJPAI, P. K. (2010). *Biological Instrumentation and Methodology*, Second Revised Edition. S. Chand and Company Limited.
4. UPADHYAY, UPADHYAY & NATH (2010) *Biophysical Chemistry Principles and Techniques*, Fourth Revised Edition, Himalaya Publishing House, New Delhi.
5. SIVASANKAR, B. (2009). *Bioseparations Principles and Techniques*, PHI Learning Private Limited, New Delhi.
6. PLUMMER, D.T. (1993). *An Introduction to Practical Biochemistry*, Sixth Reprint. Tata McGraw-Hill Publishing Company Limited, New Delhi.
7. JAYARAMAN, J. (2011). *Laboratory Manual for Biotechnology*, Second Edition. New Age International Private Limited, Publishers New Delhi.
8. VERMA, A.S., DAS, S. & SINGH, A. (2014). *Laboratory Manual for Biotechnology, First Edition*, S. Chand and Company Private Limited.

# **BIOSTATISTICS**

**PAPER TITLE: BIOSTATISTICS**

**PAPER CODE: BIO-III.E-3**

**MARKS: 75 MARKS THEORY + 25 MARKS PRACTICAL**

**CREDITS: 3 (THEORY) + 1 (PRACTICAL)**

**COURSE OBJECTIVES:** The main aim of this paper is to introduce the students to the concept of Biostatistics. This paper covers a range of topics which will introduce the theory behind each topic and the concept in each case through problem solving.

**LEARNING OUTCOME:**

On completion of this module, students will be able to understand the importance of Biostatistics and the application of the same to the field of Biotechnology. The paper is so designed so as to understand the concepts that can be applied to relevant research work and to evaluate different parameters that are studied in quantitative research.

**BIO-III.E-3: BIOSTATISTICS****Theory (75 marks)**

<b>Sr.No</b>	<b>Topics</b>	<b>Sub Topics</b>	<b>No. of hours</b>
1	Review of statistical principles applied to biological data	<ul style="list-style-type: none"><li>- Recap of mean, median, mode, standard deviation &amp; variance (formulae and steps in the calculation)</li><li>- Concept of Pythagorean means and its calculation (Arithmetic, Harmonic &amp; Geometric mean &amp; the relationship between them)</li><li>- Concept and importance of correlation &amp; regression (recap of formulae and steps in the calculation)</li><li>- Null and alternate hypothesis with examples</li><li>- Understanding decision errors, decision rules</li><li>- One tailed and two tailed tests</li><li>- Concept of parametric and non-parametric tests.</li><li>- Z test, T test, F test</li><li>- Introduction to Chi-square test</li><li>- Importance of Chi-square test</li><li>- Procedure for calculation of chi square and problem solving with examples</li></ul>	12
2	Scope & importance of Biostatistics	<ul style="list-style-type: none"><li>- Definition of statistics and biostatistics</li><li>- Understanding importance of biostatistics</li><li>- Applications of Biostatistics</li></ul>	2

		- Types of Biological Data	
3	Software used in Biostatistics computation	<ul style="list-style-type: none"> <li>- Introduction to statistical software</li> <li>- Introduction, Importance and applications of statistical software – MS Excel, SPSS, PSPP</li> <li>- Examples and uses of the free statistical software</li> <li>- Introduction to open source software in Biostatistics</li> </ul>	6
4	Graphical & Diagrammatic representation of data	<ul style="list-style-type: none"> <li>- Importance of graphical and diagrammatic representation of data and its uses.</li> <li>- Construction of graphs using MS Excel.</li> </ul>	3
5	Introduction to Sampling Design	<ul style="list-style-type: none"> <li>- Concepts of: statistical population, sample.</li> <li>- Advantages and disadvantages of sampling</li> <li>- Types of Sampling Designs – simple random sampling, stratified random sampling, systematic sampling, cluster sampling</li> </ul>	3
6	Introduction to multivariate analysis	<ul style="list-style-type: none"> <li>- Introduction to multivariate data, matrices</li> <li>- Concept of correlation matrix, multiple and partial correlations, multiple regression</li> <li>- Introduction to principle component analysis (PCA), Cluster analysis</li> </ul>	7
7	Design of experiments	<ul style="list-style-type: none"> <li>- Introduction to ANOVA</li> <li>- One way ANOVA – examples and problem solving</li> <li>- Introduction to two way ANOVA (only importance &amp; difference from one way</li> </ul>	7



		ANOVA) - Introduction to designs – completely randomized design (CRD), Randomized Block Design (RBD), Latin Square Design (LSD)	
8	Case studies	- Application of statistical analysis in Biotechnology	5
		<b>TOTAL</b>	<b>45</b>

**Practical (25 marks)**

<b>BIOSTATISTICS</b>	
Problem solving on arithmetic mean, median, mode (measures of central tendency) with reference to biological data.	2
Problem solving on measures of central tendency with reference to biological data using MS Excel and PSPP.	3
Problem solving on measures of dispersion with reference to biological data.	2
Graphical presentation of data – Construction of various types of graphs and charts based on the given data (Manually and using MS Excel)	2
Problem solving on ANOVA and Chi square test	3
Application of biostatistics to Biotechnology (case studies)	3
<b>TOTAL</b>	<b>15</b>

## REFERENCES:

1. BANERJEE, P.K. (2011). *Introduction to Biostatistics, A textbook of biometry*, New Delhi, India: S. Chand & Company Ltd.
2. JOHNSON, R.A. & WICHERN, D.W. (2007). *Applied Multivariate Statistical Analysis, 6<sup>th</sup> Edition*, Pearson Education, Inc.
3. KHAN & KHANUM (2004). *Fundamentals of Biostatistics*, Delhi: Ukaaz publications.
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## **CONCEPTS IN GENETIC ENGINEERING**

**PAPER TITLE: CONCEPTS IN GENETIC ENGINEERING**

**PAPER CODE: BIO-IV.C-6**

**MARKS: 75 MARKS THEORY + 25 MARKS PRACTICAL**

**CREDITS: 3 (THEORY) + 1 (PRACTICAL)**

**COURSE OBJECTIVES:** The paper aims to introduce the students to the principles and techniques involved in Genetic Engineering. This paper will define the meaning of Genetic engineering and the methods used in Genetic engineering of genes through the use of genetic material and vehicles for suitable manipulation of genes.

### **LEARNING OUTCOME:**

On completion of this module, students will be able to understand how genes are genetically engineered and the need for the same. They will also be able to critically analyze different concepts studied in this paper. The practical component will train them towards performing with understanding genetic manipulations of genes.

**BIO-IV.C-6: CONCEPTS IN GENETIC ENGINEERING****Theory (75 marks)**

<b>Sr.No</b>	<b>Topics</b>	<b>Sub Topics</b>	<b>No. of hours</b>
1	Introduction to genetic engineering	<ul style="list-style-type: none"><li>- Aims, principles, applications, ethical issues involving recombinant DNA technology and Genetic engineering</li></ul>	2
2	DNA modifying enzymes	<ul style="list-style-type: none"><li>- Nucleases- Endonucleases (Restriction enzymes recognition sequences, cleavage pattern), Exonucleases</li><li>- DNA ligases</li><li>- Reverse Transcriptases</li><li>- Polynucleotide kinases</li><li>- Alkaline phosphatases</li><li>- Nucleotidyl transferases</li></ul>	3
3	Vehicles for Gene cloning	<ul style="list-style-type: none"><li>- Vectors - properties of ideal cloning vectors</li><li>- Plasmids - Properties, Classification</li><li>- Vector for Prokaryotes - pBR322, pUC 18</li><li>- Bacteriophages as cloning vectors - Lambda Bacteriophages Features- Insertional vectors and Replacement vectors &amp; M13 Bacteriophage</li></ul>	10

		- Cosmids, Phagemids and Phasmids-	
		<p>Definition, features with examples</p> <ul style="list-style-type: none"> <li>- List of vectors for cloning in <i>Saccharomyces cerevesiae</i>. (Examples and features)</li> <li>- Shuttle vectors - any one example</li> <li>- Vectors for plant – Ti plasmid</li> </ul>	
4	DNA Insertion into Vector	<ul style="list-style-type: none"> <li>- Ligation (Definition and concept)</li> <li>- Use of linkers and Adaptors</li> <li>- Homopolymer tailing</li> </ul>	3
5	Transformation methods	<ul style="list-style-type: none"> <li>- Methods, Advantages and Disadvantages: Competence (transformation in bacteria), Microinjection, Lipofection, Electroporation, Macroinjection, Sonication, Silicon carbide fibre vortex, DNA co-precipitation, Ultrasonication, Laser induced, <i>Agrobacterium</i> mediated transfers</li> </ul>	8
6	Identification of Recombinants	<ul style="list-style-type: none"> <li>- Principle and importance of identification of recombinants.</li> <li>- Antibiotic resistance (amp, tet resistance)</li> <li>- lac Z selection</li> <li>- Colony hybridization</li> <li>- <i>cI</i> selection</li> </ul>	4

7	DNA isolation methods and analysis	- Isolation of Genomic DNA & plasmid DNA	5
		- Principle of Plasmid Isolation. - Spectrophotometric analysis of DNA - Agarose gel electrophoresis. - Purification of DNA	
8	Amplification of nucleotide sequences	- Polymerase chain reaction (Principles, components & method of PCR)	3
9	DNA sequencing	- Significance and importance of DNA sequencing - Maxam Gilbert's method - Sanger's method - Automatic DNA sequencer	5
10	Genomic / cDNA libraries	- Preparation of genomic library, cDNA library. - Screening of Libraries.	2
		<b>TOTAL</b>	<b>45</b>

**Practical (25 marks)**

<b>CONCEPTS IN GENETIC ENGINEERING</b>	
Plasmid DNA isolation by alkaline lysis method.	1
Plasmid DNA isolation by boiling method.	1
Restriction digestion of plasmid DNA and confirmation by gel electrophoresis	2
Ligation of restricted fragments and conformation by gel electrophoresis	2

Plasmid DNA separation on agarose gel.	1
Molecular size determination of restricted products	1
Preparation of competent cells in bacteria.	2
Transformation in bacteria using suitable plasmid (pUC 18)	1
Selection of transformed colonies	1
Elution of DNA from agarose electrophoresis.	1
Deciphering the DNA sequence from a sequencing gel photograph by Maxam and Gilbert's method and Sanger's method.	1
Concept of PCR – principle, preparation of reaction mixtures & analysis of the PCR method (Demonstration)	1
<b>TOTAL</b>	<b>15</b>

#### REFERENCES:

1. JOGDAND, S.N. (2008). *Gene Biotechnology*, 2<sup>nd</sup> edition, Himalaya Publishing House, Mumbai.
2. PRIMROSE, S.B. & TWYMAN, R.M. (2009). *Principles of Gene Manipulation and Genomics*, Blackwell Publishing.
3. PUROHIT, S.S. (2009). *Biotechnology: Fundamentals and Applications*, Student Edition.
4. SINGH, B.D. (2008). *Biotechnology: Expanding Horizons*, Kalyani publishers.
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## **MOLECULAR GENETICS**

**PAPER TITLE: MOLECULAR GENETICS**

**PAPER CODE: BIO-III.E-2**

**MARKS: 75 MARKS THEORY + 25 MARKS PRACTICAL**

**CREDITS: 3 (THEORY) + 1 (PRACTICAL)**

**PREREQUISITES: Completion of BIO-II.C-3 and BIO-II.C-4**

**COURSE OBJECTIVE:** Having completed the two prerequisite courses - Fundamental Genetics and Cell and Molecular Biology, students will be able to apply their knowledge and skills to this paper. It focuses on various aspects of human genetics and explores the techniques and tools at the molecular level that can be used to identify them.

**LEARNING OUTCOME:** On completion of this course, students will understand the molecular aspects of genetics including DNA variation and mutations. They will also be able to apply their knowledge of various molecular techniques in order to diagnose specific genetic disorders and to calculate risk factors in genetic counseling for individuals with a family history of these disorders.



**BIO-III.E-2: MOLECULAR GENETICS****Theory (75 marks)**

<b>Sr. No</b>	<b>Topic</b>	<b>Sub –Topics</b>	<b>No. of hours</b>
1	Introduction	<ul style="list-style-type: none"><li>- Introduction to Molecular Genetics – organization of a eukaryotic genome (human genome)</li></ul>	2
2	Chromosomes and Cell Division	<ul style="list-style-type: none"><li>- Classification and nomenclature of chromosomes</li><li>- Methods of chromosome analysis (chromosome banding techniques – G, R, Q, C and High resolution banding)</li><li>- Brief account of cell cycle, mitosis and meiosis</li><li>- Mechanisms of Aneuploidy – non-disjunction, non-conjugation, anaphase lag, premature division of centromere</li><li>- Syndromes caused by aneuploidy – prevalence, causes and clinical features of Down’s syndrome, Edward’s syndrome and Patau syndrome</li><li>- Causes of Polyploidy</li><li>- Structural abnormalities – reciprocal and Robertsonian translocations</li><li>- Brief account of mosaicism and Chimerism</li></ul>	9
3	Review of central dogma of molecular biology	<ul style="list-style-type: none"><li>- Brief review of structure of DNA and replication, transcription and translation processes</li></ul>	1
4	DNA Variation	Variation in DNA: <ul style="list-style-type: none"><li>- Genetic Polymorphism</li><li>- Restriction Fragment Length Polymorphism (RFLP)</li><li>- Short Tandem Repeat Polymorphism (STR)</li><li>- Variable Number Tandem Repeat (VNTR)</li></ul>	3
5	Techniques and Tools in Molecular Biology	Techniques and Tools in Molecular Biology used in Genetic Diagnoses: <ul style="list-style-type: none"><li>- Genetic Material studied for diagnoses– DNA, RNA and cDNA</li><li>- DNA fragmentation and separation by electrophoresis and</li></ul>	8

		<p>membrane transfer</p> <ul style="list-style-type: none"> <li>- Selective amplification of a nucleotide sequence using PCR</li> <li>- Molecular hybridization techniques and applications: <ul style="list-style-type: none"> <li>□ Labeled probes</li> <li>□ Fluorescence in situ hybridization (FISH)</li> <li>□ Southern blot hybridization</li> <li>□ Dot blot and reverse dot blot</li> <li>□ ARMS and OLA techniques</li> <li>□ DNA microarrays</li> </ul> </li> </ul>	
6	The Diagnosis of Inherited Diseases	<p>Clinical description, molecular basis and genotype-phenotype correlation of:</p> <ul style="list-style-type: none"> <li>- Cystic fibrosis</li> <li>- <math>\alpha</math>-thalassemia and <math>\beta</math>-thalassemia</li> <li>- Duchenne Muscular dystrophy</li> <li>- Huntington's disease</li> </ul>	6
7	Genetic Counselling	<ul style="list-style-type: none"> <li>- Screening (pre and post natal) for genetic abnormalities</li> <li>- Establishing the diagnosis (family history and pedigree chart)</li> <li>- Calculation, presentation and quantification of risk (Bayesian Determination of Recurrent risks for genetic disorders within families)</li> <li>- Placing risks in context and discussion of options</li> <li>- Patient support groups</li> <li>- Directive and non-directive genetic counseling</li> <li>- Special problems in genetic counselling</li> </ul>	7
8	Gene Therapy	An Overview of Gene Therapy and its applications in treating genetic disorders e.g. SCID	3
9	Forensic Genetics	<ul style="list-style-type: none"> <li>- Brief History</li> <li>- Biological evidence – sources, collection, identification, characterization</li> <li>- DNA fingerprinting using PCR-based and non-PCR-based techniques</li> </ul>	6
		<b>TOTAL</b>	<b>45</b>

**Practical (25 marks)**

<b>MOLECULAR GENETICS</b>	
Extraction of DNA from human blood and saliva	2
Visualization of extracted DNA on agarose gels	1
Preparation of a Southern blot	1
Study of diagnostic tools based on DNA polymorphisms	1
Preparation of human metaphase chromosomes	1
Steps in molecular diagnosis of and further genetic counseling for: 1) Cystic fibrosis 2) $\alpha$ -thalassemia and $\beta$ -thalassemia 3) Duchenne Muscular dystrophy 4) Huntington's disease	4
Risk calculation: using Bayes method for any two clinical case studies	2
Clinical features of Down's syndrome, Edward's syndrome and Patau syndrome and mechanisms leading to aneuploidy	2
Research: Current status of gene therapy for any two genetic disorders	1
<b>TOTAL</b>	<b>15</b>

**REFERENCES:**

- GOODWIN, W., LINACRE, A. & HADI, S. (2007). *An Introduction to Forensic Genetics*, John Wiley & Sons, Ltd.
- PASTERNAK, J.J. (2005). *An Introduction to Human Molecular Genetics, Mechanisms of Inherited Diseases, Second Edition*, John Wiley & Sons, Inc.
- SERRE, J.L. (2006). *Diagnostic Techniques in Genetics*, John Wiley & Sons, Ltd.
- TURNPENNY, P.D. & ELLARD, S. (2007). *Emery's Elements of Medical Genetics, 13<sup>th</sup> Edition*, Churchill Livingstone Elsevier.

### BIO-III.C-5: IMMUNOLOGY

**COURSE OBJECTIVES:** This paper aims at introducing the basic concepts of the immune system and its defense mechanisms. This will help them understand and reason out concepts related to diseases. A section on vaccination, monoclonal and polyclonal antibodies stresses on the importance of these for treatment of lethal diseases.

**LEARNING OUTCOME:** On completion of this module, the student will be able to understand all about the immune system and various antigen-antibody interactions involved in certain immune reactions.

#### Theory (75 marks)

Sr. No	Topic	Sub –Topics	No. of hours
1	Immune system and Autoimmunity	<ul style="list-style-type: none"><li>- Introduction to the immune system - Historical perspective</li><li>- Types of Immunity (Innate and Acquired)</li><li>- Barriers of Innate Immunity – anatomic, physiologic, phagocytic, inflammatory</li><li>- Collaboration between innate and adaptive immunity</li><li>- Introduction to Humoral and Cell mediated immunity</li><li>- Autoimmunity</li><li>- Introduction to Autoimmunity (any one example)</li><li>- B-cells &amp; T-cells</li><li>- Maturation, Activation of B-cells and T-cells</li></ul>	9
2	Cells and Organs of the Immune system	<ul style="list-style-type: none"><li>- Cells (myeloid and lymphoid lineage) Immunoreactive Cells (Macrophages, Granulocytes, NK Cells)</li><li>- Primary lymphoid organs (bone marrow and thymus)</li><li>- Secondary lymphoid organs (spleen, lymph nodes, GALT and MALT)</li></ul>	7

3	Antigens- Antibodies and their interactions	<ul style="list-style-type: none"> <li>- Introduction to Antigens and Antibodies</li> <li>- Structure, types, classes, properties and variants (e.g. Immunogens, Antigens, Haptens, adjuvants)</li> <li>- Paratope and Epitope</li> <li>- Antigen – Antibody Interaction</li> <li>- Forces involved in antigen-antibody reaction</li> <li>- Concept of affinity, avidity, precipitation, agglutination reactions</li> <li>- Applications in diagnostics</li> </ul>	6
4	MHC and Hypersensitivity	<ul style="list-style-type: none"> <li>- Major Histocompatibility Complex (MHC) Introduction and discovery of Human</li> <li>- Histocompatibility complex</li> <li>- Structure of MHC I and II</li> </ul>	5
		<ul style="list-style-type: none"> <li>- Presence of MHC I and II on different cells and their significance</li> <li>- Hypersensitivity - Introduction</li> <li>- Hypersensitive reactions (Type I and Type II, III, IV)</li> </ul>	
5	Complement system	<ul style="list-style-type: none"> <li>- The complement system</li> <li>- Functions, components and activation pathways (Classical, Alternate &amp; Lectin)</li> </ul>	4
6	Immune response, Monoclonal antibodies	<ul style="list-style-type: none"> <li>- Immune response to bacterial infection</li> <li>- Immune response to viral infection</li> <li>- Polyclonal &amp; Monoclonal antibodies (Hybridoma technology)</li> <li>- Vaccination</li> <li>- Introduction to vaccines and types of vaccines</li> </ul>	8
7	Introduction to Cancer	<ul style="list-style-type: none"> <li>- Cancer and the Immune System</li> <li>- Introduction to Oncogenes and Tumour-Suppressor genes</li> </ul>	3
8	Immunodeficiency	<ul style="list-style-type: none"> <li>- Immunodeficiency types with examples</li> </ul>	3
		<b>TOTAL</b>	<b>45</b>

**Practical (25 marks)**

<b>IMMUNOLOGY</b>	
Study of lymphoid organs and cells of the Immune System	2
Total count of WBC & RBCs using haemocytometer	2
Differential count of WBC	1
Blood grouping & Rh factor	1
Preparation of serum	1
Single Radial Immunodiffusion	1
Ouchterlony's double diffusion method	2
Immunoelectrophoresis	1
ELISA (Demonstration) / ESR	1
Serological tests involving precipitations (Pregnancy & Widal)	2
Estimation of Haemoglobin by Sahali's method	1
<b>TOTAL</b>	<b>15</b>

**REFERENCES:**

1. ARORA, M.P. (2006). *Cell Biology, Immunology and Environmental Biology*, Himalaya Publishing House.
2. KUBY, J. (2000). *Immunology*, W.H. Freeman.
3. RAO, C.V. (2011). *Immunology*, Narosa Book Distributors Pvt. Ltd.
4. ROITT, I.M., BROSTOFF, J. & MALE, D.K. (1993). *Immunology*, Mosby-Year book Europe Limited.

## **ANIMAL CELL CULTURE**

**PAPER TITLE: ANIMAL CELL CULTURE**

**PAPER CODE: BIO-VI.E-16**

**MARKS: 75 MARKS THEORY + 25 MARKS PRACTICAL**

**CREDITS: 3 (THEORY) + 1 (PRACTICAL)**

**COURSE OBJECTIVES:** This paper is designed to introduce the students to the basic concepts of Animal Cell Culture. The paper covers topics that explain animal cell culturing and methods involved in basic culturing of animal cells with a few applications to life sciences.

**LEARNING OUTCOME:** On completion of this module, students will be able to understand the basics in animal cell culture, comprehend methods used in culturing animal cells and the importance of the same. They will be able to apply concepts related to culturing animal cells to the latest developments made in this field. They will also understand the impact it has made to the development of mankind, especially in development of disease diagnostics and therapeutics.

### **BIO-VI.E-16: ANIMAL CELL CULTURE**

<b>Sr.No</b>	<b>Topics</b>	<b>Sub Topics</b>	<b>No. of hours</b>
1	Introduction to Animal Cell Culture	- Animal Tissue and Cell Culture (Definition and Concepts in brief) - History and Scope of Animal Tissue Culture	3
2	Requirements for Animal Cell Culture	- Basic layout of an animal cell culture laboratory (washing room, media preparation & sterilization room, inoculation and aseptic	4

		<p>culture room)</p> <ul style="list-style-type: none"> <li>- Equipments, culture vessels for tissue culture</li> </ul>	
3	Basics of an Animal Cell – (structure, organization and function pertaining to animal cell culture)	<ul style="list-style-type: none"> <li>- Structure and organization of animal cell</li> <li>- An overview of developmental biology (importance in understanding differentiation of cells in culture)</li> </ul>	3
4	Media in Animal Cell Culturing	<ul style="list-style-type: none"> <li>- Physico-chemical properties of culture media (pH, CO<sub>2</sub>, O<sub>2</sub> &amp; Temperature)</li> <li>- Growth media – (Types, advantages and disadvantages of each type) Natural and artificial media</li> <li>- Natural media – clots, biological fluid, tissue extracts, complex natural media</li> <li>- Artificial media – serum containing, serum-free media, chemically defined and protein-free media</li> <li>- Basal salt solutions (BSS) – constituents (vitamins, amino acids, trace elements, inorganic ions), importance, uses and examples</li> <li>- Serum as a complex supplement</li> <li>- Growth factors in promoting proliferation of cells – uses and examples (EGF, FGF, PDGF)</li> </ul>	6
5	Basic techniques in Animal Cell Culture	<ul style="list-style-type: none"> <li>- Techniques in mammalian cell culture – source of cells, dissection/isolation of cells, mechanical and enzymatic disaggregation</li> <li>- Types of cell cultures (organ culture, whole embryo culture, histotypic cultures, explants)</li> </ul>	6



		cultures)	
6	Cell line cultures	<ul style="list-style-type: none"> <li>- Primary and Established cell line cultures</li> <li>- Establishment of continuous cell lines – spontaneous transformation, chemical transformation, viral transformation, non-chemical methods</li> <li>- Characteristics &amp; maintenance of Established/continuous cell lines</li> <li>- Characteristics of normal and transformed cells (Properties of Transformed cells)</li> </ul>	6
7	Characterization and Growth measurement of cultured cells	<ul style="list-style-type: none"> <li>- Characterization – Genetic and enzymatic methods (cytogenetics, karyotyping, Isoenzymes and immunological tests)</li> <li>- Growth measurement – Direct method (particle counter, dye exclusion test, cytotoxicity assay)</li> <li>- Growth measurement – Indirect method (MTT assay)</li> </ul>	6
8	Normal cell growth, phases of growth in culture and synchronization of cells	<ul style="list-style-type: none"> <li>- Eukaryotic cell cycle and basics of cell synchronization</li> <li>- Apoptosis in cultured cells – Reasons for cell suicide</li> <li>- Phases of cell growth (lag, log, stationary, decline), population doubling level, morphology</li> </ul>	3
9	Cell separation methods	<ul style="list-style-type: none"> <li>- Physical method of cell separation – separation based on cell size, cell density, cell surface charge, cell affinity</li> </ul>	2

		- Separation by cytofluorometry	
10	Applications of Animal Cell Culture	<ul style="list-style-type: none"> <li>- Stem cell culture (applications in Animal Cell Culture)</li> <li>- Artificial skin</li> <li>- Artificial cartilage</li> <li>- Special secondary metabolites / products (insulin, growth hormone, interferon, t-plasminogen)</li> <li>- Other valuable products obtained using animal cell cultures (emphasis on monoclonal and polyclonal antibodies)</li> </ul>	6
		<b>TOTAL</b>	<b>45</b>

**Practical (25 marks)**

<b>Animal Cell Culture</b>	
Washing of glassware and culture wares, preparation of animal cell culture media, sterilization	2
Introduction to use of instruments and sterile techniques in animal cell culture	1
Preparation of Basal Salt Solutions (DPBS) and filter sterilization	1
Preparation of culture media for animal cell culture (DMEM / RPMI 1640) using BSS.	1
Preparation of serum from goat blood & filter sterilization for animal cell culture	1
Culturing lymphocytes from blood cells using RPMI 1640	1
A comprehensive observations on extra embryonic membranes of chick	1
Dissection of chick embryo for culturing fibroblast cells	1
Estimation of cell viability using trypan blue (dye exclusion) & calculations of seeding density for animal cell cultures	2
Establishing a monolayer culture using warm trypsinization method	1
Establishing a monolayer culture using cold trypsinization method	1
Subculture of monolayer culture	1
An investigation into the use of any 1 commercially available cell line for animal cell culture	1
	<b>TOTAL 15</b>

## **REFERENCES**

1. Das, H.K. (2005). Text book of Biotechnology, Wiley India Pvt. Ltd.
2. Freshney, I.R. (2005). Culture of animal cell –A Manual of Basic Techniques, 5<sup>th</sup> Edition, Wiley- Liss Publications.
3. Gangal, S. (2010). Principles and Practice of Animal Tissue Culture, 2<sup>nd</sup> edition, Universities Press.
4. Shivangi, M. (2006). Animal Cell and Tissue Culture, Agrobios, India.
5. Singh, B.D (2013). Biotechnology, Expanding horizons, Kalyani Publishers, New Delhi.

## **BIOETHICS AND BIOSAFETY**

**PAPER TITLE: BIOETHICS AND BIOSAFETY**

**PAPER CODE: BIO-VI.C-8**

**MARKS: 75 MARKS (THEORY) + 25 MARKS (PRACTICAL)**

**CREDITS: 3 (THEORY) + 1 (PRACTICAL)**

**COURSE OBJECTIVES:** This paper aims at introducing the importance of the basic concepts of bioethics and bio-safety and their relationship with several fields such as ecology, agriculture, medicine, chemistry and advances brought about in the field of biology and medicine. The course deals with answers to ethical questions that arises in the relationships among the life sciences, biotechnology, medicine, politics, law, philosophy, theology and their importance in the field of biotechnology.

**LEARNING OUTCOME:** On completion of this paper the students will be able to understand the importance of bioethics and biosafety procedures to be followed and describe the basic concepts, its principles, and use in the present life and be able to solve interesting and novel scientific problems.

### **BIO-VI.C-8: BIOETHICS AND BIOSAFETY**

<b>BIOETHICS AND BIOSAFETY</b>			
<b>Sr.No.</b>	<b>Topics</b>	<b>Sub Topics</b>	<b>No. of hours</b>
1.	Introduction to Bioethics	- Introduction to Bioethics - Social and ethical issues in biotechnology	2
2.	Principles of	- Principles of bioethics	3

	bioethics and ethical conflicts	<ul style="list-style-type: none"> <li>- Ethical conflicts in biotechnology</li> <li>- Bioethics vs business ethics.</li> </ul>	
3.	Bioethics in Genetic Engineering	<ul style="list-style-type: none"> <li>- Bioethical issues related to test tube babies</li> <li>- Bioethics in Plant genetic engineering</li> <li>- Bioethics in Animal genetic engineering</li> </ul>	3
4.	Introduction to Biosafety	<ul style="list-style-type: none"> <li>- Introduction, History and Definition of Biosafety</li> <li>- Biosafety Guidelines and Regulations</li> <li>- Operation of Biosafety Guidelines and Regulations</li> <li>- Levels of Physical containment</li> <li>- Levels of Biological containment</li> </ul>	7
5.	Safety in Laboratories	<ul style="list-style-type: none"> <li>- Hazards : Physical, Biological and Chemical</li> </ul>	3
6	Introduction to IPR and Protection of Intellectual Property Right	<p>Introduction, history of Intellectual Property Rights</p> <ul style="list-style-type: none"> <li>- Trade secrets</li> <li>- Patents: Reading a patent &amp; Patenting strategies</li> <li>- Copyrights</li> <li>- Trademarks</li> <li>- Plant variety protection (PVP)</li> <li>- World Intellectual Property Organization (WIPO)</li> <li>- GATT &amp; TRIPs</li> <li>- Patent status – International Scenario</li> <li>- Patenting of Biological materials</li> <li>- Significance of Patents in India</li> </ul>	8
7.	International and Indian Biosafety guidelines	<ul style="list-style-type: none"> <li>- Biosafety Guidelines in India</li> <li>- International Biosafety Guidelines : OECD, FAO, WHO, CAC and Other organisations</li> </ul>	5
8.	Case studies	<ul style="list-style-type: none"> <li>- Patenting Basmati rice</li> <li>- Revocation of patents-turmeric and neem</li> </ul>	3
9.	Protection of Biotechnological Inventions	<ul style="list-style-type: none"> <li>- Patenting of genes and DNA sequences</li> <li>- Gene patents and Genetic resources</li> <li>- Farmers rights</li> <li>- Plant breeder's rights</li> <li>- Patenting of life forms</li> <li>- Broad patents in Biotechnology</li> </ul>	5
10.	Regulatory affairs	<ul style="list-style-type: none"> <li>- Regulatory requirements for drugs and biologics</li> </ul>	3

		- Good laboratory practices - Good manufacturing practices	
11.	Biosafety of GMOs and GEMs	- Planned introduction and field trials of: GMOs and GEMs - Biosafety during industrial production	3
		<b>TOTAL</b>	<b>45</b>

**Practical (25 marks)**

<b>BIOETHICS AND BIOSAFETY</b>	
General safety measures and study of safety notices	2
Study of preventive measures and first aid during laboratory hazards	1
Case study on handling and disposal of radioactive waste	1
Case study on handling and disposal of medical/microbial waste	1
Study of Good Laboratory Practices	1
Study of Good Manufacturing Practices	1
Study of components and design of a Biosafety laboratory	2
A case study on clinical trials in India with emphasis to ethical issues	2
Planning of establishment of a hypothetical biotechnology industry in India	2
Study of steps of a patenting process	2
<b>TOTAL</b>	<b>15</b>

**REFERENCES**

1. Das H.K. (2008). Text book of Biotechnology, 3rd edition, Wiley India Pvt. Limited, New Delhi.
2. Dubey R.C. (1993). A Textbook of Biotechnology, S.Chand and Company, New Delhi.
3. Krishna V.S. (2007). Bioethics & Biosafety in Biotechnology, New Age Publishers, Bangalore.
4. Plummer D.T. (1988). An Introduction to Practical Biochemistry, 3<sup>rd</sup> Edition, Tata McGraw, New York.
5. Singh B.D. (2003). Biotechnology - Expanding Horizons, 1<sup>st</sup> edition, Kalyani Publishers, Ludhiana.
6. Thomas J.A. & Fush R.L. (2002). Biotechnology & Safety Assessment, 3<sup>rd</sup> Edition, Academic press.

## **BIOINFORMATICS**

**PAPER TITLE: BIOINFORMATICS**

**PAPER CODE: BIO-V.E-12**

**MARKS: 75 MARKS (THEORY) + 25 MARKS (PRACTICAL)**

**CREDITS: 3 (THEORY) + 1 (PRACTICAL)**

**COURSE OBJECTIVES:** This paper aims at introducing the importance of the basics of computers, concept of Human Genome Project, storage of biological information and tools and techniques of bioinformatics used and their importance in the field of biotechnology.

**LEARNING OUTCOME:** On completion of this paper the students will be able to understand the importance of computers and networking and the various types of biological databases used for storing genetic information of various organisms and the use of various tools and techniques used for retrieving the same that maybe used in present life and be able to solve interesting and novel scientific problems.

### **BIO-V.E-16: BIOINFORMATICS**

<b>BIOINFORMATICS</b>			
<b>Sr.No.</b>	<b>Topics</b>	<b>Sub Topics</b>	<b>No. of hours</b>
1.	Introduction to Computers in Biology	- Introduction to use of computers, internet and softwares in biology, medicine and research. - Historical developments in Biology	5
2.	DNA, RNA and Proteins & HGP	- Background of DNA, RNA and Proteins, ORF - Review of Transcription and Translation	4

		<ul style="list-style-type: none"> <li>- Introduction to HGP, Objectives</li> <li>- Achievements of HGP</li> <li>- Ethical and Social issues.</li> </ul>	
3.	Introduction to Bioinformatics	<ul style="list-style-type: none"> <li>- Definition, Scope of Bioinformatics</li> <li>- Bioinformatics vs Computational biology</li> <li>- Components of Bioinformatics and Applications</li> </ul>	3
4.	Information resources	<ul style="list-style-type: none"> <li>- Introduction, aim and objectives (NCBI, NLM, NIH, EBI and SRS)</li> </ul>	6
5.	Biological databases	<ul style="list-style-type: none"> <li>- Types of data</li> <li>- Types of biological databases</li> <li>- Primary databases : Gen Bank and EMBL, DDBJ</li> <li>- Secondary databases:Swiss-PROT, PDB &amp; PIR</li> <li>- Composite databases: OWL &amp; PROSITE</li> </ul>	6
6.	Structural databases	<ul style="list-style-type: none"> <li>- PDB, MMDB, CATH &amp; SCOP</li> <li>- Visualization of proteins – Cn3D and Rasmol</li> </ul>	5
7.	Literature databases	<ul style="list-style-type: none"> <li>- Pubmed, MedLINE &amp; OMIM</li> </ul>	3
8.	BLAST & FASTA	<ul style="list-style-type: none"> <li>- Introduction, BLAST &amp; FASTA and their types</li> </ul>	4
9.	Sequence Alignment tools and Phylogeny	<ul style="list-style-type: none"> <li>- Pairwise sequences alignment,</li> <li>- Multiple sequence alignment using Clustal-W Omega</li> <li>- Introduction, Definition, construction, structure and types of phylogenetic trees.</li> <li>- Differences between cladogram and phylogenetic tree.</li> </ul>	6
		<b>TOTAL</b>	<b>45</b>

**Practical (25 marks)**

<b>BIOINFORMATICS</b>	
Introduction to Bioinformatics & its Applications	1
Study of Human Genome Project	1



Usage of NCBI resources	1
Biological data search using NCBI – Protein or amino acid sequences	1
Biological data search using NCBI – DNA or gene sequences	1
Biological data search using NCBI – Literature & Structure databases	2
Database search & Pairwise sequence alignment using NCBI BLAST : BLASTp & BLASTn	2
Multiple sequence alignment using Clustal-W	2
Construction of phylogenetic tree using Clustal-W	1
DNA sequence analysis to find restriction enzymes sites using NEBcutter	1
Visualization of protein structures using Cn3D/ Rasmol	2
<b>TOTAL</b>	<b>15</b>

## REFERENCES

1. Harisha, S. (2007). Fundamentals of Bioinformatics, I.K. International Publishing House, Mumbai.
2. Ignacimuthu, S. (2005). Basic Bioinformatics, Narosa Publishing House, New Delhi.
3. Mount, D.W. (2004). Bioinformatics – sequence and Genome analysis, CBS Publishers.
4. Murthy, C.S.V. (2003). Bioinformatics, Himalaya Publishing House, Mumbai.
5. Rastogi, S.C., Mendiratta, N. & Rastogi, P. (2004). Bioinformatics: Concepts, Skills and Applications, CBS Publishers.
6. Xiong, J. (2006). Essential Bioinformatics, Cambridge University Press.

## **ENVIRONMENTAL BIOTECHNOLOGY**

**PAPER TITLE: ENVIRONMENTAL BIOTECHNOLOGY**

**PAPER CODE: BIO-V.E-10**

**MARKS: 75 MARKS THEORY + 25 MARKS PRACTICAL**

**CREDITS: 3 (THEORY) + 1 (PRACTICAL)**

**COURSE OBJECTIVES:** The main aim of this paper is to introduce the students to the hazards of our environment, the effects of pollution on living systems, solutions to protect the environment for sustainable development.

**LEARNING OUTCOME:** On completion of this module, students will be able to understand the effects of various types of pollution and gain knowledge in areas like development of biological systems for remediation of contaminated environments and environment-friendly processes such as green manufacturing technologies and sustainable development.

### **BIO-V.E-10 ENVIRONMENTAL BIOTECHNOLOGY**

<b>Sr. No</b>	<b>Topics</b>	<b>Sub Topic</b>	<b>No. of hours</b>
1.	Introduction	The scope of environmental biotechnology	1
2.	Basic Ecological Concepts and Principles	- Structure (biotic and abiotic components) -Food chain and food webs -Ecological pyramids -Productivity and eco-energetic (10% law)	4

3.	Anthropogenic activities, its effects and control	<p><u>Air pollution</u></p> <ul style="list-style-type: none"> <li>- Major air pollutants and their sources.</li> <li>- Impacts of air pollution on human health, animals, plants and climate.</li> <li>- Removal of gaseous contaminants and odour: bioscrubbers, biotrickling filters and biofilters/biobeds</li> </ul> <p><u>Water pollution</u></p> <ul style="list-style-type: none"> <li>-Principal forms of water pollutants and their sources.</li> <li>-Waste water monitoring: Concepts of total solid/suspended solid, BOD (Biochemical Oxygen Demand), COD (Chemical Oxygen Demand), Total Solids (Dissolved and Suspended)</li> <li>-Wastewater treatment: <ul style="list-style-type: none"> <li>Aerobic processes (Activated sludge process, rotating biological discs, oxidation ponds, trickling filters)</li> </ul> </li> </ul> <p><u>Soil pollution</u></p> <ul style="list-style-type: none"> <li>-Concept of soil pollution and their sources: Industrial waste effluents and heavy metals, soil acidity/alkalinity, soil salinity.</li> <li>-Treatment of solid wastes: Composting and vermitechnology</li> </ul>	15
4.	Pollution Monitoring	<ul style="list-style-type: none"> <li>-Bio indicators: Concept and examples (indicators of water quality; air pollution indicators).</li> <li>-Choice of criteria: Visual rating, Genotoxicity, Metabolic rating</li> <li>-Applications (two each), using plant test systems and animal Test Systems.</li> <li>-Tests for assessing Genetic damage: AMES Test, Cyto-genetic assay, Membrane damage.</li> <li>-Concept and applications of molecular biology in</li> </ul>	8

		<p>environmental monitoring: reporter gene.</p> <p>-Concept and applications of biosensors in pollution detection</p>	
5	<p>Pollution abatement:</p> <p>Bioremediation and biodegradation</p>	<p><u>Bioremediation</u></p> <p>-Definition</p> <p>-Microbial bioremediation</p> <p>-Phytoremediation</p> <p>- Microbial desulphurization of coal (direct and indirect mechanisms)</p> <p><u>Biodegradation</u></p> <p>-Introduction to xenobiotic and recalcitrant compounds</p> <p>-Basis of biodegradation: Concepts of use of mixed microbial populations.</p> <p>- Biodegradation of two xenobiotics: Aromatic hydrocarbons (benzene) and alkanes</p> <p><u>Biosorption</u></p> <p>-Principle</p> <p>-Use of Fungi and Algae (2 Examples each).</p> <p><u>Genetically engineered microorganisms</u></p> <p>-Super Bug (<i>Pseudomonas</i> sps.)</p>	10
6.	<p>Ecofriendly Bio-products</p>	<p>-Merits of bioenergy against conventional fuels</p> <p>Process and organisms involved in:</p> <p>-Biogas (Biomethanisation) production: Dome shaped biogas plant</p> <p>-Bio hydrogen production: anaerobic bacteria and photolysis photosynthetic algae</p> <p>-Biodiesel production: Biodiesel from lipids and hydrocarbons</p> <p>- Bioplastics : Merits against synthetic plastics- Biopol and Biolac</p> <p>- Microbial insecticide (any 1 example)</p>	7
		<b>TOTAL</b>	<b>45</b>

**Practical (25 marks)**

<b>ENVIRONMENTAL BIOTECHNOLOGY</b>	
Detection of coliforms for determination of the purity of potable water (MPN, Presumptive, confirmatory and confirmed tests).	4
Determination of dissolved oxygen concentration of water sample by Winkler's method.	1
Determination of biological oxygen demand (BOD) of the given sample.	1
Determination of chemical oxygen demand (COD) of the given sample (KMnO <sub>4</sub> / K <sub>2</sub> Cr <sub>2</sub> O <sub>7</sub> method).	1
Determination of TS (total solids) of the given water sample.	1
Isolation of xenobiont degrading bacteria by selective enrichment.	2
Vermicomposting/ compositing.	1
Determination of potassium/nitrates from soil sample.	2
Visit to an effluent treatment plant and preparation of report.	2
<b>TOTAL</b>	<b>15</b>

**REFERENCES**

1. Agarwal S.K. (2009). Environmental Biotechnology, APH Publishing Corporation New Delhi.
2. Anjaneyulu Y. (2005). Introduction to environmental Science, BS publications, India.
3. Chatterji A.K. (2009). Introduction to Environmental Biotechnology, 2<sup>nd</sup> ed, Prentice Hall of India Pvt. Ltd. New Delhi.
4. Jogdand B.N. (2008). Environmental Biotechnology (Industrial Pollution Management), Himalaya Publishing House, Mumbai.
5. Santra S.C. (2001). Environmental Science, New central book agency (P) Ltd. Calcutta.
6. Singh B.D. (2008). Biotechnology, 3<sup>rd</sup> edition, Kalyani Publishers.
7. Thakur I.S. (2006). Environmental Biotechnology: Basic concepts and applications, I.K. International Pvt. Ltd. New Delhi.

## **INDUSTRIAL BIOTECHNOLOGY (BASIC)**

**PAPER TITLE: INDUSTRIAL BIOTECHNOLOGY (BASIC)**

**PAPER CODE: BIO-V.C-7**

**MARKS: 75 MARKS THEORY + 25 MARKS PRACTICAL**

**CREDITS: 3 (THEORY) + 1 (PRACTICAL)**

**COURSE OBJECTIVES:** This paper is designed to introduce the students to the basic concepts in Industrial Biotechnology. The paper covers concepts in Industrial Biotechnology, mainly introducing the basics of upstream processes in fermentation technology on an industrial scale.

**LEARNING OUTCOME:** On completion of this module, students will be able to understand the concept of a bioprocess and its importance in today's world of fast pacing technology. They will be able to apply concepts of fermentation technology to the industrial sector and understand how large scale bioprocesses are carried out. This module will be a pre-requisite to the module Industrial Biotechnology (advanced) of semester VI.

### **BIO-V.C-7: INDUSTRIAL BIOTECHNOLOGY (BASIC)**

<b>Sr.No</b>	<b>Topics</b>	<b>Sub Topics</b>	<b>No. of hours</b>
1	Industrial Biotechnology – scope and applications	<ul style="list-style-type: none"><li>- Historical developments (Contributions of Indian Scientists)</li><li>- Understanding concepts related to industrial biotechnology and fermentation processes (Concept of bioprocess)</li><li>- Scope and applications of industrial biotechnology</li></ul>	3

2	Fermentation equipment	<ul style="list-style-type: none"> <li>- Structure of an ideal fermentor</li> <li>- Parts of the fermentor and their uses – impellers, spargers, baffles, headspace, controls and sensors (temperature, pH, antifoam)</li> <li>- Types of reactors (definition, description, diagram and uses) - Bubble columns, Airlift, Fluidized bed, Packed bed, Tray bioreactors, Photobioreactors</li> </ul>	8
3	Fermentation media	<ul style="list-style-type: none"> <li>- Characteristics of an ideal fermentation medium</li> <li>- Types of media – crude and synthetic</li> <li>- Composition of fermentation media</li> <li>- Methods for sterilization of media – heat, radiation, chemical methods</li> </ul>	5
4	Types of fermentation	<ul style="list-style-type: none"> <li>- Introduction to the types of fermentation processes - submerged, surface/solid state, batch, fed-batch and continuous, pilot fermentor.</li> </ul>	4
5	Screening of microorganisms for fermentation processes	<ul style="list-style-type: none"> <li>- Primary screening (Definition)</li> <li>- Methods of primary screening – crowded plate, auxanography, enrichment, indicator dye</li> <li>- Secondary screening (Definition and features)</li> <li>- Example of secondary screening (Giant colony method)</li> <li>- Strain improvement - overview of the methods</li> </ul>	6
6	Maintenance of stock cultures	<ul style="list-style-type: none"> <li>- Aims of preservation of stock cultures</li> <li>- Primary stocks and Working stocks</li> <li>- Techniques of preservation – serial subcultures, sterile soil, water storage, silica gel storage, sterile mineral oil, lyophilization, cryogenic preservation</li> <li>- Inoculum preparation – concept with an example</li> </ul>	5

7	Detection and assay of fermentation products	<ul style="list-style-type: none"> <li>- An overview of the working principle involved in:</li> <li>- Physical and Chemical assays - titration and gravimetric assay, turbidity analysis and cell determination, spectrophotometric assay, chromatographic partition assay</li> <li>- Biological assays - diffusion assays, turbidometric and growth assay, end point assay, metabolic response and enzymatic assays.</li> </ul>	5
8	Applications of fermentation technology (Industrial productions on a large scale)	- Organisms, fermentation media, fermentation conditions and production processes in: citric acid, vinegar, penicillin and industrial alcohol	7
9	Introduction to downstream processing	- An overview of the steps in downstream processing (An introduction to concepts related to separation of cells, disintegration, broth enrichment/extraction, purification, drying and formulation)	2
<b>TOTAL</b>			<b>45</b>

**Practical (25 marks)**

<b>INDUSTRIAL BIOTECHNOLOGY - BASIC</b>	
Parts of a fermentor	1
A study on the phases of growth of microorganisms during batch fermentation (equipment: erlenmeyer flask, medium: nutrient broth, inoculum: <i>E.coli</i> ).	2
Preparation and sterilization of medium for a typical fermentation process (batch fermentation)	1
Batch fermentation using fermentor	1
Preparation and sterilization of medium for a typical fermentation process (fed-batch fermentation)	1



Fed-batch fermentation using fermentor	1
Decontamination and sterilization of the fermentor	1
Primary screening of antibiotic producing bacteria by crowded plate technique	1
Secondary screening for antibiotic producers by Giant Colony Technique	1
Production of citric acid (from fruit waste) using <i>Aspergillus niger</i> .	1
Production of wine (from pineapple or any other fruit/vegetable) using yeast and estimation of percentage alcohol.	2
Production of vinegar	1
Estimation of total reducing sugars and acidity (total and volatile) in wine, citric acid and vinegar (before and after fermentation)	1
<b>TOTAL</b>	<b>15</b>

## REFERENCES

1. Casida L.E. (2009). Industrial Microbiology, New Age International (P) Ltd. New Delhi.
2. Okafor N. (2007). Modern Industrial Microbiology and Biotechnology, Science Publishers Enfield, NH, USA.
3. Patel A.H. (2012). Industrial Microbiology, MacMillan Publishers India Ltd.
4. Prescott & Dunn. (1982). Industrial Microbiology, 4<sup>th</sup> edition, AVI Publishinhg Co.
5. Ratlege C. & Kristiansen B. (2001). Basic Biotechnology, 2<sup>nd</sup> edition. Cambridge university press.
6. Stanbury P. F, Whitaker A. & Hall. (1997). Principles of fermentation technology, 2<sup>nd</sup> Edition, Aditya Books Pvt. Ltd, New Delhi.

## **INDUSTRIAL BIOTECHNOLOGY (ADVANCED)**

**PAPER TITLE: INDUSTRIAL BIOTECHNOLOGY (ADVANCED)**

**PAPER CODE: BIO-VI.E-14**

**MARKS: 75 MARKS THEORY + 25 MARKS PRACTICAL**

**CREDITS: 3 (THEORY) + 1 (PRACTICAL)**

**PRE REQUISITES: Completion of BIO-V.C-7**

**COURSE OBJECTIVES:** This paper is designed to introduce the students to advanced concepts of Industrial Biotechnology. The paper covers topics that explain downstream processing and basic methods involved in industrial production process. The pre-requisite for this paper in the Industrial Biotechnology (Basic) course

**LEARNING OUTCOME:** On completion of this module, students will be familiar with downstream processes that mainly include recovery of the product following upstream processes. They will also understand the method of production of various industrially important substances as well as methods of treatment of industrial waste for suitable disposal into the environment.

### **BIO-VI.E-14: INDUSTRIAL BIOTECHNOLOGY (ADVANCED)**

<b>Sr.No</b>	<b>Topics</b>	<b>Sub Topics</b>	<b>No. of hours</b>
1	Bioprocess and upstream processing (Review)	<ul style="list-style-type: none"><li>- Overview of concepts related to bioprocess technology and importance of upstream processing</li><li>- A review of production processes</li></ul>	2

2	Concepts in downstream processing	<ul style="list-style-type: none"> <li>- Introduction to downstream processing</li> <li>- Separation of cells – flocculation, floatation, use of filter aids and Filtration</li> <li>- Centrifugation of cells – concept and examples (tubular bowl and basket centrifuges)</li> <li>- Disintegration of cells – concept</li> <li>- Mechanical methods – examples (ultrasonication, homogenisers, use of ballotini)</li> <li>- Non mechanical methods – examples (thermal lysis, detergent solubilization, organic solvents and enzymatic agents)</li> <li>- Enrichment methods for fermentation broth – evaporation, membrane filtration, liquid-liquid extraction, precipitation &amp; adsorption</li> <li>- Purification methods – chromatography and crystallization</li> <li>- Drying as a method in downstream processing</li> <li>- Final steps in downstream processing – formulation, packaging and storage</li> </ul>	16
3	Basics of quality control	<ul style="list-style-type: none"> <li>- Good Manufacturing Practice &amp; Good Laboratory practices and safety standards</li> <li>- Examples of regulatory agencies governing safety of products produced by bioprocess technology (example: FDA, other agencies)</li> <li>- Limulus amoebocyte lysate (LAL) assay</li> </ul>	4

4	Production of industrially important substances	<ul style="list-style-type: none"> <li>- Production of fermented foods (wheat, milk, fermented vegetables, cocoa, soyabeans, fermented sausages)</li> <li>- Production of whole cell for food (single cell protein)</li> <li>- Production of beer and spirits (basic concepts in production of whiskey, brandy, rum vodka)</li> <li>- Production of microbial insecticides</li> <li>- Manufacture of steroids</li> <li>- Production of vaccines (virus, bacterial, killed bacterial)</li> <li>- Production of enzymes (fermentation, bulk enzymes and fine enzymes, extraction, packaging, finishing, toxicity testing and standardization)</li> </ul>	19
5	Treatment of wastes in industry	<ul style="list-style-type: none"> <li>- Methods for the Determination of Organic Matter Content in Waste Waters</li> <li>- Wastes from Major Industries</li> <li>- Systems for the Treatment of Wastes (aerobic breakdown of raw waste waters)</li> <li>- Treatment of the Sludge (anaerobic Breakdown of Sludge)</li> <li>- Waste Water Disposal (example: pharmaceutical Industry)</li> </ul>	4
		<b>TOTAL</b>	<b>45</b>

### Practical (25 marks)

<b>INDUSTRIAL BIOTECHNOLOGY (ADVANCED)</b>	
Introduction to downstream processing	1
Demonstration of HPLC	1
Liquid – liquid extraction of Penicillin (produced from upstream)	2
Assay of extracted Penicillin (Minimum Inhibitory Concentration method) using any test organism ( <i>E.coli</i> or <i>S.aureus</i> )	1
Antibiotic (Penicillin) assay using disc diffusion or agar cup method	1
Distillation of wine (for production of brandy)	2
Fermented vegetables (sauerkraut or pickle)	1
Production and analysis of yoghurt	2
Production of bread (bread making)	2
Screening and maintenance of algal cultures for SCP.	2
<b>TOTAL</b>	<b>15</b>

### REFERENCES

1. Cruger W.& Cruger, A. (2007). A Text book of Industrial Microbiology. Sinauer associates publications
2. Okafor N. (2007). Modern Industrial Microbiology and Biotechnology. Science Publishers Enfield, NH, USA.
3. Prave P, Faust U., Sitting W & Sukatsch D.A. (2004). Fundamentals of Biotechnology. VCH publishers.
4. Ratlege C. & Kristiansen, B. (2001). Basic Biotechnology. 2<sup>nd</sup> edition. Cambridge university press.
5. Sivasankar B. (2005). Bioseparations: Principles and techniques. Prentice hall of India Pvt. Ltd. New Delhi.
6. Stanbury P. F, Whitaker A. & Hall. (1997). Principles of fermentation technology. 2<sup>nd</sup> Edition, Aditya Books Pvt. Ltd, New Delhi.

## **PLANT BIOTECHNOLOGY**

**PAPER TITLE: PLANT BIOTECHNOLOGY**

**PAPER CODE: BIO-VI.E-15**

**MARKS: 75 MARKS THEORY + 25 MARKS PRACTICAL**

**CREDITS: 3 (THEORY) + 1 (PRACTICAL)**

**COURSE OBJECTIVES:** This paper aims at introducing the concept of *in vitro* culture of plants including set up of a plant tissue culture laboratory, labware, instruments and sterilization techniques. This paper will help the students to understand that various parts of the plant may be cultured, with each type of culture having specific applications. Plant tissue culture also lends itself to genetic engineering techniques for production of transgenic plants which have various applications.

**LEARNING OUTCOME:** On completion of this module, the student will be able to understand all about plant biotechnology in terms of set up of a laboratory, culture of explants and genetic engineering methods for production of transgenic plants.

### **BIO-VI.E-15: PLANT BIOTECHNOLOG**

<b>Sr. No</b>	<b>Topic</b>	<b>Sub –Topics</b>	<b>No. of hours</b>
1	History of Plant Tissue Culture	- International and Indian scientists	2

2	Laboratory Organization	<ul style="list-style-type: none"> <li>- Washing and drying facility, general laboratory and media preparation area, transfer area.</li> <li>- Culture room, growth chambers and Green house (ideal conditions for incubation and maintenance of cultures/plants).</li> </ul>	4
3	Sterilization Techniques	<ul style="list-style-type: none"> <li>- Sterilization Techniques used in Plant Tissue culture – steam, dry, filter, ultra violet, alcohol, flame and chemical (explants)</li> </ul>	2
4	Plant Tissue Culture Media	<ul style="list-style-type: none"> <li>- Major and minor inorganic nutrients, vitamins, carbon source, hormones, complex organic additives and their functions</li> <li>- Composition of some commonly used plant tissue culture media – MS, White's, Nitsch, Gamborg B5</li> </ul>	4
5	Totipotency	<ul style="list-style-type: none"> <li>- Totipotency and its Importance</li> <li>- Various parts of the plant serving as Explants</li> </ul>	2
6	Organ Culture and its Applications	<ul style="list-style-type: none"> <li>- <i>Root</i></li> <li>- Shoot tip/meristem</li> <li>- Anther and pollen</li> <li>- Ovary and ovule</li> <li>- Embryo</li> </ul>	5
7	Callus and Cell Suspension Cultures	<ul style="list-style-type: none"> <li>- <i>Callus culture – principle, characteristics of callus tissue, applications</i></li> <li>- Cell suspension culture - Principle, isolation, growth patterns, concept of batch and continuous culture, viability testing</li> </ul>	4
8	Somaclonal Variation	<ul style="list-style-type: none"> <li>- Concept, isolation of variants, mechanisms of somaclonal variation and applications</li> </ul>	2
9	Organogenesis	<ul style="list-style-type: none"> <li>- Root and shoot regeneration and applications</li> </ul>	1
9	Somatic Embryogenesis and Artificial Seeds	<ul style="list-style-type: none"> <li>- Somatic Embryogenesis – principle, procedure and applications</li> <li>- Artificial seeds – methods of production and applications</li> </ul>	2
10	Protoplast Culture	<ul style="list-style-type: none"> <li>- Protoplast Culture - Principle, isolation of protoplasts</li> </ul>	4

	and Somatic Hybridization	(mechanical and enzymatic), methods of culture, checking viability - Somatic hybridization - protoplast fusion (spontaneous and induced); selection of hybrid protoplasts, applications of somatic hybridization.	
11	Applications of Tissue Culture in Plant Sciences	- Micropropagation, gene conservation banks, forestry	2
12	Production of Secondary Metabolites	- Classification of secondary metabolites with examples - Production using culture methods - callus culture, cell suspension culture, hairy root culture ( <i>A. rhizogenes</i> ), immobilized cell systems	2
13	Gene Transfer in Plants	- Introduction to <i>Agrobacterium tumefaciens</i> and Ti plasmid - <i>Agrobacterium</i> based vectors (co-integrate and binary vectors) - Co-culture method and in planta transformation - Direct methods of gene transfer – electroporation, chemical methods, particle gun method and microinjection	4
14	Applications of Transgenic Plants	- Insect resistance (BT toxin), drought and salt tolerance, herbicide resistance, increasing shelf life of fruits, improvement of vitamin content (golden rice) and edible vaccines	5
		<b>TOTAL</b>	<b>45</b>

**Practical (25 marks)**

<b>PLANT BIOTECHNOLOGY</b>	
Washing, Packing and Sterilization of Glassware	1
Preparation of Stock solutions for Murashige and Skoog (MS) medium	1
Preparation, sterilization and pouring of MS medium	1



Aseptic germination of seedling	1
Callus induction from hypocotyl and carrot cambial explants and subculturing	2
Shoot tip culture	2
Regeneration of shoot/root from callus	2
Setting up of cell suspension culture and checking viability by Evan's blue method	2
Setting up an <i>in vitro</i> culture from seed embryo (embryo culture)	1
Encapsulation of somatic/true embryo (synthetic seeds)	1
Regeneration of Plants from Synthetic Seeds	1
<b>TOTAL</b>	<b>15</b>

#### **REFERENCES**

1. Chawla, H.S. (2002) Introduction to Plant Biotechnology, Science Publishers Inc. USA.
2. De, K.K. (2008) Plant Tissue Culture, New Central Book Agency Pvt. Ltd.
3. Jha, T.B. & Ghosh, B. (2005) Plant Tissue Culture, University Press (India) Pvt. Ltd.
4. Singh, B.D. (2005) Plant Biotechnology, Kalyani Publishers.

## INTER-DISCIPLINARY PAPER

### **MUSHROOM CULTIVATION & VERMICOMPOSTING TECHNOLOGY**

**SEMESTER: V / VI**

**COURSE TITLE: MUSHROOM CULTIVATION & VERMICOMPOSTING  
TECHNOLOGY (THEORY)**

**COURSE CODE: BIO- ID-1**

**CREDITS: 4**

**TOTAL HOURS: 60**

**COURSE OBJECTIVE:** This paper provides an insight to create awareness among students on mushroom cultivation and organic vermicompost production from biodegradable wastes using earthworms.

**LEARNING OUTCOME:** On completion of this module, students will be able to understand the importance of mushroom cultivation and vermicompost production for sustainable environment management.

### **MUSHROOM CULTIVATION & VERMICOMPOSTING**

#### **TECHNOLOGY MUSHROOM CULTIVATION**

##### **Unit 1: Introduction & History**

**(5 hrs)**

Nutritional and medicinal value of edible mushrooms; Poisonous mushrooms.

Types of edible mushrooms available in India - *Volvariella volvacea*, *Pleurotus citrinopileatus*, *Agaricus bisporus*.

##### **Unit 2: Cultivation Technology**

**(10 hrs)**

Infrastructure: substrates (locally available) Polythene bag, vessels, Inoculation hook, inoculation loop, low cost stove, sieves, culture rack, mushroom unit (Thatched house) water sprayer, tray

Culture media preparation; Selection of mushrooms to be cultivated

Production of the starter – Preparation of spawn

Mushroom bed preparation - paddy straw, sugarcane trash, maize straw, banana leaves

Factors affecting the mushroom bed preparation

Preparation of the compost – Spawning, harvesting, post harvesting technology

### **Unit 3: Storage and nutrition**

**(15 hrs)**

Short-term storage (Refrigeration - up to 24 hours) Long term Storage (canning, pickels, papads), drying, storage in salt solutions

Nutrition - Proteins - amino acids, minerals, Carbohydrates, Crude fibre content, Vitamins

Types of foods prepared from mushroom

Research Centres - National level and Regional level

Major pests: Insect Pests, Mite Pests, Viral, Bacterial, fungal

Mushroom insect diseases – Prevention and Control measures

## **VERMICOMPOSTING TECHNOLOGY**

### **Unit 4 Introduction to Vermicomposting**

**(5hrs)**

Meaning, history, economic importance, value in maintenance of soil structure, role in recycling of organic wastes

### **Unit 5 Selection of the worms**

**(10hrs)**

Choosing the right worm; Useful species of earthworms; Local species of earthworms; Exotic species of earthworms; working with worms: bedding; food source; moisture, aeration; protection against predators

### **Unit 6 Vermicomposting technology**

**(15hrs)**

Requirements for vermicompost production- site selection, selection of suitable earth worm, selection of food, selection of bedding material

Methods of vermicomposting-Pit or pot method- Heap method, Bin or tray method, Windrow method, Wedge system, Vermi reactor system

Harvesting - Manual methods, Self-Harvesting (migration) methods, Mechanical methods

Nutritive value of vermicompost, Overview of Potential Benefits and Constraints

Vermiwash collection, composition & use

General problems in vermicomposting, Prospects of vermicomposting as self employment venture.

## **REFERENCES**

### **A. Mushroom cultivation**

- Casida L.E. (2009). Industrial Microbiology, New Age International (P) Ltd. New Delhi.
- Prescott & Dunn. (1982). Industrial Microbiology, 4<sup>th</sup> edition, AVI Publishinhg Co.
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- V.N.Pathak, Nagendra Yadav & Maneesha Gaur, Mushroom Production and Processing Technology. Agrobios (India) Jodhpur.

### **B. Vermicomposting technology**

- R.K. Bhatnagar & R.K. Palta, Earthworm Vermiculture and Vermicomposting. Kalyani Publishers, Chennai.
- P.K. Gupta, Vermi Composting for Sustainable Agriculture. Agrobios (India), Jodhpur.

# **BOTANY**

**Parvatibai Chowgule College of Arts and Science  
(Autonomous)  
Margao- Goa**

**COURSE STRUCTURE – DEPARTMENT OF BOTANY  
Three year B.Sc Degree Course in BOTANY 2018-19**

Sem.	Core		Elective			
I	<b>BOT-I.C-1</b> Plant diversity AGS	<b>BOT-I.C-2</b> Cell Biology & Biomolecules UAM	-----	-----	-----	-----
II	<b>BOT-II.C-3</b> Plant Anatomy and Embryology	<b>BOT-II.C-4</b> Microbiology	-----	-----	-----	-----
III	<b>BOT-III.C-5</b> Physiology of Plants SGS		<b>BOT- E-1</b> Ecology & Conservation AGS+DSR	<b>BOT-.E-2</b> Techniques and Instrumentation in Botany UAM+DSR	<b>BOT-E-3</b> Enzymes and metabolic pathways X	<b>BOT- E-4</b> Herbal Cosmetology
IV	<b>BOT-IV.C-6</b> Cytogenetics		<b>BOT-E-5</b> Plant Breeding and Biostatistics	<b>BOT- E-6</b> Systematics of Flowering plants and Phylogeny	<b>BOT- E-7</b> Plant pathology	<b>BOT- E-8</b> Horticulture, Floriculture & Landscaping
V	<b>BOT-V.C-7</b> Plant Molecular Biology SGS		<b>BOT- E-9</b> Bioinformatics DSR+AGS	<b>BOT-E-10</b> Seed Technology	<b>BOT- E-11</b> Plant Drug Technology and Pharmacognosy UAM	<b>BOT-E-12</b> Organic Farming DSR
VI	<b>BOT-VI.C-8</b> Plant Biotechnology and Genetic Engineering		<b>BOT- E-13</b> Plant tissue culture	<b>BOT-E-14</b> Algal Biotechnology	<b>BOT-E-15</b> Economic Botany	<b>BOT-E-16</b> Applied Mycology

**COURSE TITLE: PLANT DIVERSITY (THEORY)**

**COURSE CODE: BOT-IC1**

**MARKS: 75**

**CREDITS: 3**

**COURSE DURATION: 45 HOURS**

**COURSE OBJECTIVES:**

This paper provides knowledge on morphology, structure and importance of the lower group of organisms. Education and awareness about plant diversity, its role in sustainable livelihoods.

**LEARNING OUTCOMES:**

On completion of the course: The students will be able to differentiate between various groups of algae, fungi, lichens, bryophytes and pteridophytes. Students will gain knowledge about the economic and ecological importance of the lower group of plants also to effectively conserve the plantbiodiversity.

<b>Sr.No.</b>	<b>UNITS, TOPICS AND SUB-TOPICS</b>	<b>Hours</b>
<b>UNIT I: ALGAE AND LICHENS</b>		11
1.1	Five kingdom classification	1
1.2	Classification of algae (Cyanobacteria, Chlorophyta, Phaeophyta and Rhodophyta) following Lee (1999) upto groups with general characters and examples	2
1.3	Endosymbiotic theory: origin of plastids	1
1.4	Cyanophyceae: Ecology, importance. Distribution, systematic position and life cycle of <i>Nostoc</i> and Charophyta: <i>Chara</i>	4
1.5	Economic importance of algae	1
1.6	Structure and reproduction: Ecological and economic importance of lichens	2
<b>UNIT II: FUNGI</b>		08
2.1	General characteristics, Classification, economic importance. systematic position, life history of <i>Puccinia</i> and <i>Penicillium</i>	8
<b>UNIT III: BRYOPHYTES</b>		09
3.1	General characters, brief classification and alternation of generation	2
3.2	Study of morphological and anatomical studies and reproductive character of <i>Riccia</i> , <i>Marchantia</i> , <i>Anthoceros</i> and <i>Funaria</i> .	7

<b>UNIT IV: PTERIDOPHYTES</b>		<b>08</b>
4.1	General characters, brief classification, alternation of generation.	2
4.2	Structure, reproduction, life history and systematic position of <i>Psilotum</i> , <i>Lycopodium</i> and <i>Marsilea</i> .	6
<b>UNIT V: GYMNOSPERMS AND PALEOBOTANY</b>		<b>09</b>
5.1	General characters, brief classification, alternation of generation of Gymnosperms	2
5.2	Systematic position, life history of <i>Pinus</i> and <i>Gnetum</i>	6
5.3	Fossils and fossilization, importance of fossils (with a mention of Birbal Sahni institute)	1
<b>TOTAL</b>		<b>45</b>



**COURSE TITLE: PLANT DIVERSITY (PRACTICAL)****COURSE CODE: BOT-I.C-1****MARKS: 25****CREDITS: 1****PRACTICAL SESSIONS: 15**

<b>Sr. No</b>	<b>Topics</b>	<b>Practical Sessions</b>
1.	Morphological study of algal and Blue green algal forms: <i>Oscillatoria/Nostoc, Chara, Sargassum, Polysiphonia</i>	03
2.	Morphological study of fungal forms: <i>Puccinia, Penicillium, Albugo</i> and <i>Rhizopus</i>	03
3.	Study of lichens (Permanent slide/ specimen)	01
4.	Study of fossils: (Permanent slide/ specimen)	01
5.	Morphological and anatomical study of: i. Bryophyte (preferably <i>Riccia</i> or <i>Anthoceros</i> ) ii. Pteridophyte (preferably <i>Selaginella</i> ) iii. Gymnosperm (preferably <i>Cycas</i> )	05
6.	Mini project: Collection and field study of locally available Algae, Bryophytes, Pteridophyte, Gymnosperms and Lichens	02
Total		15

**REFERENCES:**

1. Alexopoulos, Constantine J.; Mims, Charles W. (1983). Introductory Mycology; 3<sup>rd</sup> edition; New Delhi: Wiley Eastern Limited.
2. Kar, Ashok Kumar; Gangulee, Hirendra Chandra (2006). College Botany: Volume II; 2<sup>nd</sup> Edition; Kolkata: New Central Book Agency (P) Ltd.
3. Smith, Gilbert M. (1955). Cryptogamic Botany Algae & Fungi Volume 1; 2<sup>nd</sup> Edition; McGraw-Hill Book Comp. Tokyo.
4. Smith, Gilbert M. (1955). Cryptogamic Botany Bryophyta & Pteridophyta Volume 2; 2<sup>nd</sup> Edition; McGraw-Hill book Comp. Tokyo.
5. Vasishtha B.R. And Sinha A. K. (2005). Botany for degree students Part 1 Algae; 1<sup>st</sup> Edition S. Chand & Company Ltd.
6. Parihar N.S., (2013); An introduction to Embryophyta: Bryophyta. Vol I, fifth edition, Surjeet Publications.

7. Parihar N.S., ( 2012); An introduction to Embryophyta: Pteridophytes.Vol II, fifth edition, Surjeet Publications.
8. Fritsch, F.E.,(1956). The structure and reproduction of the Algae; Volume I and II. Cambridge University Press.

**COURSE TITLE: CELL BIOLOGY AND BIOMOLECULES (THEORY)**  
**COURSE CODE: BOT-I.C-2**  
**MARKS: 75 MARKS**  
**CREDITS: 3**

**COURSE DURATION: 45 HOURS****COURSE OBJECTIVES:**

This course will provide a detailed discussion on a wide range of topics in Cell biology & Bio-molecules emphasizing experimental approaches and key experiments that have provided important insights. The course is aimed at conveying an understanding of how cellular structure and function arise as a result of the properties of cellular macromolecules. Emphasis will be on the dynamic nature of cellular organization, structure and function.

**LEARNING OUTCOME:**

Students will understand the structures and purpose of basic components of prokaryotic and eukaryotic cells, especially macromolecules, membranes, organelles and importance of cells as basic units of living organisms & the role of cell membrane in movement of substances into and out of cells. It will also help to understand the chemical structure of water, carbohydrates, lipids and proteins and their role in living organisms.

Sr. No	Units, Topics and Sub- Topics	Hours
<b>Unit-I: Overview of cells</b>		<b>04</b>
1.1	Discovery of cells, Basic properties of cells	1
1.2	Prokaryotic and Eukaryotic cell; Cell theory	2
1.3	Cell evolution and biogenesis	1
<b>Unit-II: Cytoskeleton and its role in motility</b>		<b>03</b>
2.1	Structure and functions of cytoskeleton; Structure and function of Microtubule, Intermediate filaments, Microfilaments	03
<b>Unit-III: The Ultra-structure and Function of Cell wall and Plasma membrane</b>		<b>11</b>
3.1	Structure and function of cell wall; Chemical composition of cell wall; Extracellular matrix and cell interactions; Gap -Junctions & plasmodesmata	4
3.2	Structure and function of plasma membrane; Active and Passive transport of solute (channels & pumps); Cell signaling- molecules and receptors, signaling network	7
<b>Unit-IV: The Cell Organelle studies</b>		<b>14</b>
4.1	Structural organization and functions; Semiautonomy and gene control; Structure & functions of peroxisome, glyoxysome & lysosomes	5
4.2	Nucleus and its Organization; Nuclear envelope, nuclear pore complex Nuclear matrix, Chromosomes and chromatin structure	5
4.3	Structure and function of ribosome ; Endomembrane systems- Endoplasmic reticulum and Golgi complex	4
<b>UNIT- V: BIOCHEMISTRY OF CARBOHYDRATES AND LIPIDS</b>		<b>08</b>

5.1	Definition & importance of biomolecules; types of bonds in biomolecules; pH and buffers ; Water as a biological solvent	4
5.2	Classification and biological functions of carbohydrates and lipids	4
<b>UNIT VI: AMINO ACIDS AND PROTEINS</b>		<b>05</b>
6.1	Classification and biological functions of amino acids and proteins	05
<b>Total</b>		<b>45</b>

**COURSE TITLE: CELL BIOLOGY & BIOMOLECULES (PRACTICAL)**  
**COURSE CODE: BOT-I.C-2**  
**MARKS: 25**  
**CREDITS: 1**  
**PRACTICAL SESSIONS: 15**

Sr.No	TOPICS	PRACTICAL SESSIONS
1.	Study of cell structure in <i>Hydrilla</i> and <i>Tradescantia</i> staminal hairs	1
2.	Examination of prokaryotic cell, eukaryotic cell and cell organelles by EM graphs	1
3.	Preparation of temporary slides to observe different types of cells	2
4.	Staining and Preparation of slides	6
	I. Cytochemical staining of Nucleus- Acetocarmine II. Cytochemical staining of polysaccharides- Periodic Acid Schiff's (PAS) III. Cytochemical staining of Mitochondria – Jannis Green IV. Cytochemical staining of Total proteins –Bromophenol blue V. Cytochemical staining of Histones – Fast Green	
5.	Determination of pH using pH meter	1
6.	Quantitative determination of carbohydrates (Anthrone reagent)	1
7.	Estimation of oil in fatty seeds	2

8.	Estimation of proteins	1
	<b>Total</b>	<b>15</b>

#### REFERENCES:

1. David L. Nelson.& Michael M. Cox. (2013). Lehninger Principles of Biochemistry, 4<sup>th</sup> ed. W.H. Freeman & Co, New York.
2. Donald Voet., Judith G. Voet and Charlotte W. Pratt. (2002). Fundamentals of Biochemistry, 2<sup>nd</sup> edition, John Wiley and Sons (Asia) Pvt Ltd.
3. Gupta, P.K. (1999). A Text-book of Cell and Molecular Biology. Rastogi Publications, Meerut, India.
4. H.Robert Horton. (2006).Principals of biochemistry.4<sup>th</sup> ed. Pearson Prentice Hall.
5. Jeremy M. Berg, John L. Tymoczko and Lubert Stryer.(2002). Biochemistry5<sup>th</sup> edition, W.H.Freeman & Company, New York
6. Karp, G. (1999). Cell and molecular Biology, Concepts and experiments (John Wiley and Sons Inc) 2<sup>nd</sup> edition. USA.
7. Paul Flinch (1999). Carbohydrates structure, Synthesis & Dynamics. Kluwer Academic Pub.The Netherlands.
8. U. Satyanarayana and U. Chakrapani. (2000).Biochemistry,4<sup>th</sup> edition., Elsevier Pub. Kolkata.
9. Verma P.S. and Agarwal V. K. (1998).Cell Biology, Genetics, Molecular Biology, Evolution and ecology. Edn.14

#### COURSE TITLE:PLANT ANATOMY AND EMBRYOLOGY (THEORY)

**COURSE CODE : BOT-II. C-3**

**MARKS: 75**

**CREDITS: 3**

#### COURSE OBJECTIVES:

This paper deals to understand the plant anatomy and embryology of angiospermic plant. Importance of studying this paper is highlighted reflecting on the current changing needs of the students by providing latest information. Practical component will provide an ample understanding of anatomical and embryological features.

#### COURSE OUTCOME:

- Define, describe and explain the basic plant anatomical and embryological features
- Compare the interrelatedness of organ-systems and their functions
- Examine the features through histological techniques.
- Define, describe, explain, compare theories in organization of tissues

Sr.No.	TOPICS	Hours
	<b>Module I: Shoot, Root and Leaf Anatomy</b>	15

1.1	Organization of Shoot apical meristem	
1.2	Apical cell theory, Histogen theory, Tunica-Corpus theory, Cyto-histological zonation.	
1.3		
1.4	Organization of root apical meristem	
1.5	Korper-Kappe theory, Quiescent centre.	
1.6	Anatomy of leaf: epidermis, mesophyll and vascular tissue	
	Stomata and its diversity, leaf abscission	
<b>Module II: Wood Structure</b>		15
2.1	Vascular cambium, Secondary xylem, Xylary elements	
2.2	Secondary phloem, Phloem elements and Periderm	
2.3	Conifer wood, Dicotyledon wood, wood anatomy-TS, TLS, RLS.	
<b>Module III: Reproductive biology, Pollination and fertilization</b>		15
3.1	Floral development: ABC model of flowering	
3.2	Structure and development of male gametophyte- Microsporangium	
3.3	Microsporogenesis & Pollen grains	
	Structure and development female gametophyte – Megasporangium, Megasporogenesis, Forms of ovule-Monosporic, bisporic and Tetrasporic	
3.4	Mechanism of pollination and fertilization- types of pollination, germination of pollen grain, pollen pistil interaction, self-incompatibility	
3.5	Double fertilization, embryo (dicot and monocot) and endosperm formation. General account of Apomixis and Polyembryony	
	<b>TOTAL</b>	45

**COURSE TITLE:PLANT ANATOMY AND EMBRYOLOGY (PRACTICAL)**

**COURSE CODE : BOT-II.C-3**

**MARKS: 25**

**CREDITS: 1**

<b>Sr.No.</b>	<b>Module 4: TOPICS</b>	<b>PRACTICAL</b>
<b>1.</b>	Study of simple and complex tissues by using permanent slides/ EM graphs.	<b>2</b>
<b>2.</b>	Microscopic study of wood tissues in T.S, T.L.S. and R.L.S. and maceration (Any one species)1	<b>3</b>
<b>3.</b>	Study of Meristems, Microsporogenesis and Megasporogenesis through permanent slides	<b>2</b>
<b>4.</b>	Mini Project- Study of diversity in leaf anatomy, stomata and female gametophyte exhibiting self-incompatibility.	<b>3</b>
<b>5.</b>	Embryo and Endosperm with haustoria mounting ( <i>Tridax/ Cucurbit</i> ).	<b>2</b>
<b>6.</b>	In vitro growth of pollen tube in <i>Portulaca/ Vinca</i> .	<b>1</b>

7.	Pollen studies: Chitaley's method for analysis in <i>Ipomoea</i> , <i>Ocimum</i> , <i>Hibiscus</i> , <i>Acacia auriculiformis</i> and Grass.	2
<b>TOTAL</b>		<b>15</b>

**REFERENCES: -**

1. Bhojwani, S. S and Bhatnagar, S.P. The Embryology of Angiosperms, Vikas Publishing House Pvt. Ltd., New Delhi.
2. Dwivedi. J.N. (1988). Embryology of Angiosperms. Rastogi and Co. Meerut.
3. Esau, K. (1977). Plant Anatomy, 2<sup>nd</sup> Edition. Wiley Eastern Private Limited. New Delhi.
4. Fahn, A. (1982). Plant Anatomy (3rd edition). Pergoman Press, Oxford.
5. John Jothi Prakash, E. (1987). A Text Book of Plant Anatomy.
6. Mauseth, J.D. (1988). Plant Anatomy. The Benjamin Cummings Publishing Co. Inc., Mehlo Park, California, USA.
7. Maheswari, P. (1971). An Introduction to the Embryology of Angiosperms. Tata McGra
8. Pandey, B.P. (1981). A textbook of Botany Angiosperms. S. Chand and Co., New Delhi.
9. Pandey, B.P. (1978). Plant Anatomy, S. Chand and Co., New Delhi.
10. Vashista, P.C. (1968). A text Book of plant Anatomy.

**COURSE TITLE: MICROBIOLOGY (THEORY)**

**COURSE CODE: BOT.II.C-4**

**MARKS: 75**

**CREDITS: 3**

**COURSE OBJECTIVES:**

The objective of this course is to familiarize the student with basic concepts that help in understanding of microbial world. The course is aimed to understand microbial survival and distribution, it's relation and interaction with environment and human beings. The laboratory exercises are designed so that students acquire basic and bacteriological skills and are able to successfully use them.

**COURSE OUTCOME: Students will be able to:**

- Appraise student's to fundamental basis of all living organisms (Plant and Microbes) and their interactions with the environment.



- Apply the knowledge of microbial world for sustainable usage of resources for the quality human survival on planet earth and protect environment.

Sr.No.	TOPICS	Hours
<b>Module I: Overview of microbial world &amp; development</b>		<b>15</b>
1.1	Developments of microbiology in the twentieth century Microbial taxonomy & phylogeny (archaea, bacteria, fungi, algae, protozoa)	
1.2	Structure & General characteristics of viruses, viroids, Prions, Bacteriophages, TMV & mycoplasma	
1.3	Distribution of microbes in the environment (air, soil & water) Scope of microbiology and Microbial diseases	
<b>Module 2: Isolation, characterization, growth of microorganisms &amp; microbial genetics</b>		<b>15</b>
2.1	<b>Control of microbial growth:</b> Biochemical characterization & nutritional types; Sterilization techniques,	
2.2	Preparation of pure cultures; growth factors & growth curve.	
2.3	Staining techniques	
2.4	<b>Bacterial Reproduction:</b> Conjugation, Transformation & transduction;	
2.5	<b>Methods of viral replication</b> (Lytic & Lysogenic mode)	
<b>Module 3: Application Microbiology</b>		<b>15</b>
3.1	<b>Applications in Environment:</b> Applications of microbes in environment sustenance (microbial degradation of cellulose, hemicelluloses, lignin, biodegradation of hydrocarbons),	
3.2	<b>Applications in Agriculture:</b> Association of plants with cyanobacteria, actinomycetes, fungus; Xenobiotics (biodegradation of pesticides, herbicides; metals, biofuels	
3.3	<b>Applications in Medicine:</b> Microbial antibiotics	
3.4	<b>Applications in Industry:</b> Microbes in Fermentation technology & dairy industry.	
		<b>TOTAL</b>
		<b>45</b>

**COURSE TITLE: MICROBIOLOGY (PRACTICAL)****COURSE CODE: BOT.II.C-4****MARKS: 25****CREDITS: 1**

Sr.No.	Module 4: Topics	Practical
1	Preparation of culture media for bacteria, pure cultures and aseptic transfer of pure culture	3
2	Staining of microorganisms	2
3	Measurement of bacterial growth, cell number in a culture (Turbidity, serial dilution & Haemocytometer)	3
4.	Distribution of microorganisms in our environment (Skin, air, water and soil sample)	2
5	Mini Projects: i) Microbiological examination of water ii) Bacteriological testing of milk iii) Fermentation of carbohydrates and wine preparation	5
<b>TOTAL</b>		<b>15</b>

**REFERENCES:**

1. Aneja, K. R. (2007). Experiments in Microbiology Plant Pathology & Biotechnology. 5<sup>th</sup> ed., New Age International Publishers.
2. Atlas, R.M., Principles of Microbiology, 2<sup>nd</sup> ed., (1997), McGraw-Hill
3. Dubey, R.C & Maheshwari, D.K. (2002). Practical Microbiology. S. Chand & Company Ltd., New Delhi.
4. Frazier, W.C. and Westhoff, D.C. (2008), Food Microbiology 4<sup>th</sup> ed., the McGraw Hill.
5. Pelczar, M. (2000). Microbiology, 5<sup>th</sup> ed., Tata-McGraw Hill.
6. Powar, C.B & Dagainawala, H.F. (1982). General Microbiology–Volume II. Himalaya Publishing house: Bombay.
7. Prescott Harley (2008). Microbiology. McGraw-Hill Higher Education, Boston.
8. Prescott, L.M. (2005), Microbiology. 6<sup>th</sup> ed. 2005., McGraw-Hill.
9. Salle, A.J., Fundamental Principles of Bacteriology, 7<sup>th</sup> ed., (1999). Tata- McGraw Hill.
10. Shivkumar P.K., MM Joe & Sukesh K. (2010). An Introduction to Industrial Microbiology. 1<sup>st</sup> ed., S.Chand & Company Pvt.Ltd

**COURSE TITLE: PHYSIOLOGY OF PLANTS(THEORY)**

**COURSE CODE: BOT.III.C-5**

**MARKS: 75**

**CREDITS: 3**

**COURSE DURATION: 45 HOURS**

**COURSE OBJECTIVES:**

Objective of this introductory course is to provide understanding of how plants function. The course explain principle of plant functions covering physiological processes in plants, such as biochemical metabolism, secondary products, water & solute (organic & inorganic) uptake and growth & development.

**LEARNING OUTCOMES:** Upon completing this course, students will be familiar with contemporary concepts in Plant Physiology and the physiological mechanisms controlling plant growth and development. Students will have an understanding of movement of water and solutes in plant, know the importance of the photosynthesis as related to harvesting solar energy and plant productivity, hormone and its relation with plant growth and development.

<b>Sr. No</b>	<b>UNITS, TOPICS AND SUB-TOPICS</b>	<b>Hours</b>
<b>UNIT-I: PLANT WATER RELATIONS</b>		<b>09</b>
1.1	Water and its significance to plants	3
1.2	Osmotic & water potential of cell	3
1.3	Transpiration, stomatal regulation & anti-transpirants	3
<b>UNIT-II: SOLUTE TRANSPORT</b>		<b>08</b>
2.1	Uptake, transport and translocation of water	3
2.2	Essentiality of mineral nutrition and its uptake (active, passive and its role on membranes)	2
2.3	Transport of organic solutes (source sink relationship)	3
<b>UNIT III: PHOTOSYNTHESIS</b>		<b>12</b>
3.1	Chloroplast and Light harvesting complexes	3
3.2	Z scheme of photosynthesis & Mechanisms of electron transport	3
3.3	CO <sub>2</sub> fixation (C3, C4 and CAM pathways)	3
3.4	Photoprotective mechanisms (photorespiration); Environmental change and its impact on photosynthesis	3
<b>UNIT IV: PLANT GROWTH AND DEVELOPMENT</b>		<b>09</b>
4.1	Role of phytochromes & cryptochromes and its functions	2
4.2	Plant hormones, transport and physiological functions	3
4.3	Photoperiodism and vernalization	2
4.4	Senescence, seed dormancy & germination	2
<b>UNIT V: SECONDARY METABOLITES AND STRESS PHYSIOLOGY</b>		<b>07</b>

5.1	Responses of plants to abiotic (water, temperature and salt) stresses	4
5.2	Biosynthetic pathway of terpenes, phenols and alkaloids and their functions.	3
	<b>TOTAL</b>	<b>45</b>

**COURSE TITLE: PHYSIOLOGY OF PLANTS(PRACTICALS)**

**COURSE CODE: BOT.III.C-5**

**MARKS: 25**

**CREDITS: 1**

**PRACTICAL SESSION: 15**

<b>Sr. No</b>	<b>TOPICS</b>	<b>PRACTICAL SESSIONS</b>
1	Determination of osmotic potential of plant cell sap by plasmolytic method.	2
2	Determine water potential of given tissue by falling drop method	2
3.	Chromatographic separation of plant pigments and plant sugars	4
4	Quantitation of total free amino acids	2
5	<b>Mini Project:</b> 1. Mineral deficiency symptoms in plants 2. Secondary metabolites in plants. 3. Oxygen consumption during respiration 4. Role of Plant hormones in plant growth 5. Light intensity and starch production	5
		<b>15</b>

**REFERENCES:**

1. William G. Hopkins (1999). Introduction to Plant Physiology, 2<sup>nd</sup> edition, John Wiley A Sons, Inc.
2. Taiz, L. and Zeiger, E. (2006). Plant Physiology, 4<sup>th</sup> edition, Sinauer Associates Inc .MA, USA.
3. Frank B. Salisbury and Cleon W. Ross (2002). Plant Physiology 3rd edition. CBS publishers and distributors.
4. G. Ray Noggle and George J.Fritz (2010) Introductory Plant Physiology Prentice Hall.
5. Goodwin Y.W., and Mercer E.I. (2003) Introduction to Plant Biochemistry. 2<sup>nd</sup> edition CBS Publishers and distributors.
6. Galstone A.W. (1989). Life processes in Plants. Scientific American Library, Springer Verlag, New York,
7. Moore T.C. (1989). Biochemistry and Physiology of Plant Hormones Springer –Verlag, New York,USA.
- 8.Singhal G.S.,Renger G., Sopory, S.K. Irrgang K.D and Govindjee (1999).Concept in Photobiology; Photosynthesis and Photomorphogenesis. Narosa Publishing House, New Delhi
9. Hopkins, W.G. and Huner, P.A. (2008) Introduction to Plant Physiology. John Wiley and Sons.
10. Salisbury, F.B. and Ross, C.W. (1991) Plant Physiology, Wadsworth Publishing Co. Ltd.
11. David I. Nelson and Michael M. Cox (2000). Lehninger. Principles of biochemistry, 3<sup>rd</sup>edition, Macmillan U.K.
12. David T Plummer (1985).An introduction to Practical Biochemistry 2<sup>nd</sup> edition. Tata Mcgraw Hill Publishing company Ltd.

13. D. Bajracharya (1999). Experiments in Plant Physiology. Narosa Publishing House new Delhi.

**CURRENT LITERATURE (JOURNAL ARTICLES):**

Plant Physiology, The Plant Cell, Journal of Plant Physiology, Physiologia Plantarum, Plant Physiology and Biochemistry, Postharvest Biology and Technology, Journal of the American Society for Horticultural Science, Science, Nature, Scientific American.

**COURSE TITLE: ECOLOGY & CONSERVATION (THEORY)**

**COURSE CODE: BOT E-1**

**MARKS: 75**

**CREDITS: 3**

**COURSE DURATION: 45 HOURS**

**COURSE OBJECTIVES:**

Objective of this paper is to provide introductory knowledge on biotic and abiotic environmental factors, pollution and phytogeography with regards to Govt regulations towards environmental management with respect to agriculture and food security.

**LEARNING OUTCOMES:**

The Students will be able to understand the role and importance of biotic and abiotic environment factors in the sustenance of plant life and causes, consequences, prevention, remediation of pollution and efforts taken in reducing or controlling the pollution causing factor. The course will impart importance of phytogeography and forestry to teach managing regional flora.

<b>Sr.No.</b>	<b>UNITS, TOPICS AND SUB-TOPICS</b>	<b>HOURS</b>
<b>UNIT I: CONCEPT OF ECOSYSTEM</b>		<b>05</b>
1.1	Concept of Ecosystem: Components and their interactions, food chains and food web; Ecological pyramids; Ecological adaptations of plants belonging to following ecological groups: Hydrophytes, Xerophytes and Halophytes	<b>5</b>

<b>UNIT II: ECOLOGICAL FACTORS (Biotic &amp; Abiotic)</b>		<b>16</b>
2.1	Light - quality, duration, absorption, intensity & effects on plants	<b>03</b>
2.2	Temperature-variation due to altitude effects on plants, thermal constant and stratification	<b>03</b>
2.3	Water- precipitation, moisture & measurement of rainfall	<b>03</b>
2.4	Wind - speed, advantages and damage caused to plants	<b>03</b>
2.5	Soil- soil profile, texture, classification and organic matter	<b>03</b>
2.6	Biotic-community relationships	<b>01</b>
<b>UNIT III: POLLUTION , CAUSES AND CONSEQUENCES</b>		<b>11</b>
3.1	Air pollution- polluting gases; ozone depletion, greenhouse effect, global warming, acid rain and smog	<b>03</b>
3.2	Water pollution-eutrophication, sewage, industrial waste, heavy metals	<b>04</b>
3.3	Soil pollution – chemical pollutants	<b>03</b>
3.4	Bioremediation	<b>01</b>
<b>UNIT IV: PHYTOGEOGRAPHY AND FORESTRY</b>		<b>13</b>
4.1	Phytogeography- plant distribution, theories on plant distribution	<b>03</b>
4.2	Endemism, major biomes of the world, minor biomes, and phytogeographical regions of India	<b>02</b>
4.3	Forestry- destruction of forest, deforestation, afforestation, reforestation, forest research, education and training institutes, biosphere reserves	<b>03</b>
4.4	Forest conservation act, Indian forest act, biodiversity act, western Ghat protection act, Kasthurirangan Act, Gadgil committee report, Mining committee reports, wild life act ( <b>recent acts to bestudied</b> )	<b>05</b>
<b>TOTAL</b>		<b>45</b>

**COURSE TITLE: ECOLOGY & CONSERVATION (PRACTICAL)****COURSE CODE: BOT.E-1****MARKS: 25****CREDITS: 1****PRACTICAL SESSIONS:15**

<b>Sr. No</b>	<b>Topics</b>	<b>Practical sessions</b>
1.	Study of ecological instruments i.e. lux meter, rain guage, hygrometer, wet and dry bulb thermometer, maximum and minimum thermometer	02
2.	To study the physical and chemical characters (moisture, texture and pH) of different types of soils.	02
3.	Analysis of different water samples for oxygen and carbon-dioxide content	03
4.	Estimation of total carbonates from soil sample	01
5.	Visual interpretation of remotely sensed image for vegetation types	01
6.	Study of community relationships- Mutualism (mycorrhizae)	01
7.	Mini project: To determine minimum area of sampling unit (quadrat) for the study of local community and to determine species diversity index (Simpson's & Shannon-Weiner) of herbaceous vegetation	05
<b>Total</b>		<b>15</b>

**REFERENCES:**

1. Ambasht, R.S. A Text Book of Plant Ecology. Students Friends Co., Varanasi. 1988
2. Ecology and environment; P. D. Sharma, Rastogi publications, Meerut. 7th ed –2004.
3. Ecology- N.S. Subrahmanyam and A.V.S.S. Sambamurty, Narosa Publishing House, 2000.
4. Environmental Biotechnology. Jogdand, SN 1995. Himalaya Publishing House, Mumbai.
5. Environmental chemistry by B. K. Sharma, Goel publication house, Meerut, Sixth revised edition –2001.
6. Environmental Chemistry, A. K. Day, Fourth Edition, New Age International Publishers- 2002



7. Environmental Science; by-Santra SC; Central Publ. NewDelhi.
8. Fundamental of Ecology: EP Odum; WB Saunders Company.1971
9. Moore, P.W.and Chapman, S.B. 1986. Methods in Plant Ecology. Blackwell ScientificPublications.
10. Piper, C.S. 1950. Soil and Plant Analysis. University of Adelaide,Australia.
11. Sharma, P.D. Ecology and Environment; 7th edition; Meerut :Rastogi Publishers , 1998.
12. Subrahmanyam, N.S.;Sambamurty, A.V.S.S.; Ecology; 1st edition; New Delhi : Narosa Publishing House ,2000.

**COURSE TITLE: TECHNIQUES & INSTRUMENTATION IN BOTANY**  
**COURSE CODE: BOT.E-2**  
**MARKS: 75**  
**CREDITS: 3**  
**COURSE DURATION:45 HOURS**

**COURSE OBJECTIVES:**

Objective of the course is to impart knowledge of principle, methodology and application of various techniques & instrumentation.

**LEARNING OUTCOMES:**

Students will learn the principle, working and applications of various instruments essential to study different facets of Botany.

<b>Sr.No</b>	<b>UNITS, TOPICS AND SUB-TOPICS</b>	<b>Hours</b>
	<b>UNIT I: MICROSCOPY</b>	<b>11</b>
<b>1.1</b>	Light microscopy (compound microscopy and Phase contrast microscopy)	<b>3</b>
<b>1.2</b>	Fluorescence microscopy	<b>2</b>
<b>1.3</b>	Transmission and Scanning electron microscopy (sample preparation for electron microscopy, cryofixation,)	<b>4</b>
<b>1.4</b>	Microscopic measurements and photography (Micrometry & cytometry)	<b>2</b>
	<b>UNIT-II : CENTRIFUGATION AND RADIOISOTOPY: PRINCIPLE, METHODOLOGY AND APPLICATIONS</b>	<b>09</b>
<b>2.1</b>	Centrifugation: Low speed, high speed, cooling centrifuges and ultracentrifugation Analytical, preparatory and gradient centrifugation	<b>04</b>
<b>2.2</b>	Various types of rotor heads and their maintenance	<b>01</b>
<b>2.3</b>	Radioactivity and its measurements (Geiger Muller and Scintillation counter and autoradiography)	<b>04</b>

<b>UNIT – III: SPECTROPHOTOMETRY: PRINCIPLE, METHODOLOGY AND APPLICATIONS</b>		<b>08</b>
<b>3.1</b>	UV visual spectrophotometry	02
<b>3.2</b>	Fluorescence spectrophotometry	02
<b>3.3</b>	Flame (Atomic absorption) spectrophotometry	02
<b>3.4</b>	Mass spectrophotometry	02
<b>UNIT –IV: CHROMATOGRAPHY: PRINCIPLE, METHODOLOGY AND APPLICATIONS</b>		<b>09</b>
<b>4.1</b>	Adsorption and partition chromatography	03
<b>4.2</b>	Column chromatography (isocratic and gradient)	03
<b>4.3</b>	HPLC & GC	03
<b>UNIT- V: ELECTROPHORESIS &amp; MOLECULAR TECHNIQUES: PRINCIPLE, METHODOLOGY AND APPLICATIONS</b>		<b>08</b>
<b>5.1</b>	Electrophoresis: AGE,SDS- PAGE , IEF and 2D Electrophoresis	05
<b>5.2</b>	PCR, Real Time PCR	03
	<b>TOTAL</b>	<b>45</b>

**COURSE TITLE: TECHNIQUES & INSTRUMENTATION IN BOTANY  
(PRACTICAL)**

**COURSE CODE: BOT.E-2**

**MARKS: 25**

**CREDITS: 1**

**PRACTICAL SESSIONS: 15**

<b>SR.NO</b>	<b>TOPICS</b>	<b>PRACTICAL SESSIONS</b>
1	Use of pH meter to set pH of a given solution	1
2	Determination of Lambda ( $\lambda$ ) max of a given solution Verification of Beer's Law	2
3	Micrometric dimensions (cytometry and micrometry)	2
4	Demonstration of SDS- PAGE/ Agarose gel Electrophoresis	2
5	Preparation of TLC and Separation of biomolecule	2
6	Centrifugation	1
7.	Visit to Instrumentation Lab (NIO./College/ GoaUniversity)	1
8	Microscopy and photography	2
9	Flame photometry	2
	<b>Total</b>	<b>15</b>

**REFERENCES:**

1. Karp, G. (1999). Cell and molecular Biology, Concepts and experiments (John Wiley and Sons Inc) 2<sup>nd</sup> edition. USA.
2. Bajpai P. K. (2006). Biological instrumentation and methodology (S. Chand and Company. Ltd. Mumbai.
3. Plummer D.T. (2009). An Introduction to Practical Biochemistry. 3<sup>rd</sup> edition. Tata Mc Graw Hill Education Private ltd. New Delhi.

**COURSE TITLE:ENZYMES AND METABOLIC PATHWAYS (THEORY)****COURSE CODE: BOT. E-3****MARKS: 75****CREDITS: 3****COURSE DURATION: 45 HOURS****COURSE OBJECTIVES:**

The objective of this course is to understand the importance and mechanisms of enzyme action. The course also discusses about enzymatic regulation & metabolic control of biochemical reactions.

**LEARNING OUTCOMES:**

On completion of this course students will be able to relate the relationship between structure and function of enzymes, importance of enzymes in regulation of metabolic processes.

<b>Sr.No</b>	<b>UNITS, TOPICS AND SUB-TOPICS</b>	<b>Hours</b>
<b>UNIT I: NOMENCLATURE, CLASSIFICATION AND HARACTERISTICS OF ENZYMES</b>		<b>11</b>
1.1	Classifications & nomenclature (IUB system); Biological role of enzymes; Concept of holoenzyme & apoenzymes, prosthetic group, iso-enzymes and allosteric enzymes.	5
1.2	Chemical nature of enzymes; Characteristics (Physico-chemical and biological properties); specificity of enzyme action (thermolability, reversibility and pH sensitivity)	6
<b>UNIT II: MECHANISM OF ENZYME ACTION</b>		<b>10</b>
2.1	Applications of Michalis Menten equation; Active sites, Fisher's lock and key module and Koschland (induced fit theory);	5
2.2	Enzyme action (competitive, noncompetitive and reversible)	5
<b>UNIT III: METABOLIC CONCEPTS</b>		<b>14</b>
3.1	Catabolic and anabolic pathway of Carbohydrate, Lipids and Proteins.	7
3.2	Respiratory substrate , Glycolysis (aerobic & anaerobic) Citric acid cycle and Mitochondrial electron transport (alternate oxidase pathway)	7
<b>UNIT IV: AMINO ACID METABOLISM</b>		<b>10</b>
4.1	Nitrogen cycle	3
4.2	Biological Nitrogen Fixation	5
4.3	Pathway of amino acid catabolism Nitrogenase enzyme complex , NIF and Nod genes.	2
<b>TOTAL</b>		<b>45</b>

**COURSE TITLE:ENZYMES AND METABOLIC PATHWAYS (practicals)****COURSE CODE: BOT. E-3****MARKS: 25 MARKS****CREDITS: 1**

<b>Sr. No</b>	<b>TOPICS</b>	<b>PRACTICAL SESSIONS</b>
1	Qualitative determination for amylase enzyme in the given plant samples.	3
2	Effect of enzyme concentration, temperature, substrate, inhibitors and pH on the activity of $\alpha$ -amylases	5
3	To demonstrate anaerobic respiration in germinating seeds	2
4	To extract and study the activity of catalase , lipase and peroxidase enzymes Mini project on role of Nitrogen in plants	5
	<b>TOTAL</b>	<b>15</b>

**COURSE DURATION: 15 SESSIONS****REFERENCES:**

1. Bennett, T. P., and Frieden, (1969) E.: Modern Topics in Biochemistry, pg. 43-45, Macmillan, London
2. Breaker, Ronald R. "Making Catalytic DNAs." *Science* 290 (2000): 2095–2096.
3. Campbell, Neil A., Jane B. Reece, and Lawrence G. Mitchell (1999) *Biology*, 5th ed. Menlo Park, CA: Benjamin/Cummings.
4. Deeth, Robert J. (1997)"Chemical Choreography." *New Scientist* 155: 24–27.
5. Harrow, B., and Mazur, A.(1958): Textbook of Biochemistry, 109, Saunders, Philadelphia.
6. Holum, J (1968): Elements of General and Biological Chemistry, 2nd ed., 377, Wiley, NY.
7. Koshland, Daniel E.,(1973). Jr. "Protein Shape and Biological Control." *Scientific American* 229: 52–64.
8. Madigan, Michael R., and Barry L. Marrs. (1997) "Extremophiles." *Scientific American* 276: 82–87.
9. Martinek, R.: Practical Clinical Enzymology(1969). *J. Am. Med. Tech.*, 31, 162.
10. Pfeiffer, J. (1954). Enzymes, the Physics and Chemistry of Life, pg 171-173, Simon and Schuster, NY.
11. Price C. Nicholas, Stevens Lewis: Fundamentals of Enzymology (1999) Oxford University Press.

**COURSE TITLE: HERBAL COSMETOLOGY (THEORY)****COURSE CODE: BOT.E-4****MARKS: 75****CREDITS: 3****COURSE DURATION: 45 HOURS****COURSE OBJECTIVES:**

Objective of this course is to impart knowledge about the different plants that play a very important role in enriching inner health and skin quality.

**LEARNING OUTCOMES:**

The student by the end of this course will gain knowledge of most of the herbs that are useful in the cosmetic industry.

<b>Sr.No.</b>	<b>UNITS, TOPICS AND SUB-TOPICS</b>	<b>HOURS</b>
<b>UNIT I - INTRODUCTION TO HERBAL COSMETICS</b>		<b>09</b>
<b>1.1</b>	Definition, Collection and processing of herbal material, Natural and artificial drying of herbal material	02
<b>1.2</b>	Herbal remedies for holistic health (including weight gain and weight loss)	04
<b>1.3</b>	Current status and future prospects of Herbal Cosmetic Industry	03
<b>UNIT II- IDENTIFICATION (BOTANICAL NAME AND FAMILY), UTILIZATION OF FOLLOWING PLANTS WITH COSMETIC BENEFITS &amp; THEIR COSMETIC USES</b>		<b>20</b>
<b>2.1</b>	<i>Curcumalonga, Aloevera, Azadirachtaindica, Ocimumsp., Cymbopogonflexuosus, Murrayakoenigii, Citruslimon, Rosasp., Rubia cordifolia</i>	13
<b>2.2</b>	Commonly used herbs in the following herbal cosmetics -Herbal Shampoo , Herbal Conditioner, Herbal Hair Dye/ Herbal Hair Oil/Hair Cream/Hair Gel, Herbal Face Mask, Herbal Bath Oil and aroma therapy.	07

<b>UNIT III - STANDARDIZATION OF RAW MATERIAL</b>		<b>06</b>
<b>3.1</b>	Importance of standardization, Physical and chemical methods of standardization Quantitative and qualitative estimation of phytoconstituents	06
<b>UNIT IV- PROTOCOLS FOR PREPARATION</b>		<b>06</b>
<b>4.1</b>	Different types of Herbal face masks- for dry skin, oily skin, pigmented skin & wrinkled skin, Special Herbal masks for sensitive skin, Herbal Shampoo	06
<b>UNIT V -HERBAL EDIBLE CHURNAS BENEFICIAL FOR SKIN TO HAIR</b>		<b>04</b>
	<b>TOTAL</b>	<b>45</b>

**COURSE TITLE:HERBALCOSMETOLOGY (PRACTICAL)**

**COURSE CODE:BOT. E-4**

**MARKS: 25**

**CREDITS: 1**

**PRACTICAL SESSIONS: 15**

<b>Sr. No</b>	<b>TOPICS</b>	<b>PRACTICAL SESSIONS</b>
1	Herbal face masks for dry skin, oily skin, pigmented skin, wrinkled skin	02
2	Study of plants valued in the cosmetic industry- skin and hair	02
3	Preparation of Herbal Shampoo	02
4	Visit to Ayurvedic institute and a local clinic.	02
5	Demonstration of Churna preparation	01
6	Extraction of plant pigments- <i>Lawsonia inermis</i> (mehndi) and <i>Curcuma longa</i> (turmeric),	01



7	Mini projects: 1. Local Survey to know about awareness about home remedies for cosmetic purposes 2. Study of various skin and hair care herbal products available in the market 3. Comparison of Herbal products to non-herbal products 4. Study of herbal products for weight loss and weight gain 5. Study of locally available herbal Churnas.	05
	<b>TOTAL</b>	<b>15</b>

### **REFERENCES:**

1. Fuller, K.W. and Gallon, J.A. Plant Products and New Technology. Clarendon Press, Oxford, New York.1985
2. Kocchar, S.L. Economic Botany in Tropics, 'i.'d edition. Macmillan India Ltd., New Delhi.1998.
3. Simpson, B.B. and Conner-Ogorzaly, M. Economic Botany- Plants in Our World. McGraw Hill, New York.1986.
4. Sachs, M. Ayurvedic Beauty Care: Ageless Techniques to Invoke Natural Beauty. ISBN: 9788120818804.2014
5. Sharma, O.P. Hill's Economic Botany. Tata McGraw Hill Publishing Company Ltd., New Delhi.1996.

**COURSE TITLE: CYTOGENETICS (THEORY)**

**COURSE CODE: BOT-IV.C-6**

**MARKS: 75**

**CREDITS: 3**

**COURSE OBJECTIVES:**

This course will enable the students to understand fundamentals of genetics and evolution.

**COURSE OUTCOMES: Students will be able to:**

- restate fundamentals of genetics
- identify different stages of cell division.
- construct chromosome maps.
- review the effects of mutagens on seed germination.

<b>Sr.No.</b>	<b>TOPICS</b>	<b>HOURS</b>
<b>Module 1: Mendelian Genetics and Linkage</b>		<b>15</b>
<b>Mendelian genetics and principles of inheritance and Multiple allelism</b>		
1.1	Mendel's Laws, backcross and test cross.	
1.2	Allelic and non-allelic interactions, Epistatic interactions	
1.3	Multiple alleles in Drosophila (eye colour), man (blood groups) and plants (self-incompatibility).	
<b>Linkage, Mutations and Molecular basis of mutations</b>		
1.4	Linkage- Coupling and Repulsion Hypothesis  Chromosome maps.	
1.5	Mutations and its types. Types of mutagens.	
1.6	Transitions and transversions; frame shift mutations. DNA repair mechanisms, Applications of mutations	

<b>Module 2: Extranuclear inheritance and Sex linked inheritance</b>		<b>15</b>
<b>Extranuclear inheritance and Maternal influence</b>		
2.1	Extranuclear inheritance and maternal influence: Kappa particles in <i>Paramecium</i> ; CO <sub>2</sub> sensitivity in <i>Drosophila</i> ; cytoplasmic inheritance in mitochondria and plastids; Shell coiling in snails; eye colour in flour moth.	
<b>Sex Determination and Sex Linkage</b>		
2.2	Sex Chromosomes, Mechanisms of sex determination; Genic balance mechanism.	
2.3	Sex-linked inheritance- X linked and Y linked inheritance.	
<b>Module 3: Genetic variation due to chromosome structure and number</b>		<b>15</b>
<b>Genetic variation due to chromosome structure and number</b>		
3.1	Chromosomal aberrations – duplications, deletions, inversions and translocation	
3.2	Variations in chromosome number; auto-and allo-polyploidy - types and effects; artificial induction of polyploidy. Auto and allo-polyploid crop species Aneuploid segregations in plants- tetrasomics and nullisomics; triploid and tetraploid plants. Applications of polyploidy	
	<b>TOTAL</b>	<b>45 HOURS</b>

**COURSE TITLE: CYTOGENETICS (PRACTICAL)**

**COURSE CODE: BOT-IV.C-6**

**CREDITS: 1**

<b>Sr. No</b>	<b>MODULE 4: TOPICS</b>	<b>Practical</b>
<b>1.</b>	Study of Mitosis and meiosis using suitable plant material	<b>03</b>
<b>2.</b>	Karyotype analysis and preparation of ideogram	<b>02</b>
<b>3.</b>	Detection of anomalies in cell division using suitable plant material.	<b>02</b>
<b>4.</b>	Study of multiple allelism in blood groups of human beings.	<b>01</b>
<b>5.</b>	Effect of physical and chemical mutagen on seed germination	<b>03</b>
<b>6.</b>	Preparation of chromosome maps from 3-point test cross data and calculation of Interference and coincidence	<b>01</b>
<b>7.</b>	Induction of polyploidy using Colchicine treatment.	<b>02</b>
<b>8.</b>	Study of sex linked inheritance	<b>01</b>
	<b>TOTAL</b>	<b>15 P</b>

**REFERENCES:**

1. Concepts of Genetics W. S. Klug, M. R. Cummings, C. A. Spencer. 8 Edition, Pearson Education International (2006)
2. Gardner, Eldon J.; Snustad, Peter D.; Principles of genetics; 7th edition; New York: John Wiley & Sons, (1984).
3. Genetics : A Conceptual Approach B. Pierce, 3rd Edition, Freeman & Co., (2008)
4. Genetics Peter Russell, 2nd Edition, Pearson International, (2006)
5. Gupta, P.K. Genetics. Rastogi Publications. (1990).
6. Gupta, P.K.; Cytogenetics; 1st edition, reprint; Meerut :Rastogi Publications , (2004).
7. Gupta, P.K.; Genetics: A textbook for University students; 3rd edition; Meerut: Rastogi Publications , (2007).

8. Introduction to Genetic Analysis A. J. Griffiths, S. R. Wessler, R. C. Lewontin, S. B. Carroll.  
9th Edition, Freeman and Company (2008)  
Molecular Biology of the Gene J. D. Watson, T. A. Baker, S. P. Bell, A. Gann, M. Levine, R.  
Losick. 5th Edition, Pearson Education (2004)
9. Principles of Genetics P. Snustad, M. Simmons, 4th Edition, John Wiley and Sons Co., (2006)
10. Shukla, R.S. and Chandel, P.S.; Cytogenetics, Evolution, Biostatistics and Plant Breeding.  
(2007)

**COURSE TITLE: PLANT BREEDING & BIOSTATISTICS (THEORY)****COURSE CODE: BOT-IV.E-5****MARKS: 75****CREDITS: 3****COURSE OBJECTIVES:**

To enable the students to learn various techniques in plant breeding with regards to crop productivity.

**COURSE OUTCOMES: Students will be able to:**

- To recognise various techniques in plant breeding
- To differentiate between modes of plant breeding
- To employ manual emasculation procedure.
- To calculate mean, median, mode, standard deviation, std. error for provided material.

<b>Sr.No.</b>	<b>TOPICS</b>	<b>HOURS</b>
<b>Module 1: Introduction to Plant breeding, Organisations and Certifications</b>		<b>15</b>
<b>Introduction to Plant breeding and Organisations</b>		
<b>1.1</b>	Introduction, history, objectives, achievements and prospects. Centres of origin of crop plants.	
<b>1.2</b>	Organizations & their mandate - ICAR, ICRISAT, IRRI (Indian & International)	
<b>1.3</b>	Plant breeders' & Farmers' Rights Phytosanitary and Seed Certifications	
<b>Module 2: Hybridisation, Heterosis, Inbreeding Depression and Mutation breeding</b>		<b>15</b>
<b>Hybridisation, Heterosis and Inbreeding Depression</b>		

2.1	Pure line and mass selection	
2.2	Types and Techniques in hybridization Introduction, domestication and acclimatization.	
2.3	Heterosis and inbreeding depression.	
<b>Mutation Breeding; Plant breeders'rights; Breeding for stresses.</b>		
2.4	Varieties developed in India through mutation breeding;	
2.5	Limitations of mutation breeding	
<b>Module 3: Biostatistical methods and Genetics of Pathogenicity</b>		<b>15</b>
<b>Biostatistical methods and Genetics of Pathogenicity</b>		
3.1	Introduction to biostatistics: Terms used in biostatistics, types of data, Sampling theories- random sample, sample size determination, precision, data collection, processing and presentation of data: qualitative and quantitative	
3.2	Measures of central tendency: Mean, Median, Mode. Measures of variation: standard deviation, standard error	
3.3	Concept of correlation between two variables and regression line Chi square	
3.4	Physiological races and types. Genetics of pathogenicity; vertical and horizontal resistance & breeding for various biotic stresses in rice/wheat.	
	<b>TOTAL</b>	<b>45</b>

**COURSE TITLE: PLANT BREEDING & BIOSTATISTICS****(PRACTICAL) COURSE CODE: BOT-IV.E-5****MARKS: 25****CREDITS: 1**

<b>Sr. No</b>	<b>MODULE 4: TOPICS</b>	<b>Practical</b>
<b>1.</b>	Emasculation and bagging of flowers using suitable plant material and Estimation of fruit and seed set in emasculated flowers	<b>03</b>
<b>2.</b>	Correlation of floral structure with pollination system	<b>01</b>
<b>3.</b>	Estimation of pollen fertility (pollen viability) in (any two) locally grown crop species.	<b>02</b>
<b>4.</b>	Study of centres of origin of some important crop plants.	<b>01</b>
<b>5.</b>	Study of soil pH using different soil types & relate it to crops	<b>01</b>
<b>6.</b>	Analysis of data for mean, median & mode, Standard deviation and standard error using suitable plant samples	<b>03</b>
<b>7.</b>	Determination of correlation and regression, Chi square analysis	<b>03</b>
<b>8.</b>	Visit to ICAR	<b>01</b>
	<b>TOTAL</b>	<b>15 P</b>

**REFERENCES:**

1. Mahajan, B.K.; Methods in biostatistics; 6th edition; New Delhi:Jaypee Brothers, (1997)
2. Rastogi, Veer Bala.; Fundamentals of Biostatistics; 2nd edition, reprint; New Delhi: Ane Books India,2006(2008).
3. Shukla, R.S. and Chandel, P.S.; Cytogenetics, Evolution, Biostatistics and Plant Breeding.(2007)
4. Singh, B.D.; A textbook of Plant Breeding; Kalyani Publishers.(2009)
5. Sokal R R and Rahlf H A. Biometry: the principles and practice of Statistics for Biology. research. 3rd edi W H Freeman and Co.(1995)
6. Zar J H, Biostatistical analysis 4th ed. Prentice Hall.(1998)



**COURSE TITLE: SYSTEMATICS OF FLOWERING PLANTS  
AND PHYLOGENY**

**COURSE CODE: BOT-IV.E-6**

**MARKS: 75**

**CREDITS: 3**

**COURSE OBJECTIVES:**

To study the morphology, systematics and phylogeny of flowering plants.

**COURSE OUTCOME: Students will be able to:**

- Name, arrange, describe and compare the taxa
- Outline keys for identification of flowering plants
- Interpret phylogenetic trees, cladograms, etc.

	<b>TOPICS</b>	<b>Hours</b>
<b>Module 1: Introduction to Plant classification, Nomenclature</b>		<b>15</b>
1.1	Plant classification, nomenclature & biosystematics	
1.2	Field inventory; Functions of Herbarium; Important herbaria and botanical gardens (India & world), virtual herbarium; e-flora	
1.3	Documentation: Flora, Monographs, Journals; Keys: Single access and Multi-access	
1.4	Principles and rules (ICBN); Ranks and names (names of hybrids); Typification, author citation, valid publication, Rejection of names, principle of priority and its limitations	
<b>Module 2: Concept, Taxonomic evidences and Phylogeny of Angiosperms</b>		<b>15</b>
<b>2.1</b>	Concept of taxa (family, genus, species); Categories and taxonomic hierarchy; species concept (taxonomic, biological, evolutionary).	
<b>2.2</b>	Evidence from palynology, cytology, phytochemistry and molecular data.	
<b>2.3</b>	Origin & evolution of angiosperms, Co-evolution of angiosperms Characters; Variations; OTUs, cluster analysis, Phenograms, cladograms (definitions and differences)	

<b>Module 3: Systems of classification; position and diagnostic features of families</b>		<b>15</b>
<b>3.1</b>	Concepts of evolution and phylogeny	
<b>3.2</b>	Study of classification systems (major contributions by Linnaeus, Bentham and Hooker, Engler and Prantl) and Angiosperm Phylogeny group (APG III).	
<b>3.3</b>	Position and diagnostic features of families: Annonaceae, Capparidaceae, Brassicaceae, Fabaceae, Rutaceae, Myrtaceae, Cucurbitaceae, Rubiaceae, Apocyanaceae, Asclepiadaceae, Solanaceae, Verbenaceae, Lamiaceae, Amaranthaceae, Orchidaceae, Araceae, Asteraceae, Zingiberaceae, Commelinaceae, Poaceae.	
	<b>Total:</b>	<b>45</b>

**COURSE TITLE: SYSTEMATICS OF FLOWERING PLANTS AND PHYLOGENY****COURSE CODE: BOT-IV.E-6****MARKS: 75****CREDITS: 3**

<b>Sr.no</b>	<b>Module 4: Topics</b>	<b>Practical</b>
<b>1</b>	Plant identification using flora book and database	<b>01</b>
<b>2</b>	Preparation of herbarium	<b>01</b>
<b>3</b>	Identification of 15 families mentioned in unit IV (Bentham & Hooker's system) studied in theory from locally available specimens (with floral diagram).	<b>10</b>
<b>4</b>	Use of taxonomic keys and construction of dichotomous keys	<b>01</b>
<b>5</b>	Taxonomic interpretation using pollen of related species	<b>01</b>
<b>6</b>	Construction of Phenogram and Cladogram	<b>01</b>
	<b>Total</b>	<b>15</b>

**REFERENCES:**

1. Singh, G. 1999. Plant Systematics: Theory and Practice. Oxford & IBH Pvt. Ltd., New Delhi.
2. Chopra, G. L. 1985. Angiosperm (Systematics & Life cycles). Pradeep Publications, Jaladhar, India, pp.339-350.
3. Pandey, B. P. 1969. Taxonomy of Angiosperms. S. Chand and company Ltd. New Delhi, India, pp.102-105.
4. Subrahmanyam N S, Modern plant taxonomy, Vikas publishing house pvt. Ltd., 1995.
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9. Davis, P.H. and Heywood, V.H. 1963. Principles of Angiosperm Taxonomy. Oliver and Boyd, London.
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**COURSE CODE: BOT-IV.E-7**

**MARKS: 75**

**CREDITS: 3**

### **Course Objectives**

Make the students aware of various plant pathogens and their control

### **Course Outcome: Students will be able to:**

- Identify various diseases and causal agents of economically important plants
- Find effective control measures

<b>Sr. No</b>	<b>TOPICS</b>	<b>Hours</b>
<b>MODULE I: : AN INTRODUCTION AND EPIDEMIOLOGY OF PLANTS DISEASES</b>		<b>15</b>
<b>1.1</b>	History, Definitions and Importance of plant pathology	
<b>1.2</b>	Concepts and types of diseases in plants	
<b>1.3</b>	Biotic causes of plant diseases.	
<b>1.4</b>	Infectious agents (nematodes, protozoans, bacteria, fungi & viruses) Growth, reproduction, survival and dispersal of important plant pathogens Role of environment and host nutrition on disease development	
<b>MODULE II:: PLANT DISEASE DEVELOPMENT (PATHOGENESIS) AND MANAGEMENT</b>		<b>15</b>
<b>2.1</b>	Parasitism and pathogenicity	
<b>2.2</b>	Symptomatology	
<b>2.3</b>	Host parasite interaction	
<b>2.4</b>	Recognition concept and infection,	
<b>2.5</b>	Role of enzymes, toxins & growth regulators in pathogenesis	
<b>2.6</b>	Quantitative resistance (Physical, Biological & cultural methods) Biochemical defences (oxidative burst; Phenolics, Phytoalexins, PR proteins, antimicrobial substances and plantibodies), Quarantine measures	

<b>UNIT IV: GENETICS OF PLANT DISEASE AND STUDY OF PLANT DISEASES IN INDIA</b>		<b>15</b>
<b>3.1</b>	Altered plant metabolism due to pathogens attack	
<b>3.2</b>	Genetics of resistance ( 'R' & avr genes, elicitors responses)	
<b>3.3</b>	Signalling and programmed cell death	
<b>3.4</b>	<b>Study of Diseases</b> (Name of disease, pathogen, symptoms and control measures need to be studied) Important diseases ( Any 2 of each) of Paddy, Arecanut, Wheat, Banana, Coconut, Sugarcane, Mango and Amaranth/ Raddish	
	<b>TOTAL</b>	<b>45</b>

**COURSE TITLE: PLANT PATHOLOGY (PRACTICAL)****COURSE CODE: BOT-IV.E-7****MARKS: 25****CREDIT :1**

Sr. No	MODULE 4: Topics	Practicals
1	Isolation and culture of fungal and bacterial pathogens.	02
2.	Demonstration of Koch's postulates	01
3.	Assay for cellulase /pectinase enzyme from diseased plant	02
4.	Study of plant diseases with reference to pathogen & symptomology (Viral, Bacterial & Fungal) (any 10 as per theory )	05
5	Anatomical observations of fungal infected plants (rust, blight, rots)	3
6	Study of antagonistic behaviour of bacterial pathogens	1
7.	Visit to Plant Pathology Laboratory (ICAR)	1
	<b>Total</b>	<b>15</b>

**Refer  
ences**

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gros,  
G.N.  
(1997  
)  
Plant  
Patho  
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Academic Press.

2. Bilgrami K.H. & H.C. Dube (1976) A textbook of Modern Plant Pathology. International Book Distributing Co. Lucknow.
3. Mehrotra, R.S. (1980) Plant Pathology, TMH, New Delhi.
4. Pandey, B.P. (1999) Plant Pathology. Pathogen and Plant diseases. Chand & Co. New Delhi.
5. Rangaswami, G. (1999) Disease of Crop plants of India Prentice Hall of India Pvt. Ltd.
6. Sharma P.D. (2004). Plant Pathology Rastogi Publishers.
7. P Gunasekaran (2005) Laboratory manual in Microbiology. New Age International (P) Limited, Pub. New Delhi.
8. K.R. Aneja (2009). Experiments in Microbiology Plant Pathology & Biotechnology, 4<sup>th</sup> edition New Age International (P) Limited, Pub. New Delhi.

**COURSE TITLE: PLANT MOLECULAR BIOLOGY (THEORY)**

**COURSE: BOT-V.C-7**

**MARKS: 75**

**CREDITS: 3**

**COURSE DURATION: 45 HOURS**

**COURSE OBJECTIVES:**

To introduce the students with fundamental knowledge of molecular system in cells.

**LEARNING OUTCOMES:**

The students will be able to understand general principles of gene organization and functions.

<b>Sr. No</b>	<b>UNITS, TOPICS AND SUB-TOPICS</b>	<b>Hours</b>
<b>UNIT-I: NATURE OF GENETIC MATERIAL</b>		<b>08</b>
1.1	Characteristics of genetic material, physical and biological evidences to prove DNA & RNA as genetic material, Watson and Crick's model of DNA, polymorphism of DNA; comparison between DNA and RNA.	5
1.2	Central Dogma of molecular biology, Model organism for studying molecular biology; C-value paradox	2
1.3	Chargoff's Law, Franklin's and Wilkin's work	1
<b>UNIT II: REPLICATION OF DNA</b>		<b>12</b>
2.1	General feature of DNA replication (replication eye, replication forks); Types of DNA replication, mechanism of DNA replication in; Prokaryotes (Transduction, transformation and conjugation), & in Eukaryotes (Dispersive, Conservative and Semi- conservative)	3  3
2.2	Enzymes of replication –DNA Primase; DNA polymerases I, II, III,	3
2.3	Types of DNA damages and repair (direct reversal of damage, excision repair)	3
<b>UNIT III: TRANSCRIPTION</b>		<b>09</b>

3.1	Structure and functions of mRNA, tRNA and rRNA	2
3.2	Transcription of mRNA in Prokaryotes & eukaryotes	4
3.3	Post transcriptional event; eukaryotes splicing, processing	3
<b>UNIT IV: GENE REGULATION &amp; EXPRESSION</b>		<b>10</b>
4.1	Units of Gene (Cistron, recon, muton, Enhancers, Split genes, overlapping genes; transposons and its role in gene structure, promoters & terminators.	5
4.2	Gene regulation in prokaryotes (Lac operon concept) and eukaryotes Inducible and repressible mechanism.	5
<b>UNIT V: TRANSLATION-PROTEIN SYNTHESIS</b>		<b>06</b>
5.1	Secondary structure of mRNA and its functions; Genetic code.	2
5.2	Mechanism & factors Translation; RNA polymerases; and factors	2
5.3	Post translational modifications; Protein targeting	2
<b>Total</b>		<b>45</b>

**COURSE TITLE: PLANT MOLECULAR BIOLOGY (PRACTICALS)**

**COURSE CODE: BOT-V. C-7**

**MARKS 25**

**CREDIT 1**

**PRACTICAL SESSIONS: 15**

<b>SR. NO</b>	<b>TOPICS</b>	<b>PRACTICAL SESSIONS</b>
1	Isolation of plant genomic-DNA	3
2	Spooling of DNA from different plant samples	3
3	Quantification of DNA by DPA method.	2
4	Isolation and estimation of RNA from plant tissue	3
5	Preparation of Agarose gel and running of DNA (demonstration)	2
6	Demonstration of DNA amplification by PCR	2
<b>Total</b>		<b>15</b>

**REFERENCES:**

1. Alberts, B., Bray, D Lewis, J., Raff, M., Roberts, K and Walter (1999). Molecular Biology of the Cell. Garland Publishing, Inc., New York



2. David Freifelder (1983) Jones & Bartlett publishers. 2ed Molecular biology. Reprint 1993. Narosa Publishing House.
3. J.K.Pal and S.S.Ghaskadabi (2008) Fundamentals of Molecular Biology. Oxford.
4. James D. Watson (2007). Molecular Biology of the Gene (6th Edition) by, Tania A. Baker, Stephen P. Bell, and Alexander Gann.
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6. Lehninger (2008). Principles of Biochemistry by David L. Nelson and Michael M.
7. R.C. Dube (2008) A Text Book of Biotechnology S. Chand pub.
8. R.L. Adams, J.T. Knowler, and D.P. Leader (1992). The Biochemistry of the Nucleic Acids.
9. Lewin B. (2000). Genes VII. Oxford University Press, New York.
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**COURSE TITLE: BIOINFORMATICS (THEORY)**

**COURSE CODE: BOT. E-9**

**MARKS: 75**

**CREDITS: 3**

**COURSE DURATION: 45 HOURS**

**COURSE OBJECTIVES:** The course will help the students to understand the fundamentals of bioinformatics and tools available.

**LEARNING OUTCOMES:**

It will enable the students to gain knowledge in vast data handling and analysis, and to develop skills.

<b>Sr.No.</b>	<b>UNITS, TOPICS AND SUB-TOPICS</b>	<b>HOURS</b>
<b>UNIT I: INTRODUCTION TO BIOINFORMATICS</b>		<b>08</b>
1.1	Introduction to bio-informatics, The biological sequence / structure deficit	02
1.2	Genome projects, Pattern recognition and prediction, Levels of protein structure	03
1.3	Role of Chaperons, Sequence analysis	01
1.4	Fields Related to Bioinformatics: Computational Biology, Genomics, Proteomics, Pharmacogenomics, Cheminformatics, Medical Informatics Importance of Bioinformatics	02
<b>UNIT II: INFORMATION NETWORKS</b>		<b>07</b>
2.1	Internet and the facilities available on it, computational biology, What is World Wide Web, Web browsers and Web Addresses	03
2.2	HTTP, HTML, CORBA and URLs	01

2.3	The National Centre for Biotechnology Information- NCBI The European Molecular Biology Network- EMBnet	02
2.4	Bioinformatics programme in India- BTISNet, BPI-2004	01
<b>UNIT III : INTRODUCTION TO BIOLOGICAL DATABASE</b>		<b>04</b>
3.1	Introduction To Biological Database : GenBank, EMBL, SwissProt, PROSITE, EC-ENZYME, PDB, GDB, PIR-PSD,	04
<b>UNIT IV : PROTEIN AND GENOME INFORMATION RESOURCES</b>		<b>15</b>
4.1	Introduction to Protein information resources, Primary Sequence Databases, Composite protein sequence databases, Secondary databases, Composite protein pattern databases; Structure classification databases.	07
4.2	Introduction to genome information resources, DNA sequence databases, Specialised genomic resources, ORF (Open Reading Frame Finder), TIGR Genome Resources , Genome comparison, Genome Annotation, Microarray image analysis	08
<b>UNIT V : HOMOLOGY, ANALOGY, ORTHOLOGY, PARALOGY, PAIRWISE ALIGNMENT AND MULTIPLE SEQUENCE ALIGNMENTS</b>		<b>11</b>
5.1	Introduction, Comparison of Homology, Analogy, Orthology And Paralogy. Alignment based methods and Hybrid method; Comparison of Computer Prediction Algorithms.	05
5.2	Introduction to pairwise and multiple sequence alignment; Comparison of sequences; Global alignment: The Needleman and Wunsch algorithm; Database interrogation, Alphabetsandcomplexity; Pairwise database searching, BLAST; Databases of Multiple Alignments, Clustal Omega	06
<b>TOTAL</b>		<b>45</b>



**COURSE TITLE: BIOINFORMATICS (PRACTICALS)**

**COURSE CODE: BOT.E-9**

**MARKS: 25**

**CREDITS: 1**

**PRACTICAL SESSIONS:15**

<b>SR. NO</b>	<b>TOPICS</b>	<b>PRACTICAL SESSIONS</b>
1	Biological databases and exploring various websites- NCBI, PUBMED and Gen Bank databases, To study the file formats- FASTA, PDB, Mol	5
2	To explore EBI server and searching EMBL	2
3	Exploring and querying UniProt KB	1
4	Pairwise global alignment of protein and DNA using Needleman- Wunsch algorithm with 6	2
5	Obtaining sequences for Pairwise alignment and to interpret the results to study the homology between the sequences Database searching using different versions of BLAST and FASTA and Derivation of relationships of query sequences	4
6	Use of Clustal Omega for multiple sequence alignment	1
	<b>TOTAL</b>	<b>15</b>

**REFERENCES:**

1. Attwood, D. J., Parry Smith D.J. and Phukan, S. (2011). Introduction to Bioinformatics; Pearson education.
2. Ignacimuthu, S. (2005). Basic Bioinformatics. Narosa Publishing House
3. Khan, I. A. and Khanum, A. (2003). Fundamentals of Bioinformatics –Ukaaz publications.
4. Mani, K. and Vijayaraj, K.A. (2002). Bioinformatics for Beginners. Aparnaa Publication.
5. Murthy, C. S. V. (2004). Bioinformatics. Himalaya Publishing House.

**WebResources**

1. <http://genes.mit.edu/GENSCAN.html>

2. <http://vmoc.museophile.org> ComputerHistory
3. <http://www.clcbio.com/index>
4. <http://www.genome.jp>
5. <http://www.genome.jp/dbget/LinkDB>
6. <http://www.ncbi.nlm.nih.gov/Structure/CN3D/cn3d.shtml>
7. <http://www.softberry.com/berry>
8. <http://www.studentworkzone.com/>
9. [www.ebi.ac.uk](http://www.ebi.ac.uk)
10. [www.fgcu.edu/support/office2000](http://www.fgcu.edu/support/office2000)
11. [www.learnthenet.com](http://www.learnthenet.com) WebPrimer
12. [www.clustawomega.org](http://www.clustawomega.org)
13. [www.embl.org](http://www.embl.org)

**COURSE TITLE: SEED TECHNOLOGY (THEORY)****COURSE CODE: BOT. E-10****MARKS: 75****CREDITS: 3****COURSE DURATION: 45 HRS****COURSE OBJECTIVES:**

The course is focused in training students with knowledge of seed health, seed testing techniques, importance of plant breeding for production of high yielding seeds and various storage & protection techniques.

**LEARNING OUTCOMES:**

Student will have better understanding of seed physiology and vigor. The course knowledge will create trained human resource for seed industry and research organizations dealing with seed.

Sr. No	UNITS, TOPICS AND SUB-TOPICS	Hours
<b>UNIT-I: PRINCIPLES OF SEED TECHNOLOGY</b>		<b>07</b>
1.1	History, concepts, and role of seed technology	2
1.2	Seed definition and its types ( nucleus seed, breeders seed, foundation seed, certified seed and truthful seed), characteristics of good seeds	2
1.3	Difference between seed and grain, Seed development programmes in Indian seed industry, national seed corporation.	3
<b>UNIT-II: ORGANIZATIONS OF SEED TESTING</b>		<b>08</b>
2.1	International seed testing association	2
2.2	Association of official seed analysts.	2
2.3	Central and state seed testing laboratory	2
2.4	Role of ICRISAT and ICAR	2
<b>UNIT III: SEED TESTING AND CERTIFICATION</b>		<b>10</b>
3.1	Objectives and concept of seed certification, Phases of seed certification	3
3.2	Procedure of seed certification: Minimum seed certification standards , General seed certification standard, and Specific crop standards.	4
3.3	Principles and procedure of seed testing; Equipments for seed testing	3

	Importance of seed testing, Seed heterogeneity test and tolerance value	
<b>UNIT IV: PLANT BREEDING IN RELATION TO SEED TECHNOLOGY , SEED PROTECTION, PROCESSING AND STORAGE</b>		<b>10</b>
<b>4.1</b>	Maintenance of breeders seed methods in self and cross fertilized crops.	3
<b>4.2</b>	Development trial and release of seed variety	2
<b>4.3</b>	Germ plasm and its conservation, seed banks and types of seed collections	3
<b>4.4</b>	Use of heterosis in crop improvement	2
<b>UNIT V: SEED PROTECTION, PROCESSING AND STORAGE</b>		<b>10</b>
<b>5.1</b>	Importance of epidemic and seed borne diseases	3
<b>5.2</b>	Factors affecting seed infection	1
<b>5.3</b>	Seed borne pathogens and control measures; Seed drying- principles; its advantages and methods; Seed treating chemicals and equipments Pest problems and their treatment during storage; Concept of seed marketing	5
<b>5.4</b>	Forecasting of seed demand and supply.	1
<b>TOTAL</b>		<b>45</b>

**COURSE TITLE: SEED TECHNOLOGY (Practicals)**

**COURSE CODE: BOT-V.E-2**

**MARKS: 25**

**CREDITS: 1**

**PRACTICAL SESSIONS: 15**

<b>Sr. No</b>	<b>TOPICS</b>	<b>Practical sessions</b>
1	Analysis of physical and chemical properties of seed	3
2	Study of structure of dicot and monocot seeds from various plant species	3
3	Testing of seed viability (2,3,5-triphenyl tetrazolium chloride test)	2
4	<b>Mini Projects</b> 1. Breaking of seed dormancy methods (chemical, hormone	6



	&temperature) 2. Seeds and diseases 3. Seed moisture and germination	
5	Visit to seed production plant and report submission	1
	Total	15

#### REFERENCES:

1. Agrawal (2005). Seed Technology. Oxford and IBH Publishing Co. Pvt. Ltd., New Delhi.
2. Dutta (1983). A Class book of Botany, Oxford University Press, Calcutta
3. Pandey (2010). A text book of Botany. S. Chand and Company Ltd., New Delhi.
4. Reddy (2008). Principles of crop production. Kalyani Publishers, New Delhi.
5. Santra and Chatterjee (2007).College Botany, New Central Book Agency (P) Ltd., Kolkata .
6. Singh, (2009). Plant Breeding: Principles and Methods. Kalyani Publishers, New Delhi.
7. Umaraniet. A.L. (2006). Experimental Seed Science and Technology, Agrobios, Jodhpur

**COURSE TITLE: PLANT DRUG TECHNOLOGY AND PHARMACOGNOSY (THEORY)**

**COURSE CODE: BOT.E-11**

**MARKS: 75**

**CREDITS: 3**

**COURSE DURATION: 45 HOURS**

**COURSE OBJECTIVES:**

To enable the students to learn and understand fundamental knowledge, the techniques & skills in plant drug industry, drug discovery and development.

**LEARNING OUTCOMES:**

To understand and use the techniques in plant drug industry along with bioassays and creating human resource in the field of drug development and pharmacognosy.

Sr.No.	UNITS, TOPICS AND SUB-TOPICS	Hours
<b>UNIT I: INTRODUCTION</b>		<b>08</b>
1.1	History, present status, future scope & development of plant drug technology and Pharmacognosy	04
1.2	Classification of drugs: Morphological, Chemical And Pharmacological.	04
<b>UNIT II: CULTIVATION COLLECTION AND CONSTITUENTS OF FOLLOWING</b>		<b>15</b>
2.1	ROOTS/ RHIZOME: <i>Rauwolfia</i> and <i>Curcuma</i>	03
2.2	LEAVES: <i>Adathoda</i> and <i>Ocimum</i>	03
2.3	SEEDS: Fenugreek and Nutmeg	03
2.4	FRUITS: Coriander and Senna pod	03
2.5	FLOWERS: Clove and Rose	03
<b>UNIT III: PHYTOCHEMICALS</b>		<b>11</b>
3.1	Biosynthesis of alkaloids and effect of biological and chemical factors which affects biosynthetic pathways with e`xamples. Metabolic pathways of selected plants (from Tulsi and Rauwolfia).	05
3.2	Methods of Characterization: NMR,MS,UV-Vis,GC-MS.LC-MS	06
<b>UNIT IV:Extraction and analysis of Phytochemicals</b>		<b>11</b>
4.1	Extraction methods and principles. Traditional and modern techniques	04
4.2	Analysis of Pigments, Phenolics, Flavonoids and Alkaloids	04
4.3	Bioassays: Identification of marker compounds in the formulations. Fingerprint and identification of plant drugs.	03
		53

	<b>Total</b>	<b>45</b>
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**COURSE TITLE: PLANT DRUG TECHNOLOGY AND PHARMACOGNOSY (PRACTICAL)**

**COURSE CODE: BOT.E-11**

**MARKS: 25**

**CREDITS: 1**

**PRACTICAL SESSIONS: 15**

Sr. No.	Experiments	Practical
1.	Test for alkaloids: Mayer's, Wagner's, Dragendorffs' reagent	<b>01</b>
2.	Isolation of alkaloids and Phenolics	<b>02</b>
3.	Disc diffusion for antimicrobial assay	<b>02</b>
4.	MIC evaluation for antimicrobial assay	<b>02</b>
5.	Anatomical study of <i>Nux vomica</i> seeds, Ginger, Citronella leaf, Senna leaf & its medicinal properties	<b>04</b>
6.	Histochemical tests for Oils And Fats – Castor seed/ Citrus	<b>01</b>
7.	Microchemical test of Arum / <i>Colocasia</i> leaves for observation of Calcium oxalate crystals.	<b>01</b>
8.	Mini project Adulteration of crude drugs	<b>02</b>
	<b>TOTAL</b>	<b>15</b>

### **REFERENCES:**

1. Gokhale S.B and Kokate, C.K. (2009). Pharmacognosy. Nirali Prakashan.
2. Khandelwal, K. R. (2008). Practical Pharmacognosy. Nirali Prakashan.
3. Kokate, C. K. (2008). Pharmacognosy. Nirali Prakashan.
4. Qadry, J.S. (2014). A Textbook of Pharmacognosy Theory And Practicals, CBS Publishers & Distributors.
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7. Leleand J. Cseke.(2006). Natural products from Plants. Taylor and Francis. New York
8. Harborne J. B. (2010). Phytochemical methods. Springer International edition, New Delhi
9. Daniel Mammen. (1991). Methods in plant chemistry and economic botany, Kalyani publishers, New Delhi.

**COURSE TITLE: ORGANIC FARMING (THEORY)**

**COURSE CODE: BOT.E-12**

**MARKS: 75**

**CREDITS: 3**

**COURSE DURATION: 45 HOURS**

**COURSE OBJECTIVES:**

The course provides knowledge of principles and practices of organic agriculture and its role in sustainable crop production.

**LEARNING OUTCOMES:**

On completion of the course: the students will develop an understanding of the social, economic and environmental context for current and future organic agriculture production and management.

<b>Sr.No.</b>	<b>UNITS, TOPICS AND SUB-TOPICS</b>	<b>Hours</b>
<b>UNIT I: CONCEPT OF ORGANIC FARMING</b>		<b>09</b>
1.1	Introduction: Farming, organic farming, concept and development of organic farming.	02
1.2	Principles of organic farming, Types of organic farming	02
1.3	Needs and benefits of organic farming.	02
1.4	Agencies and institutions related to organic agriculture	01
1.5	Farm components for an organic farm	02
<b>UNIT II: COMPOSTS, MANURES AND ITS APPLICATION</b>		<b>11</b>
2.1	Manure application: Composted vs. uncomposted manure	03
2.2	Composting- principles, stages, types and factors	03
2.3	Composting methods, Vermicomposting	02
	Bio-fertilizers, Microbial inoculants, Farm Yard Manure, Neem cake,	03

	Mulching, Alley farming/ cropping.	
<b>UNIT III: SOILS, SOIL FERTILITY MANAGEMENT AND FERTILIZERS</b>		<b>13</b>
3.1	Soil types, Soil profile and Soil tillage	03
3.2	Factors affecting soil fertility and productivity	02
3.3	Land preparation	01
3.4	Water management for good soil, Commercial fertilizers, composition	03
3.5	Residual effects and fertilizer use efficiency	02
3.6	Foliar application and its concept	02
<b>UNIT IV: ORGANIC PLANT PROTECTION AND SEED CERTIFICATION</b>		<b>07</b>
4.1	Plant protection- cultural and mechanical methods	02
4.2	Plant protection- bio pesticide and bio control agents	02
4.3	Allelopathic methods of weed control	02
4.4	Certification of organically produces seeds.	01
<b>UNIT V: ENTREPRENEURSHIP DEVELOPMENT</b>		<b>05</b>
5.1	Entrepreneurship – Concept, characteristics, approaches, need for entrepreneurship in Organic farming	02
5.2	Popularization of organic farming. Marketing of organic produce. Organic farming in the rest of the world.	03
<b>TOTAL</b>		<b>45</b>

**COURSE TITLE: ORGANIC FARMING (PRACTICAL)**

**COURSE CODE: BOT.E-12**

**MARKS: 25**

**CREDITS: 1**

**PRACTICAL SESSION: 15**

<b>Sr. No.</b>	<b>TOPICS</b>	<b>PRACTICAL SESSIONS</b>
1.	Comparative analysis of pH, EC, organic C, total N, available N, P, K and S from organic and inorganic data (obtained data).	1
2.	Survey of weeds in crop fields (Organic v/s inorganic farming)	1
3.	Study of soil types.	1
4.	Study of bio pesticide (Neem cake)	1
5.	Study of Mulching	1
6.	Visit to an organic farm	2
7.	Effectt of various manures on plant growth	3
8.	Mini projects - Preparation of Compost/ vermi-compost Study of Algal biofertilisers	5
	<b>TOTAL 15</b>	

**REFERENCES:**

1. Chakraverty, A. (1991). Post-harvest technology of cereal, pulses and oil seeds. Oxford IBH Publishing Co. PvtLtd.

2. Deshmukh, S.N. (2012). Organic Farming: Principles, Prospects and Problems, Agrobios Publishers(India).
3. Gehlot, D. (2010). Organic Farming: Components and Management, Agrobios Publishers (India).
4. Gupta, O.P. (2010). Modern weed management. Agrobios Publishers.
5. Israelsen, O.W. and Hansen, V.E. (2015). Irrigation Principles and Practices. John Wiley & SonsInc.
6. Kanwar, J.S. (1978). Soil Fertility, Theory and Practice. Indian Council of Agricultural ResearchPublication.
7. Palaniappan, S.P. and Annadurai, K.A. (2010). Organic Farming: Theory and Practice. Indian Council of Agricultural Research, Scientific Publishers JournalsDept.
8. Rao, V.S. (2000). Principles of Weed science. Taylor & FrancisPublishers.
9. Reddy, T.Y. and Sankar Reddi, G. H. (2015). Principles of Agronomy. Kalyani Publishers.
10. Sadhu, A.N. and Singh, A. (2014). Fundamentals of Agricultural Economics. Himalaya PublishingHouse.
11. Saraswat, V.N., Bhan, V. M. and Yaduraju, N.T. (2003). Weed management - (ICAR), Indian Council of Agricultural ResearchPublication.
12. Sharma, A.K. (2002). A hand book of Organic Farming. AgrobiosPublishers.
13. Singh, B. D. (2006). Plant Breeding Principles and Methods. KalyaniPublishers.
14. Tisdale, S.L., Nelson, W.L., Beaton, J.D. and Havlin, J. L. (2013). Soil fertility and fertilizers. PearsonPublishers.
15. Yawalkar, K. S., Agrawal, J.P. and Bokde, S. (1962). Manures and Fertilizers. Agri-Horticulture PublishingHouse.

**COURSE TITLE: PLANT GENETIC ENGINEERING (THEORY)****COURSE CODE: BOT- VI.C-8****MARKS: 75****CREDITS: 3**

**COURSE OBJECTIVES:** This course is to develop fundamental knowledge and skills in various aspects of Genetic engineering.

**COURSE OUTCOME: Students will be able to:**

- Apply the basic knowledge of Plant Genetic Engineering in research
- Perform experiments by themselves
- Compare and assess the different DNA sequencing techniques
- Design experiments in plant genetics

Sr.No	TOPICS	Hours
<b>Module 1: Recombinant DNA technology: Tools</b>		<b>15</b>
<b>1.1</b>	Enzymes- Exonucleases; Endonucleases; Restriction endonucleases Type I, II&III; ligases, methylases; Reverse Transcriptase, Polymerase.	
<b>1.2</b>	Prokaryotic and eukaryotic cloning vectors; General account of plasmids, cosmids, bacteriophages, Phasmids – Advantages and disadvantages; Structure of pBR 322; Artificial chromosome vectors – BAC, YAC, Shuttle vectors.	
<b>1.3</b>	DNA Ligation – Linkers, adaptors, Homopolymer tailing, Transformation, selection of transformed bacteria – antibiotic selection, reporter genes - GUS,GFP.	
<b>Module 2 : Techniques in Recombinant DNA technology</b>		<b>15</b>
<b>2.1</b>	Polymerase chain reaction – Principle, types of primers, Taq polymerase, Protocol, Reverse Transcriptase PCR and Real Time PCR	
<b>2.2</b>	Prokaryotic expression of foreign genes; Isolation of gene of interest – Construction of cDNA library; Genomic Library	
<b>2.3</b>	DNA sequencing – Maxam Gilbert’s method, Sanger’s method, Automated DNA sequencing, Pyrosequencing	



<p><b>2.4</b></p> <p><b>2.5</b></p> <p><b>2.6</b></p>	<p>Molecular Analysis of gene and gene products – Southern, Northern and Western blotting, ELISA, RIA</p> <p>Molecular markers – RAPD, RFLP, AFLP, Brief account of DNA Fingerprinting and Bar coding of plants</p> <p>Brief account of: Antisense RNA technology – FLAVR SAVR Tomato; Gene Silencing; RNA interference; mtRNA</p>	
<p><b>Module 3: Gene transfer methods in plants, Biosafety and Applications of Genetic Engineering</b></p>		<p><b>15</b></p>
<p><b>3.1</b></p> <p><b>3.2</b></p> <p><b>3.3</b></p> <p><b>3.4</b></p> <p><b>3.5</b></p>	<p>Vector mediated gene transfer- Agrobacterium mediated gene transfer – T DNA, Ti plasmid and Ri plasmid derived vector systems; hairy-root culture; Plastid/ Mitochondria transformation.</p> <p>Process of transfer - Bacterial colonization, Induction of virulence, generation of TDNA transfer complex, T-DNA transfer, Integration of TDNA into plant genome</p> <p>Direct methods of gene transfer – Biolistics, Lipofection, Electroporation, microinjection – Advantages and disadvantages</p> <p>Intellectual Property Rights, Genetic engineering and Public issues Biosafety regulation</p> <p>Applications: Agricultural: Bt cotton, Golden rice Environmental: Biodiversity and conservation; Waste management and Bioremediation Industrial- Large scale production of beverages, Pharmaceuticals,</p>	
		<p><b>45</b></p>

**COURSE TITLE: PLANT GENETIC ENGINEERING (PRACTICAL)****COURSE CODE: BOT- VI.C-8****MARKS: 25****CREDITS: 1**

<b>Sr. No</b>	<b>Module 4: Topics</b>	<b>Practical</b>
1	DNA isolation by CTAB/(any other) method	02
2.	Estimation of DNA	02
3.	Agarose Gel Electrophoresis	02
4.	Restriction of DNA	02
5	Sequence reading – Sanger method/Maxam Gilbert method – problem	02
6	<i>Agrobacterium tumefaciens</i> -mediated plant transformation. ( Virtual Library)	01
7	Small scale plasmid preparation from <i>E. coli</i>	03
8	Visit to a leading biotechnology institute and Report making.	01
	<b>Total</b>	<b>15</b>

**REFERENCES:**

1. Brown, T. A. (2006) Gene cloning and DNA analysis; Blackwell scientific publishers
2. Sobti, R.C. & Pachauri, S.S. (2009) Essentials of Biotechnology; Ane Books, New Delhi
3. Dubey, R.C. Introduction to Plant Biotechnology; S. Chand & Co
4. Purohit, S.S. (2003) Agricultural Biotechnology, Agrobios (India)
5. Chawla, H.S. (2000) Introduction to Plant Biotechnology
6. Dovstekel (2005) Microarray Bioinformatics; Cambridge University press
7. Ignacimuthu, S. (1997) Plant Biotechnology, New Hampshire Science Publishers
8. Gupta, P. K. (1996) Elements of Biotechnology; Rastogi and Company, Meerut
9. Lewin, B. (2004) Genes VIII. Oxford University Press
10. Primrose, S. B, Twyman, R. M. & Old R. W. (2001) Principles of gene manipulation: An Introduction to genetic engineering. 6<sup>th</sup> Edn. Blackwell Oxford
11. Smith, J.E. (2005) Biotechnology; Cambridge University press, UK
12. Wilson, K. & Walker, J. (2008) Principles and Techniques of Biochemistry and Molecular Biology. Cambridge University Press
13. Brown TA (2002) Genome, Blackwell.

**COURSE TITLE: PLANT TISSUE CULTURE (THEORY)**

**COURSE CODE: BOT-VI.E-13**

**MARKS: 75**

**CREDITS: 3**

**COURSE OBJECTIVES:** To develop the plant tissue culture skills.

**COURSE OUTCOME: Students will be able to:**

- Explain and discuss the general theoretical backgrounds and practical techniques
- Describe, define, explain/ discuss, compare, concept of differentiation and culture types
- Define, describe, explain/ discuss, techniques in PTC in media preparation, sterilisation, callus culture and organogenesis
- Describe, explain, discuss applications in forestry, agriculture etc

Sr.No	TOPICS	Hours
<b>Module – I: Introduction and differentiation Concept</b>		<b>15</b>
1.1	Scope and history of plant tissue culture, Laboratory organization.	
1.2	Culture techniques – Sterilization methods of glasswares, Explant preparation, sterilization, media composition and preparation.	
1.3	Cellular differentiation and totipotency; effect of growth regulators on differentiation.	
<b>Module – II: Culture types and Techniques in Tissue culture</b>		<b>15</b>
2.1	Cell culture types- callus, single cell and suspension culture Organogenesis and embryogenesis; Somaclonal variation; meristem	
2.2	Micropropagation, Germplasm conservation; Isolation and regeneration of protoplasm; Somatic hybridization, Synthetic seeds, Cryopreservation, secondary metabolite production.	
<b>Module- III: Application of Plant tissue culture</b>		<b>15</b>
3.1	Horticulture	
3.2	Agriculture	
3.3	Forestry	
<b>Total</b>		<b>45</b>

**COURSE TITLE: PLANT TISSUE CULTURE (Practical)**

**COURSE CODE: BOT-VI.E-13**

**MARKS: 25**

**CREDITS: 1**

<b>Sr. No</b>	<b>MODULE 4: Topics</b>	<b>Practical</b>
<b>1</b>	Preparation of MS Medium; Sterilization techniques	03
<b>2</b>	Embryo culture of maize	02
<b>3</b>	Callus induction and its morphological studies	04
<b>4</b>	Sub-culturing callus for rooting and shooting	03
<b>5</b>	Enzymatic Isolation of plant protoplast	01
<b>6</b>	Synthetic seed production	01
<b>7</b>	Visit to Plant tissue culture unit	01
		<b>15</b>

**REFERENCES:**

1. Bhojwani, S.S. 1990. Plant Tissue Culture: Applications and Limitations. Elsevier Science Publishers, New York,USA.
2. Kumar, U. (1999). *Methods in Plant Tissue Culture*. Jodhpur: Agrobios(India).
3. Razdan, M. K. (2002). *Introduction to Plant Tissue Culture*. New Delhi: Oxford & IBH Publishing Co. Pvt.Ltd.
4. Satyanarayana U.( 2013). *Biotechnology*. Books and allied (P)Ltd.
5. Vasil, I.K. and Thorpe, T.A. 1994. *Plant Cell and Tissue Culture*. Kluwer Academic Publishers, TheNetherlands.

**COURSE TITLE: HORTICULTURE, FLORICULTURE & LANDSCAPING  
(THEORY)**

**COURSE CODE: BOT-IV.E-14**

**MARKS: 60**

**CREDITS: 3**

**COURSE OBJECTIVES:**

Is to provide entrepreneur opportunities.

**COURSE OUTCOMES: Students will be able to:**

- Explain the basics of Horticulture, floriculture and landscaping
- Outline the requirements for building up nurseries, garden, etc.
- Inculcate the technique of vegetative propagation of plants.
- Identify and relate the scope of these fields in building up career

Sr.No	Topics	Hours
<b>Module 1: Tools and Techniques in Horticulture, floriculture</b>		<b>15</b>
1.1	<p><b>Theory sessions:</b>            Definition and importance; Pomoculture, Olericulture, Floriculture.  <b>Fertilizers:</b> inorganic, Organic – biofertilizers: vermicomposting, green manure, algal culture, FYM.            Knowledge of annual, biennials and perennials with reference to ornamental flowers            Irrigation:- Surface, Sprinkle, Drip and Gravity irrigation            Introduction to Green house, Poly house, Moist chamber, Net frame, Introduction to Hydroponics.</p> <p><b>Practice sessions:</b></p> <p>i) Local visits to nurseries, home gardens to know about different pots and its potting system</p> <p>ii) Preparation of potting mixture – Potting, repotting</p> <p>iii) Preparation of organic compost &amp; vermicompost</p> <p>iv) Familiarizing gardening tools and implements</p> <p>v) Improving the shelf life of cut flowers using chemicals</p> <p>vi) Study of Hydroponics</p> <p>vii) Local visit to an established green house/polyhouse and report making.</p>	
1.2		

<b>Module 2: Propagation Methods</b>		<b>15</b>
<b>2.1</b>	<p><b>Theory sessions:</b></p> <p>Introduction to sexual methods (seed propagation) – Definition, Merits and Demerits, Criteria for selection of seeds.</p> <p>Asexual (Vegetative) propagation – Definition, and types- Cutting (root, stem, leaf), Layering (simple, air), Grafting (Whip, Approach) and Budding (T, patch), Stock –scion relationship in important horticultural crops.</p> <p>Use of plant growth regulators in horticulture</p>	
<b>2.2</b>	<p><b>Practice sessions:</b></p> <p>i) Field work in cutting, grafting, budding, layering</p> <p>ii) To design experiments for induction of rooting, flowering, fruit set, fruit development and control of fruit crops</p> <p>iii) To study the cultivation practices of local commercial flowers</p> <p>iv) Field work in Nursery management; Cut flowers; to improve shelf life of cut flowers.</p>	
<b>Module 3: Landscaping</b>		<b>15</b>
<b>3.1</b>	<p><b>Theory sessions:</b></p> <p>Types of garden: Formal, informal and kitchen garden</p> <p>Locations in the garden- edges, hedges, fence, lawn, flower beds, Avenue, water garden (with two examples of each). Focal point.</p> <p>Auto CAD in garden designing. Bonsai techniques</p>	
<b>3.2</b>	<p><b>Practice session:</b></p> <p>i) Visit to local gardens and giving comparative account of types of garden</p> <p>ii) Listing of plants used for edges, fence, lawn, flower beds, water gardens, etc.</p> <p>iii) Visit to a botanical gardens/ water garden</p> <p>iv) To learn different styles of Bonsai techniques</p> <p>v) Lawn making: type of lawn grasses and maintenance. Plants suitable for hedges.</p> <p>Aftercare: Weeding, top dressing methods of pruning and topiary</p> <p>vi) Garden designing using (preferably Auto CAD) software</p>	

<b>Module 4: Applications of Horticulture, Floriculture and Landscaping</b>		<b>15</b>
4.1	<p>Theory sessions: Entrepreneurship skills, Invited lecture by Guests (Spice Farm owner, Ecotourism sector, Organic farmer/ Organic products outlet owner, Nursery manager/ Landscaper, Krishivigyan Kendra, Agriculture dept, Forest Dept, etc)</p> <p>Latest schemes in horticulture, floriculture, agriculture in Goa.</p> <p><b>Practice sessions:</b></p> <p>Preparation of garden design (area of the campus)</p>	
4.2	<p>Innovative ideas for beautification of the campus and preparation of the same.</p> <p>Establishment of vegetable garden using organic compost &amp; vermi-compost</p> <p>Or Internship at any firm related to Horticulture.</p>	
<b>Total</b>		<b>60</b>

#### **REFERENCES:**

1. Swarup V. (1997). Ornamental horticulture. MaMillan India Limited, NewDelhi.
2. Randhava, G.S, 1973 – Ornamental horticultural in India Today and Tomorrow Printers and Publishers, NewDelhi.
3. Trivedi TP (2007). Ornamental horticultural in India. Indian Council of Agricultural Research NewDelhi.
4. Nayak, K.C. South Indian fruits and their culture P.L. Varadaraj&Co.,&Lingichetti Street, Madras.
5. Edment Senn Andrews 1994 Fundamentals of Horticulture – TataMcGraw Hill Publishing Co., Ltd., Delhi

**COURSE TITLE: ECONOMIC**

**BOTANY (THEORY)**

**COURSE CODE: BOT-VI. E-15**

**MARKS: 75**

**CREDITS: 3**

**COURSE OBJECTIVES:**

This course provides knowledge on the value of plants with scientific information and critical thinking to enhance economic botany.

**COURSE OUTCOMES: Students will be able**

- To identify economically important plants/plant parts.
- To identify valuable plant products of potential market and economic value.
- To evaluate, describe and create awareness of the uses of natural plant products as alternative to synthetic and chemical products.

Sr. No	TOPICS	Hours
<b>Module 1: Origin of Cultivated Plants (Centres of Origin, Cereals &amp; legumes)</b>		<b>15</b>
1. 1	<b>Centres of origin:</b> Concept, Vavilov's work, examples of major plant introductions; evolution of new crops/ varieties; crop domestication, Genetic diversity and its loss, Importance of germplasm <b>Cereals:</b> Wheat, Rice (local varieties) and Millets (any one) <b>Legumes:</b> Chick pea, Cow pea and one fodder legumes	
1.2		
1.3		
1.4		
<b>Module 2: Sources of sugars &amp; Starch, Oils &amp; Fats, Drugs &amp; Natural Rubber</b>		<b>15</b>
2.1	<b>Sugar &amp; sugarcane sources:</b> Sugarcane ; Potato & Dioscorea	
2.2	<b>Fat and Oil sources:</b> Groundnut, Coconut, Soybean and; extraction and applications of essential oils, Eucalyptus and mustard oils	
2.3	<b>Therapeutic and habit-forming drugs:</b> <i>Cinchona, Cannabis;</i> Tobacco (Morphology, processing, uses and healthhazards)	



2.4	<b>Tapping, processing and uses of <i>Hevea brasiliensis</i></b>	
<b>Module 3: Classification, general description and uses of Spices, &amp; beverages, Fruit and Nuts, Fibers and Timber Plants</b>		<b>15</b>
3.1	<b>Spices &amp; condiments:</b> Clove, Black pepper, cinnamon, turmeric	
3.2	<b>Beverages:</b> Tea & Coffee	
3.3	<b>Fruits:</b> Mango, Cashew & Jackfruit	
3.4	<b>Fibers:</b> Coconut, cotton & Jute.	
3.5	<b>General account of Timber Plants:</b> Teak and Matti	
		<b>45</b>

**COURSE TITLE: ECONOMIC BOTANY(PRACTICAL)**

**COURSE CODE: BOT-VI.E-15**

**MARKS: 25**

**CREDITS: 1**

<b>Sr. No</b>	<b>Module 4: Topics</b>	<b>Practical</b>
1	Morphological and Microscopic study of cereal and legumes seeds (rice and groundnut)	04
2	Study of essential oil yielding plants (Coconut, Eucalyptus, Citrus)	02
3	Mini Projects:  i. Essential oil from plantsources ii. Analysis of starch content from plant sources(fruits, rhizome, tubers) iii. Analysis of plants for drugs, alkaloids anddyes iv. Fibers fromplants v. Study of local fruits andspices	07
4	Visit to a Spice Farm/ Rubber Plantation/ economically important plant farm	02
<b>Total</b>		<b>15</b>

**REFERENCES:**

1. Kochhar, S.L. (2012). Economic Botany in Tropics, MacMillan & Co. New Delhi, India.
2. Wickens, G.E. (2001). Economic Botany: Principles & Practices. Kluwer Academic Publishers, the Netherlands.
3. Chrispeels, M.J. and Sadava, D.E. (1994) Plants, Genes and Agriculture. Jones & Bartlett Publishers.
4. Subrahmanyam N.S. Sammbamurty A.V.S.S. ( 2008). A textbook of Modern economic Botany. CBS Publishers & Distributors.

**COURSE TITLE: APPLIED MYCOLOGY (THEORY)****COURSE CODE: BOT-IV.E-16****MARKS: 75****CREDITS: 3****COURSE OBJECTIVES:**

This paper provides knowledge on culture techniques and the applicative aspects of fungi.

**COURSE OUTCOMES:** The students be able to:

- To explain techniques involved in sampling, culturing and maintaining fungal cultures.
- To discuss industrial and agricultural applications of fungi.

Sr.No.	TOPICS	Hours
<b>Module 1: Introduction and Fungal Culture studies</b>		<b>15</b>
<b>INTRODUCTION</b>		
1.1	General account of fungi. Microscopic structure, Chemical composition and understanding of fungal cell wall	
1.2	Environmental factors influencing fungal growth	
<b>STUDIES OF FUNGAL CULTURE</b>		
1.3	Introduction to culture collections, Culture Media formulations and types of media used in mycology. Culture databases.	
1.4	Various techniques for pure culture isolation and maximum recovery from different habitats (Soil, Litter, Water, Dung)  Baiting, moist-chamber and particle-plating techniques	
1.5	Isolation of pure cultures and maintenance.	
1.6	Study of colony characters and growth patterns	
1.7	Fungal gene banks- Culture Collection Centres.	
<b>Module 2: Industrial Mycology</b>		

<b>INDUSTRIAL MYCOLOGY</b>		<b>15</b>
2.1	Role of fungi in biotechnology	
2.2	Applications of fungi in food industry <ul style="list-style-type: none"> <li>• Flavour and texture</li> <li>• Fermentation and baking</li> <li>• Organic acids (Preferably Citric acid)</li> <li>• Enzymes (Preferably Cellulases and Pectinases)</li> </ul> Mycoproteins– SCP (Yeast)	
2.3	Endophytic fungi and its industrial applications.	
<b>Module 3: Fungi in Agriculture, medicine and recent mycological advances.</b>		<b>15</b>
<b>FUNGI IN AGRICULTURE</b>		
3.1	Fungi as biofertilizers (Preferably <i>Trichoderma</i> )  Fungi as biocontrol agents- Mycofungicides, Mycoherbicides, Mycoinsecticides	
3.2	Mycorrhizae and its role	
3.3	Medical mycology - Secondary metabolites- Pharmaceutical preparations from fungi, antibiotics from fungi. (Preferably <i>Penicillium</i> and <i>Ganoderma</i> )	
<b>MUSHROOM CULTIVATION &amp; RECENT ADVANCES IN MYCOTECHNOLOGY</b>		
3.4	Mushroom cultivation techniques: Oyster and Button mushrooms.	
3.5	Applications of PCR and other molecular techniques in mycology, Mycoinformatics, Mycoremediation	
		<b>TOTAL: 45 Hours</b>

**COURSE TITLE: APPLIED MYCOLOGY (PRACTICAL)**

**COURSE CODE: BOT-IV.E-8**

**MARKS: 25**

**CREDITS: 1**

<b>Sr. No.</b>	<b>MODULE 4: TOPICS</b>	<b>Practicals</b>
1.	Isolation and preparation of pure culture from a mixed culture plate on solid medium.	02
2.	Preparation of moist chamber and incubation of fungi	01
3.	Particle dilution plating for fungi	01
4.	Isolation of endophytic fungi from plant leaves	01
5.	Study of effect of incubation temperatures and pH on fungal growth	02
6.	Colorimetric estimation of cellulase and amylase produced by fungi	02
7.	Production of Citric acid (using <i>Aspergillus</i> ) in broth and testing for its presence.	02
8.	Mushroom cultivation- Oyster mushrooms and its protein estimation	03
9.	Understanding structures of fungal enzymes using Bioinformatics tools.	01
<b>TOTAL</b>		<b>15</b>

**REFERNCES:**

1. Aneja, K. R. (2007) Experiments in Microbiology Plant Pathology & Biotechnology. 5<sup>th</sup> ed., New Age International Publishers.

2. Bhat, D. J. (2010) Fascinating Microfungi (Hyphomycetes) of Western Ghats – India. First edition.,Broadway Book Centre, Goa.
3. Powar, C.B. and Daginawala, H.F.(1982) General Microbiology–Volume II. Himalaya Publishing house: Bombay.
4. Prescott, L. M. (2005) Microbiology. 6th ed., Mc Graw-Hill.
5. Shivkumar, P.K., Joe, M.M. &Sukesh K.(2010) An Introduction to Industrial Microbiology. 1st ed., S.Chand& Company Pvt. Ltd.
6. Trivedi, P.S. and Pandey, S.N. (2009) A Textbook of Botany. Volume I. Vikas Publishing House Pvt Limited, New Delhi.

# CHEMISTRY

## SEMESTER- II

### CORE COURSE

#### THEORY

**Course Title: Concepts in Physical and Analytical Chemistry**

**Course Code: CHE-II. C-3**

**Name of Faculty:** Mrs. Manjita R. Porob and Dr. S. B. Kakodkar

**Marks: 75**

**Credits: 3**

#### Course Objectives:

1. To provide an understanding of some important topics in Physical Chemistry
2. To provide an understanding of titrimetric methods of analysis.

#### Learning Outcome:

1. Will have knowledge of the main areas of Physical Chemistry, will develop critical thinking abilities and be able to work in chemical or related fields.
2. Will be able to understand the principles of titrimetric methods.
3. Attain practical skills.

### SECTION- I (PHYSICAL CHEMISTRY)

#### 1. Thermodynamics

**10 L**

Thermodynamic terms: system, surrounding, types of systems, intensive and extensive properties, State and path functions and their differentials, Thermodynamic process, Concept of work and heat, First law of thermodynamics: Definition and statements of internal energy and enthalpy, Heat capacities at constant volume and pressure and their relationships, Joule's law, Joule Thomson coefficient and inversion temperature, Calculation of  $w$ ,  $q$ ,  $dU$ ,  $dH$ , for the expansion of ideal gases under isothermal and adiabatic conditions for reversible processes Thermochemistry: Standard state, standard enthalpy of formation, Hess's law of heat summation and its applications, Heat of reaction at constant pressure and at constant volume, Enthalpy of neutralisation, bond dissociation energy and its calculation from thermodynamical data, Temperature dependence of enthalpy, Kirchoff's equation.

(Numerical expected)

#### 2. Liquid State and Applications

**07 L**

The Intermolecular forces, structure of liquids (qualitative description), structural differences between solids, liquids and gases, Physical properties of liquids: vapour pressure, surface tension, surface tension by capillary rise method, drop number method using stalagmometer, Viscosity of liquids, Poiseuille equation, determination of viscosity using Ostwald's viscometer, introduction to liquid crystals.

(Numerical expected)

#### 3. Phase Equilibria

**06 L**

Statement, meaning of terms: phase, components, degrees of freedom, Gibbs phase rule, derivation of Gibbs phase rule, Phase equilibria of one component system: water system, sulphur system, Phase equilibria of two component system, simple eutectic system, Pb/Ag system. Nernst distribution law, deviations from Nernst distribution law, applications of the law.



## SECTION- II (ANALYTICAL CHEMISTRY)

### **1. Introduction to Analytical Chemistry and some basic concepts** **04 L**

Analytical Chemistry and its role in sciences. some important units of measurement, solutions and their concentrations, stoichiometric calculations.  
(Numericals expected)

### **2. Titrimetric methods of analysis** **05 L**

Some general aspects of volumetric titrimetry, standard solutions, volumetric calculations. variables that influence the magnitude of salt effect, titration curves in titrimetric methods.  
(Numericals expected)

### **3. Theory and applications of neutralization titrations** **05 L**

Solutions and indicators for acid/base titrations, titration curves for strong acids and strong bases, buffer solutions, titration curves for weak acids, titration curves for weak bases, composition of buffer solutions as a function of pH. reagents for neutralization titrations, applications of neutralization titrations.  
(Numericals expected)

### **4. Titration curves for polyfunctional acids and polyfunctional bases** **04 L**

Polyfunctional acids and polyfunctional bases, titration curves for polyfunctional acids, titration curves for polyfunctional bases, composition of solutions of a polyprotic acid as a function of pH.  
(Numericals expected)

### **5. Precipitation and Complex formation titrations** **04 L**

Titration curves, end points for argentometric titrations, applications of standard silver nitrate solutions. Complex formation reactions, titrations with aminopolycarboxylic acids.  
(Numericals expected)

## **PRACTICAL**

**Course Title: Concepts in Physical and Analytical Chemistry**

**Course Code: CHE- II. C-3**

**Name of Faculty: Dr. Sachin B. Kakodkar**

**Marks: 25**

**Credits: 1**

## **PHYSICAL CHEMISTRY**

1. To determine the partition coefficient of  $I_2$  between  $C_2H_4Cl_2$  and  $H_2O$ .
2. To determine the amount of strong acid (HCl) present in the given solution by conductometric titration using standard NaOH solution.
3. To determine the amount of weak acid ( $CH_3COOH$ ) present in the given solution by conductometric titration using standard NaOH solution.
4. To determine viscosity of a given liquid using Ostwald's Viscometer.

## **ANALYTICAL CHEMISTRY**

1. To standardize hydrochloric acid against sodium carbonate.
2. To standardize sodium hydroxide against potassium hydrogen phthalate.
3. To determine hardness in water.
4. To standardize sodium thiosulphate solution against copper.

## **THEORY**

**Course Title: Industrial Chemistry**

**Course Code: CHE-III. E-2**

**Name of Faculty: Dr. Rohan K. Kunkalekar, Dr. Roopa Belurkar**

**Maximum Marks: 75**

**Credits: 3**

**Course Objectives:** The main objective of this course is to study the industrial processes, pollution caused due to industries, some pharmaceutical preparations and preparation and properties of solid materials.

**Learning outcome:** students will learn about industrial processes, preparation and properties of solid materials, they will learn about the different types of pollutions caused by industries. Students will develop the laboratory skills about the synthesis and analysis of industrially important materials.

### **1. Pollution 12 L**

- A. Segments of environment  
Air, Oxygen, nitrogen cycle, water, Biosphere, Flora and Fauna, Soil
- B. Types of Pollution (i) Air Pollution: Introduction, classification of pollutants, sources, control, effect with respect to oxides of Nitrogen, Carbon and Sulphur, Photochemical smog, acid rain and Green House Effect. (ii) Water pollution: Organic /inorganic pollutants Sewage analysis (iii) Noise pollution.
- C. Effluent treatment and waste management  
Principles and equipments for aerobic, anaerobic treatment, adsorption, filtration, sedimentation, Bag filters, electrostatic precipitators, mist eliminators, wet scrubbers, Absorbers, Solid Waste Management.
- D. Pollution evaluation methods, Pollutants and their statutory limits.

### **2. Materials Science 15 L**

- A. Mechanical properties of materials and change with respect to temperature
- B. Metals and alloys – important metals and alloys
- C. Corrosion – various types of corrosion relevant to chemical industry – Mechanism, Preventive methods.
- D. Cement – Types of cement, composition, manufacturing processes, setting of cement.
- E. Ceramics – Introduction, Types, Manufacturing processes, Applications, Refractories.
- F. Glass – types, composition, manufacture, physical and chemical properties applications.

### **3. Pharmaceutical Drugs 10 L**

Classification of various types of drugs with examples; Raw materials, process of manufacture, effluent handling etc of the following bulk drugs:

- A. Antimicrobial – chloramphenicol, furazolidone, isoniazid, Ethambutol
- B. Analgesic/Anti-inflammatory / salicylic acid and its derivatives, Ibuprofen

### **4. Industrial fuels and chemicals 08 L**

- A. Industrial fuels like coal gas, producer gas and water gas.
- B. Physico chemical principles involved in the manufacture of  $\text{HNO}_3$  (Ostwald's method) and  $\text{NH}_3$  (Haber's method).

## **PRACTICALS**

**Course Title: Industrial Chemistry**

**Course Code: CHE-III. E-2**

**Name of Faculty: Dr. Rohan K. Kunkalekar, Dr. Roopa Belurkar**

**Maximum Marks: 25**

**Credit: 1**

1. Volumetric estimation of amount of chloride present in given sample
2. To prepare crystals of potash alum,  $K_2SO_4 \cdot Al_2(SO_4)_3 \cdot 24 H_2O$ , from Aluminium foil
3. To estimate the amount of copper present in brass by colourimetric method
4. To separate and estimate the amount of magnesium ion and zinc ion present in the given magnesium-zinc mixture, using an anion exchange resin column (minimum 4 hours)
5. To estimate amount of zinc present in brass by complexometric titration (minimum 4 hours)
6. Ore analysis: Ca from Limestone (minimum 4 hours)
7. Ore analysis: Mn from Manganese ore (minimum 4 hours)
8. Synthesis of common industrial compounds involving two step reactions: Phthalic acid to Phthalic anhydride. (minimum 4 hours)
9. Complete pharmacopeia analysis of drugs: a) Paracetamol OR b) Ibuprofen (minimum 4 hours)

## **TEXT BOOK:**

Sharma B. K., Industrial Chemistry, 6<sup>th</sup> Edition, Goel Publishing House, Meerut

## **REFERENCE BOOKS:**

1. Lee, J. D., Concise Inorganic Chemistry, 5<sup>th</sup> Edition, Wiley Blackwell Science Publications
2. Cotton F. A., and G. Wilkinson G., Basic Inorganic Chemistry, 2<sup>nd</sup> Edition, Wiley Eastern Ltd.,
3. Iqbal S. A., and Mido, Y., Chemistry of Air and Air Pollution, Discovery Publishing House, New Delhi
4. Tyagi O. D. and Mehra M., A Text Book Of Environmental Chemistry, Anmol Publications, New Delhi
5. De, A. K., Environmental Chemistry, Wiley Eastern Limited
6. Bahl B. S., Comprehensive Inorganic Chemistry
7. Foye A. O., Principles of Medicinal Chemistry, Publication Philadelphia
8. Wilson, Gisvold, Doerge, Textbook of Organic Medicinal and Pharmaceutical Chemistry, Lippincott -Toppan
9. Korolkovas and Burkhalter, Essentials of Medicinal Chemistry, Wiley- Interscience
10. Lednicer D., and Mitscher, L. A., Organic Chemistry of Drugs Synthesis, Wiley Interscience
11. Singh P. P. and Rangnekar, D.W., An Introduction to Synthetic Drugs, Himalaya Publication, Bombay

## **THEORY**

**Course Title: Surface Chemistry and Catalysis**

**Course Code: CHE- III. E-3**

**Name of Faculty: Dr. S. B. Kakodkar**

**Maximum Marks: 75**

**Credits: 3**

### **Course Objectives:**

1. To understand the surface features of solid surfaces and its importance in chemical processes.
2. To understand the process of adsorption and its types.
3. To understand catalytic processes and some important classes of catalysts.

### **Learning outcome:**

1. Will have an understanding of chemistry of surfaces and be able to interpret various types of adsorption.
2. Will understand the mechanism and applications of catalytic processes.
3. Will have practical knowledge of synthesis and characterisation of catalysts.

### **1. Surfaces of solids**

**08 L**

Introduction, surface mobility of solids-sintering; effect of past history on condition of solid surfaces; Thermodynamics of crystals; Surface tension and surface free energy; equilibrium shape of a crystal; Kelvin equation; Theoretical estimates of surface energies and free energies in various types of crystals and metals; Factors affecting surface energies and surface tensions of actual crystals; experimental methods for determining surface structure, reactions of solid surfaces.

### **2. Adsorption**

**17 L**

Introduction, Differences between adsorption, absorption and sorption, Characteristics of adsorption, sorption and occlusion, Adsorption of gases on solids; Physisorption and chemisorptions; Adsorption isotherms, Types of adsorption isotherms: Freundlich adsorption isotherm, Langmuir adsorption isotherm, The BET equation; Determination of surface area: Harkin and Jura method, Benton and White method, The BET method, Point B method, From electrical potential of adsorbed layer, Using rate of dissolution, From heat of wetting; Importance of surface area; Heat of adsorption and its measurement; Adsorption isobars; Adsorption from solution, Gibbs adsorption equation, Adsorption by porous solids, Adsorption in mesopores and micropores

### **3. Catalysis**

**20 L**

Introduction, Types of catalysis, Characteristics of catalysts; Theory of Homogenous catalysis, Function of a catalyst in terms of Gibbs Free energy of activation; Theory of heterogeneous catalysis, Quantitative treatment of Adsorption theory, Kinetics of heterogeneous reactions, Effect of temperature on heterogeneous reactions, Absolute rate theory in heterogeneous gas reactions; Classification of catalysis, Enzyme catalysis, Characteristics of enzyme catalysis; Factors governing rate of enzyme catalysed reactions; Mechanism and kinetics of enzyme catalysed reactions, Michaelis-Menten equation; Acid-base catalysis, Mechanism and kinetics of acid-base catalysis, catalytic coefficients, Hammett and Bronsted equation; Acidity function; some important classes of catalysts

## **PRACTICALS**

**Course Title: Surface Chemistry and Catalysis**

**Course Code: CHE- III. E-3**

**Name of Faculty: Dr. S. B. Kakodkar**

**Maximum Marks: 25**

**Credits: 1**

1. To study the adsorption of acetic acid on charcoal and to verify Freundlich isotherm.
2. To study the adsorption of oxalic acid on charcoal and to verify Langmuir adsorption isotherm.
3. To study acid catalysed inversion of cane sugar by polarimetry.
4. To determine the interfacial tension between two immiscible liquids (chloroform-water) at room temperature.
5. To determine the indicator constant of a given indicator by colourimetric measurements.
6. To synthesize ZnO from zinc nitrate by decomposition method and determine the amount of zinc in ZnO by titrimetry.
7. To synthesize CuO from copper nitrate and determine the amount of copper in CuO using titrimetry.
8. To study the kinetics of iodination of acetone.
9. To study the hydrolysis of methyl acetate and determination of energy of activation in presence of sulphuric acid.
10. To investigate the auto-catalytic reaction between potassium permanganate and oxalic acid.
11. To determine the Scherrer particle size of any three catalysts using their X-ray diffraction data.
12. To calculate band gap of any five catalysts using their UV-DRS data.
13. To determine the Hammett constant of a substituted benzoic acid by pH measurements
14. To study the adsorption of iodine from alcoholic solution using charcoal
15. To investigate the autocatalytic reaction between  $\text{KMnO}_4$  and oxalic acid

## **TEXT BOOK:**

Raj Gurdeep, Advanced Physical Chemistry, Goel Publishing House

## **REFERENCE BOOK:**

Adamson A. W., Physical Chemistry of Surfaces, Interscience Publishers

## **PRACTICAL BOOK**

Rajbho S.W., Chondhekar T. K., Systematic Experimental Physical Chemistry

## SEMESTER IV

### CORE COURSE THEORY

**Course Title: Comprehensive Chemistry-II**

**Course Code: CHE- IV. C- 6**

**Name of Faculty: Sandesh T. Bugde and G. K. Naik**

**Maximum Marks: 75**

**Credits: 3**

#### Course Objectives:

1. The main objective of this course is to study the organic compounds containing CHO elements.
2. This course focuses on the study of ethers, aldehydes, ketones, acids and esters with respect to their structural and chemical properties, method of formation and chemical reaction.

#### Learning outcome: Students will learn about;

1. Important classes of organic compounds include CHO elements.
2. Preparations involved in different classes of organic compound having CHO elements.
3. Important reaction involved in each class of included compounds.

### SECTION I (ORGANIC CHEMISTRY)

#### 1. a. Studies of organic compound containing C, H and O 04 L

Chemistry of organic compounds containing C, H, O elements; Alcohols, ethers, acids, ester, aldehydes and ketones

##### b. Ethers

Properties of ethers, Symmetric and asymmetric ethers, crown ethers, Preparations of ethers: Williamson ether synthesis, alkoxymercuration-demercuration, Reaction of ethers with acids (HX).

#### 2. Aldehydes and Ketones 08 L

Properties of aldehydes and ketones, Geometry and polarity of the carbonyl group, Preparation of aldehydes: Oxidation of alcohols, reduction of acid chlorides, Ozonolysis of alkene; Preparation of ketones: oxidation of alcohols, Friedel-Crafts acylation, Reaction of acid chloride with organocopper compounds; Reactions of aldehydes and ketones: General mechanism of nucleophilic addition at carbonyl group; Oxidation and reduction of aldehyde and ketones; Reaction with amine derivative (imine formation with mechanism); Cannizzaro reaction and addition of Grignard reagents; Addition of carbanions (Aldol condensation).

#### 3. Carboxylic Acids 06 L

Properties of carboxylic acids, Preparation of acids: Oxidation of primary alcohols and alkyl benzenes, hydrolysis of nitriles with mechanism; Reaction of acids: Salt formation, conversion to different functional groups (esters, amides, acid chlorides and anhydrides), reduction of acids.

#### 4. Esters 05 L

Properties of esters; Preparation of esters: from acids, acid chlorides and anhydrides; Reactions of esters: Conversion to acids (Hydrolysis along with mechanism), conversion to amides, Trans-esterification, reduction to aldehydes and alcohols.

### SECTION II (ANALYTICAL CHEMISTRY)

#### 1. The Scope and Nature and of Analytical Chemistry 05 L

Introduction; quantitative and qualitative analysis; qualitative analysis by classical and instrumental methods; analytical chemistry and analytical process (steps involved in chemical analysis): defining the

problem, sampling, separation of desired components, actual analysis, presentation and interpretation of results; factors affecting the choice of analytical method.

## **2. Sampling Techniques**

**07 L**

Terms encountered in sampling: Sample, the population or the universe, sampling unit, increment, the gross sample, the sub sample, Analysis sample, bulk ratio, size to weight ratio, random sampling, systematic sampling, multistage sampling, sequential sampling; sampling of gases, liquids and solids; Preservation, storage and preparation of sample solution.

## **3. Statistical Treatment of Analytical Data**

**10 L**

Limitations of analytical methods, classification of errors, accuracy and precision; Errors: determinate and indeterminate error, constant and proportionate errors, minimization of errors; Significant figures and rounding off; mean, median, mode, range; standard deviation; histogram and frequency polygon; measures of central tendency and dispersion; Gaussian distribution curve; Confidence limit; Test of significance: F test, Students T; Rejection of the results: Q test, 2.5 d and 4.0 d rule; linear least squares/ method of averages.

## **PRACTICALS**

**Course Title: Comprehensive Chemistry-II**

**Course Code: CHE- IV. C- 6**

**Name of Faculty: Sandesh T. Bugde and G. K. Naik**

**Maximum Marks: 25**

**Credit: 1**

## **ORGANIC CHEMISTRY EXPERIMENTS**

1. Qualitative analysis of organic compounds:  
Solids (examples: Benzoic acid, Nitro-benzaldehyde, Benzophenone)  
Liquids (Acetone, methylacetate, benzaldehyde)
2. Identification of type and separation of mixture of organic compounds:  
Solid-solid (Soluble-insoluble, insoluble-insoluble), solid-liquid (Solid and low boiling liquid), liquid-liquid) (High boiling and low boiling liquid)

## **ANALYTICAL CHEMISTRY EXPERIMENTS**

1. To estimate the  $\text{NO}_2^-$  in the given solution by  $\text{KMnO}_4$  method by back titration
2. To determine the amount of HCl in the given solution by pH metric titration
3. To determine the specific rotation of the given solution and to determine the percentage composition of unknown solution using polarimeter
4. To estimate the amount of benzoic acid in the given solution by back titration
5. To estimate the amount of vitamin C in the given solution
6. To estimate the amount of Aspirin present in the given tablet
7. To calibrate the burette and pipette using statistical treatment of data
8. To calibrate the volumetric flask of different volume capacity
9. To determine the hardness of water by EDTA method and to take at least five readings and apply the statistical data treatment to calculate mean, median, range, standard deviation and Q test. (Any six experiments to be performed)

## **ORGANIC CHEMISTRY**

### **TEXT BOOK:**

1. Morrison, R. T., Boyd, R. N. and Bhattacharjee, S. K., Organic Chemistry, Pearson India.

### **REFERENCE BOOKS:**

1. Bruice, P. Y. Organic Chemistry, Pearson India

2. Carey, F. C. and Giuliano, R. M. Organic Chemistry, Tata McGraw-Hill India
3. Finar, I. L. Organic Chemistry, Pearson India

**PRACTICAL TEXT BOOK:**

Furniss, B. Brian, S., Vogel's Textbook of Practical Organic Chemistry, Pearson education

**ANALYTICAL CHEMISTRY**

**TEXT BOOK:**

1. Skoog, D. A., West, D. M., Holler F. J. and Crouch, S. R., Fundamentals of Analytical Chemistry, 8<sup>th</sup> Edition,

**REFERENCE BOOKS:**

1. Willard, H. H., Merritt, L. L., Dean, J. A., Settle, F. A., Instrumental Methods of Analysis, CBS Publishing, New Delhi, 7<sup>th</sup> Edition
2. Vogel's Text Book of Quantitative Inorganic Analysis - J. Bassett, R. C. Denney, G. H. Jeffrey, J. Mendham.
3. Christian, G. D., Analytical Chemistry, Analytical Chemistry, John Wiley, 5<sup>th</sup> Edition

**PRACTICAL TEXT BOOK:**

Yadav J. B. Advanced Practical Physical Chemistry, Goel Publishing House, 14<sup>th</sup> Edition



## SEMESTER IV

### ELECTIVE COURSES

#### THEORY

**Course Title: Pharmaceutical Chemistry**

**Course Code: CHE- III. E-5**

**Name of Faculty: Sandesh T. Bugde**

**Maximum Marks: 75**

**Credits: 3**

#### Course Objectives:

1. The main objective of this course is to study the Chemistry involved in pharmaceutical industries.
2. This course gives blend of chemical and pharmaceutical principles necessary for understanding structure–activity relationships and molecular mechanisms of drug action.
3. This course also includes synthesis of some important drugs.

#### Learning outcome:

1. Students will learn about important aspects with respect to pharmaceutical Chemistry.
2. Students will develop understanding in structure-activity relationship.
3. Students will learn efficient chemical synthesis involved in important drug.

#### **1. Introduction to pharmaceutical Chemistry and its scope**

**05 L**

Introduction to pharmaceutical Chemistry; Scope of pharmaceutical Chemistry; General terminologies used in pharmaceutical Chemistry: Pharmacopoeia, Pharmacokinetics, Pharmacodynamics.

#### **2. Drug design strategies and general pathways of drug metabolism**

**10 L**

Drug designing; General pathways of drug metabolism: Oxidative reactions, reductive reactions, hydrolytic reactions, Phase II or conjugation reactions.

#### **3. Anti-infective agents**

**10 L**

Antifungal agents: Haloprogin and Flucytosine. (Definition, structures, Mechanism of action and uses); Antibacterial agents: Ciprofloxacin and Furazolidone (Definition, structures and uses); Anti protozoal agents: Metronidazole (Definition, structure and uses); Anthelmintics: Thiabendazole (Definition, structure and uses); Antibacterial agents: Linezolid (Definition, structure and uses); Synthesis of Flucytosine.

#### **4. Central nervous system stimulant and depressant**

**10 L**

Analeptics: Pentylenetetrazole (Definition, structure and uses); Central sympathomimetic agents (psychomotor stimulants): Pentylenetetrazole (Definition, structure and uses); Antidepressants: Desipramine Hydrochloride and Clomipramine Hydrochloride (Definition, structure and uses); Anxiolytic: Paroxetine (Definition, structure and uses); Sedative and hypnotic agents: Propofol, Methaqualone (Definition, structure and uses); Synthesis of clomipramine.

#### **5. Cardiovascular agents**

**06 L**

Antianginal Agents and Vasodilators: Nitroglycerin, Nifedipine (Definition, structures and uses); Antiarrhythmic Drugs: Quinidine sulfate (Definition, structure and uses); Antihypertensive Agents: Prazosin (Definition, structure and uses); Synthesis of Nifedipine by Hantsch synthesis, Prazosin.

#### **6. An introduction to the Medicinal Chemistry of plants**

**04 L**

Historical background; Type of plant, active ingredient structure and their medicinal properties: Capsicum, Garlic, turmeric.

## **PRACTICALS**

**Course Title: Pharmaceutical Chemistry**

**Course Code: CHE- III. E-5**

**Name of Faculty: Sandesh T. Bugde**

**Maximum Marks: 25**

**Credit: 1**

1. Synthesis of Aspirin
2. Synthesis of Benzocaine
3. Synthesis of Paracetamol
4. Synthesis of Acetaminophen
5. Synthesis of benzophenone oxime.
6. Synthesis of phenytoin
7. Synthesis of benzimidazole
8. Estimation of acetyl salicylic acid in the given aspirin tablet by titrating against 0.1N alcoholic KOH potentiometrically.
9. Determination of purity of paracetamol spectrophotometrically.
10. Determination of optical rotation of pharmaceutical compounds.
11. UV Absorbance Standard Curve of Salicylic Acid
12. Assay by titration of the following: Ibuprofen, aspirin.
13. Hydroxyzine dihydrochloride (HDH) determination by titrimetry.
14. Assay of Nitrazepam potentiometrically.
15. Quantitative estimation of aspirin in tablets using metformin hydrochloride.

## **TEXT BOOK:**

1. Wilson and Gisvold's Textbook of Organic Medicinal and Pharmaceutical Chemistry, 12<sup>th</sup> Edition

## **REFERENCES BOOKS:**

1. Foye, W.O., Medicinal Chemistry
2. A. Pengelly, The Constituents of Medicinal plants
3. Lednicer and Meischer, Organic Chemistry of Drug Synthesis

## SEMESTER IV

### ELECTIVE COURSE

#### THEORY

**Course Title: Polymer and Colloid Science (Theory) [with effect from June 2020].**

**Course Code: CHE- IV. E-6**

**Maximum Marks: 75**

**Credits: 3**

**Duration: 45 hours**

#### Course Objectives:

1. Will be able to classify colloids.
2. Will be able to calculate molar mass of polymers.
3. Will learn to synthesis some polymers in the laboratory

#### Course Outcomes:

On successful completion of the course, the student will be able to:

**CO1:** Understand the colloidal state of matter

**CO2:** Evaluate properties of colloids.

**CO3:** Explain properties of gels and emulsions.

**CO4:** Calculate the molecular mass of polymer.

**CO5:** Understand solid state properties of polymers.

**CO6:** Design the synthesis of a polymer.

**CO7:** Synthesize and characterize colloids and determine molecular weight of polymer.

**CO8:** Distinguish between different types of solutions in terms of solute dimensions.

#### UNIT I: Colloidal Science

**15 hours**

Colloidal state; colloidal solution; classification of colloids; lyophobic and lyophilic colloids; true solution, colloidal solution and suspension; preparation of sols; purification of sols; stability of colloids; protective action; Hardy- Schulze Law; gold number; General properties; electrical properties; electrical double layers; kinetics of coagulation; inhibition; general applications of colloids on size of colloidal particles

#### UNIT II: Emulsions, Gels and Introduction to Polymer Science

**15 hours**

Emulsions- definition, types, preparation; gels- definition; classification, preparation and properties; Classification of polymers: thermoplastics and thermosetting, classification based on polymerization scheme, polymer structure: copolymers, tacticity, geometric isomerism; molecular weight: molecular weight distribution, molecular weight averages; chemical structure and thermal transitions; calculation of molecular weight: osmometry, light scattering method, intrinsic viscosity method

#### UNIT III: Polymer Chemistry

**15 hours**

Step growth polymerization- kinetics, molecular weight; chain growth polymerization- free radical polymerization and copolymerization, ionic polymerization and copolymerization; polymerization technique; bulk polymerization, solution polymerization, suspension polymerization, emulsion polymerization, solid state- gas phase and plasma polymerization; polymer conformation and chain dimensions; thermodynamics of polymer solution- Flory-Krigbaum and Flory-Huggins theory; equation of state theory; amorphous state- chain enlargements and reptation, the glass transition, secondary relaxation processes; the crystalline state- ordering of polymer chains, crystalline-melting temperature, crystallization kinetics; technique to determine crystallinity.

## PRACTICALS

Course Title: Polymer and Colloid Science (Practicals) [with effect from June 2020].

Course Code: CHE- IV. E-6

Maximum Marks: 25

Credit: 1

Duration: 30 hours

### List of experiments:

1. To prepare colloidal solutions of cadmium sulphide and ferric hydroxide
2. To determine the flocculation value of a univalent and a divalent electrolyte for ferric hydroxide sol
3. To study the coagulation value of  $As_2S_3$  sol with  $AlCl_3$
4. To study the mutual coagulation value of ferric hydroxide sol
5. To determine the molar mass of a polymer using Ostwald's viscometer
6. To study the variation of the viscosity of a given liquid with temperature using Ostwald's viscometer
7. To determine the composition of a binary liquid mixture using viscometer
8. To determine the viscosity of liquid mixture and test the validity of Kendall's equation
9. To determine the surface tension of a liquid by drop number method using stalagmometer
10. To determine the composition of a binary liquid mixture using stalagmometer
11. To determine critical micelle concentration of a soap by surface tension method using stalagmometer
12. To determine the molecular weight of a given polymer by turbidimetric method
13. To separate the amino acids from the mixture by electrophoresis method
14. To separate the inorganic cations by paper electrophoresis method
15. To determine the amount of chloride ion by adsorption indicator method

### TEXT BOOK:

Raj G., *Advanced Physical Chemistry*; Goel Publishing House, Meerut.

### REFERENCE BOOKS:

1. Puri B. R., Sharma L.R., Pathania M. S., *Principles of Physical Chemistry*, Vishal Publishing Co.
2. Fried J. R., *Polymer Science and Technology*; Prentice Hall of India private limited
3. Bhatnagar M. S., *A Text Book of Polymer Science*, Volume 1

### WEB REFERENCES:

1. <https://www.toppr.com/guides/chemistry/surface-chemistry/classification-of-colloids/>
2. <https://www.slideshare.net/azamushahiullahprottoy/applications-of-colloid>
3. <https://www.livescience.com/60682-polymers.html>
4. <https://www.sciencenewsforstudents.org/article/explainer-what-are-polymers>
5. <https://www.toppr.com/guides/chemistry/surface-chemistry/properties-of-colloidal-solutions/>

## **THEORY**

**Course Title: Spectroscopic Techniques**

**Course Code: CHE-IV. E-7**

**Name of Faculty: G. K. Naik**

**Maximum Marks: 75**

**Credits: 3**

### **Course Objectives:**

1. To learn the basic principles on interaction of electromagnetic radiation with matter and instrumentation basics.
2. To understand principles, instrumentation and applications of UV-Visible spectroscopy and atomic spectrometric methods.
3. To provide a practical approach to understand UV-Visible spectroscopy.

### **Learning outcome:**

1. Will be able to understand the basic components of instruments and the choice of solvents for spectrometry.
2. Will be able to perform qualitative and quantitative analysis using principles of spectrometry.
3. Will be able to operate an UV-visible spectrophotometer.

### **1. General Introduction**

**15 L**

Overview of spectroscopy; meaning of electromagnetic radiation; interaction of electromagnetic radiation with matter; wave properties of electromagnetic radiation; particle properties of electromagnetic radiation; the electromagnetic spectrum; regions of spectrum; atomic and molecular spectra; representation of spectra; photons as a signal source; basic components of spectroscopic instruments; sources of energy; sources of electromagnetic radiation; sources of thermal energy; chemical sources of energy; wavelength selection; wavelength selection using filters; wavelength selection using monochromators; interferometers; detectors; photon transducers; thermal transducers; signal processors; solvents for spectrometry; quantitative calculations; spectrometric errors in measurements

### **2. UV Visible Spectroscopy:**

**20 L**

Beer's Law; Lambert's Law; Beer-Lambert's Law; Deviations from Beer-Lambert's Law; validity and limitations of Beer-Lambert's law; principles of instrumentation: Sources, monochromators, cells; types of instruments; photoelectric colorimeters: single and double beam photoelectric colorimeters; single and double beam spectrophotometers; comparison between colorimeter and spectrophotometer; analytical applications of colorimeter and spectrophotometer:  $\lambda_{\max}$ , quantitative analysis, identification of structural groups in a molecule, study of co-ordination compound; photometric titrations; Theory of electronic (UV) spectroscopy; Electronic transitions in a molecule; Chromophores and auxochromes; Bathochromic, hypsochromic, hyperchromic and hypochromic shifts; solvent effect; effect of temperature; applications of UV and visible spectroscopy: identification of structural groups, cis-trans isomerism, chemical kinetics, qualitative and quantitative analysis; limitations of UV and visible spectroscopy.

### **3. Atomic Spectroscopy**

**10 L**

Origins of atomic spectra, production of atoms and ions; Atomic Emission Spectrometry: Introduction, principle, instrumentation, applications, advantages and limitations of flame photometry and Inductively coupled plasma spectroscopy; Atomic Absorption Spectrometry: Introduction, principle, instrumentation, applications, internal standard and standard addition calibration, limitations  
Atomic Fluorescence Spectrometry: Introduction, principles, instrumentation and applications.

## **PRACTICALS**

**Course Title: Spectroscopic Technique/ Method**

**Course Code: CHE-IV. E-7**

**Name of Faculty: G. K. Naik**

**Maximum Marks: 25**

**Credit: 1**

1. To test the validity of Beer-Lambert Law using spectrophotometer and determine the unknown concentration of a solution
2. To calibrate the UV- Visible spectrophotometer for control of absorbance and limit of stray light
3. Determination of  $Mn^{2+}$  ion concentration by periodate method using spectrophotometer
4. Determination of  $Fe^{3+}$  ion concentration by salicylic acid method using spectrophotometer
5. To verify the law of additivity of absorbance ( $KMnO_4$  and  $K_2Cr_2O_7$ ) at  $\lambda_{max}$  of  $K_2Cr_2O_7$  and determine molar absorptivity
6. To verify the law of additivity of absorbance ( $KMnO_4$  and  $K_2Cr_2O_7$ ) at  $\lambda_{max}$  of  $KMnO_4$  and determine molar absorptivity
7. To determine the amount of  $K_2CrO_4$  present in given sample by using UV-Visible spectrophotometer
8. Spectrophotometric methods for determining the stoichiometry of a complex formed between iron and 1,10- phenanthroline by continuous variation method
9. Spectrophotometric methods for determining the stoichiometry of a complex formed between iron and 1,10- phenanthroline by mole ratio method
10. To determine the phosphate concentration in a soft drink by spectrophotometric method
11. To determine the dissociation constant of methyl red indicator by spectrophotometric method
12. To estimate the amount of nitrite in water sample by spectrophotometric method
13. To estimate the amount of paracetamol in tablet by spectrophotometric method
14. To estimate the amount of aspirin in the given tablet by spectrophotometric method
15. To determine the amount of Cr (VI) in the given solution as dichromate by least square method spectrophotometrically

## **TEXT BOOK:**

Skoog, D. A., West, D. M., Holler F. J., Crouch, S. R., Fundamentals of Analytical Chemistry, 8<sup>th</sup> Edition

## **REFERENCE BOOKS:**

1. Holler F. J., Skoog, D. A., Crouch, S. R., Principles of Instrumental Analysis, 6<sup>th</sup> Edition, Thomson Books
2. Willard, H.H., Merritt, L.L., Dean, J. A., Settle, F. A., Instrumental Methods of Analysis, CBS Publishing New Delhi, 7<sup>th</sup> Edition
3. Christian, G. D., Analytical Chemistry, John Wiley, 5<sup>th</sup> Edition
4. Ewing, G.W., Instrumental Methods of Chemical Analysis, 5<sup>th</sup> Edition, Mc-Graw Hill International Edition.
5. Bassett J., Denney R. C., Jeffrey G. H., Mendham J., Vogel's Text Book of Quantitative Inorganic Analysis, 4<sup>th</sup> Edition, ELBS and Longman

## **PRACTICAL BOOK:**

Yadav, J. B., Advanced Practical Physical Chemistry, 14<sup>th</sup> Edition, Goel Publishing House

## SEMESTER V

### ELECTIVE COURSES

#### THEORY

Course Title: Heterocyclic Chemistry

Course Code: CHE- V. E-9

Name of Faculty: Sandesh T. Bugde and Ms. Padmini C. Raiker

Maximum Marks: 75

Credits: 03

#### Course Objectives:

1. The main objective of this course is to study the chemistry of heterocyclic compounds.
2. This course gives an overview of different classes of heterocyclic compounds.
3. It includes physical, chemical properties and synthesis of most of the heterocyclic compounds.

#### Learning outcome:

1. Students will learn about important aspects with respect to heterocyclic chemistry.
2. Students will develop understanding with regards to reactivity of heterocyclic chemistry.
3. Students will learn efficient chemical synthesis involved in heterocyclic compounds.

#### UNIT I: Introduction to heterocyclic compounds 03L

Classification and Nomenclature of aliphatic and aromatic heterocycles.

#### UNIT II: Aliphatic heterocycles 10L

Structure and reactivity of nitrogen and oxygen containing aliphatic heterocycles. Methods of preparation and reactions of oxiranes, aziridines, tetrahydrofuran, pyrrolidine.

#### UNIT III: Five and six membered aromatic heterocycles 12L

Structure and reactivity of five and six membered heterocycles: furan, pyrrole, thiophene and pyridine; comparison of basicity of pyrrole, pyridine & piperidine. Electrophilic substitution reaction of five and six membered heterocycles: General mechanism, mechanism of halogenations, nitration and reaction with acids. Oxidation and reduction of condensed heterocycles. Methods of preparation of furan, pyrrole, thiophene and pyridine. Nucleophilic substitution reactions of aromatic heterocycles.

#### UNIT IV: Condensed heterocycles 10L

Structure and reactivity of condensed heterocycles like benzofuran, Indole, benzothiophene, quinoline and isoquinoline. Electrophilic and nucleophilic substitution reactions of condensed heterocycles: General mechanism and with examples. Oxidation and reduction of condensed heterocycles. Methods of preparation of benzofuran, Indole, benzothiophene, quinoline and isoquinoline.

#### UNIT V: Heterocycles with more than one heteroatom 10L

Classification of heterocycles with more than one heteroatoms. Reactions of 1,2-azoles, 1,3-azoles, oxazoles, imidazole, purines and pyrimidines: Reactions with electrophilic reagents, reactions with nucleophilic reagents, oxidation and reduction. Methods of preparations of 1,2-azoles, 1,3-azoles, oxazoles, imidazole, purines and pyrimidines.

## **PRACTICALS**

**Course Title: Heterocyclic Chemistry**

**Course Code: CHE- V. C-9**

**Name of Faculty: Dr. Sandesh T. Budge and Ms. Padmini C. Raiker**

**Marks: 25**

**Credits: 01**

### **List of experiments:**

1. Epoxidation of chalcones (2steps)
2. Synthesis of the Coumarins via Pechmann condensation
3. Synthesis of 3,4- dihydropyrimidin-2(1H)-ones by a one-pot three component cyclocondensation reaction of 1,3 dicarbonyl compound, aldehyde, and urea via Biginelli reaction
4. Synthesis of 1,3,5-trisubstituted pyrazoles (2steps)
5. Synthesis of benzimidazole from o-phenylenediamine and formic acid
6. Synthesis of 2-substituted benzoxazoles from 2-amino phenol and aromatic aldehydes.
7. Synthesis of quinoxaline derivatives
8. Synthesis of flavones via Baker-Venkataraman rearrangement (3steps)
9. Preparation of 2-phenyl indole via Fischer indole synthesis

### **REFERENCES:**

#### **TEXT BOOK**

1. Joule J. A., et al. "Heterocyclic Chemistry"

#### **ADDITIONAL READING:**

1. Heterocyclic Chemistry by T. Gilchrist
2. Organic Chemistry by J. McMurry
3. Organic Chemistry by I. L. Finar



## **THEORY**

**Course Title: Nanomaterials and Solid State Chemistry**

**Course Code: CHE-VI. E-10**

**Maximum Marks: 75**

**Credits: 3**

### **Course Objectives:**

The main objective of this course is to study the chemistry of nanomaterials their general properties, synthesis and applications. Also includes the part of solid state chemistry which involves reaction of solids and their electrical and magnetic properties.

### **Learning outcome:**

1. Students will learn a comprehensive and detail understanding of nanomaterials.
2. Will gain the basic knowledge about nanomaterial synthesis and properties.
3. Will be able to get a deeper understanding in the field of material science.

### **UNIT I: Introduction to nanomaterials**

**6L**

Fundamentals: terminology and history, classification of nanomaterials, properties of nanomaterials: optical, magnetic, electronic, surface area, catalytic and mechanical.

### **UNIT II: Synthesis of nanomaterials**

**10L**

Synthesis Approach: top down/bottom up, physical methods (mechanical methods, methods based on evaporation, sputter deposition, chemical vapour deposition), chemical methods (sol-gel, hydrothermal, sonochemical, microwave, precursor), Biological methods (using microorganism and plant extract). Characterization techniques: electron microscopes (SEM/TEM), diffraction techniques, spectroscopic (UV-Visible, magnetic measurement).

### **UNIT III: Applications of nanomaterials**

**6L**

Energy, automobiles, sports, textile, cosmetics, medicinal, space, defence, engineering and catalytic. Toxicity of nanomaterials.

### **UNIT IV: Solid state chemistry**

**11L**

Reactions of solids: tarnish reactions, decomposition reaction, solid-solid reactions, addition reactions, double decomposition reaction, electron transfer reaction, solid-gas reactions, sintering, factors influencing reactivity of solids.

Phase transformations in solid: structural change in phase transformation, Martensite transformation, temperature and pressure induced transformations, order-disorder transitions.

### **UNIT V: Electrical and magnetic properties of solids**

**12L**

Electrical conductivity, Insulators, semiconductor and conductors, Band theory of semiconductor, Brillouin zones, Hall effect, Seebeck effect, photo conductivity, ionic conductivity, superconductivity, BCS theory, Meissner effect, high temperature superconductor, piezoelectronic, ferroelectric materials and applications.

Introduction to magnetism, behavior of substance in a magnetic field, magnetic moments, diamagnetism, paramagnetism, experimental determinations of susceptibility, ferromagnetism, antiferromagnetism, ferrimagnetism, magnetizations of a ferromagnetic substance.

## **PRACTICALS**

**Course Title: Nanomaterials and Solid State Chemistry**

**Course Code: CHE-VI. E-10**

**Maximum Marks: 25**

**Credits: 01**

### **List of Practicals:**

1. Synthesis of silver nanoparticles.
2. Synthesis of ZnO nanomaterials.
3. Synthesis of CdS nanomaterials.
4. Synthesis of nanoparticles using plant extract.
5. To find out particle size using SEM/TEM of given SEM/TEM data.
6. To study the X-ray diffraction pattern of given sample.
7. Preparation of zinc oxalate dihydrate.
8. Preparation of Ferrous oxalate dehydrate.
9. To study the thermal analysis pattern of given samples.
10. To prepare mixed metal oxide using co-precipitation technique.
11. To prepare mixed metal oxide using precursor technique.

### **Book:**

1. Atkins P. W., Overton T. L., Rourke J. P., Weller M. T. and Armstrong F. A., Shriver and Atkins Inorganic Chemistry, 5<sup>th</sup> edition, Oxford University press.

### **References:**

1. Keer H. V., Principles of solid state chemistry, 1<sup>st</sup> edition, New Age International Publishers,
2. Kulkarni S. K., Nanochemistry, principles and practices, 3<sup>ed</sup> edition, Capital publishers.
3. Poole C. P. and Owens F. J., Introduction to nanotechnology, John-Wiley and Sons.
4. Rao M. B. and Reddy K. K., Introduction to nanotechnology, 1<sup>st</sup> edition, Campus books International.
5. West A. R., Solid state chemistry and its applications, John-Wiley and Sons.

## **THEORY**

**Course Title: Organometallic Chemistry**

**Course Code: CHE- III. E-11**

**Name of Faculty: Dr. Lactina R. Gonsalves**

**Maximum Marks: 75**

**Credits: 03**

### **Course Objectives:**

To provide knowledge of fundamental content in the area of organometallic chemistry and impart practical skills so that the student will be able to integrate the knowledge with critical thinking to solve problems.

**Learning outcome:** Upon completion of the course, the student will be able to:

1. Use the basic principles of chemistry and molecular orbital theory to describe chemical bonding and structure of organometallic compounds and describe the structure and behaviour of organometallic compounds.
2. Explain and predict the chemical behavior and reactivity of organometallic compounds.
3. Describe and explain catalytic processes using an organometallic compound as a catalyst and explain how organometallic compounds are used as catalysts in organic synthesis.

### **UNIT I: Introduction to organometallic chemistry (08)**

Definition, classification of organometallic compounds, Nomenclature, ligands, concept of hapticity of organic ligands, 18 electron rule, EAN concept, electron counting and oxidation states in complexes. General methods of preparation (direct combination, reductive carbonylation, thermal and photochemical decomposition) and properties of organometallic compounds of 3d series

### **UNIT II: Metal carbonyls (10)**

Classification of metal carbonyls; Mononuclear metal carbonyls: Preparation, properties, structure and bonding of  $\text{Ni}(\text{CO})_4$ ,  $\text{Fe}(\text{CO})_5$ ,  $\text{Cr}(\text{CO})_6$  using VBT; Polynuclear metal carbonyls: Preparation, properties, structure and bonding of  $\text{Co}_2(\text{CO})_8$ ,  $\text{Mn}_2(\text{CO})_{10}$ ,  $\text{Fe}_2(\text{CO})_9$  and  $\text{Fe}_3(\text{CO})_{12}$ .  $\pi$ -acceptor behaviour of CO (MO diagram of CO), synergic effect and use of IR data to explain structure and bonding in metal carbonyls.

### **UNIT III: Metallocenes (09)**

Sandwich compounds, Ferrocene: Preparation and reactions (acetylation, alkylation, metallation, Mannich Condensation etc.). Structure and aromaticity, comparison of aromaticity and reactivity with benzene. Synthesis and reactivity of cyclopentadienyl compounds, bonding in bis(cyclopentadienyl) complexes, Fluxional behaviour of metallocenes. Metal-metal bonding and metal clusters: structure of clusters, electron counting in clusters, synthesis of clusters.

### **UNIT IV: Organometallic compounds of Main group elements (09)**

Preparation, properties, reactions and structure of alkyls and aryls of Group 1 elements (Li,

Na); Group 2 elements (Be, Mg); Group 13 elements (B, Al), Group 14 (Sn, Pb). Alkyls and aryl compounds of Ti, Zn and Hg

**UNIT V: Reactivity of organometallic compounds (09)**

Reactions of organometallic compounds: Ligand substitution, Oxidative addition and reductive elimination,  $\sigma$ -bond metathesis, 1,1-migratory insertion reactions, 1,2-insertions and  $\beta$ -hydride elimination. Catalysis by organometallic compounds: Alkene hydrogenation with Wilkinson's catalyst, hydroformylation, Ziegler-Natta catalysts.

**PRACTICALS**

**Course Title: Organometallic Chemistry**

**Course Code: CHE- III. E-11**

**Name of Faculty: Dr. Lactina R. Gonsalves**

**Maximum Marks: 25**

**Credit: 01**

**List of practicals**

1. Synthesis of Bromo(4-tert-butylpyridine)cobaloxime
2. Synthesis of Ethyl(4-tert-butylpyridine) cobaloxime
3. Preparation of chloro(pyridine) *bis* (dimethylglyoximato) cobalt(III)
4. Preparation of bromo (pyridine) bis (dimethylglyoximato) cobalt (III)
5. Preparation of Grignard reagents with different alkyl/aryl substituent.
  - i. phenyl magnesium bromide
  - ii. phenyl magnesium chloride
  - iii. methyl magnesium iodide
6. Preparation of alcohol using Grignard reagent (or any other Grignard reaction)
7. Structure analysis of metal-carbonyls based on IR data.
8. Metal complexes with triphenyl phosphine (minimum 4 hrs)
  - i.  $\text{Co}(\text{PPh}_3)\text{Cl}_2 \cdot 2\text{H}_2\text{O}$
  - ii.  $\text{Ni}(\text{PPh}_3)\text{Cl}_2 \cdot 2\text{H}_2\text{O}$

**References:**

5. Atkins P, Overton T, Rourke J et.al, *Shriver and Atkins' Inorganic Chemistry*, 5<sup>th</sup> Edition, Oxford University Press.
6. Cotton F.A and Wilkinson G, *Basic Inorganic Chemistry*, Wiley Eastern Ltd.
7. Huheey J.E, Keiter E.A, Keiter R.L, Medhi O.K, *Inorganic Chemistry: Principles of structure and reactivity*, Pearson Edu.
8. Lee J.D, *Concise Inorganic Chemistry*, Wiley-India

9. Puri B.R, Sharma L.R, Kale K.C, *Principles of Inorganic Chemistry*, Vallabh Publications.

## SEMESTER VI

### CORE COURSE

#### THEORY

**Course Title: Advanced Chemistry II**

**Course Code: CHE- I. C-8**

**Name of Faculty:** Ms. Padmini C. Raiker, Dr. Sandesh T. Bugde and Dr. Sachin B. Kakodkar

**Marks: 75**

**Credits: 03**

#### Course Objectives:

1. To provide a basic understanding of the core areas of Organic and analytical Chemistry.
2. Will learn principles of separation and its applications.
3. Will have practical knowledge of chromatographic techniques.

#### Learning outcome

1. Will learn to write mechanisms with stereochemistry.
2. Will help to get better understanding about the basics of Physical and Inorganic Chemistry.
3. Will be able to carry out experiments with required skills.

### SECTION I (ORGANIC CHEMISTRY)

#### UNIT I: Mechanism and stereochemistry of addition, substitution and elimination reactions

7L

Mechanism and stereochemistry of (i) Addition of halogens and halogen acids to open chain alkenes. Markownikoff's and anti- Markownikoff's addition. (ii)  $S_N1$ ,  $S_N2$ ,  $S_Ni$ , substitutions and (iii) E1, E2 and E1cb elimination reactions.

#### UNIT II: Organic Compounds of Nitrogen

6L

Preparation of nitroalkanes and nitroarenes. Chemical reactions of nitroalkanes. Mechanisms of nucleophilic substitution in nitroarenes and their reductions in acidic, neutral and alkaline media. Picric acid: preparation and properties. Structure and nomenclature of amines, physical properties. Structural features affecting basicity of amine. Amine salts as phase-transfer catalysts. Preparation of alkyl and aryl amines by reduction of nitro compounds and nitriles, reductive amination of carbonyl compounds, Gabriel phthalimide reaction and Hofmann bromamide reaction.

#### UNIT III: Carbohydrates

6L

Classification and nomenclature. Monosaccharides: General reactions, chain lengthening by Killiani-Fischer synthesis and chain shortening by Ruff degradation of aldoses, mechanism of osazone formation. Configuration of monosaccharides with reference to glucose. d(+)/l(-) and D/L systems of nomenclature. Interconversion of glucose to fructose and glucose to mannose. Cyclic structure of D(+)-12 glucose. Mechanism of mutarotation. Formation of glycosides, ethers and esters. Structure of sucrose and inversion of cane sugar.

#### UNIT IV: Chemistry of Organosulfur and organophosphorus compounds

4L

Nomenclature and classification of Organosulfur compounds. Methods of preparation and chemical reactions of thiols, disulfides and sulphonic acids. Nomenclature and classification

of organophosphorus compounds. General methods of preparation of phosphines. Preparation of Ylides. Wittig reaction and application.

## SECTION II (ANALYTICAL CHEMISTRY)

### UNIT V: Solvent Extraction

05L

Principle, efficiency of extraction, percentage extraction, complexing agents in solvent extraction, separation factor, types of extraction, applications of solvent extraction

(Numericals expected)

### UNIT VI: Chromatographic techniques

17L

Principle, classification of chromatographic techniques

Column Chromatography: Principle, technique and applications

Paper chromatography: Principles, techniques and applications

Thin layer chromatography: Principles, techniques and applications

Theory of chromatographic separation: Distribution equilibrium, rate of travel, retention time, retention volume and relative retention.

Ion exchange chromatography: Principles, classification of ion exchangers. Factors affecting the distribution of ions between the resin and the solution, ion exchange capacity, applications of ion exchange chromatography

Gas chromatography: Basic principles, instrumentation, and applications. Comparison of GSC and GLC

HPLC: Basic principles, instrumentation, and applications

Hyphenated techniques

(Numericals expected)

### PRACTICALS

**Course Title: Advanced Chemistry II**

**Course Code: CHE- I. C-8**

**Name of Faculty:** Ms. Padmini C. Raiker, Dr. Sandesh T. Bugde and Dr. Sachin B. Kakodkar

**Marks: 25**

**Credits: 01**

### List of experiments:

#### ORGANIC CHEMISTRY EXPERIMENTS:

Organic mixture separation, purification of individual compounds and qualitative analysis of separated compound.

At least 08 mixtures of compounds:

Solid-solid, 02 mixtures

Solid-liquid, 02 mixtures

Liquid-liquid, 02 mixtures

Note: 1 gm of solid-solid mixture to be analyzed on small scale. 3-4 ml of liquid to be added in mixture.

#### ANALYTICAL CHEMISTRY EXPERIMENTS:

1. To estimate of  $\text{Na}^+$  from NaCl using cation exchanger resin
2. To separate metal ions by paper chromatography and determine retardation factor
3. To study separation of organic compounds by TLC

4. To estimate magnesium from  $Zn^{2+}/Mg^{2+}$  mixture by using an anion exchanger resin
5. To estimate zinc from  $Zn^{2+}/Mg^{2+}$  mixture by using an anion exchanger
6. To determine the equilibrium constant for the reaction  $KI + I_2 = KI_3$
7. To determine partition coefficient for the distribution of iodine between  $CCl_4$  and water

#### **REFERENCES:**

#### **ORGANIC CHEMISTRY TEXT BOOK**

1. Morrison, R. T., etal. **2010**. "Organic Chemistry". Pearson Publications, Noida India.

#### **ADDITIONAL READING**

1. Bruice, P. Y. **2015**. "Organic Chemistry". Pearson Publications, Noida India.
2. Carey, F. C., etal. **2012**. "Organic Chemistry". Tata McGraw-Hill India.
3. Finar, I. L. **2013**. "Organic Chemistry". Volume 1. Pearson Publications, Noida India.

#### **ANALYTICAL CHEMISTRY**

1. Christian, G. D. "Analytical Chemistry". 5<sup>th</sup> edition. Wiley publications
2. Skoog and Leary; Principles of Analytical Chemistry, 4<sup>th</sup> International edition



## SEMESTER VI

### ELECTIVE COURSES

#### THEORY

**Course Title: Principles and Applications of Organic Spectroscopy**

**Course Code: CHE-VI. E-13**

**Name of Faculty: Ms. Padmini C. Raiker and Dr. Sandesh T. Budge**

**Maximum Marks: 75**

**Credits: 03**

#### Course Objectives:

1. To understand the importance of spectroscopy in organic chemistry.
2. To understand principles and applications of UV-Visible spectroscopy, IR Spectroscopy, Nuclear Magnetic Resonance and Mass Spectrometry.
3. To learn structure elucidation of organic compounds based on spectral data.

#### Learning outcome:

1. Will be able to do spectral analysis of organic compounds.
2. Will learn theory of important spectroscopic techniques.
3. Will be able to elucidate structures of organic compounds based on spectral data.
4. Will be able to operate an UV-visible spectrometer.

#### UNIT I: Introduction to Organic spectroscopy

3L

Nature of electromagnetic radiation -wave length, frequency, energy, amplitude, wave number, and their relationship, different units of measurement of wavelength frequency, different regions of electromagnetic radiations, Regions of electromagnetic radiation. Interaction of radiation with matter-absorption, emission, florescence and scattering, Types of spectroscopy and advantages of spectroscopic methods.

#### UNIT II: UV-Visible Spectroscopy

6L

Ultraviolet (UV) absorption spectroscopy – Absorption laws (Beer-Lambert law), Molar absorptivity, presentation and analysis of UV spectra, Types of electronic transitions, effect of conjugation. Concept of chromophore and auxochromes, Bathochromic, hypsochromic, hyperchromic and hypochromic shifts. UV spectra of conjugated dienes and enones, Woodward-Fieser rules for calculation of UV maxima of the above two systems. Numerical problems on above.

#### UNIT III: Infra Red (IR) absorption spectroscopy

6L

Molecular vibrations, Hooke's law, selection rules, Intensity and position of IR bands, measurement of IR spectrum, Functional group region, Finger print region and its use to establish identity, Applications to determine purity, to study progress of chemical reactions and hydrogen bonding. Characteristic absorptions of various functional groups and interpretation of IR spectra of simple organic compounds. Simple problems in structure elucidation using UV and IR spectroscopy.

#### UNIT IV: Proton Magnetic Resonance ( $H^1$ NMR) spectroscopy

13L

Introduction to NMR Spectroscopy, types of protons: equivalent, non-equivalent, homotopic, enantiotopic and diastereotopic protons, NMR Spectrometer, nuclear shielding and deshielding, chemical shift and molecular structure, spin-spin splitting and coupling constants, intensity of peaks, interpretation of PMR spectra of simple organic molecules.

Problems pertaining to the structure elucidation of simple organic molecules. UV and IR to be used as supporting data.

**UNIT V: C<sup>13</sup> Nuclear Magnetic Resonance** **10L**

Number of signals, splitting of signals – proton coupled and decoupled spectra, off resonance decoupled spectra. <sup>13</sup>CMR chemical shifts – identification of hybridization of carbons and nature of functionalization. Problems pertaining to the structure elucidation of simple organic molecules. UV and IR to be used as supporting data.

**UNIT VI: Mass Spectrometry** **7L**

Simple idea of instrumentation, Definitions of parent or molecular ion peak and base peak. Isotope effect with respect to alkyl halides, Fragmentation of ketones –  $\alpha$  cleavage and Mc Lafferty rearrangement.

**PRACTICALS**

**Course Title: Principles and Applications of Organic Spectroscopy**

**Course Code: CHE-VI. E-13**

**Name of Faculty: Ms. Padmini C. Raiker and Dr. Sandesh T. Budge**

**Maximum Marks: 25**

**Credits: 01**

**List of experiments:**

1. Calculate UV maxima for given organic structure and match it with the given spectra of organic compounds.
2. Match the given set of organic compounds with the given set of spectra. List: Alkane, alkene, alcohol, ether, amine, carboxylic acid, ester and amides.
3. Verify Bathochromic, hypsochromic, hyperchromic and hypochromic shifts in phenol and aniline using UV-Vis spectrometer.
4. Identification of organic compounds based on given IR spectra of organic compounds.
5. On basis of IR spectra, distinguish between the given set of organic compounds. (set of 2 compounds X 3).
6. Identify the compounds based on given Mass Spectra. List: Alkane, alkene, alcohol, ether, amine, carboxylic acid, ester and amides.
7. Give the fragmentation patterns for the given mass spectra of organic compounds.
8. Compare relative abundance of isotopes of halogen containing compound.
9. Determination of organic compound using given set of <sup>1</sup>HNMR data.
10. Determination of organic compound using given <sup>1</sup>HNMR spectrum.
11. Assigning the chemical shift values to the peaks of given <sup>1</sup>HNMR spectrum of organic compounds.
12. Determination of organic compound using given set of <sup>13</sup>CMR data.
13. Assigning the chemical shift values to the peaks of given <sup>13</sup>CMR spectrum of organic compounds.
14. Assigning the chemical shift values to the peaks of given <sup>1</sup>HNMR spectrum of organic compounds.
15. Identification of organic compounds based on given spectroscopic information.

## REFERENCES:

### BOOKS:

1. Silverstein, R. M., etal. **2015**. "Identification of Organic Compounds". Wiley publications.

### REFERENCE:

2. Introduction to Spectroscopy by Pavia
3. Kalsi, P. S. **2007**. "Spectroscopy of Organic compounds". New Age International (P) Ltd. New Delhi.
4. Morrison, R. T., etal. **2010**. "Organic Chemistry". Pearson Publications, Noida India.

Parvatibai Chowgule College of Arts and Science  
(Autonomous)  
**DEPARTMENT OF CHEMISTRY**  
**2019-2020**

**ELECTIVE COURSE**

**THEORY**

**Course Title: Pharmaceutical Chemistry**

**Course Code: CHE- IV. E-5**

**Maximum Marks: 75**

**Credits: 3**

**Theory: 45 lectures**

**Course Outcomes:**

On successful completion of the course, the student will be able to:

1. Outline the significance of terminologies and regulation in Pharmaceutical chemistry.
2. Classify pharmacological drugs.
3. Delineate the medicinal chemistry in plants.
4. Define and apply different types of chromatographic techniques in pharmaceutical industry.
5. Understand the working of quality control and quality.
6. Discuss Safety in Pharmaceutical laboratories.

**Learning outcomes:**

1. Students will learn about important aspects with respect to pharmaceutical Chemistry.
2. Students will develop understanding in structure-activity relationship.
3. Students will learn efficient chemical synthesis involved in important drug.

**Unit I: General Introduction**

**05 L**

Importance of Chemistry in Pharmacy, Definition of terminologies: Pharmacology: Pharmacokinetics, Pharmacodynamics; Pharmacognosy, Dosage forms and Routes of administration, Advantages and disadvantages. Pharmacopoeia

**Unit II: Regulation and Authorities**

**05 L**

Introduction to different regulatory bodies and their role: WHO, Therapeutic Goods Administration(TGA), Medicines and Health care products Regulatory Agency (MHRA), Central Drugs Standard Control Organisation (CDSCO), UNICEF, USFDA, Food and Drug act 1945, Good Automated Manufacturing Practices (GAMP), State Licensing Authority

Requirement of regulation: 21CFR part 11, Electronic Signature and Password control, ICH, (Different guideline and scope), CGMP & Schedule M

**Unit III: Pharmacological classification of Drugs**

**04 L**

Anti-Infective agents, anti-diabetic agents, anti-cancer agents, anti-pyretic agents, antipsychotic agents, Antacids, Analgesics, CNS Depressants, CNS stimulants, Anti histaminic agents, Diuretics, anti-malarial, antibiotics, adrenergic agents, cholinergic agents, Cardiovascular drugs, Non-Steroidal Anti-Inflammatory Drugs (NSAIDs) (Definition of each class, any two examples with structure)

**Unit IV: An introduction to the Medicinal Chemistry of plants**

**04 L**

Historical background; Type of plant, active ingredient structure and their medicinal properties: Capsicum, Garlic, turmeric.

**Unit V: Introduction to Chromatography****06 L**

Column chromatography, Paper Chromatography, HPLC, Gas chromatography

**Unit VI: Quality Control****10 L**

Introduction, Quest for Quality, Role of QC, Good Laboratory Practices (GLP), Standards: Reference Standard, Primary standard, Working standard.

Raw Material Testing: Solubility, Acidity /Alkalinity, Chloride, Sulphate, LOD, Sulphated ash, Loss on ignition, Heavy metals, Karl-fischer titration.

Finished Product Testing: Dimension, Weight variation, Hardness, Dissolution, Identification, Assay, Uniformity of content, Stability Testing, Different conditions for stability testing, Dissolution, Related substances

Handling of “Out Of Specifications”, ‘Out Of Trend’, Laboratory Incidences, Root cause analysis, Corrective action and Preventive Action. Facing audits: Roles, Responsibilities and ensuring compliances.

Data integrity and its challenges

Archiving of results – introduction

**Unit VII: Quality Assurance****08 L**

Introduction: Role of QA, Standard Operating procedure, Change control, Deviation, Market complaints, Master production record ( Batch card ) , Audit, Drug Master File (DMF), Complaints &amp; adverse reactions, Labels &amp; printed materials, Documentation &amp; records, Distribution records

Validation: Method Validation, Types of Analytical Procedures to be Validated; Accuracy, Precision (Repeatability, Intermediate Precision, Reproducibility), Specificity, Detection Limit, Quantitation Limit, Linearity, Range, Robustness.

Process validation,

**Unit VIII: Safety in Pharmaceutical laboratories****03 L**

Introduction, Risks in a pharmaceutical Laboratory, Personal Protective Equipment (PPE), General preparation for Emergencies, Laboratory Emergencies: Spills and Fires.

**PRACTICALS****Course Title: Pharmaceutical Chemistry****Course Code: CHE- IV. E-5****Maximum Marks: 25****Credits: 1****List of experiments:(Any 7-8 practicals may be conducted)**

1. Complete Pharmacopoeial analysis of drugs: a) Paracetamol b) Ibuprofen c) Aspirin
2. Synthesis of Benzocaine
3. Synthesis of benzophenone oxime.
4. Synthesis of phenytoin
5. Estimation of acetyl salicylic acid in the given aspirin tablet by titrating against 0.1N alcoholic KOH potentiometrically.
6. UV Absorbance Standard Curve of Salicylic Acid
7. Assay of Nitrazepam potentiometrically.
8. Estimation of Ascorbic acid in tablets by iodometry.
9. Calibration of UV-visible spectrophotometer
10. Estimation of Penicillin – G.
11. Estimation of Chloramphenicol.

**TEXT BOOK:**

1. Skoog Douglas A., Leary James J. (1992). *Principles of Instrumental Analysis* (04 ed.). Philadelphia: Saunders College Publishing.
2. Beale John Jr., Block John (2010). *Wilson and Gisvold's Textbook of Organic Medicinal and Pharmaceutical Chemistry* (12 ed.). Baltimore: Lippincott Williams and Wilkins.

**REFERENCES:**

1. Indian Pharmacopoeia Commission. (2007). Indian Pharmacopoeia 2007.
  2. Prichard Elizabeth, B. V. (2007). *Quality Assurance in Analytical Chemistry*. John Wiley & Sons.
  3. Beckett A.H., Stenlake J.B.(2001). *Practical Pharmaceutical Chemistry* (04 ed.). London: The Athlone Press.
  4. Christian, G. D. (2004). *Analytical Chemistry* (06 ed.). New Jersey: John-Wiley & Sons, Inc.
  5. Prabhu D.V, Raghuraman K, (2014). *Basic Principles of Analytical Chemistry* (05 ed.). Mumbai: Sheth Publishers.
  6. Lednicer Daniel, Mitscher Lester (2008). *The Organic Chemistry of Drug Synthesis* (01 ed.). New Jersey: John-Wiley & Sons, Inc.
  7. Gennaro, A. R. (1995). *Remington: The Science and Practice of Pharmacy* (19 ed.). London: Mack Publishing Company.
- Sharma, D. B. (2005). *Instrumental Methods of Chemical Analysis* (24 ed.). Meerut: Goel Publishing House.
- Higuchi T., E. B.-H. (1961). *Pharmaceutical Analysis*. New York: Interscience Publishers.

# **COMPUTER SCIENCE**

**Yearwise Syllabus for 1.1.3  
of NAAC Criteria I**

**(Year 2015-16)**

**B.Sc. Computer Science**

**Paper Title:** Introduction to Programming

**Paper Code:** COM-I.C-2

**Name of Faculty:** Mr. D. Prabakaran

**Marks:** 75

**Credits:** 3

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**Course Objectives:**

- To make the student understand the concept of basic computer algorithm and use the algorithm for various problem solving.
- To implement algorithms using high level programming language.
- To understand basic principles of structured programming – example C

**Learning Outcomes:**

On completion of the course students will learn the following:

- Designing algorithms for a given problem.
- Writing C Programs to implement the algorithms.

**1. Introduction to Computer Problem Solving:**

[5L]

Algorithm, Flowchart, The Problem Solving Aspect, General problem solving strategies, Top-Down Design, Implementation of Algorithms, Efficiency of Algorithms, Recursive algorithms.

**Basic Algorithms:**

[3L]

Exchanging the values, Summation of a set of numbers, factorial computation, generation of the Fibonacci series, reversing the digits of an integer, base conversion.

**Factoring Methods:**

[2L]

Finding divisors of an integer, finding the Greatest Common Divisor of two integers, generating prime numbers, computing prime factors of an integers.

**Sorting and Searching algorithms**

[2L]

Bubble sort, Insertion Sort, Sequential Search and Binary Search.



**Introduction to ‘C’:** [3L]

History, Structure of a C program, Keywords, Identifiers, variables, constants, data types, Arithmetic Operators & Expressions, Logical operators and Relational Operators, Precedence and Associativity rules.

**Conditions and Iterations:** [3L]

Conditions and Actions, Condition statement, Simple control statement (*if, if-else, switch*), Iterative control statements (*for, while, do-while*).

**Functions:** [5L]

What is a function, Advantages of functions, Standard library functions; User defined functions – declaration, definition, function call, parameter passing, return keyword. Scope of variables, Storage classes, Recursion.

**Arrays:** [4L]

One and Two dimensional arrays: Array declaration, initialization, accessing the values, passing arrays to functions.

**Pointers:** [4L]

Pointer declaration, initialization, Pointer arithmetic, Pointer to Pointer, Arrays and Pointers, Functions and Pointers – passing pointers to functions, function returning pointer, dynamic memory allocation.

**Strings:** [4L]

Declaration and initialization, standard library string functions, strings and pointers, array of strings.

**Structure and Union:** [4L]

Creating structures, accessing structure members, array of structures, passing structure to functions, nested structure, pointers and structures, union, difference between structures and unions.

**File Handling:** [4L]

FILE variable, file access modes, operations on files, random access to files, command line arguments.

**Preprocessing:** [2L]

Format of Preprocessor directive, File Inclusion directive, Macro substitution, conditional compilation.

**Text Books:**

1. Dromey R.G., *How to solve it by computer*, Prentice Hall of India, 2<sup>nd</sup> Edition, 2004.

2. Kanetkar Yeshwant, *Let us C*, BPB Publications, 13<sup>th</sup> Edition, 2012.
3. Behrouz Forouzan, Richard Gilberg, *Computer Science: A Structure Programming Approach using C*, Cengage Learning 3<sup>rd</sup> Edition, 2013.

**Reference books:**

- Horowitz Ellis, Sahni Satraj, Sanguthevar Rajasekaran, *Fundamentals of Computer algorithm*, Orient Longman, 2<sup>nd</sup> Edition, 2008.
- Gottfried Byron, *Programming with C*, Tata McGraw Hill, 3<sup>rd</sup> Edition, 2010.
- Brain W. Kernighan and Dennis M Ritchie, *The C Programming Language*, Prentice Hall India, 2<sup>nd</sup> Edition, 1988.

**Paper Title:** Object Oriented Programming

**Paper Code:** COM-II.C-3

**Name of faculty:** Mr. Ian Barreto

**Credits:** 3

**Course Objectives:**

- To teach the basic concepts and techniques which form the object oriented programming paradigm
- To introduce object oriented programming (OOP) using Java.

**Learning Outcome:**

- Understand the concept and underlying principles of Object-Oriented Programming.
- Understand how object-oriented concepts are incorporated into the Java programming language.
- Develop problem-solving and programming skills using the OOP concept.

**Principles of OOP:**

Programming Paradigms, Basic concepts, OOP: major principles - encapsulation, abstraction, inheritance, polymorphism. Benefits of OOP, Applications of OOP.

[4L]

**Introduction to Java:**

Basics of Java programming, Data types, Variables, Operators, Control structures including selection, Looping, Java methods, Overloading, java.Math class, Arrays in java.

[6L]

**Objects and Classes:**

[7L]

Basics of objects and classes in java, Constructors, Finalizer, Visibility modifiers, Methods and objects, Inbuilt classes like String, Character, StringBuffer, File, this reference.

**Inheritance and Polymorphism:** [7L]

Inheritance in java, Super and sub class, Overriding, java.lang.Object class, Polymorphism, Dynamic binding, Generic programming, Casting objects, Instance of operator, Abstract class, Interface in java, Package in java, java.util package.

**Event and GUI programming** [6L]

Design patterns – what and why? It's classification. Introduce the Observer design pattern. Event handling in java, Event types, Mouse and key events, GUI Basics, Panels, Frames, Layout Managers: Flow Layout, Border Layout, Grid Layout, GUI components like Buttons, Check Boxes, Radio Buttons, Labels, Text Fields, Text Areas, Combo Boxes, Lists, Scroll Bars, Sliders, Windows, Menus, Dialog Box, Applet and its life cycle, Introduction to swing.

**I/O programming:** [4L]

Text and Binary I/O, Binary I/O classes, Object I/O, Random Access Files.

**Multithreading in java:** [4L]

Multithreading in java, Thread life cycle and methods, Runnable interface, Thread synchronization.

**Exception Handling:** [3L]

Exception handling – what and why? Try and catch block. Multiple catch blocks. Nested try, finally block, throw keyword, throws keyword. Custom Exception.

**Introduction to the Collections Framework.** [2L]

**1. Introduction to JavaBeans and Network Programming.** [2L]

**Text Book:**

Deitel & Deitel, *Java - How to Program*, Prentice Hall Publications

**Reference Books:**

- 1) Patrick Naughton, Herbert Schildt, *Java 2 – The Complete Reference*, McGraw Hill Education (India) Pvt. Ltd., 2002.
- 2) Patrick Naughton, *The Java Handbook*, McGraw Hill Education (India) Pvt. Ltd., 1996.
- 3) Balaguruswamy E, *Programming with Java – A Primer*, McGraw Hill Education (India) Pvt. Ltd., 2009.
- 4) Flanagan David, *Java Examples in a Nutshell*, Spd/O'Reilly Reprint, 2<sup>nd</sup> Edition.

- 5) Gosling J, Arnold K, & Holmes D, *The Java Programming Language*, Addison- Wesley Professional, 3<sup>rd</sup> Edition, 2008.

**Practical:** Object Oriented Programming

**Credit:** 1

**Marks:** 25

Programs using Java language that covers the following concepts:

- 1) Classes and instances
  - 2) Working with the java.Math class
  - 3) Inheritance
  - 4) Composition v/s inheritance
  - 5) Polymorphism, abstract classes and interfaces
  - 6) Algorithm and Data Structures
  - 7) Utilising the java.util package
  - 8) Event handling and GUI
  - 9) Applets
  - 10) I/O programming
  - 11) Exception handling
  - 12) Multithreading
  - 13) Collections framework
-

## Yearwise Syllabus for 1.1.3 of NAAC Criteria I

**(Year 2016-17)**

**B.Sc. Computer Science**

**Paper Title:** Data Base Management Systems

**Paper Code:** COM-III.C-5

**Names of Faculty:** Dr. Animesh Adhikari , Ms. Suchitra R. Bhat

**Marks:** 75

**Credits:** 3

**Prerequisites: -**

--Nil--

**Course Objectives:**

It provides basic knowledge of a database management system. It helps to understand importance of ER diagram. It introduces SQL to query a database.

**Learning outcome:**

- On completion of the course students will learn Database concepts and structures. They will be able to explain terms related to database design and management. Students will understand data modeling and database development process.
- Students will be able to construct and normalize data models and implement the same using any Relational Database Management System.
- Students will become proficient in using database query language, i.e. SQL.

**Syllabus**

### **1. Overview of database management**

[7L]

Data, information, database, database management system; Managing data; File systems versus a DBMS, advantages of a DBMS; Data abstraction, instances and schemas, data models; Data manipulation language, data definition language; Architecture of a DBMS; Users of a DBMS, database administrator

### **Database design and the ER model**

[10L]

Design phases – conceptual design, logical design, physical design; ER model – entities, attributes, and relationships, mapping cardinalities, keys; ER diagrams – strong entities,

weak entities, generalization, specialization, aggregation; Converting ER diagram to relational schemas.

## **Relational model** [9L]

Relation, properties of relational model; Entities, integrity constraints, referential integrity constraints; Relational algebra – select, project, cross product, set operations, rename operation; Other relational operations – natural join, outer join.

## **4.SQL** [10L]

Basic structure of SQL query – Create, select, where, from, rename operation; Set operations; Aggregate functions; Group by, having clauses; Nested queries; Views; Insert, delete, update.

## **5.Functional dependency and normalization** [6L]

Atomic domain, nested relation; Key, super key, primary key, candidate key; Functional dependency, axioms, closure of a set of attributes, closure of a set of functional dependencies; Purpose of normalization; 1NF; 2NF; 3NF; BCNF

## **6.Introduction to Transactions** [3L]

Transaction concept, Transaction state, ACID properties, Concurrent Transactions, Serializability.

### **Text Book:**

A Silberschatz, H F Korth, S Sudarshan, *Database system concepts*, McGraw-Hill, sixth Edition

### **Reference Books:**

Ramakrishnan, J Gehrke, *-Database management systems*”, McGraw-Hill, 3<sup>rd</sup> edition

R Elmasri, S B Navathe, *-Fundamentals of database Systems*”, Pearson Education, 5<sup>th</sup> Edition

## **Lab : Database Management Systems**

**Credit : 1**

**Marks : 25**

### **List of Practicals**

1. ER diagram
  2. ER diagram with specialization/generalization and aggregation.
  3. Converting ER diagram to Schemas
  4. Converting ER diagram with generalization/specialization, aggregation into schema
  5. Studying RDBMS
    - a. Understanding Client server architecture
    - b. Creating tables
  6. SQL
  7. SQL
  8. Introduction of .NET Framework, Advantages of .Net Framework, Components of .NET Framework, Data type & Operators with examples.
  9. Loops, Control Statements, Operators, Data Types
  10. Controls : Label, Button, Textbox, Picture Box, Radio button, Checkbox, Timer Control, Scroll Bars
  11. Controls : List box, Combo Box, Main Menu Dropdown list etc.
  12. Working on Database
  13. Working on Database
  14. Normalization
  15. Report Writing
-

**Paper Title:** Software Engineering

**Paper Code:** COM-III.E-I

**Names of Faculty:** Dr. Sameena Falleiro & Ms. Judith Barreto

**Marks:** 75

**Credits:** 3

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**Prerequisites:** Nil

**Course Objectives:**

On completion of the course the students will develop specific skills and competencies to use various software engineering tools and methods to develop software for medical, industrial, military, communications, aerospace, business, scientific, and general computing applications.

**Learning Outcomes:**

- Gain knowledge of concepts & principles, methods and tools used in software engineering .
- Appreciate the role of software engineering in the software development industry.
- Be enabled to use various software engineering methods and tools employed during analysis, design, programming, testing and project management

**Syllabus**

**SOFTWARE PROCESS:**

**[9L]**

Introduction- What is software, Software myths from managers, \_users and developers‘ perspective, Software characteristics, Why engineering approach, definition(s) of software engineering.

Characteristics of software process.

Software Development Processes and Methodologies: waterfall, prototyping, iterative, spiral, unified process.

Benefits of iterative and incremental approach with emphasis on Unified process, CASE Tools, Agile methodologies.

**PROJECT MANAGEMENT:**

**[8L]**

Planning a Software Project – Cost estimation, Project Scheduling, Software configuration management plans, Quality Assurance plans, Project Monitoring plans and Risk Management. Techniques such as Interviewing, Requirement Workshop, brainstorming, prototyping. Characteristics of SRS



**Design:****[9L]**

Design Principles.

Design Concepts: Abstraction, Refinement, Modularity, Software architecture, Control Hierarchy, Structural Partitioning, Data Structure, Software procedure, Information hiding.

Effective modular design: Functional Independence, Cohesion, Coupling.

Design heuristics for effective modularity.

Design Specification outline.

Design methods: Data design – Principles, Architectural design using transform flow, transaction flow.

Interface Design- Internal and External Interface design, User Interface Design.

Interface design guidelines.

Procedural design.

**CODING:****[5L]**

Coding styles, standards, peer reviews, checklist, Halstead Metrics

**TESTING:****[5L]**

Testing Fundamental, Functional Testing, Structural Testing, Testing Process and Metrics.

**DOCUMENTATION and MAINTENANCE:****[4L]**

Need for Software Documentation. Types of documentation

Need for Maintenance; Types of Maintenance

**REENGINEERING:****[5L]**

Business Process Reengineering, Software Reengineering, Reverse Engineering, Restructuring, Forward Engineering, The Economics of Reengineering

**Text Book:**

- Roger Pressman, Software Engineering: A Practitioners Approach, (6th Edition), McGraw Hill, 1997.

**Reference Books :**

1. Pankaj Jalote, -An Integrated Approach to Software Engineering, Narosa Publishing House, 2<sup>nd</sup> Edition
2. Glenford J. Myers, - The Art of Software Testing -, John Wiley & Sons, 1979.
3. Sommerville, -Software Engineering, 7<sup>th</sup> edition, Addison Wesley, 1996.
4. Thomas T. Barker, "Writing s/w documentation - a task oriented approach", Allyn & Bacon Series of Technical Communication, 1998.
5. Steve McConnell, -Code Complete, Microsoft Press, ISBN 978-0-7356-1967-8 Second Edition (June 2004)

**Laboratory:** Software Engineering

**Credit:** 01

**Marks:** 25

List of suggested **PRACTICALS** (the numbers in brackets indicate number of practicals)

:

- Requirements Gathering Techniques[2]
  - SRS using IEEE format[2]
  - Cost and Effort Estimation [4]
  - I/O design [2]
  - Test Case Design[2]
  - Draw a Gantt Chart for a project[2]
  - Develop a mini project/ Case Study[1]
-

**Paper Title:** Web Designing

**Paper Code:** COM-III.E-4

**Name of Faculty:** Ian Barreto

**Marks:** 75

**Credits :** 3

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**Course objectives:**

- How to design good user interfaces covering important design principles such as learnability, visibility, error prevention, efficiency and graphic design

**Learning Outcomes:**

- Implementation of user interfaces following design principles and using technologies such as HTML, CSS, JavaScript and JQuery.

**Syllabus**

**Unit I : User Interface** – Introduction, its importance, design principles – learnability, visibility, error prevention, efficiency, graphic design. Design Patterns for GUI – View tree, Listener, Widget, Model-View-Controller. Approaches to GUI programming – Procedural, Declarative, Direct Manipulation. Web UI – HTML, Javascript, JQuery. [6L]

**Unit II : Structure and Style with HTML and CSS**

**HTML** [6L]

Introduction. The development process, basic HTML, formatting and fonts, commenting code, color, hyperlink, lists, tables, images, simple HTML forms, web site structure, Meta tags, Character entities, frames and frame sets.

**HTML5** [6L]

Introduction, New Elements, Canvas, SVG, Drag/Drop, Geolocation, Video, Audio, Input types, form elements, form attributes, semantic, web storage, app cache, web workers, SSE

**CSS** [5L]

Introduction – Syntax, Id & Class, Backgrounds, Text, Fonts, Links, Lists, Tables. CSS Box Model – Border, Outline, Margin, Padding. Advanced - Grouping/Nesting,

Dimension, Display, Positioning, Floating, Align, Pseudo-class, Pseudo-element, Navigation Bar, Image Gallery, Image Opacity, Image Sprites, Media Types, Attribute Selectors.

**CSS3** [5L]

Introduction, Borders, Backgrounds, Gradients, Text Effects, Fonts, 2D Transforms, 3D Transforms, Transitions, Animations, Multiple Columns.

**Unit 3 : Javascript** [10L]

Introduction - What is JavaScript, Understanding Events, JavaScript Example, External JavaScript. Basic Elements – Comment, Variable, Global Variable, Data Types, Operators, If Statement, Switch, Loop: for and while, Function. JavaScript Objects – objects, Array. Browser Object Model - Browser Objects, Window Object, Document Object – getElementById, getElementsByName, getElementsByTagName, innerHTML property, inner Text property. Validation- form validation, email validation.

**Unit 4 : Introducing jQuery** [7L]

**JQuery** : Introduction - Syntax, Selectors, Events. Effects- Hide/Show, Fade, Slide, Animate, stop(), Callback, Chaining. HTML/CSS- Add, Remove, CSS Classes, css(), Dimensions, slider. Traversing – ancestors, descendants, siblings, filtering.

**Reference books:**

Elisabeth Robson, Eric Freeman, -Head First HTML and CSS, O'Reilly

Ivan Bayross, -HTML 5 and CSS 3 Made Simple, BPB publication

Kogent Learning Solutions Inc., -HTML5 Black Book: Covers CSS3, Javascript, XML, XHTML, Ajax, PHP and JQuery, Pearson Education.

Steven M. Jacobs, Ben Shneiderman, —Designing the User Interface : Strategies for effective human-computer interaction, 5<sup>th</sup> Edition, Pearson Education

**Lab : Web Designing**

**Marks: 25**

**Credits: 1**

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**List of Assignments:** (the numbers in brackets indicate number of practicals) :

- 1) Case studies to review UI designs [2 P]
- 2) Create a HTML page with the following : [3 P]
  - a) title heading paragraph emphasis strong and image elements
  - b) complex HTML table
  - c) simple HTML Form covering major form elements
  - d) Embed Video in an HTML page
- 3) Using CSS do the following : [3 P]
  - a) Create a Navigation bar (with dropdown) with CSS
  - b) Create a CSS Grid
  - c) Create a CSS3 based button
  - d) make an image rounded shape
  - e) Create a CSS based sticky footer
  - f) Create CSS3 Corner Ribbon
  - g) Create CSS3 blurry text effect
  - h) Create CSS3 speech bubble shape
  - i) Create image cross fade with CSS3 transition
  - j) Set style for link hover active and visited states of hyperlink
- 4) Write JavaScript functions to : [4 P]
  - a) accept a string as a parameter and converts the first letter of each word of the string in upper case
  - b) check whether a given credit card number is valid or not.
  - c) check whether a given value is an valid url or not.
  - d) check whether a given email address is valid or not.
  - e) print an integer with commas as thousands separators

f) remove items from a dropdown list.

5) Use JQuery to :

[3 P]

- a) Disable buttons
- b) Make textbox read only
- c) Uncheck check boxes
- d) Confirm again
- e) Sort
- f) Switch rows and columns

**A mini project combining all the technologies learnt using a front-end development framework such as bootstrap is recommended.**

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**Paper Code:** COM-IV.E-6

**Names of Faculty:** Dr. Animesh Adhikari , Ms. Suchitra R. Bhat

**Marks:** 75

**Credits:** 3

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**Prerequisites:** - Data Base Management Systems

**Course Objectives:**

To provide advance database solutions.

**Learning outcome:**

On completion of the course student will learn:

- Advance SQL
- Concept of Big data.
- Developing a database application.

**Syllabus**

**1. Advanced SQL** [15L]

SQL data types and schemas, Integrity constraints, Authorization, Embedded SQL, Dynamic SQL, Triggers, Stored Procedures, views

**Indexing and Hashing** [7L]

Basic concepts, Ordered Indices, Dense and Sparse Indices. B and B+ trees Hashing – Static hashing, Dynamic Hashing, Extendable hashing, Comparison of Ordered Indexing and Hashing.

**Transaction, Concurrency Control, Recovery System.** [10L]

Transaction: Transaction concept, Transaction state, Implementation of Atomicity and Durability, concurrency. Serializability, conflict serializability.

Concurrency Control : Lock-Based Protocol

Recovery System: Failure Classification, Storage structure, Stable storage implementation, Recovery and Atomicity: Log-Based Recovery.

## **Introduction to Big data and NoSQL**

[13L]

Introduction to the Big Data problem. Current challenges, trends, and applications

Comparison between SQL and NOSQL Databases

Types and examples of NoSQL databases- Column, Document, Key-value, Graph, Multi-model

Introduction to Document type NoSQL database such as MongoDB. - Introduce concepts of collection and documents, Advantages, Data types, Projections, indexing, Sharding .

### **Text Book:**

A Silberschatz, H F Korth, S Sudarshan, *Database system concepts*, McGraw-Hill ,sixth Edition

### **Reference Books :**

Ramakrishnan, J Gehrke, *-Database management systems*”, McGraw-Hill , 3<sup>rd</sup> edition  
R Elmasri, S B Navathe, *-Fundamentals of database Systems*”, Pearson Education , 5<sup>th</sup> Edition

Kristina Chodorow *MongoDB : The Definitive Guide (English)* O'Reilly 2nd Edition

**Lab :** Database Application Development

**Credits :** 1

**Marks :** 25

Practical should cover following concepts

1. SQL Revision
2. Advance SQL- Dynamic SQL, Triggers
3. Advance SQL- Stored Procedures
4. Using ODBC API for insertion of record into database.
5. Using ODBC API for deletion of record.
6. Using ODBC API for modification of data.
7. Using ODBC API for data retrieval.
8. Installing and Creating a document using MongoDB concept
9. Performing Indexing using MongoDB
10. Performing aggregation functions on MongoDB
11. Implementation of Master-Slave approach.
12. Connection of MongoDB using Java



13. Insertion, modification, deletion using MongoDB
  14. Data retrieval using MongoDB
  15. Sharding using Java and MongoDB.
-

**Paper Title:** Server Side Programming

**Paper Code:** COM-IV.E-7

**Name of Faculty:** Ian Barreto

**Marks:** 75

**Credits :** 3

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**Course Prerequisite:**

- **Object Oriented Programming**
- **Software Engineering**

**Course Objectives:**

- Provide an in depth understanding of object oriented approaches to software development, in particular to the analysis and design phases of the software life cycle.
- Design and implement basic server-side scripts
- Create data documents using XML
- Create and manipulate databases using SQL and server side technologies  
Understand how rich internet applications are implemented using AJAX and XML/JSON.

**Learning Outcomes:**

- Understand the basic underlying concepts in World Wide Web: web server, 3-tier web applications, server side scripting and programming languages, rich internet applications, AJAX and web services
- Understand and apply supporting and emerging web technologies: access to databases, AJAX, rich client user interfaces.

**Syllabus**

**OOAD and UML:**

**[12L]**

OOAD: Definition; object oriented analysis; object oriented design and modelling; Assigning responsibilities.

UML: Main UML diagrams – Class diagram, sequence diagram, activity diagram, use case diagram. Use case model – use case diagram, use case descriptions, use case realization using sequence and activity diagrams. Supplementary requirements. Advanced use case model features.

Requirements: Functional and non-functional

System Design: Class diagram, sequence diagram, activity diagram, state chart diagram, deployment diagram. Brief introduction to other UML diagrams.

**Server-side technologies:** [11 L]

Static vs. Dynamic web pages, Need for Server Side technologies, Multitier Web Architecture. Common Gateway Interface standard, server-side includes, server APIs, server-side scripting – working principles, and implicit objects. Database and file access. Comparison of Web servers.

**Ajax-Enabled Rich Internet Applications with XML and JSON** [13 L]

AJAX – introduction, purpose, advantages and disadvantages. Key elements of AJAX – introduction to XML. XML processing with server side script. XSL, transforms and templates. The XMLHttpRequest object – methods and properties. Creating and using XMLHttpRequest objects. Using XSLT with AJAX.

JSON – Syntax, mixing literals, Array, object, encoding/decoding, JSON versus XML, server-side JSON tools.

**Web Services:** [9 L]

Introduction, its role. Basics – Creating, Publishing, Testing and Describing a Web services (WSDL)-Consuming a web service. SOAP - introduction, requests and responses. Role of UDDI – accessing registries. REST based web services – building, deploying and consuming

**Reference Books:**

1. Martin Fowler, UML Distilled, Addison Wesley, 3<sup>rd</sup> Edition

2. Booch, Rumbaugh, Jacobson, The Unified Modelling Language User Guide, Addison Wesley, 2<sup>nd</sup> edition
3. James Rumbaugh, Object Oriented Modelling and Design, Prentice Hall
4. Dana Moore, Edward Benson, Professional Rich Internet Applications: Ajax And Beyond (English), Wiley India.
5. Schmelzer, XML and Web Services Unleashed, Pearson India.

**Lab : Server Side programming**

**Credit : 1**

**Marks : 25**

List of suggested **PRACTICALS** (the numbers in brackets indicate number of practicals)

- 1) Perform OOAD of a given system using the following diagrams: [3 P]
    - a) use case
    - b) class
    - c) sequence
    - d) activity
  - 2) Using server side programming and following OOAD principles develop a dynamic web application. [6 P]
  - 3) Add AJAX and Web service(s) to the application. [3 P]
-

**Paper Title:** Human Computer Interface

**Paper Code:** COM-IV.E-8

**Names of Faculty:** D.Prabakaran & Neeta Dhopeswarkar

**Marks:** 75

**Credits:** 3

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**Prerequisites:** Nil

**Course Objectives:**

- To study the different aspects of human computer interaction and the computer interface design concepts.

**Learning Outcomes**

- To understand the intricacies of human interaction with a computer System
- To understand the concept of a graphical user interface, and its design characteristics
- To recognize the human element its strengths and weakness for computer interaction
- To know the principles of good screen design and layouts
- To know the different navigation schemes on windows based interface; learn the different types of selection devices and components of a window based interface
- To know the different types of interaction devices and media

**Syllabus**

1. Introduction: Human-Computer Interaction, Evaluating Designs, The Birth of HCI. Importance of user Interface, Importance of good design, Benefits of good design, principles & heuristics of good design (4L)
2. Human interaction with computers, Importance of : Human characteristics, Human consideration, Human interaction speeds, Understanding business functions. User centred design- Need-finding: Participant Observation, Interviewing, Additional Need finding, contextual inquiry & persona. (6L)
3. Rapid Prototyping: story boarding. Paper Prototyping and Mockup, Video Prototyping, Creating and Comparing Alternatives (5L)

4. Direct Manipulation and Representations: various user interaction models- command, menu, Direct Manipulation. Mental Models. Heuristics (guidelines) for design. (7L)
5. Graphical Interface Design: Graphical user interface, standards such as Microsoft windows HCI guidelines, Windows: Navigation schemes selection of window; Selection of devices based and screen based controls, Components, Text and messages, Icons, Multimedia, Colors., controls, Help & error messages design. (8L)
6. Web user interface design – jessy James Garette five layers of user experience. (4L)
7. Heuristic Evaluation: Heuristic Evaluation — Why and How? (4L)
8. visualization, Amount of information, Focus and emphasis, Presentation information simply and meaningfully, Information retrieval on web, Statistical graphics (7L)

**Text books:**

1. Alan Cooper & Robert Reimann, About Face 2.0: The Essentials of Interaction Design, Wiley
2. Alan Dix, Janet Finlay, Gregory D. Abowd, and Russell Beale, Human-Computer Interaction, Pearson, 3rd Edition, 2004.
3. Ben Shneiderman and Catherine Plaisant, Designing the User Interface: Strategies for Effective Human-Computer Interaction, Pearson Addison-Wesley, 5th Edition, 2009
4. Donald A. Norman, The Design of Everyday Things, Basic Books, 2002

**Lab : Human Computer Interface**

**Credit : 1**

**Marks : 25**

Suggested list of practical (Numbers in brackets indicate number of practicals)

1. Paper Prototyping using templates (1)

2. Conducting survey interview and summarizing the result(1)
  3. Persona- conducting contextual interview and developing persona(1)
  4. GUI design- form design, menu design, help, error messages(2 )
  5. Web UI design- pages, navigation, controls, (Ajax) (2)
  6. Report designs (2)
  7. Visualization and info graphics (1)
  8. Heuristic evaluation(2)
  9. Story boarding (1)
-

**Yearwise Syllabus for 1.1.3  
of NAAC Criteria I**

**(Year 2017-18)**

**B.Sc. Computer Science**

**Paper Title: Embedded Systems**

**Paper Code: COM-V.E-9**

**Marks: 75**

**Credits: 3**

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**Prerequisite Courses:**

- Digital Logic Design(COM-III.E-2)
- Knowledge of Programming

**Course Objectives:**

To have a thorough understanding of Embedded Systems and their applications.

**Learning Outcome:**

After completion of the course students will be able to:

- Gain knowledge about the world of Embedded Systems, their characteristics and applications.
- Understand the function and use of Embedded System hardware and Interfacing I/O devices.
- Identify various sensors, actuators and their use.
- Understand the need for Real Time Operating Systems
- Develop Embedded Applications.

**Syllabus :**

• **Introduction:**

Introduction to Embedded Systems, Microprocessors and Micro-controllers. Components of Embedded System & its Classification, Characteristic of embedded system.

Introduction to embedded processor, Digital Signal Processor, Application Specific System Processor, Design Process in Embedded System, Design metrics, Steps in design process. Challenges in Embedded System design, Design Examples. Advances in Embedded Systems.

**[6L]**



**System hardware:**

[10L]

System hardware, Interrupt structure and Applications, ARM Processor - Architecture, Programmer's model, Modes of operation, Interrupt, Handling Interrupts, Comparison of ARM7 & ARM9.

Components of Embedded Systems-Management of Power Supply, Clocking Unit, Real Time Clock and Timers, Reset Circuitry and Watchdog Timer. Processor and Memory Selection, Memory Map of Embedded System, Interfacing Processors, Memories and I/O – Analog vs Digital. Overview of Arduino, Intel Edison and Raspberry Pi boards.

**Sensors and Actuators (Overview):**

[12L]

Sensors / Transducers: Principles – Classification – Parameters – Characteristics – Environmental Parameters (EP) – Characterization.

**Thermal Sensors:** Introduction – Gas thermometric Sensors – Thermal Expansion Type Thermometric Sensors.

**Magnetic sensors:** Introduction – Sensors and the Principles Behind – Magneto-resistive Sensors, Semiconductor Magnetoresistors.

**Smart Sensors:** Introduction – Primary Sensors – Excitation – Amplification – Filters – Converters – Compensation – Information Coding/Processing - Data Communication – Standards for Smart Sensor Interface – The Automation.

**Sensors Applications:** Introduction – On-board Automobile Sensors (Automotive Sensors) – Home Appliance Sensors – Aerospace Sensors — Sensors for Manufacturing – Sensors for environmental Monitoring.

**Actuators:** Overview of Pneumatic and Hydraulic Actuation Systems, Mechanical Actuation Systems, Electrical Actuation Systems

- **I/O Interfacing and Communication:**

[10L]

I/O interfacing and Communication Buses, Serial vs Parallel Communication, Serial Data Communication RS-232/UART.

I/O devices, ADC / DAC, Optical Devices such as LED / LCD Display devices, Opto-Isolator, Relays, DC motor, Stepper motor, Timers/Counters, Parallel ports - Device interfacing.

Serial communication Protocols - UART Protocols, I<sup>2</sup>C, CAN, USB & ZigBee – Protocol Architecture, Topology, Packets, Communication Cycle, Arbitration, Applications and comparison.

**Internet of Things (IoT):**

[3L]

Introduction to IoT, **M2M to IoT**-The Vision-Introduction, M2M towards IoT- the global context, IoT **Architectural Overview, Potential and Challenges.**

**Real Time Operating System:****[4L]**

Introduction to RTOS, architecture of kernel, task and task scheduler, interrupt service routines in RTOS Environment.

**Text Books**

- Rajkamal, “Embedded Systems – Architecture, Programming and Design”, Tata McGrawHill, Second Edition, 2008.
- D. Patranabis, “Sensors and Actuators”, 2nd Ed., PHI, 2013.

**Reference Book:**

- Dr. K. V. K. K. Prasad, “Embedded / Real Time System : Concepts, Design, & Programming – Black Bookl”, Dreamtech Press Publication.
- David E Simon, “An Embedded Software Primer”, Pearson India, 1<sup>st</sup> Edition.
- Tammy Noergaard, “Embedded Systems Architecture”, Elsevier
- D. Patranabis, “Sensors and Transducers”, PHI Learning Private Limited.
- Dr. K. V. K. K. Prasad, Gupta Dass, Verma, “Programming for Embedded system”, Wiley – Dreamtech India Pvt. Ltd.
- Jan Holler, Vlasios Tsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, “From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence”, 1<sup>st</sup> Edition, Academic Press, 2014.

**Lab : Embedded Systems****Credit: 1****Marks: 25**

Programs to be executed on some of the embedded boards like Arduino, Intel Edison, Raspberry Pi, Bolt, etc., that covers the following tasks:

- |   |      |
|---|------|
| 1) Interfacing sensors                  | (3P) |
| 2) Interfacing output devices           | (1P) |
| 3) Interfacing input devices            | (1P) |
| 4) Interfacing actuators                | (1P) |
| 5) Building obstacle avoiding Robot     | (1P) |
| 6) Line Following Robot                 | (1P) |
| 7) Programming with Raspberry Pi        | (2P) |
| 8) Monitoring Data over Cloud           | (1P) |
| 9) Building Web app to control devices. | (1P) |
| 10) Mini Project                        |      |
- 
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**Paper Title:** Mobile Application Development

**Paper Code:** COM-V.E-10

**Marks:** 75

**Credits:** 3

**Prerequisite Courses :**

- Object Oriented Programming(COM-II.C-3)
- Web Designing(COM-III.E-4)

**Course Objective:**

Students learn how to develop applications for mobile devices, including smart phones and tablets. Students are also introduced to the current mobile platforms, mobile application development environments and mobile device input methods. Students will design and build a variety of apps on a popular platform throughout the course to reinforce learning and to develop real competency.

**Learning Outcome :**

Upon successful completion of the course, the student will demonstrate the ability to:

- Explain mobile devices, including their capabilities and limitations.
- Review current mobile platforms and their architectures.
- Develop mobile applications on a popular mobile platform.
- Evaluate development with another mobile platform.

**Syllabus :**

**Introduction to mobile devices**

**(3 L)**

Mobile devices vs. desktop devices, Why we Need Mobile App, Different Kinds of Mobile Apps, ARM and intel architectures, Power Management, Screen resolution, Touch interfaces, Application deployment - App Store, Google Play, Windows Store, Development environments– Android Studio, PhoneGAP, Native vs. web applications.

**Review of HTML5/JS/CSS3**

**(2 L)**

Quick recap of technologies, Mobile-specific enhancements, Browser-detection, Touch interfaces,

Geolocation, Screen orientation, Mobile browser “interpretations” (Chrome/IE).

### **Mobile OS Architectures (3 L)**

Comparing and Contrasting architectures of Android, iOS and Windows, Underlying OS(Darwin vs. Linux vs. Windows ), Kernel structure and native level programming, Runtime (Objective-C vs. Dalvik vs. WinRT), Approaches to power management, Security.

### **Android overview (2 L)**

Introduction to Android. Overview of android stack, Introduction to OS layers, Android features. Linux Kernel, Libraries, Android Runtime, Application Framework, Dalvik VM

### **Android Components – Introduction(3 L)**

Activities, Services, Broadcast Receivers, Content Providers.

### **Building UI with Activities(4 L)**

Activities, Views, layouts and Common UI components, Creating UI through code and XML, Activity life cycle, Intents, Communicating data among Activities.

### **Advanced UI (5 L)**

Selection components (GridView, ListView, Spinner ), Adapters, Custom Adapters, Menus, Toast, Custom Toast, Dialogs, Status bar Notifications.

### **Multithreading (4 L)**

Using Java Multithreading classes, AsyncTask, Handler, Post.

### **Intent, Intent Filters and Broadcast Receivers**

**(4 L)**

Role of filters, Intent-matching rules, Filters in your manifest, Filters in dynamic Broadcast Receivers, Creating Broadcast receiver, Receiving System Broadcast, Understanding Broadcast action, category and data, Sending Broadcast.

age

**(5 L)**

Shared Preferences, Android File System, Internal storage, External storage. SQLite Introducing SQLite, SQLiteOpenHelper and creating a database, Opening and closing a database, Working with cursors, inserts, updates, and deletes.

### **Content Providers**

**(5 L)**

Accessing built in content providers, Content provider MIME types, Searching for content, Adding, changing, and removing content, Creating content provider, Working with content files.

### **Services**

**(5 L)**

Overview of services in Android, Implementing a Service, Service lifecycle, Inter Process Communication (AIDL Services).

Web Services and WebView - Consuming web services, Receiving HTTP Response (XML, JSON ), Parsing JSON and XML, Using WebView.

#### **Reference books:**

- Beginning Android 4 Development, Wei-Ming Lee(John Wiley & Sons)
- Pro Android 4 ; Satya Komateneni, Dave MacLean (Apress)

- Hello Android - Introducing Google's Mobile Development platform - Ed Brunette (The Pragmatic Bookshelf)
- Android Apps with Eclipse 1st Edition, Onur Cinar(Apress)
- Android- A Programmer'S Guide, Dimarzio, J.F.( Tata McGraw Hill)

**Web References:**

- 1.<http://developer.android.com/index.html>
- 2.<http://www.appinventor.org/>

**Lab :** Mobile Application Development

**Credit:** 1

**Marks:** 25

**List of practicals**

1. Getting Started with Android – Installing the Development Environment, Configuring Android Stack (1P)
2. Creating the First Android Application - Creating a Simple Android Project, Debugging Application through DDMS. setting up environment. AVD Creation, Executing Project on Android Screen. (1P)
3. Android application development - Use of GUI components to implement a simple application such as a Calculator. (1P)
4. Review the earlier application making use of the advanced UI components. (1P)
5. Implementing Data storage application - an application to make Insert , update , Delete and retrieve operation on the database. (2P)
6. Understanding content providers and permissions: Read phonebook contacts using content providers and display them suitably. (1P)

7. Optimizing your app performance with Services/Multithreading/Multiprocessing

(2P)

8. Course Project (3P)



**Paper Title:** Software Testing  
**Paper Code:** COM-V.E-12  
**Marks:** 75  
**Credits:** 3

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**Prerequisite courses:** Introduction to Programming (COM-I.C-2)

### **Course Objectives:**

- To study fundamental concepts in software testing, including software testing objectives, process, criteria, strategies, and methods.
- To discuss various software testing issues and solutions in software unit test; integration, regression, and system testing.
- To learn how to plan a test project, design test cases and data, conduct testing operations, manage software problems and defects, generate a testing report.

### **Learning Outcomes:**

On Completion of this course the student will:

- Have an ability to understand and identify various software testing problems, and solve these problems by designing and selecting software test models, criteria, strategies, and methods.
- Have an ability to use software testing methods and modern software testing tools for their testing projects.

### **Syllabus :**

**Software testing principles - Software Testing-** Need for testing, Psychology of testing, Testing economics, SDLC and Testing, Verification & Validation. Quality Assurance, Quality Control (3L)

**Testing strategies and types - White box testing techniques -** Statement coverage, Branch Coverage, Condition coverage, Decision/Condition coverage, Multiple condition coverage, Dataflow coverage, Automated code coverage analysis, Inspections, Walkthroughs Code Review (5L)



**Black box testing techniques** - Boundary value analysis,Robustness testing ,Equivalence partitioning,Syntax testing,Finite state testing,Levels of testing,Unit, Integration and System Testing,Compatibility Testing,Domain Testing,Adhoc Testing ,Use of Requirement,Traceability Matrix (6L)

**Integration Testing Waterfall** - Top-down ,Bottom up,Bigbang,Sandwich (3L)

**System and Performance Testing** - Types of system testing ,Functional and non-functional testing Acceptance Testing ,Setting entry and exit criteria for phases and typical product release scenarios ,Basic factors governing performance testing, Methodology for performance testing ,Tools forperformancetesting (4L)

**Regression Testing** - Purpose ,Timing, Choice of tests ,Smoke tests ,Best practices (3L)

**Internationalization and Localization testing** - Preliminary concepts,Adhoc testing,Pair testing, Extreme testing, Agile testing, Exploratorytesting,Defectseeding (3L)

**Usability Testing** - Factors in usability testing ,Aesthetics testing ,Accessibility testing,Tools forusabilitytesting (3L)

**Testing object oriented software** - Definitions and Challenge differences from testing non-OO Software,Class testing strategies Class Modality,State-based Testing,Message SequenceSpecification (4L)

**People and organizational issues in testing** - Common people issues and myths in testing, Providing career paths in testing,Organizational structures for testing teams,Geographically distributed testing teams andsuccessfactors (6L)

**Test Management and Automation-** Test Planning,Test Management,Test Process,Test Reporting,Test Automation,Factors to consider in automation,Challenges in test automation,Test Metrics,Product Metrics,Process Metrics,ProgressMetrics

Use of metrics in ascertainingproductrelease (5L)

### **References:**

1. Software Testing- PrinciplesandPractices ,Srinivasan Desikan and Gopaldaswamy Ramesh , PearsonPublication
2. Integrated Approach to Software Engineering , Pankaj Jalote, Narosa PublishingHouse
3. Software Engineering – A Practitioners Approach, Roger Pressman, McGraw Hill Publication

**Lab:** Software Testing

**Credit:**01

**Marks:**25

List of suggested **PRACTICALS** using any testing tool such as Selenium or equivalent :

1. Planning Test Cases (1P)
2. Generating Test Cases/Test Suite (2P)
3. Enhancing Tests (3P)
4. Debugging Tests (2P)
5. Running Tests (2P)
6. Analyzing Results (1P)
7. Reporting Defects (1P)

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**Paper Title:** Computer Networks

**Paper Code:** COM-VI. C-8

**Marks:** 75

**Credits:** 3

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**Prerequisite Courses :**

- Introduction to Programming(COM-I.C-2)
- Object Oriented Programming(COM-II.C-3)

**Objectives:**

- To understand the basic concepts of Computer Networking
- Be familiar with the components required to build and design different types of networks.

**Learning outcome:**

- Gain Knowledge of the Reference models
- Understand basic concepts of data transmission over wired medium Compare various routing, transport protocols and Identify suitable protocol for a given network.
- Able to design the basic Computer network and maintain the networks
- Develop client server programs for different applications

**Syllabus :**

**1. Introduction**

**[8L]**

Basics of Computer Networks, Classification: transmission technology, scale; Applications; Data Communications: data, signal, bandwidth, bit interval and bit rate, Modes of Communication. Layered network architecture, Networks models: OSI model, TCP/ IP protocol suite; Guided and Unguided Transmission media, Multiplexing: FDM, TDM. Switching: Circuit switching, message switching, Packet Switching.

**Datalink layer**

**[12L]**

Data link control: Framing: Character Count, Character Stuffing, Bit Stuffing; , Error Detection and correction, Flow and error control, HDLC; Multiple access: Random access – Controlled access , ALHOA, CSMA, CSMA/CD and CSMA/CA; Ethernet : IEEE standards, standard Ethernet, Fast Ethernet, Gigabit Ethernet; Connecting devices: repeater/hub, bridge, router and gateway, Backbone networks - Virtual LANS.

**4. Network layer**

**[14L]**

Functions of Network layer; Network Service types: Virtual Circuits, Datagrams; Logical addressing: IPv4, private and public IP addressing, special IP addresses, subnetting, IPV6

addressing Internet Protocol: Internetworking:IPv4, Fragmentation and reassembly , Address mapping : ARP, RARP, BOOTP, DHCP, ICMP . Routing: classification of routing, Shortest path routing, Distance Vector routing, Link State routing;

## **5. Transport layer and Application layer**

**[9L]**

Process-to-Process delivery: User Datagram Protocol (UDP), Transmission Control Protocol (TCP), Quality of services (QoS); Application Layer: Domain Name System (DNS) ,E-mail, FTP,HTTP.

## **6. Wireless Networks**

**[2L]**

Basics of wireless networking.

### **TEXT BOOK:**

1. Andrew S. Tanenbaum, David J. Wetherall “Computer Networks”, Prentice-Hall, 5th Edition.

### **REFERENCES:**

1. Behrouz A. Forouzan, “Data Communication and Networking”, Tata McGraw-Hill, 2011, 4<sup>th</sup> Edition.
2. James F. Kurose, Keith W. Ross, “Computer Networking – A Top-Down Approach Featuring the Internet”, Pearson Education, 2009, 5<sup>th</sup> Edition,
3. Nader. F. Mir, “Computer and Communication Networks”, Pearson Prentice Hall Publishers, 2010.
4. Ying-Dar Lin, Ren-Hung Hwang, Fred Baker, “Computer Networks: An Open Source Approach”, Mc Graw Hill Publisher, 2011.
5. Larry L. Peterson, Bruce S. Davie, “Computer Networks: A Systems Approach”, Morgan Kaufmann Publishers, 2011, 5<sup>th</sup> Edition

**Lab : Computer Networks**

**Credits : 1**

**Marks : 25**

List of Practicals

1. Installing virtual machines, Ethernet cabling
2. Study of network commands ping, ipconfig, netstat, traceroute
3. Setting up of LAN Network
4. IP address manipulation -Extract network id and Host id given netmask
5. Mini Project / Packet capture tool/ packet generator tool
6. UDP Socket programming (c/c++/Java/ perl)
7. TCP Socket programming-I
8. Configuring VLAN (DLink Switch)/ TCP Socket programming-II
9. Configuring routing tables

10. Configuring DHCPserver/client
11. Mini Project / Simulation of IP fragmentation
12. Mini Project/ConfiguringE-Mail/DNS

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**Paper Title:** Multimedia Techniques

**Paper Code:** COM-VI. E-15

**Marks:** 75

**Credits:** 3

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**Prerequisite Courses:** Nil

**Course Objectives:**

On completion of the course the students will develop specific skills and competencies by making them proficient in Designing Graphical Images, Audio and Video Capture and Editing using Software tools

**Outcomes:**

On Completion of this course the student will:

- Study Multimedia Concepts
- Develop their Creativity and publish a self-contained multimedia Application using multimedia authoring tool in various application areas.

**Syllabus :**

**1. Introduction to Multimedia: [8L]**

Commonly used terms associated with multimedia like CDROM, Storyboard, Script and Authoring tools.

Stages of a Multimedia Project-Planning and Costing, Designing and Producing, Testing and Delivering.

The Multimedia team and their roles- Project Manager, Writer, Video specialist, Audio specialist and Multimedia programmer.

Multimedia Software. Multimedia Hardware.

Social & Ethical considerations, Digital Representations & Standards.

**Introduction to Computer Graphics: [8L]**

Vector graphics fundamentals, shapes, transforms and filters,

Bitmapped graphics: resolution, image compression, manipulation, Geometrical transformations

**Text and Layout: [5L]**

Text in graphics, character set, fonts, layout

**Sound: [8L]**

Basic Sound Concepts, Digitising and processing sound, Music, Speech, Compression, formats, MIDI and Digital Audio

**Color Science and Color Models: [8L]**

Human vision, Camera systems, Gamma correction, Color matching, different Color models–

RGB, CYMK, Transformations among color model

**Video:** [8L]

Digitising video, streamed video, video standards, compression: mpeg, dv, codec comparison, introduction to Animation: captured, sprite, key frame, web, 3-D. Virtual reality: VRM

**Text Book:**

1. Nigel Chapman, Jenny Chapman; Digital Multimedia; Wiley India Edition, 2<sup>nd</sup> Edition
2. Ze-Nian Li & Mark S Drew; Fundamentals of Multimedia; Pearson Education International Edition
3. Vaughan, Tay; Multimedia: Making it Work; Tata McGraw-Hill, 3<sup>rd</sup> edition
4. Jeffcoate, Judith; Multimedia in Practice, Technology and Applications, PHI

**Lab: MULTIMEDIA TECHNIQUES**

**Credit:01**

**Marks:25**

List of suggested **PRACTICALS** (the numbers in brackets indicate number of practicals):

Practical can be done using Proprietary or FOSS for Text, Image, Audio and Video Editing. For example Scribus, GIMP, Audacity, Movie maker, Openshot, etc.

1. Design a Brochure for a given product, give details. Learn about different Image file Formats (2P)
2. Design a Poster with given information and learn about Image compression (2P)
3. Learn to prepare Images for Print, Web and Video. (1P)
4. Edit the Sound file and Learn about Effects and Filters of sound (3P)
5. Record Your voice and learn about Audio Compression. (1P)
6. Record an Audio Program and Learn about streaming an audio content. (1P)
7. Learn about Video editing – Prepare video with rough cut (2P)
8. Prepare Video content with title and special effects. (1P)
9. Record Video content and learn about video compressions. (1P)
10. Prepare Video content for streaming. (1P)

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**Paper Title:** Digital Marketing

**Paper Code :** COM-VI.E-16

**Marks:** 75

**Credits:** 3

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**Prerequisite Courses:** Web Designing(COM-III.E-4)

**Course Objectives:**

- To study various online Marketing Strategies.
- Analyze and research Internet to improve the quality and marketability of the Websites.

**Learning Outcomes:**

On completion of the course students will learn the following:

- Optimize the website for various search engines.
- Market the company/product using Search Engine and Social Media.
- Analyze the Web for improving the marketing strategy.

**Syllabus :**

**I. Search Engine Optimisation (SEO): [10L]**

Introduction to Online Search; Function of Search Engines Google Page Rank; Introduction to Search Engine Optimisation; Building Accessible Site; Keyword Research and Optimisation; Link Building Strategies; Useful Tools for SEO; The Past, Present and Future of SEO.

**Search Engine Marketing (SEM): [9L]**

Introduction to Internet and Search Engine Marketing; Google Adwords; Adwords Account Structure; Navigating in Google Adwords; Working with Keywords; Creating Ads in Google Adwords; Creating and Managing your First Ad Campaign; Adwords Reporting and Account Performance Reports.

**Social Media Marketing (SMM): [9L]**

Introduction to the World of SMM; Why Social Media?; Getting Started with Social Media; Building Relationships via Facebook, Twitter, LinkedIn, YouTube; Handling Positive and Negative Comments; Social Media Content Base Creation.



**Email Marketing:** [5L]  
Importance of Email marketing; Email Marketing Software's; Subscriber List; Email Marketing Campaign; Newsletters; Measuring the results.

**WEB Analytics:** [9L]  
Web Analytics and Intelligence Tools; Basic Metrics Demystified; Introduction to Google Analytics; Goals and Actionable Insights; Data Management; Social Media Analytics; Social Media Goals and KPI's; Tools for Social Media Analytics.

**MarketingAutomation:** [3L]  
Introduction to Marketing Automation; Advantages of using Marketing Automation Software; Issues with Marketing Automation.

**ks:**

- Damian Ryan, 2014 *“Understanding Digital Marketing: Marketing Strategies for Engaging the Digital Generation”*, Kogan Page Publisher, 3<sup>rd</sup> Edition.

**Reference Books:**

- Calvin Jones and Damian Ryan, 2012 *“The Best Digital Marketing Campaigns in the World:*
- Nick Smith, 2013 , *“Successful SEO and Search Marketing in a Week”*, Teach Yourself Publisher,.
- Lee Odden, 2012, *“Optimize: How to Attract and Engage More Customers by Integrating SEO, Social Media, and Content Marketing”*, Wiley Publishing, 1<sup>st</sup> Edition.
- [Avinash Kaushik](#), 2013, *“Web Analytics 2.0: The Art of Online Accountability & Science of Customer Centricity (Sybex)”*, Wiley Publishing, 2<sup>nd</sup> edition

**Practical: Digital Marketing**

**Credit: 1**

**Marks: 25**

1. Using Search Engine Optimization tools ( like google & bing search console, hubspot, webceo, googlepagespeed) (3P)
2. Using Search Engine Marketing tools (like google adwords, google adwords certifications, search, display, remarketing formats, facebook marketing, linkedin advertising) (3P)
3. Using Social Media Marketing tools (like hootsuite, buffer, sproutsocial, klear, twitonomy, socialmention, googlealerts, mention) (2P)
4. Using Email Marketing tools (like mailchimp, campaign monitor, mailgun, mandrill, phplist, amazon ses) (2P)
5. Using Web Analytics tools ( like google analytics, compete.com, crazyegg, facebook insights, twitterinsights) (3P)

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## Yearwise Syllabus for 1.1.3 of NAAC Criteria I

**(Year 2019-20)**

**B.Sc. Computer Science**

**Course Title: Introduction to Data Science**

**Course Code: COM-V.E-11**

**Marks: 75**

**Credits: 3**

**Duration:45 Hrs**

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**Prerequisite courses:**

- Statistical Methods
- Basic probability and statistics.

**Course Objectives:**

- Become familiar with methods of data science and their practical usefulness.
- To learn, understand, and practice machine learning approaches.
- To analyze large and unstructured data with different tools.

**Course outcomes:**

At the end of the course students will be able to :

**CO1:** Describe what Data Science is and the skill sets needed to be a data scientist.

**CO2:** Explain in basic terms what Statistical Inference means. Identify probability distributions commonly used as foundations for statistical modeling. Fit a model to data.

**CO3:** Explain the significance of exploratory data analysis (EDA) in data science. Apply basic tools(plots, graphs, summary statistics) to carry out EDA.

**CO4:** Describe the Data Science Process and how its components interact.

**CO5:** Apply basic machine learning algorithms for predictive modeling.

**CO6:** Identify common approaches used for Feature Generation. Identify basic Feature Selection. **CO7:** Reason around ethical and privacy issues in data science conduct and apply ethical practices.

**CO8:** Create effective visualization of given data (to communicate or persuade).

**CO9:** Use of Mining Social-Network Graphs in Data science out basic statistical modeling and analysis.

**SYLLABUS:**

**UNIT I:****[10HRS]****Introduction to Data Science**

What is Data Science? Big Data and Data Science hype -and getting past the hype, Why now? –Datafication, Current landscape of perspectives, Skill sets needed.

Statistical Inference:

Populations and samples, Statistical modeling, probability distributions, fitting a model, Intro to R.

**UNIT II:****[20HRS]****Exploratory Data Analysis and the Data Science Process:**

Basic tools (plots, graphs and summary statistics) of EDA, Philosophy of EDA, The Data Science Process, Case Study: Real Direct (online real estate firm).

**Three Basic Machine Learning Algorithms:**

Linear Regression, k-Nearest Neighbors (k-NN), k-means

**Feature Generation and Feature Selection (Extracting Meaning From Data):**

Motivating application: user (customer) retention, Feature Generation (brainstorming, role of domain expertise, and place for imagination) , Feature Selection algorithms ,Filters; Wrappers; Decision Trees; Random Forests

**UNIT III:****[15HRS]****Mining Social-Network Graphs:**

Social networks as graphs, Clustering of graphs, Direct discovery of communities in graphs, Partitioning of graphs, Neighborhood properties in graphs

**Data Visualization:**

Basic principles, ideas and tools for data visualization, Examples of inspiring (industry) projects, Exercise: create your own visualization of a complex data set.

**Data Science and Ethical Issues:**

Discussions on privacy, security, ethics, A look back at Data Science, Next-generation data scientists

**REFERENCES:****MANDATORY:**

1. O'Neil, C., & Schutt, R. (2013). *Doing data science: Straight talk from the frontline.* " O'Reilly Media, Inc."

**SUPPLEMENTARY:**

1. Jure.L., Anand.R., Jeffrey.U(2014). Mining of Massive Datasets v2.1(2nd ed.).Cambridge University Press.

2. Kevin P. Murphy,(2012).Machine Learning: A Probabilistic Perspective.MIT Press.

3Provost, F., & Fawcett, T. (2013). *Data Science for Business: What you need to know*

*about data mining and data-analytic thinking.* " O'Reilly Media, Inc."

4Hastie, T., Tibshirani, R., & Friedman, J. (2009). *The elements of statistical learning: data mining, inference, and prediction.* Springer Science & Business Media..

5. Blum, A., Hopcroft, J., & Kannan, R. (2020). *Foundations of data science.* Cambridge University Press.

6. Zaki, M. J., Meira Jr, W., & Meira, W. (2014). *Data mining and analysis: fundamental concepts and algorithms.* Cambridge University Press.

7. Han, J., Pei, J., & Kamber, M. (2011). *Data mining: concepts and techniques.* Elsevier.

### **WEB BASED:**

1. Cathy O’Neil and Rachel Schutt. Doing Data Science, Straight Talk From The Frontline, O’Reilly <https://classroom.google.com/u/0/w/NDA4ODg4MTQ3MjZa/t/all>

2. Data Science E-Learning Course:  
[https://onlinecourses.nptel.ac.in/noc19\\_cs60/unit?unit=5&lesson=6](https://onlinecourses.nptel.ac.in/noc19_cs60/unit?unit=5&lesson=6)

3. Simple Linear Regression Example:  
<https://www.spss-tutorials.com/simple-linear-regression/>

4. <https://www.kaggle.com/pavansanagapati/a-simple-tutorial-on-exploratory-data-analysis>

5. Data visualization

6. <https://paldhous.github.io/ucb/2016/dataviz/week2.html>

7. <https://www.targetprocess.com/articles/visual-encoding/>

### **Practicals : Introduction to Data**

**Science Credit: 1**

**Marks: 25**

**Duration:30 Hrs**

1. Implementation of probability distribution
2. Sampling and re-sampling.
3. Linear Models
4. K-Nearest neighbour
5. K-Means
6. Feature Selection Algorithm
7. Filters and Wrappers
8. Decision Trees

**All the experiments will be implemented using Excel /R-Tool/ or equivalent.**

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**Course Title: E-Learning**

**Course Code: COM-GEC.2**

**Marks: 100**

**Credits: 4**

**Duration: 60 HRS**

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**Prerequisite Courses: Nil**

**COURSE OBJECTIVES:**

- To understand basic concept of ICT (Information Communications Technology) in education.
- To understand basic concept of Instructional Design principles.
- To develop and apply the various concepts of Instructional Design skills learnt wrt E-Learning .
- To develop E-content in various application areas related to ICT and Education.

**COURSE OUTCOMES:**

On completion of this course the student will be able to:

**CO1:** Explain the working of an E-learning module.

**CO2:** Explain the various Instructional Design Principles.

**CO3:** Develop own course material and upload it using an appropriate LMS.

**CO4:** Evaluate and apply appropriate Assessment techniques to the E-content

**CO5:** Differentiate between Summative and Formative assessment.

**CO6:** Write Learning and Course objectives.

**SYLLABUS**

**UNIT I: Introduction and E-learning Strategies**

**[15 HRS]**

Scope and form of E-learning, Role of an E-learning project Phases in E-learning project  
E-learning Strategies: Simulation, Drill, Interactive Learning, Problem Solving, Tutorials.

**Activity:**

1. Construct a Mindmap (using Freemind or any other FOSS).

**UNIT II: Course Development**

**[15 HRS]**

Introduction to Instructional Design.

The process of Designing Instruction.

Developing Materials.(Story Boarding, Content Integration, and SCORM Compliance).

Working with L.M.S. (Learning Management System)- Installation and use of the administrator, teacher and student interface.

Course Definition, Registration and upload, tracking of results).

**Activities:**

1. Creating and Running a complete course using LMS Course Administration: Creation and using Resources and Planning Activities.
2. Creating Storyboards (using Movie Maker/PPT or similar FOSS).

### **UNIT III :E-learning & Pedagogical Approaches**

**[15 HRS]**

The Behaviorist School of learning and its implications on E-learning, The Cognitive School of Learning and its Implication on E-learning, The Constructivist School of Learning and its implications on E-learning, Blooms Taxonomy of Educational Objectives, Types of Learning Objectives, Content Analysis (Types- Facts, concepts, process, procedure, principles). The Teaching of concepts, procedure, principles, understanding. Enabling a motivated Learning Environment.

#### **Activity:**

1. Prepare a 10-minute Video tutorial on some system (e.g. how to search for free images in Google) using screen cast/Powtoon. Example tool that can be used: screen cast-o-matic).

### **UNIT IV: Assessment Design**

**[15 HRS]**

Online formative and summative assessment. Rubrics for Assessment- Analytic and Holistic Rubrics, Security and Authentication.

#### **Activities:**

1. Design Rubrics using any application (for a given scenario).
2. Create a fully tagged 10-question QB on a topic and load onto Moodle.

#### **REFERENCES:**

##### **MANDATORY:**

Shelly Cashman Gunter.(2011).Teachers Discovering Computers: Integrating Technology in the Classroom,(7th ed.).Wadsworth Publishing Co Inc.

##### **SUPPLEMENTARY:**

1. Smith, P. L. & Ragan, T. J.(2008). Instructional design(4rth ed.). New York: John Wiley & Sons. ISBN:0471393533
2. M.D. Roblyer, Aaron H. Doering(2018). Integrating Educational Technology into Teaching: Student Value Edition (8th ed.). Publisher: Pearson ISBN-10: 013289680X, ISBN-13:978-0132896801.
3. Dick, W., Carey, L., & Carey, J. O.(2014). The systematic design of instruction (8th ed.). Boston: Allyn and Bacon.
4. Wiggins, G. P., & McTighe, J.(2005). Understanding by design (2nd ed.). Assn. for Supervision & Curriculum Development;
5. Alexandria, VA: Association for Supervision and Curriculum Development.
6. Christensen, C. M., Horn, M. B., & Johnson, C. W.(2016). Disrupting class: How disruptive innovation will change the way the world learns(2nd ed.). New York: McGraw- Hill.

##### **WEB BASED:**

- 1.<https://www.udemy.com/course/instructional-design-for-elearning/>
- 2.<https://nptel.ac.in/courses/127101013/>
- 3.<https://nptel.ac.in/courses/121105010/>

Better learning ( Bloom's Taxonomy ):

4. <https://www.plesyoutube.com/watchv=0flnAoX9QEw>

Assessment:

5. [https://nptel.ac.in/content/storage2/nptel\\_data3/html/mhrd/ict/text/121106012/lec13.pdf](https://nptel.ac.in/content/storage2/nptel_data3/html/mhrd/ict/text/121106012/lec13.pdf)

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**Course Title: Python Programming Course**  
**Code: COM-SEC1**  
**Marks: 100**  
**Credits: 4**  
**Duration: 60 HRS**

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**Prerequisite Courses:** Nil

**Course Objectives:**

- To provides skills of data analysis using Python programming language.

**Course Outcomes:**

At the end of the course students should be able to :

**CO1:** Understand syntax of Python Programming

**CO2:** Write program using conditional statements, loops.

**CO3:**Apply required List function.

**CO4:** Write Python program specific to the domain of the given problem.

**SYLLABUS:**

**UNIT I : Introduction to Python**

**[15HRS]**

Motivation, programming paradigms, What Python can do, Python's technical strength, Python interpreter, Program execution, Execution model variations, How to run programs.

Basic Syntax

Variable and Data Types, Operator, Conditional Statements - if, if- else, Nested if-else. Looping – For, While, Nested loops. Control Statements – Break, Continue, Pass.

**UNIT II: String Manipulation, Tuple and Lists :**

**[15HRS]**

Accessing Strings, Basic Operations, String slices, Function and Methods. Tuple and Lists

Introduction, Accessing list, Operations, Working with lists, Function and Methods.

Introduction Accessing tuples, Operations, Working, Functions and Methods.

**UNIT III: Dictionaries & Functions**

**[15HRS]**

Introduction, Accessing values in dictionaries, Working with dictionaries, Properties, Functions. Functions

Defining a function, Calling a function, Types of functions, Function Arguments, Anonymous functions, Global and local variables.

**UNIT IV:Modules:**

**[ 15HRS]**

Importing module. Math module. Random module.

Exception Handling

Exception. Exception Handling - Except clause, Try , except,finally clause. User Defined Exceptions



## Input-Output

Printing on screen, Reading data from keyboard, Opening and closing file, Reading and writing files, Functions.

Printing on screen, Reading data from keyboard, Opening and closing file, Reading and writing files, Functions.

### **REFERENCES:**

#### **MANDATORY:**

1. Mark Lutz, Learning Python, O'Reilly Media, Fifth Edition.

#### **SUPPLEMENTARY:**

1. Alex Martelli, (2006) Python – A Nutshell, O'Reilly Media, Second Edition.
2. Wes McKinney, (2012) Python for Data Analysis, O'Reilly Media.

#### **WEB BASED:**

1. <https://www.w3schools.com>
2. <https://www.tutorialspoint.com>
3. <https://www.javatpoint.com>
4. <https://www.geeksforgeeks.org>
5. <https://www.guru99.com>

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**Course Title: Scilab Programming Course**

**Code: COM-SEC3**

**Marks: 100**

**Credits: 04**

**Duration: 60 Hours**

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**Pre-requisite course:** Nil

**Course Objectives:**

- To make the student understand the fundamentals of Scilab.
- To implement algorithms using Scilab.
- To handle polynomials and implement numerical methods using Scilab.
- To use Scilab for plotting charts and graphs.

**Course Outcomes:**

Upon completion of the course student will be able to:

**CO1:** Develop solutions to problems and implement these solutions in Scilab.

**CO2:** Use Scilab to handle Polynomials.

**CO3:** Use Scilab to implement Numerical Methods.

**CO4:** Plot charts and graphs using Scilab.

**SYLLABUS:**

**UNIT I: Introduction to Scilab and Working with Matrices:** [15 HRS]

Introduction: Install and configure Scilab software, Starting and ending a Scilab session, Scilab environment, Getting help, Some useful Scilab commands.

Fundamentals: Data types, Constants and Variables, Operators, Scilab Expressions, Hierarchy of operations, Built in Functions.

Vectors and Matrices: Creating matrices, empty matrix, row vectors, column vectors, scalars, special matrices, sparse matrices, matrix size, accessing matrix elements, creating sub-matrices, creating multi-dimensional array, operations on matrices and arrays, matrix manipulation, useful matrix commands.

**UNIT II: Polynomials and Scilab Graphics:** [15 HRS]

Polynomials: Polynomial creation and evaluation, roots of a polynomial, Polynomial arithmetic operations, differentiation and integration, Curve fitting.

Scilab Graphics: Two-dimensional plots, sub-plots, creating commonly used 2D plots, 3D plots.

**UNIT III: Programming in Scilab:** [15 HRS]

Keywords, Predefined variables, input and output statements, Control structures, looping, File Handling, Scripts and Functions, Error-handling, Coding conventions.

**UNIT IV: Numerical Methods using Scilab** [15 HRS] Solutions

of Algebraic and Transcendental equations, Interpolation, Numerical Differentiation and Integration, Solution of Linear Systems of Equations.

**REFERENCES:**

**MANDATORY:**

1. Verma.R, Kumar,A. Introduction to Scilab (1 st ed.) Pearson.

**SUPPLEMENTARY:**

1. Dr. M Affouf, Scilab by Example (2 nd ed.). CreateSpace Independent Publishing Platform.
2. Er. Ramachandran. H, Dr. Nair. A. Scilab a free software to Matlab (1 st ed.). S Chand & Company

**WEB BASED:**

1. <https://wiki.scilab.org/>
2. <https://scilab.in/fossee-scilab-toolbox/optimization-toolbox/functions/symphonymat>
3. [http://www.sze.hu/~molnarka/SCILAB/book\\_SCIALB.pdf](http://www.sze.hu/~molnarka/SCILAB/book_SCIALB.pdf)
4. <http://www.ee.iitm.ac.in/~hsr/scilab/manual.pdf>

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# **ECONOMICS**

**Department of Economics**  
**Syllabi of courses that indicates the employability/entrepreneurship/skill  
development/SEC**

**2015**

**Paper Title:** Evolution of Methods in Economic Analysis

**Paper Code:** ECO-I.C-1

**Marks:** 100

**Credits:** 4

**Course Objectives:**

Economic analysis – as it evolved from political economy to economics – developed in many ways since Adam Smith’s “Inquiry into the Nature and Causes of the Wealth of Nations”. Political Economy had a philosophical basis. Economic analysis started developing through the use of both the deductive and the inductive methods. From historical and empirical foundations, economic analysis moved to deductions based on axioms and abstract thinking and the use of mathematics. Economic analysis differed in terms of it being positive or normative.

The key objective of this course is to familiarize the students with the various methods, the social and the historical that transformed political economy to the present discipline of economics.

**Learning Outcomes of the Course:**

On completing the course, the students will be able to appreciate the different strands of economic analysis and discourse. They will also appreciate the evolutionary nature of the analytical methods, the foundations and the structure of analysis.

**Course duration:** Sixty lectures of one hour duration i.e. four lectures per week over a period of fifteen weeks of a semester.

**SYLLABUS**

**Module 1:** Philosophical orientation of Economics:

Smith, Ricardo, Malthus, Mill, Marx: Beginnings of Classical Political Economy (12 Lectures, 20 Marks)

**Module 2:** Historical Analysis in Political Economy:

Classical school, German school: Schmoller, Knapp, Weber etc. (12 Lectures, 20 Marks)

**Module 3:** Marginalist Methods of Analysis:

Emergence of Economics as a Science; A critical view (12 Lectures, 20 Marks)

**Module 4:** Positivism and the emergence of Economics as a discipline:

Menger to Hayek: the Austrian School. (12 Lectures, 20 Marks)

**Module 5:** General Theory to general equilibrium:

Keynes and beyond (12 Lectures, 20 Marks)

### **Mandatory Reading:**

Milonakis, Dimitris and Fine, Ben (2009): "From Political Economy to Economics: Method, the Social and the Historical in the Evolution of Economic Theory" Routledge, London.

### **Supplementary Reading**

1. Backhouse, Roger E. (1985): "A History of Modern Economic Analysis", Basil Blackwell, Oxford
2. Blaug, Mark (1997): "Economic Theory in Retrospect" Blaug, Cambridge University Press, Cambridge, U.K.
3. Blaug, Mark (1992): "The Methodology of Economics: Or How Economists Explain", Cambridge University Press, Cambridge, U.K.

**Paper Title:** Mathematical Techniques for Economics Analysis

**Paper code:** ECO-II.C-2

**Marks: 100**

**Credit: 4**

**Course Objectives:**

This course will raise the level and approach to teaching and learning economics by adequately emphasizing on concepts. This will help the students to understand economic reality in a structured manner. Further students who would like to specialize in applied branches will be better equipped. It will provide them with international dimension to academic studies by developing analytical and evaluative skill.

**Learning Outcome of the Course:**

On completing this course, the students will be able to improve their academic & professional competency. They will get equipped with mathematical techniques. Further they will create logical and analytical reasoning. It will help them build up a profession of high caliber.

**Course Duration:** Sixty lectures of one hour duration i.e. four lectures per week over a period of fifteen weeks of a semester.

**SYLLABUS**

**Module 1:** Importance of Mathematical and Statistical Methods in Economic Analysis

Review of some Concepts; Algebraic Expressions; Equations; Exponents; Graphs of Lines and Non-Linear Equations; System of Simultaneous Equations; properties of sets, number systems (5 lectures, 15 marks)

**Module 2:** Concept of Function and Types

Limit, Continuity and Derivatives; Rules of Differentiation; Marginal Concept; Marginal Cost; Revenue; Utility; Elasticities and Types; Partial and Total Differentiation and Applications. Some Simple Rules of Integration and Applications to Consumer's Surplus and Producer's Surplus (25 lectures, 35 marks)

**Module 3:** Problems of Maxima and Minima in Single and Multivariable Functions

Unconstrained and Constrained; Optimization in Simple Economic Problems. (20 lectures, 25 marks)

**Module 4:** Matrix Algebra

Determinants & input-output analysis (10 lectures, 25 marks)

**Mandatory Reading:**

Knut Sydsaeter and Peter J Hammond (2005): Mathematics for Economic Analysis; Pearson Educational Asia: 4<sup>th</sup> Indian reprint.

**Supplementary Reading:**

1. Chiang, A.C. & Kevin Wainwright (2005) Fourth Edition: Fundamental Methods of Mathematical Economics; McGraw-Hill.
2. Dowling, Edward T. (1992), Schaum's Outline of Theory and Problems of Introduction to Mathematics; 3<sup>rd</sup> Edition, McGraw-Hill



**Paper Title:** Economics of Growth and Development

**Paper Code:** ECO-II.C-3

**Marks:** 100

**Credits:** 4

**Course Objectives:**

The two basic objectives of this course are to give to students a global perspective of economic growth using traditional and contemporary theories on economic growth and development. Further this paper seeks to provide an insight into India's growth and development since the era of planned economic development.

**Learning outcome of the Course:**

On completing this course student will have a working knowledge of the phenomena of growth and development. They will also be able to understand and evaluate the relevant theories of economic growth and development. Further, they will be in a position to analyze India's development experience with unified planning.

**Course duration:** Sixty lectures of one hour duration i.e. four lectures per week over a period of fifteen weeks of a semester.

**SYLLABUS:**

**Module 1:** Growth and development (15 lectures, 25 marks)

Growth and development, Components, Indicators, Approaches to development: Traditional, New, Sen's capabilities approach, Institutional freedom as ends and means of development.

**Module 2:** Patterns of growth and development of development (15 lectures, 25 marks)

Growth and development in different countries, Critique of classical theories of development: Rostow's model, Lewis model; international dependence revolution: neoclassical dependence model, fake paradigm model: dualistic development models.

**Module 3:** New growth theories (15 lectures, 25 marks)

Exogenous growth theories: Solow model, Harrod-Domar model; Endogenous growth theories: Romer and Lucas endogenous model, Robinson model; Economic development as self discovery: Harrison, Rodrik, Velsacow model.

**Module 4:** India's development experience (15 lectures, 25 marks)

India's development journey from planning commission to NITI Aayog. India on the eve of planning, Nehru Mahalanobis growth and development model, Liberalization, Privatization and Globalization; Inclusive growth; Interstate variations in development, Case studies: Kerala and Gujarat Model; Economic development of Goa;

**Mandatory Readings:**

1. Todaro M, Smith S. (2013), Economic development, Pearson, Noida, India

Supplementary readings:

2. Thirlwall A., (2005), Growth and development: with special reference to developing economies, Palgrave, Macmillan, USA

3. Jones Charles (second edition) Introduction to economic growth, Viva book private limited, New York.
4. Hayami Y, (2005), Development economics: from the poverty to the wealth of nation, Oxford India, Paperback, India
5. Black J., (1991), Development in theory and practice: paradigms and paradoxes, Boulder, Westview, Colorado.
6. Ray Debraj, (2007) Development economics, Oxford India paperback, Noida, India.
7. Meir Gerald, Raich James (8th edition), Leading issues in economic development, Oxford university press, U.K.
8. Mishra & Puri (2013) Indian economy, Himalaya publishing house, Mumbai
9. Hirway I., Shaha Amita (2013) Growth or Development which way Gujarat is Going?, Oxford India Press, Noida, India.
10. Alternative survey group, Indian Political Economy Association (2010) Two decades of Neoliberalism, Daanish Books, Delhi, India.
11. George K.K., Kerala economy: growth, structure, strength and weaknesses (working paper no. 25) <http://csesindia.org/admin/modules/cms/docs/publication/25.pdf>

**Paper Title:** Empirical Techniques for Economic analysis.

**Paper code:** ECO-II.C-4

**Marks:** 100

**Course duration:** 60 Hours

**Credits:** 4

**Course objectives:**

1. To enable students to have a good understanding of the empirical methods and its application in economics.
2. To enable students to process the raw data by using soft techniques/tools to analyze economic phenomenon conclusively.
3. To provide them with competency not only in their professional arena but in academics also.

**Learning Outcomes:**

Upon completion of the course the students must be able to comfortably use quantitative techniques/skills for the purpose of analyzing economic issues pertaining to decision making.

**SYLLABUS:**

**Unit I: Population and Sampling**

**(Lectures 10)**

Meaning of population and sampling. Need for sampling, concept of ‘Good Sample’; Methods of sampling – probability and non-probability sampling; sampling techniques; Optimum sampling; Nyman’s sampling – problems to be solved based on sampling methods.

**Unit II: Correlation and regression**

**(Lectures 20)**

Karl Pearson’s coefficient of correlation and Spearman’s Rank coefficient of correlation; properties of Pearson’s coefficient of correlation; Linear regression – meaning, regression equations and lines. Focus on problem solving using MS EXCEL/Other spreadsheet.

**Unit III: Time Series & Index Numbers**

**(Lectures 10)**

Components of time series; fitting a trend; methods: semi-averages, moving averages and method of least squares; Weighted aggregative index numbers.

**Unit IV: Hypothesis testing**

**(Lectures 20)**

Why and How to make Hypothesis; level of significance, critical area; Type I and Type II errors, Z, t, F and  $\chi^2$  distribution; ANOVA (one way and two way).

**References:**

**Mandatory**

Arora, P.N. et.al. 2007, *Comprehensive Statistical Methods*, 1<sup>st</sup> edition, S. Chand, New Delhi.

**Supplementary**

Anderson, David R. et.al. *Statistics for Business and Economics*, Cengage Learning India Edition.

# **2016**

**Paper Title:** Microeconomics

**Paper Code:** ECO-III.C-5

**Marks:** 100

**Credits:** 4

## **Course Objectives:**

1. To familiarize students in pure theories.
2. To offer a strong base for studying applied economic theories and principles.
3. To familiarize students with market based decision making

## **Learning outcome:**

Upon successful completion of the course a student will be able to:

1. Develop solid grounding of basic principles in microeconomics.
2. Understand mathematical applications based on micro economic theory.
3. Apply the principles of Microeconomics to find solutions to societal problems arising from scarcity and choice.

**Course duration:** Sixty lectures of one hour duration i.e. four lectures per week over a period of fifteen weeks of a semester.

## **SYLLABUS:**

### **Unit I: Consumer Behaviour and Demand**

**(Lectures 15)**

Distinction between Cardinal and Ordinal Utility. Indifference Curves, Budget Line, Substitution Effect and Income Effect; Hicksian and Slutsky's Analysis; Changes in demand and Engel's Curve, Revealed preference theory.

### **Unit II: Production**

**(Lectures 10)**

Production function – AP and MP, Non- linear production function, Production with one variable input, Production with two variable inputs, Isoquants – MRTS-elasticity of factor substitution, Iso-cost line - Ridge Line, Returns to Scale.

### **Unit III: Cost and Revenue**

**(Lectures 10)**

Cost of Production, Behavior of cost, Short run and Long run Costs, Derivation of Average and marginal cost curves, Least cost input Combination, , Introduction to Modern Cost Curves: L shaped and J shaped cost curves.

Concepts of revenue: AR, MR, TR, Break-even analysis.

**Unit IV: Perfect Market Structure****(Lectures 10)**

Perfect markets, Behavior of profit maximizing firms and the production process; Price and output decisions; costs and output in short and long run, Pure competition, Role of time element in the determination of value.

**Unit V: Imperfect market structure****(Lectures 15)**

Nature and types of imperfect market structures, Assumptions, Conditions of imperfections, Imperfect markets: Monopoly and monopolistic competition; Introduction to oligopoly.

**References:**

1. Hubbard, R. G. and O'Brien, A. P. (2012), *Microeconomics*, Pearson, Delhi.
2. O'Sullivan, A., Sheffrin S. M. and Perez S. J. (2012). *Microeconomics, Principal, Application and tools*, Pearson, Delhi
3. Pindyck, Robert S and Rubinfeld, Daniel L. (2012)*Microeconomics*, Pearson, Delhi

**Paper title:** Macroeconomics

**Paper code:** ECO-IV.C- 6

**Marks:** 100

**Credit:** 4

### **Course Objectives and Rationale:**

The course gives the introduction to the macroeconomic fundamentals and to the main concepts and principles of macroeconomic theory and policy.

1. To familiarize students with the determinants of macroeconomic activities and policy.
2. To familiarize students with the main principals of macroeconomic analysis.

### **Learning Outcomes:**

Having completed this course the student is expected to have understood:

1. To identify the behavior of key macroeconomic variables.
2. To understand how economy works.
3. To understand the notion of long-run economic growth.

**Course duration:**Sixty lectures of one hour duration i.e. four lectures per week over a period of fifteen weeks of a semester.

### **SYLLABUS:**

#### **Unit I: Introduction to Macroeconomics (Lectures 10)**

Major Macroeconomic Issues: Business Cycle, Unemployment, Inflation, Long-run Economic Growth; Principles and Tools of Macroeconomic Analysis; Macroeconomic Variables; Long run and Short run Analysis in Macroeconomics.

#### **Unit II: National Accounts: Measuring Output and Income (Lectures 15)**

National income: concept and measurement: GDP, GNP, NDP, NNP; Methods of measurement: Value Added and Expenditure Approach; Price Indices and Deflator.

#### **Unit III: Keynesian macro-economic framework (Lectures 15)**

Keynesian analysis: Aggregate Demand- concepts, components and determinant's, Consumption Demand and its Determinants, Consumption Function and Consumption Line, Autonomous Consumption Demand, Marginal and Average Propensity to Consume, Saving Function and Saving Line, Marginal and Average Propensity to Save, Consumption Puzzle, Theories of Consumption, Investment Demand and its Determinants, Investment Function and Investment Demand Curve, Theories of Investment,

Aggregate Expenditures in the Closed Private Economy, Planned Expenditures and Actual Expenditures, The 45°line and Equilibrium Output in the Two-sector Model in the Short run ("Keynesian Cross Model"), Non-equilibrium Situations, Multiplier Effect of Autonomous Spending on Output.

#### **Unit IV: Monetarists framework**

**(Lecture 10)**

Origin of monetarist views: Milton Freidman; Origin of quantity theory of money.

#### **Unit V: The IS-LM Model**

**(Lectures 10)**

IS-LM equations, Dynamics in the IS-LM model, Fiscal policy-effectiveness and LM curve, Fiscal policy- effectiveness and IS curve, Monetary policy- effectiveness and IS curve, monetary policy- effectiveness of LM curve, paradox of thrift, Policy objectives.

#### **References:**

#### **Mandatory**

1. Begg, D., Dornbusch, R., Fischer, S. (2005) *Economics*, McGraw-Hill Book Co., London.
2. Mankiw, N.G. (2010) *Macroeconomics*, Worth Publishers, New York.

#### **Supplementary**

1. Lipsey, R.G.; Chrystal, K. A. (2007) *Economics*, Oxford University Press, Oxford.
2. Samuelson, P.; Nordhaus, William (2010) *Economics*, MacGraw Hill Education. Delhi

**Paper Title:** Indian Economy

**Paper Code:** ECO-III. E-1

**Marks:** 100

**Credits:** 04

**Course Rationale:**

India's transition from colonization to a mixed economy can be attributed largely to the 1991 reforms. This course is an essential component of study for students pursuing Economics in India to get an overview of the Indian economy, will provide an empirical foundation of the current position of India and understand and its position in the contemporary world.

**Course Objectives:**

1. To familiarize students with emerging issues and aspects of Indian economy.
2. To understand macroeconomic issues, policy framework, and challenges of the Indian economy.
3. To provide a post-liberalization perspective of the Indian Economy.

**Learning Outcomes:**

Upon successful completion of this course a student will be able to:

1. Gain an insight into the empirical foundations of the Indian economy.
2. To comprehend socio- economic concepts, issues and familiarize with program's implemented by the government and identify challenges faced by the economy.
3. Understand the economy of Goa and its sector wise development and further its contribution to Indian economy.
4. Know various macroeconomic issues and review the position of the economy in the globalised world.

**Course duration:**Sixty lectures of one hour duration i.e. four lectures per week over a period of fifteen weeks of a semester.

**SYLLABUS:**

**Unit I: Structural Changes in the Indian Economy**

**(Lectures 15)**

Pre reform period: India on the eve of independence, Need for planning, Structural adjustment programme: need, impact, Liberalization, Privatization, Globalization; Primary -Secondary - Tertiary sector Linkages – trends

**Unit II: Key issues and challenges of Indian Economy**

**(Lectures 15)**



Key issues: Population, poverty, inequality, unemployment; Challenges: Inclusive growth: social; Parallel Economy; Rural development, urbanization, migration; Environment & sustainable development.

### **Unit III: Policy Perspectives**

**(Lecture 12)**

Shift from Planning commission to NITI Ayog; Management decisions; Financial policies; Infrastructural development and investments; Swatch Bharat Abhiyan.

### **Unit IV: Economy of Goa**

**(Lectures 8)**

Structural trends in GSDP; Occupational shifts and trends post liberalization; Major sectors Role of micro Finance (Self help groups).

### **Unit IV: India's position in the world**

**(Lectures 10)**

Foreign Trade: Features and trends; Capital movements: FDI, FII, MNC's; WTO, Global position; Make in India.

### **References:**

#### **Mandatory**

1. Government of Goa: *Economic Survey* (various years), Directorate of Planning, Statistics and Evaluation, Panaji-Goa.
2. Government of India: *Economic Survey* (various years), Government of India, New Delhi.
3. Kumar, Arun. 2013, *Indian Economy Since Independence - Persisting Colonial Disruption*, Vision Books, Delhi.
4. Mishra, S.K and Puri, V.K. 2014, *Indian Economy Its Development Experience*, Himalaya Publishing House, Mumbai.
5. Prakesh, B.A. 2011, *The Indian Economy Since 1991 Economic Reforms and Performance*, Pearson Publication, Delhi.

#### **Supplementary**

- 1- Chaudhary, C.M. 2012, *Dynamics of Indian Economy*, Oxford book company, New Delhi.
- 2- Datt, R.; Sundaram. K.P.M. 2015, *Indian Economy*, S. Chand & Company Ltd., New Delhi.
- 3- Kapila, Uma. 2007, *India's Economic development since 1947*, Academic Foundation, New Delhi.
- 4- Rajan, K. 2006, *Indian Economy Post Reform Scenario*, Serials Publication, New Delhi.

**Paper Title:** Economics of Foreign Exchange

**Paper Code:** ECO-III.E-2

**Marks:** 100

**Credits:** 4

**Rationale for the Course:**

International integration and globalization is a phenomenon of the contemporary international economy. This has given rise not only to increased international commerce but also to large scale international resource movements. Convertible currencies and lowering of the barriers to resource movements are changing the way international economy is developing. It is important to understand these happenings.

**Course Objectives**

1. To familiarize the students with the theories and empirical evidence relating to exchange rates and international resource movements.
2. To develop strong foundations to deal with foreign exchange and international movement of resources.

**Learning Outcomes of the Course:**

On completing the course, the students will be able to appreciate:

1. The nature and dynamics of foreign exchange rates and markets,
2. The impact of fiscal and monetary policies on exchange rates and international resource movements,
3. The role of international financial institutions and multinational enterprises on the movement of financial as well as non-financial resources such as labour and technology.

**Course duration:** Sixty lectures of one hour duration i.e. four lectures per week over a period of fifteen weeks of a semester.

**SYLLABUS:**

**Unit I: Foreign Exchange and Exchange Rate Determination (Lectures 15)**

Foreign exchange market: types of foreign exchange transactions; inter-bank trade; traders run markets; foreign exchange quotations. Derivative markets: Forward and futures markets; Options. Exchange rate determination: Demand and supply of foreign exchange – appreciation and depreciation of currency; effective exchange rates; arbitrage; forward markets; interest arbitrage; Role of speculation in foreign exchange markets.

**Unit II: Exchange Rate Adjustments and the Balance of Payments (Lectures 15)**

Effects of exchange-rate changes on costs, prices; Effects of currency appreciation, depreciation and balance of payments; Devaluation and Revaluation: Requirements for a successful devaluation; Elasticity approach to ex-change rate adjustment; Absorption approach to exchange-rate adjustment; Monetary approach to exchange-rate adjustment.

**Unit III: Exchange Rate Systems and International Banking.** (Lectures 15)  
Exchange-rate practices; Fixed exchange rate systems; Floating exchange rates; Managed floating rates; Exchange controls. Nature of international reserves; International Monetary Fund and facilities for borrowing reserves; International Debt; World Bank; Euro-currency market.

**Unit IV: Exchange rate and International Resource Movement** (Lectures 15)  
Role of exchange rate and Movement of capital – International lending and borrowing; Foreign direct investment Foreign institutional investment. International movement of labour; Transfer of technology; Multinational enterprises.

**References:**

**Mandatory**

- 1- Carbaugh, Robert J. (2002), *International Economics*, South-Western (Thomson Publishing), Bangalore. (Latest available edition internationally 15<sup>th</sup> edition)

**Supplementary**

1. Krugman, Paul R.; Obstfeld, Maurice (2011), *International Economics: Theory and Policy*, Pearson, New Delhi.
2. Pilbeam, Keith (2013), *International Finance*, Palgrave Macmillan, London
3. Salvatore, Dominic (2014), *International Economics: Trade and Finance*, John Wiley & Sons, Delhi.

**Paper Title:** Emerging Market Economics

**Paper Code:** ECO-III.E-3

**Marks:** 100

**Credits:** 04

### **Course Objectives**

One of the most significant event that the world economy witnessed since the second half of the last decade is the rise of the emerging markets. After the global financial crisis and the prolonged crisis that the so developed world is going through currently, it is now clear that much will depend on how the Emerging market economies perform. This course is designed:

1. To understand the historical development of the emerging markets.
2. To understand the basis of their growth and its implications for the rest of the world.
3. To understand the role of the emerging markets in shaping the world economy.

### **Learning Outcomes**

Upon completion of the course, students are expected:

1. To identify the emerging market economies in the world economy.
2. To understand how the emerging markets have evolved over time.
3. To understand how different institutions function in these economies, and to identify the key factors behind their spectacular growth.
4. To explore how the emerging market economies interact with the rest of the world and their implications for the world economy as whole.
5. To enable students to understand and evaluate the overall growth process of the two major emerging markets India and China.

**Course duration:**Sixty lectures of one hour duration i.e. four lectures per week over a period of fifteen weeks of a semester.

### **SYLLABUS:**

#### **Unit I: Emerging market Economies: An overview**

**(Lectures 15)**

Concept and definition of the emerging markets, the historical background, Emerging market indices; Developed vs Emerging markets: the political economy of development, globalization, competitiveness and emerging markets.

#### **Unit II: Understanding Emerging Markets**

**(Lectures 15)**

Understanding BRICS: scope, purpose and importance; Emerging markets of Asia, Europe and Latin America: Importance, Growth and Evaluation.

#### **Unit III: Financialisation and Emerging Markets:**

**(Lectures 15)**

The process of financial liberalization and innovation in emerging markets, Forms & functions of finance in emerging markets, Global financial crisis and the emerging markets: Involvement, impact and recovery.

**Unit IV: The emerging markets of India and China:****(Lectures 15)**

Neo-liberalism and emergence of India as a market economy, Analysis of India's post reform growth, performance of Indian economy post 1997; Rise of China as a market economy: Economic policies since 1978, Emergence of China as a world leader in export: Evaluating the impact of technological and institutional factors..

**References:**

1. Grzegorz, W. Kolodko. (2003), *Globalization and Development*, Ashgate Publications, Aldershot.
2. Hoen, Herman W. (2014), *Globalization and institutional change: are emerging market economies in Europe and Asia converging?* Academic Publishers, Adleton.
3. Kohli, Harinder S, (2008), *Growth and Development in Emerging Market Economies: International Private Capital Flows, Financial Markets and Globalization*, Sage Publication India Pvt Ltd, Los Angles.
4. Zhu, Xiaodong, (2012), *Understanding China's growth: Past, Present and Future*. Journal of Economic Perspectives Vol 7, No.4, Pp 103-124.

**Journal Reference:**

1. Li, Hongbin, Li, Lei, Wu, Binzhen and Xiong, Yanyan. (2012), *The journal of Economic Perspectives* Vol 26, No.4, Pp 57-74.

**Paper title:** Regional Economics

**Paper Code:** ECO –III. E-4

**Marks:** 100

**Credits:** 04

**Course Objectives:**

1. To familiarize students with distribution of economic activities across space.
2. To familiarize students with market structures and migration patterns.
3. To sensitize students with the problems involved in regional growth.
4. To understand the impact of migration on regional development.

**Learning Outcomes:**

Upon successful completion of the course a student will be able to:

1. Differentiate between the different types of regions.
2. State the relevance of regional economics and its relationship with other disciplines.
3. Explain industrial clustering and firm site selection decisions using microeconomic theory.
4. Trace the evolution of cities and urban areas, including the economic incentives for their development.
5. Explain the problems of land, Wage flexibility & interregional migration etc.

**Course duration:** Sixty lectures of one hour duration i.e. four lectures per week over a period of fifteen weeks of a semester.

**SYLLABUS:**

**Unit I: Introduction**

**(Lectures 10)**

Regional economics: Meaning, Scope and Relevance; Types of regions: Homogeneous, heterogeneous; Regionalization: Development, planning & policies

**Unit II: Clustering & Agglomeration**

**(Lectures 10)**

Industrial clustering and returns to scale, Agglomeration economies: source, types, clustering & nature of transactions, Urban consumption, limited information, uncertainty and evolution of clusters.

**Unit III: Location theory and Economic activity**

**(Lectures 15)**

Webster's theory of industrial location, Moses' location production model, Thunen's theory of location of agricultural activities, Christaller and Losch's central place theory, General equilibrium & Hotelling principle.

**Unit IV: Problems of regional Economic growth**

**(Lectures 13)**

Land competition (bid rent model), mono centricity, land supply and landownership, labor markets, wage flexibility & interregional labor migration, Balance of payments and regional growth.

## **Unit V: Regional flows and economic growth**

(Lectures 12)

Commodity and Service v/s Monetary & Capital flows; Migration: Types, Causes, Ramifications, Measures; Regional Growth theory; Migration and Regional policy in India.

### **References:**

#### **Mandatory**

1. McCann, Philip. 2013, *Modern Urban and Regional Economics*, Oxford University press.
2. Shrivastava, O.S. 2009, *Regional Economics and Regional Planning*, Anmol Publications Pvt Ltd.

#### **Supplementary**

1. Hoover, Edgar M. and Giarratani. *An introduction to Regional Economics*, West Virginia university.
2. Hoover, Edgar M. 1968, *Spatial Economics: Partial Equilibrium Approach*, in Encyclopedia of the Social Sciences, Macmillan, New York.
3. Isard, Walter. 1956, *Location and Space-Economy*, The MIT Press, Cambridge.
4. Krugmen, Paul. *Geography and trade*, MIT press.
5. Martin, Beckmann. 1968, *Location Theory*, Random House, New York.
6. Moses, Leon. 1968, *Spatial Economics: General Equilibrium Approach*, in Encyclopedia of the Social Sciences, Macmillan, New York.
7. Nijkamp, Peter, Mill, S Edwin. 2007, *Handbook of Regional and Urban Economics: Regional economics*, North- Holland publishers.
8. Nourse, Hugh O. 1968, *Regional Economics*, McGraw-Hill, New York.
9. Richardson, W Harry. 1978, *The State of Regional Economics*, International Regional Science Review, Fall.
10. Webber, J Michael. 1972, *Impact of Uncertainty on Location*, MIT Press, Cambridge.
11. Woglom, W. H. 1954, *The Economics of Location*, Yale University Press, New Haven.

**Paper Title:** Economics and Governance

**Paper code:** ECO-IV.E-5

**Marks:** 100

**Credit:** 4

### **Course Rationale:**

In a democratic set-up it is feasible and desirable to carry out assessment of governance primarily due to the fact that globalization has not only opened up the economic frontiers of the nations but at the same time provided enormous opportunities for growth. Some of the bright spots of this development manifest in terms of freedom of expression and association, high level of political competition, proactive bureaucracy and subordination of law enforcing agencies to civilian government, heightened activities of the civil society etc. Flip side to this development is perhaps, the dominance of policies which separate the bottom strata of the population pyramid and evidently the corrupt practices associated with these opportunities. The issue of governance may not significantly matter as far as the developed economies are concerned, however, for the less developed and developing economies it is a matter required for accelerating economic development such as eradicating poverty and promoting inclusive growth. Lack of proper governance in developing countries has led to intervention of judiciary in executive and legislative matters, much against the established norms. Thus alternative institutional trajectories and their relationship with economic performance need to be explored.

### **Course Objectives:**

1. To provide an understanding of the role and interplay of democratic institutions in economic development.
2. To provide useful insight into the governance challenges and strategies
3. To develop critical mindset in assessing the role of non-economic factors contributing to economic development.

### **Learning Outcomes:**

1. Students will acquire sensitivity to issues of governance.
2. Students will get acquainted with the regulatory and review mechanism of governance.

**Course duration:** Sixty lectures of one hour duration i.e. four lectures per week over a period of fifteen weeks of a semester.

### **SYLLABUS:**

#### **Unit 1: Governance and growth interface (Lectures 15)**

The concept of governance and growth: Policies that make up economic environment for development of good governance; Role of social infrastructure to facilitate action-oriented and participatory development; state failure versus market failure.

#### **Unit 2: The issues of governance (Lectures 15)**

The issues of governance: Role of the State and other institutions; Strategies to address governance issues: provisions, effectiveness, challenges.



**Unit 3: Experiences of developed and developing countries****(Lectures 10)**

Experiences of developed and developing countries based on broad governance criteria, Lessons for broad-based growth.

**Unit 4: Governance in contemporary India****(Lectures 20)**

Need for good governance in India; Issues and challenges related to growth and governance.

**References:****Mandatory**

1. Dixit, Avinash K. *Lawlessness and Economics: Alternative Modes of Governance*, Princeton University Press.
2. William K. Tabb, *Economic Governance in the Age of Globalization*, University Press, Columbia.

**Supplementary**

1. Sen, Amartya 2000, *Development as Freedom*, Oxford University Press, Oxford.
2. Acemoglu, Daron. Robinson, James. 2006, *Economic Origins of Dictatorship and Democracy*, Cambridge University Press.

**Paper Title:** Entrepreneurship

**Paper Code:** ECO-IV.E-6

**Marks:** 100

**Credits:** 4

**Rationale for the Course:**

The employment seen is changing throughout the world and employment security is declining. With constraints to job expansion created by changes in the technological, economic and social conditions, job opportunities are declining. Young men and women passing out of colleges and universities are left to fend for themselves. In such a situation it is important to provide the youth with an opportunity to set up their own enterprises by providing them training in entrepreneurship.

**Course Objective:**

The key objective of this course is to provide the required skills to the students interested in pursuing entrepreneurship.

**Learning Outcomes of the Course:**

On completing the course, the students will be able to:

1. Identify and evaluate business opportunities,
2. Evaluate risks
3. Pursue innovations,
4. Understand the economics of entrepreneurship,
5. Prepare a business plan.

**Course duration:**Sixty lectures of one hour duration i.e. four lectures per week over a period of fifteen weeks of a semester.

**SYLLABUS:**

**Unit 1: Identifying and Evaluating Business Opportunities (Lectures 15)**

Analysis of Business Environment; Government Policies – Fiscal, Financial, Commercial, Environmental, Technological, and Labour Policies. Infrastructure and Local Environment; Generating alternative ideas; Market size and growth rates; market share; location and competition; Use of SWOT and Porter's Four Forces Analysis; Techno-economic feasibility, Technology and resources/materials.

**Unit 2: Risk and Innovation (Lectures 10)**

Importance and management of risk; market/commercial risk, technological risk, financial risk, social risk, political risk, personal risk; Differences between Risk and Uncertainty; Schumpeter's, Drucker's and other's views; Types and forms of innovations; innovative imitation; Imitation; Patents and Copyrights.

**Unit 3: Sources, Uses and Management of Resources****Lectures 10)**

Financial Resources - Sources of funds; Uses of funds; Fixed and Working Capital; Material Resources: Supply and distribution chains; Government and local resources; Human Resources.

**Unit 4: Costing, Pricing and Marketing****(Lectures 10)**

Costing Strategies – Absorption and marginal costing; Costing for inventories; Pricing and pricing strategies(skimming price, penetration price, mark-up, marginal-cost price); Break- even analysis and break- even chart. Marketing techniques and strategies.

**Unit 5: Preparing the Business Plan****(Lectures 15)**

Components and Uses of the Business Plan; Creating a Business Plan; Sources of funds; Marketing Plan Expenditures and Revenues; Profitability; Growth Rate of the business and the Rate of Return.

**References:****Mandatory**

1. Charantimath, Poornima M. (2014), *Entrepreneurship Development and Small Business Enterprises*, Pearson, Chennai.
2. Colombo Plan Staff College for Technical Education, Manila (1999), *Entrepreneurship Development*, Tata McGraw Hill, New Delhi.

**Supplementary**

- 1- Chandra, Prasana (1995), *Projects: Planning, Analysis, Selection, Implementation & Review*, Tata McGraw Hill, New Delhi.
- 2- Kuriloff, Arthur H; Hemphill, John M. (1988), *Starting and Managing the Small Business*, McGraw-Hill, New York.

**Paper Title:** Accounting for Non-Accountants

**Paper Code:** ECO-IV.E-7

**Marks:** 100

**Credits:** 4

**Course Objectives / Rationale for the Course:**

Understanding of the accounting language and reading, using and interpreting accounting statements is a very important requirement for the economic profession of today. The evolution of specialized areas of economics as financial economics, project planning and evaluation, international trade and resources movements, etc. requires the familiarization with accounting data. This is the spirit behind the introduction of this paper as an elective that should be available to economics students.

The key objective of this course is to provide the students an exposure to the accounting discipline and help them to understand the language of accounting.

**Learning Outcomes of the Course:**

On completing the course, the students will be able to understand the accounting process, appreciate various issues in accounting, understanding the nature of final accounts, and be able to resolve the differences between financial accounting, cost accounting and management accounting.

**Course duration:**Sixty lectures of one hour duration i.e. four lectures per week over a period of fifteen weeks of a semester.

**SYLLABUS:**

**Module 1: The Accounting Process (Lectures 15)**

Theoretical Framework of Accounting; Generally Accepted Accounting Principles, Concepts and Conventions; Capital and Revenue transactions: capital and revenue expenditures, capital and revenue receipts; Measurement, Valuation and Accounting estimates; Double entry system, Books of prime entry, Subsidiary Books; Recording of Cash and Bank transactions; Preparation of Ledger Accounts; Preparation of Trial Balance- interpretation and usefulness; Rectification of Errors; Opening entries, Transfer entries, Adjustment entries, Closing entries.

**Module 2: Issues in Accounting (Lectures 10)**

Reconciliation Statements and Accounting for Depreciation: Bank Reconciliation Statement; Receivables / Payables Reconciliation Statement; Stock Reconciliation Statement. Depreciation Policy; Methods, Computation and Accounting treatment.

**Module 3: Preparation of Final Accounts (Lectures 15)**

Profit making concern: ( for sole proprietorship concern and partnership firm only): Preparation of Trading Account, Profit & Loss Account and Balance Sheet; Accounting treatment of bad debts, reserve for bad and doubtful debts, provision for discount on debtors and provision for discount on creditors.

Not-for- Profit making concern: Preparation of Receipts and Payments Account; Preparation of Income and Expenditure Account; Preparation of Balance Sheet.

**Module 4: Fundamentals of Cost Accounting****(Lectures 12)**

Cost and Management Accounting – Generally Accepted Cost Accounting Principles; Accounting for Material cost (including Accounting of Inventory – LIFO, FIFO, Weighted, Average Cost Methods); Accounting for Labour costs, Direct Expenses and Overheads. Preparation of Cost Statements: Cost Data collection, Cost Sheet formats; Preparation of Cost Sheets (historical cost sheets and estimated cost sheets).

**Module 5: Fundamentals of Management Accounting****(Lectures 8)**

Marginal Costing and Break- even analysis – basic knowledge; Application of Marginal Costing for decision-making.

**References:**

- 1- Gibson, Charles H. (2013), *Financial statement Analysis*, Cengage Learning, Delhi.
- 2- Singal, Santosh (2012), *Accounting and Financial Analysis*, International Book House, New Delhi.

**Paper Title:** Economics and Law

**Paper Code:** ECO-IV.E-8

**Marks:** 100

**Credits:** 04

**Course Objectives:**

The discipline of law and economics uses economic ideas to understand behavioral consequences of introduction of or changes in legal rules.

1. To understand how legal arrangements enable or impede functioning of market.
2. To facilitate students to understand the inter-relationship between the two disciplines law and economics.
3. To critically evaluate the implications of the existing legal provision on the overall economic performance.

**Learning Outcomes:**

Upon successful completion of this course a student will:

- 1- Gain extensive knowledge of present economic laws that regulates different aspects of Indian economy.
- 2- Be able to evaluate the interplay between law and economics.

**Course duration:** Sixty lectures of one hour duration i.e. four lectures per week over a period of fifteen weeks of a semester.

**SYLLABUS:**

**Unit I: An Introduction to Law and Economics**

**(Lectures 20)**

Economic analysis of law: Interrelationship between economics and law; The civil law and the common law tradition, Legal structure in India; Disputes and settlements; A brief introduction to different types of law: Property law, Contract law, Criminal law and Law of Torts.

**Unit II: Economic theory of property rights**

**(Lectures 15)**

Origin of the institution of property; Legal concept of property, Bargaining theory; Economic theory of property; Establishment and verification of property rights, Conflicting property rights, Public and private property, the public use of private property. The tragedy of the common property resources, Taking Property: Eminent domain.

**Unit III: Evaluation of the existing property laws**

**(Lectures 15)**

Intellectual Property Rights: Importance; Intellectual Property Rights and World Trade Organization. Copyrights Act, 1957: Purpose; Ownership of Copyrights; Rights of Owners and Rights of Others; Registration of Copyrights and its Infringement; Remedies under Copyrights Act. Patents Act, 1970: background; Concept of Patent; Procedural aspects of filing of patents; Procedure after filing of Patents; Other provisions of the Act.

#### **Unit IV: Economic laws in India**

**(Lectures 10)**

Consumer Protection Act, 1986: Purpose, Salient Features, Organisational set-up; Grievance Redressal Mechanism. Competition Act, 2002 Purpose; Salient Features; Complaint; Procedures for redressal, Essential Commodities Act, 1955: Purpose; Scope; Penalties and Prosecution; Repeals and Savings; FEMA, Geographical indications of Goods Act.

#### **References:**

1. Cooter, Robert and Ulen, Thomas. (2011), *An Introduction to Law and Economics*, 6th ed Pearson Series in Economics
2. Gopalakrishnan, K.C. 2002, *Legal Economics (Interactional Dimensions- Economics and Law)*, Eastern Book Company, Lucknow.
3. Granstrand, Ove. 2003, *Law and Intellectual Property: Seeking Strategies for Research and Teaching in a Developing Field*, Kluwer Academic Publishers, Boston.
4. Medema, Steven G., Mercurio, Nicholas. 1998, *Economics and the Law: From Posner to Post-Modernism*, Princeton University Press, Princeton, New Jersey.
5. Reddy, G. B. 2002, *Law of Consumer Protection in India*, Gogia Law Agency, Hyderabad.
6. Wadehra, B. L. 2003, *Intellectual Property Law Handbook: Law Relating to Patents, Trade Marks, Copyrights, Design & Geographical Indications*, Universal Law Publishing Co, Delhi.

## **2017**

**Course Title: Public Economics**

**Course Code: ECO-V.C-7**

**Marks: 100**

**Credits: 04**

**Hours: 60**

### **Course Objective:**

1. To orient students towards investigating the role of the public sector.
2. To provide analytical tools and apply them to analyse key issues relating to public revenue and public spending.

### **Learning Outcomes:**

Upon completion of this course the students will be able to:

1. Understand the central concepts and basic models of modern public economics.
2. Analyse and evaluate fiscal operations of the government.

## **SYLLABUS**

### **Unit 1: Issues in Public Economics**

**(15 Hours)**

Nature of the Public Economy – Public economy and markets – Pareto optimality and Market failure – fundamental theorem of welfare – Cases of violation of Pareto optimality, Asymmetric information and market failure – the problem of externality and their internalization.

### **Unit 2: Theory of Public goods**

**(15 Hours)**

Public Choice theory – Public goods – Bowen model, Pigou model and Samuelson model, Empirical theories of public goods: Wagner hypothesis, Wiseman-peacock hypothesis, Preference revelation mechanism for public goods.

### **Unit 3: Public Revenue and Expenditure**

**(15 Hours)**

Principles of Taxation and classification of taxes – Impact and incidence of taxes - Partial and general equilibrium, examples – Excess burden of tax.Principles of expenditure and classification of expenditure.

### **Unit 4: Public debt**

**(15 Hours)**

Causes and Challenges of public debt; Debt sustainability analysis, Burden of public debt: Modigliani's burden thesis; debt trap. Internal and External debt.

### **References:**

1. Atkinson, A.B and. Stiglitz J.E (2015), *Lectures on Public Economics*, McGraw–Hill, New York.
2. Musgrave, R. A. (1959), *The Theory of Public Finance*, McGraw Hill, New York.
3. Musgrave, R. and Musgrave P. (2004), *Public Finance in Theory and Practice*, McGraw–Hill.
4. Houghton, R.W. (1970), *Public Finance: Selected readings*, Penguin Books.



**Course Title: International Trade and Policy**

**Course Code: ECO-VI.C-8**

**Marks: 100**

**Credits: 4**

**Duration: 60 Hours**

**Course Objectives:**

1. To provide theoretical foundations for analysing international trade.
2. To sensitize students on trade related issues and mechanisms.

**Learning Outcomes:**

On completing the course, the students will be able to:

1. Understand the nature and pattern of international trade.
2. Recognize the complex issues surrounding international trade.
3. Predict the course of trade and trade outcomes.

**SYLLABUS**

**Unit 1: Classical Trade Theories (15 Hours)**

Absolute Advantage; Comparative Advantage Theory and its refinements; Reciprocal demand and the international equilibrium model; Gains from Trade and Terms of Trade.

**Unit 2: Modern Trade Theories and Extensions (15 Hours)**

Factor-Endowments (Heckscher-Ohlin) Theory; Factor-price Equalisation Theorem; Leontief Paradox; Factor Intensity Reversal; Intra-industry Trade: Trade based on Economies of Scale; Differentiated Products; Technological Gaps; Product Cycles; Differences in Tastes. Trade in Goods and Services.

**Unit 3: Trade Barriers (15 Hours)**

Tariffs – Types and Effects; Non-tariff Barriers: Quotas; Exchange Controls; Dual Exchange Rates; Discriminatory Procurement; Eco Labelling; Other Human-rights and Health and Hygiene Safeguards. Dumping; Voluntary Export Restraints; Export Subsidies; Counter trade; International Cartels.

**Unit 4: Trade Issues of Developing Countries and Emerging Markets (15 Hours)**

Trade as an engine of Growth; Factors influencing Terms of Trade of Developing Countries; Prebisch-Singer Thesis; Immiserising growth; Trade Disputes and WTO; Strategic trade policies; Regional Economic Integration and Globalization; Emerging Markets and Global Resource Movements; Multinational enterprises and world trade.

**References:**

**Mandatory:**

1. Carbaugh, Robert J. (2002), *International Economics*, South-Western (Thomson Publishing), Bangalore, 8<sup>th</sup> edition (Latest available 15<sup>th</sup> edition)

**Supplementary:**

1. Krugman, Paul R.; Obstfeld, Maurice (2011), *International Economics: Theory and Policy*, Pearson, New Delhi.
2. Salvatore, Dominic (2014), *International Economics: Trade and Finance*, John Wiley & Sons, Delhi

**Course Title: Indian Economy**

**Course Code: ECO- E-1**

**Marks: 100**

**Credits: 04**

**Duration: 60 Hours**

**Course Objectives:**

1. To familiarize students with emerging issues and aspects of Indian economy.
2. To understand macroeconomic issues, policy framework, and challenges of the Indian economy.
3. To provide a post-liberalization perspective of the Indian Economy.

**Course Outcomes:** upon completion of the course students will be able to

**CO1:** Describe structural changes in Indian economy from Independence till globalization.

**CO2:** Identify & explain key issues & challenges faced by Indian economy.

**CO3:** Interpret the policy perspectives with regard to Indian economy.

**CO4:** Examine structure of Goa's economy & compare the same with Indian economy.

**CO5:** Review India's position with regard to foreign trade FDI, FII, MNC's; WTO globally.

**CO6:** Appraise the status of Indian economy with regard to current economic situation.

**SYLLABUS**

**Unit 1: Structural Changes in the Indian Economy (15 Hours)**

Pre reform period: India on the eve of independence; Need for planning, Structural adjustment programme: need, impact, Liberalization, Privatization, Globalization; Primary, Secondary, Tertiary sector Linkages : trends

**Unit 2: Key Issues and Challenges of Indian Economy (15 Hours)**

Key issues: Population, poverty, inequality, unemployment; Challenges: Inclusive growth: social; Parallel Economy; Rural development, urbanization, migration; Environment & sustainable development.

**Unit 3: Policy Perspectives (12 Hours)**

Shift from Planning commission to NITI Ayog; Impact of policy shifts on decisions: finance, infrastructure, investments; Flagship Missions of GOI.

**Unit 4: Economy of Goa (8 Hours)**

Structural trends in GSDP; Contribution of major sectors, Occupational shifts and demographic trends.

**Unit 5: India's Position in the World (10 Hours)**

Foreign Trade: Features and trends; Capital movements: FDI, FII, MNC's; WTO; India's position in the world economy.

**References:**

**Mandatory:**

1. Government of India: *Economic Survey* (various years), Government of India, New Delhi.

**Supplementary:**

1. Government of Goa: *Economic Survey* (various years), Directorate of Planning, Statistics and Evaluation, Panaji-Goa.
2. Chaudhary, C.M. (2012), *Dynamics of Indian Economy*, Oxford book company, New Delhi.

3. Datt, R.; Sundaram. K.P.M. (2018), *Indian Economy*, S. Chand & Company Ltd., New Delhi.
4. Kapila, Uma. (2007), *India's Economic development since 1947*, Academic Foundation, New Delhi.
5. Rajan, K. (2006), *Indian Economy Post Reform Scenario*, Serials Publication, New Delhi.

**Course Title: Actuarial Economics**

**Course Code: ECO-E-11**

**Marks: 100**

**Credit: 4**

**Duration: 60 Hours**

**Course Objectives:**

The objectives of the course include the following:

1. To provide tools for analysing insurance and insurance risks.
2. To develop expertise in students that is relevant for research and training in insurance companies.
3. To acquaint students to a wide range of decision making processes used for financial planning and management.

**Course Outcomes:** upon completion of the course students will be able to:

**CO1:** Understand concepts in actuarial economics

**CO2:** Identify the changes in financial sector due to globalization;

**CO3:** Calculate annuity and types of annuity.

**CO4:** Interpret life table for the purpose of calculation of premium.

**CO5:** Apply probability theory to insurance

**CO6:** Outline the role of regulatory bodies like IRDA

**SYLLABUS**

**Unit 1: Introduction to Actuarial Economics (5 Hours)**

Origin, nature and scope of Actuarial Economics : Its importance; Link between financial planning and risk management; Utility and risk preference.

**Unit 2: Annuity and its Calculations (12 Hours)**

Annuity: ordinary annuity, annuity due, deferred annuity; Perpetuity: present value of immediate perpetuity, present value of perpetuity due, deferred perpetuity; annuity with frequency different from that with which interest is convertible; varying rates of interest; redemption of loan; average interest yield on the life fund.

**Unit 3: Pricing (15 Hours)**

Basic elements in computation of life insurance premium; premium calculation; formulae for calculation of net premium.

**Unit 4: Mortality Tables (14 Hours)**

Probability theory in insurance; mortality table; types: select and ultimate tables; stages involved in construction of mortality table.

**Unit 5: Product Design and Actuarial Profession (14 Hours)**

Basic methodology and setting assumptions; product design; actuarial standards and regulations, role of IRDA.

**References:**

**Mandatory:** Mishra K.C. & Kumar C.S., (2009), *Elements of Actuarial Science*, Cengage Learning, Delhi

**Supplementary:**

1. Booth, P.M. et al., (1999), *Modern Actuarial Theory and Practice*, Chapman and Hall, London
2. Newton Bowers et al., (1997), *Actuarial Mathematics*, Society of Actuaries, (second edition), Illinois.
3. Sherris, Michael, (2001), *Principles of Actuarial Science*, **PDF**

**Course Title: Microeconomic Analysis**

**Course Code: ECO-E-12**

**Marks: 100**

**Credits: 4**

**Duration: 60 Hours**

**Course Objective:**

1. To study economic theories of distribution, general equilibrium, welfare and market failure.

**Course outcomes:** Upon completion of the course students will be able to:

**CO1:** Outline the theory of oligopoly.

**CO2:** Classify and describe pricing policies in competitive and non competitive market structures.

**CO3:** Define general equilibrium & welfare economics.

**CO4:** Compare & contrast partial equilibrium with general equilibrium.

**CO5:** Examine facets of welfare economics.

**CO6:** Evaluate given economic situation through tools of microeconomic analysis.

**SYLLABUS**

**Unit 1: Oligopoly**

**(15 Hours)**

Cournot & kinked demand curve models, Collusion: cartel & price leadership model; long run adjustments & efficiency implications of oligopoly; other oligopolistic pricing practices; Prisoners' dilemma; Price & non price competition & cartel cheating.

**Unit 2: Pricing & employment of inputs**

**(15 Hours)**

Perfect competition: Demand & supply curve for input, pricing & employment of input; analysis of labor market; Imperfect competition: Demand curve of firm for an input, monopsony pricing & employment of one variable input; analysis of imperfect input markets.

**Unit 3: Equilibrium Analysis**

**(15 Hours)**

Partial equilibrium; Walrasian general equilibrium of exchange & production; Pareto optimality; perfect competition; economic efficiency & equity; Rawl's theory of justice.

**Unit 4: Welfare Economics**

**(15 Hours)**

Pigouvian welfare economics; Utility possibility frontier, Pareto optimal conditions; Value judgment; Social welfare, Social policy criteria: Compensation principle, Arrow's impossibility theorem; Inability to obtain optimum welfare: Imperfections, market failure, decreasing costs, uncertainty and non-existent and incomplete markets.

**References:**

**Mandatory:**

1. Salvatore, Dominick, Principles of Microeconomics, Oxford International student edition, Eighth Edition

**Supplementary:**

1. Gravelle, H and Ray Rees, (2004), *Microeconomics*, Pearson Education Limited, England.
2. Hal R Varian, (2010), *Microeconomic Analysis*, W W Norton & Company, New York.
3. Mas-colell, A, Michael D. Wiston and Jerry G. Green (1995), *Microeconomics*, 3rd edition, Prentice Hall Longman, London.
4. Sen, A.,(1999), *Microeconomic Theory*, OUP, New York.
5. Stigler, G., (1996), *Microeconomics: Theory and Applications*, Oxford University Press, New Delhi.
6. Varian, H., (2004),*Theory of Price*, (4th Edition), Prentice Hall of India, New Delhi.

**Course Title: Introduction to Econometrics**

**Course Code: ECO- E-9**

**Marks: 100**

**Credits: 4**

**Duration: 60 Hours**

### **Course Objectives:**

The key objectives of this course are:

1. To acquaint the students with the tools of econometrics.
2. To help students to make estimates about the dependent variable, to test the hypothesis about the dependent variables and to forecast changes in the dependent variables.

### **Learning Outcomes:**

On completing the course, the students will be able:

1. To understand the methodology of econometrics.
2. Use econometric tools to make estimates, forecasts and test the hypothesis relating to the dependent variable.

## **SYLLABUS**

### **Unit 1: Nature and Scope of Econometrics (3 Hours)**

Theoretical and Empirical Econometrics; Methodology of Econometrics; Econometrics and Samples; Small and Large Samples; Scope: Estimating, Testing, Forecasting.

### **Unit 2: Basic Ideas of Linear Regression: The Two-Variable Model (15 Hours)**

Population Regression Function; Classical Linear Regression Model. Linear Regression Method: Sample Regression Function, Meaning of "Linear" Regression. Method of Ordinary Least Squares for Two-variable regression; Least Squares Residuals, Variances and Standard Errors of Ordinary Least Squares [OLS] Estimators; BLUE Properties of OLS Estimators: The Gauss-Markov Theorem.

### **Unit 3: The Two-Variable Model: Hypothesis Testing. (12 Hours)**

Hypothesis Testing: Test of Significance Approach; Confidence Interval Approach; Analysis of Variance and Correlation: Sum of Squares; Use of ANOVA and F-ratio to Test the Regression Equation; Use of  $r^2$  to obtain the Goodness of Fit.

### **Unit 4: Multiple Regression: Estimation and Hypothesis Testing (15 Hours)**

Three-variable Regression Model; Meaning of Partial Regression Coefficients; Assumptions of the Classical Linear (Multiple) Regression Model. Multiple Regression Equation; Estimation of Parameters of Multiple Regression, (OLS Estimators); Variances and Standard errors of OLS Estimators. Properties of OLS Estimators of Multiple Regression. Testing the slope of an individual estimator; Testing the Regression Equation. F test, R Square, Adjusted R Square, Comparing two  $R^2$  Values. Partial Correlation.

### **Unit 5: Multiple Regression Problems and Forecasting (15 Hours)**

Multicollinearity: Perfect and Imperfect Multicollinearity; Consequences of Multicollinearity, Detection of Multicollinearity, Corrections for Multicollinearity. Heteroscedasticity; Nature of Heteroscedasticity, Consequences of Heteroscedasticity, Detection of Heteroscedasticity, Corrections for Heteroscedasticity. Serial Correlation; Nature of Serial Correlation, Consequences of Serial Correlation, Detection of Serial Correlation, Corrections for Serial Correlation. Regression on Dummy Explanatory Variables. Forecasting with a Single-Equation Regression Model.

Important Note: The course entails the use of software to run regressions.

**References:**

**Mandatory:**

1. Gujarati, Damodar N. (1995), *Basic Econometrics*, McGraw Hill, Singapore.
2. Gujarati, Damodar N. (1999), *Essentials of Econometrics*, Irwin/McGraw Hill, Singapore.
3. Pindyck, Robert S. and Rubinfeld, D.L. (1991), *Econometric Models & Economic Forecasts*, McGraw Hill, Singapore.

**Supplementary:**

1. Hebden, J. (1983), *Applications of Econometrics*, Heritage Publishers, New Delhi.
2. Johnston, J. & J.D. Nardo (1997), *Econometric Methods*, McGraw Hill, New York.
3. Kennedy, P. (1998), *A Guide to Econometrics*, MIT Press, Cambridge, MA.
4. Kmenta, J. (1997), *Elements of Econometrics*, University of Michigan Press, New York.
5. Kuotsoyiannis A. (1977), *Theory of Econometrics*, Macmillan, London.
6. Levin, Richard I. (1984), *Statistics for Management*, Prentice-Hall of India, New Delhi.
7. Maddala, G.S. (1997), *Econometrics*, McGraw Hill, New York
8. Ramanathan, Ramu (2002), *Introductory Econometrics with Applications*, Thomson Asia Pte Ltd., Singapore.
9. Studenmund, A. H. (1997), *Using Econometrics: A Practical Guide*, Adisson-Wesley, Reading, Mass.



**Course Title: Labour Economics**

**Course Code: ECO-E-13**

**Marks: 100**

**Credits: 04**

**Duration: 60 Hours**

**Course Objectives:**

1. To understand the importance of labour economics in enhancing labour productivity.
2. To understand the functioning of labour markets.
3. To understand the dynamics of labour markets in the context of globalization.

**Learning Outcomes:**

On completion of the course students will:

1. Use economic tools to suggest measures for enhancing labour productivity.
2. Analyse functioning of labour markets and wage determination.
3. Understand the policies and dynamics of labour markets in context of the globalized world.

**SYLLABUS**

**Unit 1: An Introduction to Labour Economics (10 Hours)**

Labour - Concept, significance and peculiarities. Nature, scope and importance of Labour Economics. Labour Markets: positive and normative aspects – Characteristics of Indian labour markets.

**Unit 2: Efficiency of Labour (16 Hours)**

Determinants of Labour efficiency: Wages, education and training, other factors; Determination of wages – minimum wage and fair wage, alternative pay schemes, incentives; Investing in Education and Human Capital Formation; school inputs, school quality, student and teacher incentives, Human capital policy; training program; Competition and regulation.

**Unit 3: Labour Welfare (12 Hours)**

Social security; need, statutory and non-statutory welfare measures, un-employment insurance, labour welfare funds – Health and insurance schemes.

**Unit 4: Labour Market Policies in India (12 Hours)**

Exit Policy; Child Labour Policy in India; Problems and Policy of Female Workers in India, Contract Labour.

**Unit 5: Trade, globalization and labour markets (10 Hours)**

Global dimension of human resource. Perspectives and emerging issues in employer-employee relations in India consequent to economic liberalization and globalization. Brain drain and brain gain.

**Reference:**

1. Datt, G (1996), *Bargaining Power, Wages and Employment : An Analysis of Agricultural, Labour : Markets in India*, Sage Publications, New Delhi
2. Hajela, P.D. (1998), *Labour Restructuring in India: A Critique of the New Economic Policies*, Commonwealth Publishers, New Delhi.
3. Jhabvala, R. and R.K. Subrahmanya (Eds) (2000), *The Unorganised Sector: Work Security and Social Protection*, Sage Publications, New Delhi.
4. McConnell, C.R. And S.L. Brue (2009), *Contemporary Labour Economics*, McGraw-Hill, New York.
5. Papola, T.S.P.P. Ghosh and A.N.Sharma(Eds) (1993), *Labour, Employment and Industrial Relations in India*, B.R.Publishing Corporation, New Delhi.

6. Ronald G. Ehrenberg and Robert S. Smith (2012), *Modern Labor Economics: Theory and Public Policy*, Pearson Publication, Prentice Hall Boston.
7. T.N.Srinivasan (Eds) *The Handbook of Development Economics North Holland*, New York.
8. VenkataRatnam, C.S. (2001), *Globalization and Labour- Management Relations Dynamics of Changes*, Sage Publications/Response Books, New Delhi.

**Course Title: Environmental Economics**

**Course Code: ECO- E-14**

**Marks: 100**

**Credits: 4**

**Duration: 60 Hours**

**Course Objectives:**

1. To use economic approach to study environmental issues.
2. To assess environmental policy instruments.

**Learning Outcomes:**

Upon completion of this course students will be able to:

1. Understand the concepts related to environmental economics.
2. Apply economic tools to environmental management.

**SYLLABUS**

**Unit 1: Economics and the Environment (15 Hours)**

Economic Perspectives on the Environment; National Income and Environmental Accounting; Economic activity and problem of residuals, Issues of Environmental economics; Externality and Market Failure.

**Unit 2: Economics of Environmental Quality (15 Hours)**

Pollution Damage and Abatement Costs; damage and ambient functions; Efficient Level of Emissions; Application of Equi-marginal Principle to Emission Reductions; Enforcement Cost; Pollution control models.

**Unit 3: Environmental Evaluation (15 Hours)**

Use and non-use value of environmental resources; Market and non-market evaluation techniques; Impact analysis, Cost-effectiveness analysis, Benefits and Costs analysis.

**Unit 4: Environmental Policy (15 Hours)**

Criteria for Evaluating Environmental Policies, Decentralized Policies: Liability Laws, Property Rights, Moral Suasion, Command-and-Control Strategies: The Case of Standards; Incentive-Based Strategies: Emission Charges and Subsidies, Transferable Discharge Permits.

**References:**

1. Field, Berry and Field, Martha (2001), *Environmental Economics*, McGraw-Hill/Irwin
2. Hanely, Nick, Shorgen, Jason F. and White, Ben (1999), *Environmental Economics: In Theory and Practise*, MacMillian.
3. Kolstad, C, D. (2003), *Environmental Economics*, Oxford University Press.
4. Matthew Kahn, *Fundamentals of Environmental Economics: Solving Urban Pollution Problems*, (Kindle Edition).
5. Titenberg Tom and Lynne, Lewis (2012), *Environmental and Natural resource economics*, 9<sup>th</sup> edition, Pearson
6. Wallace Oates (Editor) (2006), *The RFF Reader in Environmental and Resource Policy*, 2nd edition, RFF Press

**Course Title: Financial Economics**

**Course Code: ECO- E-16**

**Marks: 100**

**Credits: 04**

**Duration: 60 Hours**

**Course Objectives:**

1. To familiarize students with the different types of financial instruments and techniques of asset management.
2. To provide understanding about different aspects of corporate finance.

**Learning Outcomes:**

On completion of the course the students will:

1. Gain a thorough understanding of how the financial market functions.
2. Be able to understand the standard models to benchmark valuation of assets.

**SYLLABUS**

**Unit 1: Types of Financial Securities (10 Hours)**

Types of money market securities; Capital market securities: common and preferred stock; Rights and Warrants; Bonds: corporate, government and public sector bonds; Mutual funds.

**Unit 2: Valuation of Financial Securities (20 Hours)**

Discount rates and the time value of money: Present value (PV) and net present value (NPV); Mechanics of NPV calculations; Compound interest, annuity and perpetuity formulas; Real vs. nominal cash flows, Fixed-income markets, Bond Valuation; Discount bond and Coupon bond.

**Unit 3: Return and Risk Analysis (20 Hours)**

Investment and returns: Interest rates, dividends, capital gains; Time value of money; Inflation and returns; Measuring investment returns; Risk and Risk factors; Measuring investment risks; Diversification; Systematic and idiosyncratic risk; Portfolio mean and variance; Covariance and correlation of returns; Feasible combinations of mean and variance; Portfolio optimization; Efficient risk/return trade-offs.

**Unit 4: Financial Statement Analysis (10 Hours)**

Introduction to Financial Statements; Importance of Financial ratios; Calculations and Interpretation of Liquidity ratios, Leverage ratios, Turnover ratios, Profitability ratios, Capital Gearing ratios – Limitations.

**References:**

1. Bodie, Zvi Kane, Alex Marcus Alan (2012), *Essentials of Investments, 9<sup>th</sup> Edition*, McGraw Hill Higher Education.
2. Francis J C & R.W Taylor (1992), *Theory and Problems of Investments*, McGraw Hill, Schaum's Outline Series, Singapore.
3. Kohn, Meir (1994), *Financial Institutions and Markets*, McGraw Hill, New York.
4. Richard A. Brealey and Stewart C. Myers (2002), *Principles of Corporate Finance*, McGrawHill, 7th edition.
5. Thomas E. Copeland, J. Fred Weston and KuldeepShastri (2003), *Financial Theory and Corporate Policy*, Prentice Hall, 4th edition.

**Course Title: Macroeconomic Analysis**

**Course Code: ECO- E-17**

**Marks: 100**

**Credit: 4**

**Duration: 60 Hours**

**Course Objectives:**

1. To understand macroeconomic performance and aggregate economic activity.
2. To evaluate determinants of economic progress and economic decisions made by policymakers and to use the intuitive analysis of economic process.
3. To introduce to the principles of solving macroeconomic problems, interpretation and analysis of the economic facts.

**Learning Outcome:**

Having completed this course the student is expected to have understood:

1. The notion, structure, key macroeconomic variables, determinants and the Keynesian framework.
2. Role of government, consequences of fiscal policy, role of central bank and monetary policy.
3. The sources of the long-run economic growth.

**SYLLABUS**

**Unit 1: Theories of Consumption and Investment (15 Hours)**

General theories of spending behavior, Absolute, Relative Permanent Income Hypotheses, Life cycle hypothesis; Motivation for Investment: Marginal Efficiency of capital, supply price; expected income streams; MEC and rate of interest; Principle of Acceleration

**Unit 2: Frameworks for Interest Rate Determination (15 Hours)**

Keynesian theory of interest; determination of rate of interest; Changes in levels of income, speculative demand and money supply and their effect on equilibrium rate of interest; liquidity trap and policy implications; IS-LM approach to the determination of equilibrium rate of interest; elasticity of LM schedule and shift in LM curve; interest elasticity of IS schedule and equilibrium.

**Unit 3: Theory of Inflation and Business Cycle (15 Hours)**

Theories of Inflation: demand pull, cost push, wage push, profit push; the Phillips curve, trade-off between inflation and unemployment, stagnation; concept and phases of trade cycle; Innovation theory; Hicks' theory.

**Unit 4: Banking System (15 Hours)**

Role of Central Bank – functions, credit control methods; monetary policy; Commercial banking – functions, credit creation, social banking; banking sector reforms in India.

**References:**

**Mandatory:**

1. Begg D., Dornbusch R., Fischer S. *Economics*, McGraw-Hill, 9th edition.
2. Mankiw N. G. (2010), *Macroeconomics*, 7<sup>th</sup> edition, Worth Publishers, NY.

**Supplementary:**

1. Bhole L.M. (1999), *Financial Institutions and Markets*, Tata Mcgraw Hill
2. Lipsey R.G., Chrystal K. *An Introduction to Positive Economics*, Oxford University Press.

3. Reddy Y.V. (2000), *Monetary and Financial Sector Reforms in India*, UBSPD, New Delhi
4. Samuelson, Paul A and Nordhaus, William d. (2010). *Economics*, Tata McGraw – Hill, New Delhi.

**Course Title: Gandhian Economic Thought**

**Course Code: ECO-INT -2**

**Marks: 100**

**Credits: 4**

**Duration: 60 Hours**

**Course Objectives:**

1. To familiarize the student of Arts & Science with Gandhian Economic thought.
2. To familiarize the students with Gandhian methodology in the light of sustainable development.
3. To acquaint the students with the relevance of Gandhian economic thought to present day India.

**Learning Outcome:**

Upon completion of this course students will able to:

1. Understand the Basic principles of Gandhian economic thought.
2. Understand its relevance to present India.

**SYLLABUS**

**Unit 1: Basic Principles of Gandhian Economy (10 Hours)**

Motives, Mother economy, Natural resources, product, Methods of production, exchange and trade, cooperation, standard of living ;Trusteeship; Swadeshi and its present relevance to India. Trusteeship; Principle of Sustainability – economic, environmental and social.

**Unit 2: Agriculture Economy (10 Hours)**

Agriculture as occupation, Manures, agricultural prices, ownership, labour, social effects, distribution of produce, self-sufficient village economy, Solutions to issues of poverty and unemployment in India.

**Unit 3: Industrial Economy (20 Hours)**

Industrial economy: Efficiency, power, tractors, electricity, diffusion, work, development of personality. Agro and Village industries: Introduction, Purpose, Public Utilities; Importance of Village and Cottage Industries in National Economy, Comparative study of large and small scale industries, Economics of Khadi, Charkha, and its relevance to Indian economy.

**Unit 4: Human Resource Development (5 Hours)**

Gandhian perspective on the policy of education, vocational training and status of women.

**Unit 5: Principle of Sarvodaya (15 Hours)**

Sarvodaya Economics: Bhoodan, Gramdan, Contribution of VinobaBhave to Sarvodaya movement; Sarvodaya and Globalization: Relevance.

**References:**

**Mandatory:**

1. Kumarappa, J.C.(1987), *Gandhian economic thought*, SarvaSevaSanghPrakasham, RajghatVaransi.

**Supplementary:**

1. Bose, N.K. (1966), *Gandhi the man and his mission*, Bhartiya Vidya Bhawan, Bombay.
2. Datta, Amlan. (1986), *The Gandhian Way*, N.E. Hill University publications, Shillong.
3. Diwarkar, R.R. (1963), *Gandhiji's basic Ideas and some modern problems*, Bharatiya Vidya Bhawan.
4. Iyer, Raghavan. (1963), *Moral and Political Thought of Gandhi*, Oxford Univ. Press, New York.

**Online Source:**

1. *The Official Mahatma Gandhi e Archive & Reference Library, Mahatma Gandhi Foundation - India*. Available from: <[www.mahatma.org.in/books](http://www.mahatma.org.in/books)> (for exhaustive list)



**Course Title: Financial Investments for All**

**Course Code: ECO-INT-3**

**Marks: 100**

**Credits: 4**

**Duration: 60 Hours**

**Course Objectives:**

1. To expose the students to the financial markets
2. To understand the need for investments
3. To provide the students the initial path to get into financial investments.

**Learning Outcome:**

On completing the course the students will get an understanding of investing in the financial markets and also develop an understanding of how to start investing in the financial instruments.

**SYLLABUS**

**Unit 1: Introduction to the financial system (15 Hours)**

Meaning; financial system: an overview, flow of funds, financial institutions, financial markets, financial instruments, financial services, regulators. Primary markets: types of issues: public issues: IPO-FPO, right issues, bonus issue: private placement: preferential allotment, qualified institutions placement. Documents, prospectus, letter of offer, placement document. Types of financial markets: *security markets, money markets, foreign exchange markets, commodity markets, insurance market*. Differences between investing in low risk vs. high risk instruments.

**Unit 2: The Banking system: (10 Hours)**

Time value of money- present and future value, calculation. Importance of a banking system; bank deposits as low risk asset class. Types of bank deposits. Bank Loans, types of loan instruments; interest rate spread, EMI calculations; other facilities provided by the banks. Effects of interest rates on the banking system. Role of central bank as a regulator of the banking system.

**Unit 3: Security markets: (15 Hours)**

Definition of securities; functions of security markets; Market segments in security markets: primary and secondary markets. Participants in security markets: *investors, issuers, intermediaries, regulators*. Offer document; SEBI regulations, issue requirements; Corporate actions: *dividends, stock split, buy back, mergers and acquisitions, rights issues, bonus issues. Demat account*

**Unit 4: Stock market indicators, trends and behavior (8 Hours)**

Meaning of a stock market Index: Sensex, Nifty, Stock market indicators: fundamental and technical analysis market capitalization, turnover, turnover ratio, market capitalization ratio trade value ratio, types of financial derivatives.

**Unit 5: Mutual Funds: (12 Hours)**

Meaning and types of mutual funds, Systematic Investment Plans, benefits of investing in mutual funds, tax benefits on selected mutual fund investments, types of MF/schemes. Calculation of NAV. Steps in creation of an initial investment Portfolio.

**References:**

1. Chandra. P. (2014), *Investment Analysis and Portfolio Management*, Tata McGraw-Hill, New Delhi
2. Graham, B. (2008), *The Intelligent Investor*, Harper
3. Khan M. Y. ; Jain P. K. (2015), *Financial Management*, Tata McGraw-Hill Publishing, New Delhi
4. Siegel, Jeremy J. (1998) *Stocks for the Long Run*, McGraw-Hill. New York
5. Van Horne J., Wachowicz, John M., Van Horne JR (2008), *Fundamentals of Financial Management*, Prentice Hall
6. *Practical checks* [www.moneycontrol.com](http://www.moneycontrol.com)

**Course Title: Taxation for All**

**Course Code: ECO-INT-4**

**Marks: 100**

**Credits: 4**

**Duration: 60 Hours**

**Course Objectives:**

1. To sensitise students on the various issues related to Taxation
2. To provide an overview of direct and indirect taxes in India
3. To help student with the calculation of tax liabilities.

**Learning Outcomes:**

On completing the course the students will:

1. Get familiar with the issues related to taxation
2. Get familiar with direct and indirect taxes in India
3. Be able to calculate tax liabilities

**SYLLABUS**

**Unit 1. Introduction to Taxation (15 Hours)**

Importance of taxation; Principles of taxation; Impact and incidence of a tax; equity and ability-to-pay; tax rates and structure of tax rates; direct and indirect taxes, advantages and disadvantages; efficient and inefficient taxes; Shifting and Evasion. Legal basis for the introduction of a Tax.

**Unit 2. Income Tax (15 Hours)**

Importance of Income Tax; Legislation supporting the Imposition of Income Tax: Features and Important Provisions; Income tax Rate structure; Taxable Incomes; Avoidance and Evasion of Taxes; Calculation of Income Tax and Corporate Tax and Filing Tax Returns.

**Unit 3. Goods and Service Tax (15 Hours)**

Evolution of Indirect Taxation in India; Types of Indirect Taxes in India; Importance of Goods and Service Tax; Legislation supporting the Imposition of Goods and Service Tax: Features and Important Provisions; GST Tax Structure; Calculations of Taxes under GST and Filing of Tax Returns.

**Unit 4. Customs Duties (15 Hours)**

Importance of Customs Duties; Legislation supporting the Imposition of Custom Duties: Features and Important Provisions; Treatment of Exports and Imports; Custom Valuation Procedures; Structure of Customs Duties; Calculations and Clearance of Custom Duties. Auctions and Customs.

**References:**

1. Jain R K (2017) *Customs Tariff of India 2017-18*, Vol. 1 and Vol. 2, CENTAX
2. Rosen S.H., *'Public Finance'*, Irwin /McGraw- Hill.
3. Saraogi CA Vishal (2017) *Goods and Services Tax Laws Practice & Procedure with Commentary*, Lawpoint Publications
4. Singhanian, Monica; Singhanian Vinod K (2017) *Student's Guide to Income Tax* (University Edition), Taxman
5. Sreekantaradhya B.S., *'STRUCTURE AND REFORMS OF TAXATION IN INDIA'*, Deep & Deep, New Delhi.

Some Websites: GST India <http://www.gstindia.com/about/>

Taxmann Goods and Service tax <https://gst.taxmann.com/>

ClearTax on GST <https://cleartax.in/s/gst-law-goods-and-services-tax>

**2018**

**Course Title: Principles of Economics**

**Course Code: ECO-I.C-1**

**Marks: 100**

**Credits: 04**

**Hours: 60**

Course outcomes: Upon completion of the course student will be able to

**CO1:** Define basic concepts in Economics.

**CO2:** Recognize economic problems that require decision making.

**CO3:** Distinguish between concepts related to national income

**CO4:** Create & draw hypothetical market demand & supply schedules & curves.

**CO5:** Differentiate & calculate different types, degrees of elasticity of demand & supply.

**CO6:** Arrange different market structure on the basis of degree of competition.

**CO7:** Propose solutions to economic problem

## **SYLLABUS**

### **Unit 1: Thinking like an economist and ten principles of Economics (15 Hours)**

Decision making; functioning of an economy; normative and positive economics; circular flow diagram; and the production possibility frontier.

### **Unit 2: Demand and Supply and Market Equilibrium (15 Hours)**

Factors affecting demand and supply; market equilibrium; elasticity of demand and elasticity of supply; consumers' surplus and producers' surplus.

### **Unit 3: Market Structure (15 Hours)**

Firms and markets; perfect competition; monopoly; oligopoly.

### **Unit 4: Macroeconomic Concepts and Policies (15 Hours)**

GDP, unemployment and inflation; growth and stabilization objectives; introduction to fiscal and monetary policy measures.

## **References:**

### **Mandatory:**

1. Mankiw, N. Gregory, *Principles of Economics*, Thomson / South-Western, Seventh Edition.

Supplementary readings

1. Salvatore, Dominick, *Principles of Micro Economics*, Oxford International student edition, Eighth Edition

**Course Title: Mathematical Techniques for Economic Analysis**

**Course code: ECO-I.C-2**

**Marks: 100**

**Credit: 4**

**Duration: 60 Hours**

**Course Outcomes:** Upon completion of the course student will be able to

**CO1:** Identify and use the rules of calculus

**CO2:** Interpret graphs and tables

**CO3:** Apply mathematical techniques in economics

**CO4:** Analyze economic reality in a structured manner

**CO5:** Assess economic questions as mathematical problems

**CO6:** Design optimal solutions to simple economic problems

## **SYLLABUS**

### **Unit1: Introduction to Basic Concepts (5 Hours)**

Importance of Mathematical and Statistical Methods in Economic Analysis Review of some Concepts; Algebraic Expressions; Equations; Exponents; Graphs of Lines and Non-Linear Equations; System of Simultaneous Equations; properties of sets, number systems.

### **Unit 2: Concept of Function and Types (25 Hours)**

Limit, Continuity and Derivatives; Rules of Differentiation; Marginal Concept; Marginal Cost; Revenue; Utility; Elasticities and Types; Partial and Total Differentiation and Applications; Some Simple Rules of Integration and Applications to Consumer's Surplus and Producer's Surplus.

### **Unit 3: Optimization (20 Hours)**

Problems of Maxima and Minima in Single and Multivariable Functions; Unconstrained and Constrained; Optimization in Simple Economic Problems.

### **Unit 4: Matrix Algebra (10 Hours)**

Determinants & input-output analysis

## **References:**

### **Mandatory:**

1. Knut Sydsaeter and Peter J Hammond (2005), *Mathematics for Economic Analysis*; Pearson Educational Asia: 4th Indian reprint.

### **Supplementary:**

1. Chiang, A.C. & Kevin Wainwright (2005), *Fundamental Methods of Mathematical Economics*; Fourth Edition, McGraw-Hill.
2. Dowling, Edward T. (1992), *Schaum's Outline of Theory and Problems of Introduction to Mathematics*; 3rd Edition, McGraw-Hill

**Course Title: Economics of Growth and Development**

**Course Code: ECO-II.C-3**

**Marks: 100**

**Credits: 4**

**Hours: 60**

**Course Outcomes:** Upon completion of the syllabus students will be able to:

**CO1:** Order the theories of growth and development on a timeline.

**CO2:** Identify patterns of growth based on classical & neoclassical theories of growth and development.

**CO3:** Give examples of economies those have experienced the growth & development in line with theories.

**CO4:** Distinguish between economies those have and have not experienced growth & development in line with theories.

**CO5:** Compare & contrast various growth & development models as applicable to India.

**CO6:** Categorize states of India based on different growth patterns.

**CO7.** Design & recommend growth model for India & or its states.

**SYLLABUS**

**Unit 1: Growth and Development (15 Hours)**

Growth and development, Components, Indicators, Approaches to development: Traditional and Modern; Sen's capabilities approach, Institutional freedom as ends and means of development.

**Unit 2: Patterns of Growth and Development (15 Hours)**

Growth and development in different countries; Critique of classical theories of development: Rostow's model, Lewis model; international dependence revolution: neoclassical dependence model; fake paradigm model: dualistic development models.

**Unit 3: New Growth Theories (15 Hours)**

Exogenous growth theories: Solow model, Harrod-Domar model; Endogenous growth theories: Romer and Lucas endogenous model, Robinson model.

**Unit 4: India's Development Experience (15 Hours)**

India's development journey from planning commission to NITI Aayog; India on the eve of planning; Nehru Mahalanobis growth and development model; Liberalization, Privatization and Globalization; Inclusive growth; Interstate variations in development; Case studies: Economic models of any two Indian States; Economic development of Goa.

**References:**

**Mandatory:**

1. Todaro M , Smith S.( 2013), *Economic development*, Pearson, Noida, India

**Supplementary :**

1. Thirlwall A.,(2005), *Growth and development: with special reference to developing economies*, Palgrave, Macmillan, USA
2. Hayami Y, (2005), *Development economics: from the poverty to the wealth of nation*, Oxford India, Paperback, India
3. Ray Debraj, (2007), *Development economics*, Oxford India paperback, Noida, India

**Course Title: Empirical Techniques for Economic Analysis.**

**Course Code: ECO-II.C-4**

**Marks: 100**

**Credits: 4**

**Duration: 60 Hours**

**Course outcomes:** Upon completion of the course students will be able to:

**CO 1:** Relate empirical methodology to economic enquiry

**CO 2:** Summarise, interpret and graph data appropriately

**CO 3:** Apply discrete and continuous probability distributions to various business problems

**CO 4:** Analyse statistical data using MS Excel

**CO 5:** Validate sampling measures

**CO 6:** Develop basic statistical inference using correlation, regression, indices, hypothesis testing, and ANOVA

## **SYLLABUS**

### **Unit 1: Population and Sampling (10 Hours)**

Meaning of population and sampling; Need for sampling, concept of 'Good Sample'; Methods of sampling: probability and non-probability sampling; sampling techniques; Optimum sampling; Nyman's sampling; problems to be solved based on sampling methods.

### **Unit 2: Correlation and Regression (20 Hours)**

Karl Pearson's coefficient of correlation and Spearman's Rank coefficient of correlation; properties of Pearson's coefficient of correlation; Linear regression: meaning, regression equations and lines; Focus on problem solving using MS EXCEL/Other spreadsheet.

### **Unit 3: Time Series & Index Numbers (10 Hours)**

Components of time series; fitting a trend; methods: semi-averages, moving averages, method of least squares; weighted aggregative index numbers.

### **Unit 4: Hypothesis Testing (20 Hours)**

Why and How to make Hypothesis; level of significance, critical area; Type I and Type II errors, Z, t, F and  $\chi^2$  distribution; ANOVA (one way and two way).

## **References:**

### **Mandatory:**

1. Arora, P.N. et.al. 2007, *Comprehensive Statistical Methods*, 1<sup>st</sup> edition, S. Chand, New Delhi.

### **Supplementary:**

1. Anderson, David R. et.al. *Statistics for Business and Economics*, Cengage Learning India Edition.

**Course Title: Microeconomics**

**Course Code: ECO-III.C-5**

**Marks: 100**

**Credits: 4**

**Hours: 60**

**Course Outcomes:** Upon completion of the course students will be able to:

**CO1:** Reproduce consumer & producer behavior theories.

**CO2:** Describe different concept of production, costs & revenue.

**CO3:** Compute total, average & marginal concepts related to production, cost & revenue.

**CO4:** Compare & contrast competitive & non competitive market structures.

**CO5:** Categorize normal profit, supernormal profit, loss and shutdown point across different market structures.

**CO6:** Assess the given micro economic situation (consumer or producer).

## SYLLABUS

### **Unit 1: Consumer Behaviour and Demand (20 Hours)**

Distinction between Cardinal and Ordinal Utility; Law of Utility; Indifference Curves; Budget Line; Substitution Effect and Income Effect; Hicksian and Slutsky's Analysis; Derivation of demand curve and Engel's Curve; Revealed preference theory.

### **Unit 2: Production (10 Hours)**

Production function: AP and MP, Non-linear production function; Production with one variable input; Production with two variable inputs, Isoquants: MRTS; Iso-cost line; Ridge Lines; Returns to Scale; Technological progress & international competitiveness.

### **Unit 3: Cost and Revenue (10 Hours)**

Cost of Production; Behavior of cost; Short run and Long run Costs; Derivation of Average and marginal cost curves; Least cost input Combination; Introduction to Modern Cost Curves: L shaped and inverted J shaped cost curves; Concepts of revenue: AR, MR, TR, Break-even analysis.

### **Unit 4: Perfect Market Structure (10 Hours)**

Perfect markets; Behavior of profit maximizing firms and the production process; Price and output decisions; costs and output in short and long run; Pure competition; Role of time element in the determination of value.

### **Unit 5: Imperfect Market Structure (10 Hours)**

Nature and types of imperfect market structures; Assumptions; Conditions of imperfections; Imperfect markets: price & output under Monopoly and monopolistic competition; Introduction to oligopoly.

## **References:**

### **Mandatory:**

1. Salvatore, Dominick, *Principles of Micro Economics*, Oxford International student edition, Eighth Edition

### **Supplementary:**

1. Hubbard, R. G. and O'Brien, A. P. (2012), *Microeconomics*, Pearson, Delhi.
2. O'Sullivan, A., Sheffrin S. M. and Perez S. J. (2012). *Microeconomics, Principal, Application and tools*, Pearson, Delhi
3. Pindyck, Robert S and Rubinfeld, Daniel L. (2012) *Microeconomics*, Pearson, Delhi



**Course Title: Macroeconomics**

**Course Code: ECO-IV.C- 6**

**Marks: 100**

**Credit: 4**

**Hours: 60**

Course outcome: Upon completion of the course students will be able to

**CO1:** Define various key macroeconomic variables; principles & tools; and national income concepts.

**CO2:** Contrast between the long run & short run macroeconomic behavior; and various macroeconomic frameworks

**CO3:** Make use of macroeconomic concepts to develop an understanding of the working of the economy

**CO4:** Examine and analyze Keynesian and Monetarist macroeconomic framework

**CO5:** Justify the policy measures undertaken in a Keynesian system; especially those influencing consumption and expenditure decisions

**CO 6:** Estimate, imagine and elaborate the impact of macroeconomic policies on the state of the economy

## SYLLABUS

### **Unit 1: Introduction to Macroeconomics (10 Hours)**

Major Macroeconomic Issues: Business Cycle, Unemployment, Inflation; Long-run Economic Growth; Principles and Tools of Macroeconomic Analysis; Macroeconomic Variables; Long run and Short run Analysis in Macroeconomics.

### **Unit 2: National Accounts: Measuring Output and Income (10 Hours)**

National income: concept; Measurement: GDP, GNP, NDP, NNP; Methods of measurement: Value Added, Expenditure Approach; Price Indices and Deflator.

### **Unit 3: Keynesian Macroeconomic Framework (20 Hours)**

Keynesian analysis: Aggregate Demand: concepts, components and determinants; Consumption Demand and its Determinants; Consumption Function and Consumption Line; Autonomous Consumption Demand; Marginal and Average Propensity to Consume; Saving Function and Saving Line; Marginal and Average Propensity to Save; Consumption Puzzle; Theories of Consumption; Investment Demand and its Determinants; Investment Function and Investment Demand Curve; Theories of Investment; Aggregate Expenditures in the Closed Private Economy; Planned Expenditures and Actual Expenditures; The 45°line and Equilibrium Output in the Two-sector Model in the Short run ("Keynesian Cross Model"); Non-equilibrium Situations; Multiplier Effect of Autonomous Spending on Output.

### **Unit 4: Monetarists Framework (10 Hours)**

Origin of monetarist views: Milton Freidman; Origin of quantity theory of money.

### **Unit 5: The IS-LM Model (10 Hours)**

IS-LM equations; Dynamics in the IS-LM model; Fiscal policy-effectiveness and LM curve; Fiscal policy: effectiveness and IS curve; Monetary policy: effectiveness and IS curve; monetary policy: effectiveness of LM curve; paradox of thrift; Policy objectives.

## **References:**

### **Mandatory:**

1. Begg, D., Dornbusch, R., Fischer, S. (2005) *Economics*, McGraw-Hill Book Co., London.

**Supplementary:**

1. Mankiw, N.G. (2010) *Macroeconomics*, Worth Publishers, New York.
2. Lipsey, R.G.; Chrystal, K. A. (2007) *Economics*, Oxford University Press, Oxford.
3. Samuelson, P.; Nordhaus, William (2010) *Economics*, MacGraw Hill Education. Delhi

**Course Title: Public Economics**

**Course Code: ECO-V.C-7**

**Marks: 100**

**Credits: 04**

**Hours: 60**

**Course outcome:** Upon completion of the course students will be able to:

**CO1:** Understand the the nature of public economy .

**CO2:** Discuss the functioning of markets and determinants of market failure.

**CO3:** Demonstrate the theory of public goods in reality.

**CO 4:**Examine the impact of revenue expenditure decisions in an economy .

**CO5:** Classify types of debt and understand the role of deficit financing in functional finance.

**CO6:** Analyse fiscal operations of the government.

## SYLLABUS

### **Unit 1: Issues in Public Economics (15 Hours)**

Nature of the Public Economy; Public economy and markets : Pareto optimality and Market failure, fundamental theorem of welfare, Cases of violation of Pareto optimality; Asymmetric information and market failure: the problem of externality and their internalization; Pigouvian tax.

### **Unit 2: Theory of Public goods (15 Hours)**

Public Choice theory: Public goods, Samuelson model, Lindahl model; Empirical theories of public goods: Wagner hypothesis, Wiseman-peacock hypothesis; Preference revelation mechanism for public goods.

### **Unit 3: Public Revenue (15 Hours)**

Principles of Taxation and classification of taxes: Impact and incidence of taxes ,deadweight loss, optimal taxation, partial and general equilibrium, examples; Excess burden of tax; tax evasion & tax avoidance.

### **Unit 4: Public Expenditure and Public debt (15 Hours)**

Principles of expenditure and classification of expenditure; Causes and Consequences of public debt; Debt sustainability analysis; Modigliani's burden thesis; Burden of internal & external debt; debt trap.

## **References:**

### **Mandatory:**

1. Cullis J. and Jones P.(latest edition) *Public Finance & Public Choice: Analytical Perspectives*, Oxford

### **Supplementary:**

1. Atkinson, A.B and. Stiglitz J.E (2015), *Lectures on Public Economics*, McGraw–Hill, New York.
2. Musgrave, R. A. (1959), *The Theory of Public Finance*, McGraw Hill, New York.
3. Musgrave, R. and Musgrave P. (2004), *Public Finance in Theory and Practice*, McGraw–Hill.
4. Hindriks J. and Myers G.D. ( ) *Intermediate Public Economics*, Prentice Hall of India, New Delhi

**Course Title: International Trade and Policy**

**Course Code: ECO-VI.C-8**

**Marks: 100**

**Credits: 4**

**Duration: 60 Hours**

**Course Outcome:** Upon completion of the course students will be able to

**CO1:** Define the conditions under which trade is beneficial for both individual nations and international community and identify gainers and losers from trade

**CO2:** Compare and evaluate alternative theories of international trade

**CO3:** Apply partial equilibrium and general equilibrium models in analysing trade theories & the economic effects of trade policies

**CO4:** Analyse key issues raised under WTO & through regional trading arrangements

**CO5:** Evaluate the implications of trade on growth and income distribution under various circumstances

**CO6:** Adapt the theory to address the issues on globalization, economic integration, and trade policy

## **SYLLABUS**

### **Unit 1: Classical Trade Theories (15 Hours)**

Absolute Advantage; Comparative Advantage Theory and its refinements; Reciprocal demand and the international equilibrium model; Gains from Trade and Terms of Trade.

### **Unit 2: Modern Trade Theories and Extensions (15 Hours)**

Factor-Endowments (Heckscher-Ohlin) Theory; Factor-price Equalisation Theorem; Leontief Paradox; Factor Intensity Reversal; Intra-industry Trade: Trade based on Economies of Scale; Differentiated Products; Technological Gaps; Product Cycles; Differences in Tastes; Trade in Goods and Services.

### **Unit 3: Trade Barriers (15 Hours)**

Tariffs: Types and Effects; Non-tariff Barriers: Quotas, Exchange Controls, Dual Exchange Rates, Discriminatory Procurement, Eco-Labeling, Other Human-rights, Health and Hygiene Safeguards; Dumping; Voluntary Export Restraints; Export Subsidies; Counter trade; International Cartels.

### **Unit 4: Trade Issues of Developing Countries and Emerging Markets (15 Hours)**

Trade as an engine of Growth; Factors influencing Terms of Trade of Developing Countries; Prebisch-Singer Thesis; Immiserising growth; Trade Disputes and WTO; Strategic trade policies; Regional Economic Integration and Globalization; Emerging Markets and Global Resource Movements; Multinational enterprises and world trade.

## **References:**

### **Mandatory:**

1. Carbaugh, Robert J. (2002), *International Economics*, South-Western (Thomson Publishing), Bangalore, 8<sup>th</sup> edition (Latest available 15<sup>th</sup> edition)

### **Supplementary:**

1. Krugman, Paul R.; Obstfeld, Maurice (2011), *International Economics: Theory and Policy*, Pearson, New Delhi.
2. Salvatore, Dominic (2014), *International Economics: Trade and Finance*, John Wiley & Sons, Delhi

**Course Title: Economics of Foreign Exchange**

**Course Code: ECO- E-2**

**Marks: 100**

**Credits: 4**

**Duration: 60 Hours**

**Course outcomes:** Upon completion of the course students will be able to:

**CO1:** Identify the factors that influence the price of currency derivatives

**CO2:** Explain the organisation and institutional details of foreign exchange and international money markets

**CO3:** Apply the theories and models covered to the various issues of international banking

**CO4:** Analyze the impact of fiscal and monetary policies on exchange rates and international resource movements

**CO5:** Show the structure of the balance of payments and the role of international financial institutions and multinational enterprises on the movement of financial & non-financial resources

**CO6:** Formulate strategies to manage foreign exchange risks and use the theories of international finance and monetary issues to real world situations

## **SYLLABUS**

### **Unit 1: Foreign Exchange and Exchange Rate Determination (15 Hours)**

Foreign exchange market: types & participants; foreign exchange quotations\*; Derivative markets: Forward\*, Futures\* and Options\*; Exchange rate determination: Demand and supply of foreign exchange ;Appreciation and depreciation of currency; effective exchange rates\*; arbitrage\*; forward rates\*; interest arbitrage\*; Role of speculation and foreign exchange rates\*.

### **Unit 2: Exchange Rates and Balance of Payments (15 Hours)**

Effects of exchange rate changes on costs, prices; Effects of currency appreciation, depreciation and balance of payments; Devaluation and Revaluation: Requirements for a successful devaluation; Elasticity approach to exchange rate adjustment; Absorption approach to exchange rate adjustment; Monetary approach to exchange rate adjustment.

### **Unit 3: Exchange Rate Systems and International Banking. (15 Hours)**

Exchange rate practices; Fixed exchange rate systems; Floating exchange rates; Managed floating rates; Exchange controls; Nature of international reserves; International Monetary Fund and facilities for borrowing reserves; International Debt and World Bank; Asia Infrastructure Investment Bank, Euro-currency market.

### **Unit 4: Exchange rate and International Resource Movement (15 Hours)**

Role of exchange rate and Movement of capital: International lending and borrowing; Foreign direct investment, Foreign institutional investment; International movement of labour; Transfer of technology; Multinational enterprises; Role of commercial banks & financial institutions.

\*Students have to solve numerical problems on these subtopics.

## **References:**

### **Mandatory:**

1. Carbaugh, Robert J. (2002), *International Economics*, South-Western (Thomson Publishing), Bangalore. (Latest available edition internationally 15<sup>th</sup> edition)

**Supplementary:**

1. Krugman, Paul R.; Obstfeld, Maurice (2011), *International Economics: Theory and Policy*, Pearson, New Delhi.
2. Pilbeam, Keith (2013), *International Finance*, Palgrave Macmillan, London
3. Salvatore, Dominic (2014), *International Economics: Trade and Finance*, John Wiley & Sons, Delhi

**Course Title: Regional Economics**

**Course Code: ECO- E-4**

**Marks: 100**

**Credits: 04**

**Duration: 60 Hours**

**Course outcomes:** Upon completion of the course students will be able to:

**CO1:** Recognize different types of economic regions.

**CO2:** Explain the problems of land, Wage flexibility & interregional migration etc.

**CO3:** Discuss the relevance of regional economics and its relationship with other disciplines.

**CO4:** Choose the appropriate micro economic theory for decision making with regards to industrial clustering and firm site selection.

**CO5:** Examine the evolution of cities and urban areas, including the economic incentives for their development.

**CO6:** Compare the inter and intra growth of economic regions in India .

## **SYLLABUS**

### **Unit 1: Introduction (10 Hours)**

Regional economics: Meaning, Scope and Relevance; Types of regions: Homogeneous, heterogeneous; Regionalization: Development, planning & policies.

### **Unit 2: Clustering & Agglomeration (10 Hours)**

Industrial clustering and returns to scale; Agglomeration economies: source, types, clustering , nature of transactions, Urban consumption, limited information, uncertainty and evolution of clusters.

### **Unit 3: Location Theory and Economic Activity (15 Hours)**

Webster's theory of industrial location; Moses' location production model; Thunen's theory of location of agricultural activities; Christaller and Losch's central place theory; General equilibrium & Hotelling principle.

### **Unit 4: Problems of Regional Economic Growth (13 Hours)**

Land competition (bid rent model); mono centricity; land supply and land ownership; labor markets; wage flexibility & interregional labor migration; Balance of payments and regional growth.

### **Unit 5: Regional flows and economic growth (12 Hours)**

Commodity & Service v/s Monetary & Capital flows; Migration: Types, Causes, Ramifications, Measures; Regional Growth theory; Migration and Regional policy in India.

## **References:**

### **Mandatory:**

1. McCann, Philip. (2013), *Modern Urban and Regional Economics*, Oxford University press.

### **Supplementary:**

1. Shrivastava, O.S. (2009), *Regional Economics and Regional Planning*, Anmol Publications Pvt Ltd.
2. Hoover, Edgar M. and Giarratani. *An introduction to Regional Economics*, West Virginia University.
3. Hoover, Edgar M. (1968), *Spatial Economics: Partial Equilibrium Approach*, in Encyclopedia of the Social Sciences, Macmillan, New York.
4. Isard, Walter. (1956), *Location and Space-Economy*, The MIT Press, Cambridge.

5. Krugmen, Paul. *Geography and trade*, MIT press.
6. Martin, Beckmann. (1968), *Location Theory*, Random House, New York.
7. Moses, Leon. (1968), *Spatial Economics: General Equilibrium Approach*, in Encyclopedia of the Social Sciences, Macmillan, New York.
8. Nijkamp, Peter, Mill, S Edwin. (2007), *Handbook of Regional and Urban Economics: Regional economics*, North- Holland publishers.
9. Nourse, Hugh O. (1968), *Regional Economics*, McGraw-Hill, New York.
10. Richardson, W Harry. (1978), *The State of Regional Economics*, International Regional Science Review, Fall.
11. Webber, J Michael. (1972), *Impact of Uncertainty on Location*, MIT Press, Cambridge.
12. Woglom, W. H. (1954), *The Economics of Location*, Yale University Press, New Haven.



**Course Title: Economics and Governance**

**Course Code: ECO- E-5**

**Marks: 100**

**Credit: 4**

**Duration: 60 Hours**

**Course outcome:** Upon completion of the course student will be able to

**CO1:** Outline the concept and dimensions of governance.

**CO2:** Identify the principles and measures of governance.

**CO3:** Apply the concept of good governance to address governance issues in public provisioning.

**CO4:** Examine experience of developed and developing countries based on broad based governance criteria.

**CO5:** Justify the need for governance through participatory development and practice good governance in India.

## **SYLLABUS**

### **Unit 1: Governance and Growth Interface (15 Hours)**

The concept of governance and growth: Policies that make up economic environment for development of good governance; Role of social infrastructure to facilitate action-oriented and participatory development; state failure versus market failure.

### **Unit 2: The Issues of Governance (15 Hours)**

The issues of governance: Role of the State and other institutions; Strategies to address governance issues: provisions, effectiveness, challenges.

### **Unit 3: Experiences of Developed and Developing Countries (10 Hours)**

Experiences of developed and developing countries based on broad governance criteria; Lessons for broad-based growth.

### **Unit 4: Governance in Contemporary India (20 Hours)**

Need for good governance in India; Issues and challenges related to growth and governance.

## **References:**

### **Mandatory:**

1. North Douglas, Acemoglu Daron ,Fukuyama Francis, Rodrick Dani 2008, *Governance, Growth and Development Decision Making* World Bank Reflections

## **Supplementary**

1. Dixit, Avinash K. *Lawlessness and Economics: Alternative Modes of Governance*, Princeton University Press.

2. William K. Tabb, *Economic Governance in the Age of Globalization*, University Press, Columbia.

3. The Inclusive Growth and Development Report January 2017, World Economic Forum.

**Course Title: Economics and Law**

**Course Code: ECO-E-8**

**Marks: 100**

**Credits: 04**

**Duration: 60 Hours**

**Course outcomes:** Upon completion of the paper students will be able to

**CO1:** Associate/relate the subject of economics and law.

**CO2:** Identify legal structure and institutions and classify different types of law.

**CO3:** Breakdown the economic theory of property rights

**CO4:** Apply the knowledge of economic principles in law

**CO5:** Interpret /Evaluate existing property laws

## **SYLLABUS**

### **Unit 1: An Introduction to Law and Economics (20 Hours)**

Economic analysis of law: Interrelationship between economics and law; The civil law and the common law tradition, Legal structure in India; Disputes and settlements; A brief introduction to different types of law: Property law, Contract law, Criminal law and Law of Torts.

### **Unit 2: Economic Theory of Property Rights (15 Hours)**

Origin of the institution of property; Legal concept of property, Bargaining theory; Economic theory of property; Establishment and verification of property rights; Conflicting property rights; Public and private property; the public use of private property; The tragedy of the common property resources; Taking Property: Eminent domain.

### **Unit 3: Evaluation of the Existing Property Laws (15 Hours)**

Intellectual Property Rights: Importance; Intellectual Property Rights and World Trade Organization; Copyrights Act, 1957: Purpose; Ownership of Copyrights; Rights of Owners and Rights of Others; Registration of Copyrights and its Infringement; Remedies under Copyrights Act, Patents Act, 1970: background; Concept of Patent; Procedural aspects of filing of patents; Procedure after filing of Patents; Other provisions of the Act.

### **Unit 4: Economic Laws in India (10 Hours)**

Consumer Protection Act, 1986: Purpose, Salient Features, Organisational set-up; Grievance Redressal Mechanism. Competition Act, 2002 Purpose; Salient Features; Complaint; Procedures for redressal, Essential Commodities Act, 1955: Purpose; Scope; Penalties and Prosecution; Repeals and Savings; FEMA, Geographical indications of Goods Act.

### **References:**

#### **Mandatory**

1. Cooter, Robert and Ulen, Thomas. (2011), *An Introduction to Law and Economics*, 6<sup>th</sup>ed Pearson Series in Economics

#### **Supplementary:**

1. Copyrights Act, 1957: <http://copyright.gov.in/>
2. Patents Act, 1970: <http://www.wipo.int/patents/en/>
3. Patents Act, 1970: <http://www.ipindia.nic.in/patents.htm>
4. Consumer protection Act, 1986: <https://www.india.gov.in/consumer-protection-act>
5. <http://www.mca.gov.in/MinistryV2/competitionact.html>
6. Essential commodities Act, 1955-  
[https://indiacode.nic.in/handle/123456789/1781?view\\_type=search](https://indiacode.nic.in/handle/123456789/1781?view_type=search)

7. FEMA: <http://dipp.nic.in/foreign-direct-investment/foreign-exchange-management-act>
8. Geographical indications of goods  
Act:<http://legislative.gov.in/sites/default/files/A1999-48.pdf>
9. Gopalakrishnan, K.C. (2002), *Legal Economics (Interactional Dimensions-Economics and Law)*, Eastern Book Company, Lucknow.
10. Granstrand, Ove. (2003), *Law and Intellectual Property: Seeking Strategies for Research and Teaching in a Developing Field*, Kluwer Academic Publishers, Boston.
11. Medema, Steven G., Mercurio, Nicholas. (1998), *Economics and the Law: From Posner to Post-Modernism*, Princeton University Press, Princeton, New Jersey.
12. Reddy, G. B. (2002), *Law of Consumer Protection in India*, Gogia Law Agency, Hyderabad.
13. Wadehra, B. L. (2003), *Intellectual Property Law Handbook: Law Relating to Patents, Trade Marks, Copyrights, Design & Geographical Indications*, Universal Law Publishing Co, Delhi.

**Course Title: Indian Economy**

**Course Code: ECO- E-1**

**Marks: 100**

**Credits: 04**

**Duration: 60 Hours**

**Course Outcomes:** upon completion of the course students will be able to

**CO1:** Describe structural changes in Indian economy from Independence till globalization.

**CO2:** Identify & explain key issues & challenges faced by Indian economy.

**CO3:** Interpret the policy perspectives with regard to Indian economy.

**CO4:** Examine structure of Goa's economy & compare the same with Indian economy.

**CO5:** Review India's position with regard to foreign trade FDI, FII, MNC's; WTO globally.

**CO6:** Appraise the status of Indian economy with regard to current economic situation.

## **SYLLABUS**

### **Unit 1: Structural Changes in the Indian Economy (15 Hours)**

Pre reform period: India on the eve of independence; Need for planning, Structural adjustment programme: need, impact, Liberalization, Privatization, Globalization; Primary, Secondary, Tertiary sector Linkages : trends

### **Unit 2: Key Issues and Challenges of Indian Economy (15 Hours)**

Key issues: Population, poverty, inequality, unemployment; Challenges: Inclusive growth: social; Parallel Economy; Rural development, urbanization, migration; Environment & sustainable development.

### **Unit 3: Policy Perspectives (12 Hours)**

Shift from Planning commission to NITI Ayog; Impact of policy shifts on decisions: finance, infrastructure, investments; Flagship Missions of GOI.

### **Unit 4: Economy of Goa (8 Hours)**

Structural trends in GSDP; Contribution of major sectors, Occupational shifts and demographic trends.

### **Unit 5: India's Position in the World (10 Hours)**

Foreign Trade: Features and trends; Capital movements: FDI, FII, MNC's; WTO; India's position in the world economy.

## **References:**

### **Mandatory:**

2. Government of India: *Economic Survey* (various years), Government of India, New Delhi.

### **Supplementary:**

6. Government of Goa: *Economic Survey* (various years), Directorate of Planning, Statistics and Evaluation, Panaji-Goa.
7. Chaudhary, C.M. (2012), *Dynamics of Indian Economy*, Oxford book company, New Delhi.
8. Datt, R.; Sundaram. K.P.M. (2018), *Indian Economy*, S. Chand & Company Ltd., New Delhi.
9. Kapila, Uma. (2007), *India's Economic development since 1947*, Academic Foundation, New Delhi.
10. Rajan, K. (2006), *Indian Economy Post Reform Scenario*, Serials Publication, New Delhi.

**Course Title: Emerging Market Economies**

**Course Code: ECO-E-3**

**Marks: 100**

**Credits: 04**

**Duration: 60 Hours**

### **Course Outcomes**

Upon completion of the course students will be able to

1. Identify the emerging market economies in the world economy.
2. Understand how the emerging markets have evolved over time.
3. Analyze how different institutions function in these economies, and to identify the key factors behind their spectacular growth.
4. Explore how the emerging market economies interact with the rest of the world and their implications for the world economy as whole.
5. Evaluate the overall growth process of the two major emerging markets India and China.

### **SYLLABUS**

#### **Unit 1: Emerging Market Economies: An overview (15 Hours)**

Concept and definition of the emerging markets; the historical background; Emerging market indices; Developed vs Emerging markets: the political economy of development, globalization, competitiveness and emerging markets.

#### **Unit 2: Understanding Emerging Markets (15 Hours)**

Understanding BRICS: scope, purpose and importance; Emerging markets of Asia, Europe and Latin America: Importance, Growth and Evaluation.

#### **Unit 3: Financialisation and Emerging Markets: (15 Hours)**

The process of financial liberalization and innovation in emerging markets; Forms & functions of finance in emerging markets; Global financial crisis and the emerging markets: Involvement, impact and recovery.

#### **Unit 4: The emerging markets of India and China: (15 Hours)**

Neo-liberalism and emergence of India as a market economy; Analysis of India's post reform growth; performance of Indian economy post 1997; Rise of China as a market economy: Economic policies since 1978; Emergence of China as a world leader in export: Evaluating the impact of technological and institutional factors.

### **References:**

1. Grzegorz, W. Kolodko. (2003), *Globalization and Development*, Ashgate Publications, Aldershot.
2. Hoen, Herman W. (2014), *Globalization and institutional change: are emerging market economies in Europe and Asia converging?* Academic Publishers, Adleton.
3. Kohli, Harinder S, (2008), *Growth and Development in Emerging Market Economies: International Private Capital Flows, Financial Markets and Globalization*, Sage Publication India Pvt Ltd, Los Angles.
4. Zhu, Xiaodong, (2012), *Understanding China's growth: Past, Present and Future*. Journal of Economic Perspectives Vol 7, No.4, Pp 103-124.

### **Journal Reference:**

1. Li, Hongbin, Li, Lei, Wu, Binzhen and Xiong, Yanyan. (2012), *The journal of Economic Perspectives* Vol 26, No.4, Pp 57-74.

**Course Title: Entrepreneurship**

**Course Code: ECO-E-6**

**Marks: 100**

**Credits: 4**

**Duration: 60 Hours**

**Course Outcome:** upon completion of the course students will be able to:

**CO1:** Understand basic concepts in entrepreneurship.

**CO2:** Evaluate risks faced by entrepreneurs

**CO3:** Identify the sources of funds & manage human resources.

**CO4:** Understand costing, pricing & marketing strategies.

**CO5:** Identify and evaluate business opportunities.

**CO6:** Design and execute a business plan.

## **SYLLABUS**

### **Unit I. Introduction to entrepreneurship (15 Hours)**

Entrepreneurship: meaning, definition, Types, qualities, skills and functions;  
Analysis of Business Environment & Policies: Market, Resources & Competition;  
Use of SWOT and Porter's Five Forces Analysis.

### **Unit 2: Risk and Innovation (15 Hours)**

Importance and management of risk; market/commercial risk, technological risk, financial risk, social risk, political risk, personal risk; Differences between Risk and Uncertainty; Schumpeter's, Drucker's and other's views; Types and forms of innovations; innovation & imitation; Patents and Copyrights; Start-up, Incubation centre: Role, status in Goa

### **Unit 3: Sources, Uses and Management of Resources (10 Hours)**

Financial Resources :Sources of funds; Uses of funds; Fixed and Working Capital;  
Material Resources: Supply and distribution chains; Government and local resources;  
Human Resources.

### **Unit 4: Costing, Pricing and Marketing (10 Hours)**

Costing Strategies: Absorption and marginal costing; Costing for inventories; Pricing and pricing strategies(skimming price, penetration price, mark-up, marginal-cost price);  
Break- even analysis and break- even chart; Marketing techniques and strategies.

### **Unit 5: Preparing the Business Plan\* (10 Hours)**

Components and Uses of the Business Plan; Creating a Business Plan; Sources of funds;  
Marketing Plan Expenditures and Revenues; Profitability; Growth Rate of the business and the Rate of Return.

\*students will submit a business plan: (10 hours)

## **References:**

### **Mandatory:**

1. Charantimath, Poornima M. (2014), *Entrepreneurship Development and Small Business Enterprises*, Pearson, Chennai.

### **Supplementary:**

1. Colombo Plan Staff College for Technical Education, Manila (1999), *Entrepreneurship Development*, Tata McGraw Hill, New Delhi.
2. Chandra, Prasana (1995), *Projects: Planning, Analysis, Selection, Implementation & Review*, Tata McGraw Hill, New Delhi.

3. Kuriloff, Arthur H; Hemphill, John M. (1988), *Starting and Managing the Small Business*, McGraw-Hill, New York.
4. <https://up.startupindia.gov.in/content/sih/en/home-page.html>
5. <http://www.ciba.org.in/>
6. <https://www.goa.gov.in/wp-content/uploads/2017/09/Goa-IT-Start-up-Policy-2017.pdf>

**Course Title: Accounting for Non-accountants**

**Course Code: ECO- E-7**

**Marks: 100**

**Credits: 4**

**Duration: 60 Hours**

**Course Outcomes:** Upon completion of the course students will be able to

**CO1:** To identify the accounting issues and describe accounting processes

**CO 2:** To understand the methods of cost and management accounting to evaluate and project business performance

**CO 3:** To apply the knowledge of accounting theory to financial analysis and decision making

**CO 4:** To analyze financial data as well as the effects of differing financial accounting methods on the financial statements

**CO 5:** To examine the effects of various financial accounting methods on the financial statements

**CO 6:** To construct Receipts and Payments Account, Income and Expenditure Account, Balance Sheet, Cost sheets, Trading Account and Profit & Loss Account

## **SYLLABUS**

### **Unit 1: The Accounting Process (15 Hours)**

Theoretical Framework of Accounting; Generally Accepted Accounting Principles, Concepts and Conventions; Capital and Revenue transactions: capital and revenue expenditures, capital and revenue receipts; Measurement, Valuation and Accounting estimates; Double entry system, Books of prime entry, Subsidiary Books; Recording of Cash and Bank transactions; Preparation of Ledger Accounts; Preparation of Trial Balance: interpretation and usefulness; Rectification of Errors; Opening entries, Transfer entries, Adjustment entries, Closing entries.

### **Unit 2: \*Issues in Accounting (10 Hours)**

Creating new ledgers/Company; Reconciliation Statements and Accounting for Depreciation: Bank Reconciliation Statement; Receivables / Payables Reconciliation Statement; Stock Reconciliation Statement; Depreciation Policy; Methods, Computation and Accounting treatment, Journal Vouchers.

### **Unit 3:\* Preparation of Final Accounts (15 Hours)**

Profit making concern: (for sole proprietorship concern and partnership firm only): Preparation of Trading Account, Profit & Loss Account and Balance Sheet; Accounting treatment of bad debts; reserve for bad and doubtful debts; provision for discount on debtors and provision for discount on creditors; Not-for-Profit making concern: Preparation of Receipts and Payments Account; Preparation of Income and Expenditure Account; Preparation of Balance Sheet.

### **Unit 4: Fundamentals of Cost Accounting (12 Hours)**

Cost and Management Accounting: Generally Accepted Cost Accounting Principles; Accounting for Material cost (including Accounting of Inventory: LIFO, FIFO, Weighted, Average Cost Methods); Accounting for Labour costs, Direct Expenses and Overheads; Preparation of Cost Statements: Cost Data collection, Cost Sheet formats; Preparation of Cost Sheets (historical cost sheets and estimated cost sheets).

### **Unit 5: Fundamentals of Management Accounting (8 Hours)**

Marginal Costing and Break- even analysis; basic knowledge; Application of Marginal Costing for decision-making.

\*Practical component to be taught using accounting software



**References:****Mandatory**

1. Kansal, Amit(2014),*NCERT solutions Accountancy*, Arihant, Meerut

**Supplementary**

1. Gibson, Charles H. (2013), *Financial Statement Analysis*, Cengage Learning, Delhi.
2. Singal, Santosh (2012), *Accounting and Financial Analysis*, International Book House, New Delhi.

**Course Title: Introduction to Econometrics**

**Course Code: ECO- E-9**

**Marks: 100**

**Credits: 4**

**Duration: 60 Hours**

### **Course Objectives:**

The key objectives of this course are:

1. To acquaint the students with the tools of econometrics.
2. To help students to make estimates about the dependent variable, to test the hypothesis about the dependent variables and to forecast changes in the dependent variables.

**Course outcomes:** Upon completion of the syllabus students will be able to:

**CO1:** List the concepts and scope of econometrics as well as the concepts of sampling

**CO2:** Outline the fundamental concepts of econometric modelling, particularly linear regression models

**CO3:** Identify and use the normal distribution appropriately

**CO4:** Draw inferences from tests of Hypothesis as well as construct confidence interval

**CO5:** Assess and interpret the results of Bi-variate and Multivariate Regression and Correlation Analysis

**CO6:** Design, construct and estimate econometric models and forecast economic variables.

**CO7:** Use computational software to perform various econometrics problems

## **SYLLABUS**

### **Unit 1: Nature and Scope of Econometrics (3 Hours)**

Theoretical and Empirical Econometrics; Methodology of Econometrics; Econometrics and Samples; Small and Large Samples; Scope: Estimating, Testing, Forecasting.

### **Unit 2: Basic Ideas of Linear Regression: The Two-Variable Model (15 Hours)**

Population Regression Function; Classical Linear Regression Mode; Linear Regression Method: Sample Regression Function; Meaning of “Linear” Regression; Method of Ordinary Least Squares for Two-variable regression; Least Squares Residuals, Variances and Standard Errors of Ordinary Least Squares [OLS] Estimators; BLUE Properties of OLS Estimators: The Gauss-Markov Theorem.

### **Unit 3: The Two-Variable Model: Hypothesis Testing. (12 Hours)**

Hypothesis Testing: Test of Significance Approach; Confidence Interval Approach; Analysis of Variance and Correlation: Sum of Squares; Use of F-ratio to Test the Regression Equation; Use of  $R^2$  to obtain the Goodness of Fit.

### **Unit 4: Multiple Regression: Estimation and Hypothesis Testing (15 Hours)**

Three-variable Regression Model; Meaning of Partial Regression Coefficients; Assumptions of the Classical Linear (Multiple) Regression Model; Multiple Regression Equation; Estimation of Parameters of Multiple Regression, (OLS Estimators); Variances and Standard errors of OLS Estimators; Properties of OLS Estimators of Multiple Regression; Testing the slope of an individual estimator; Testing the Regression Equation. F test, R Square, Adjusted R Square, Comparing two  $R^2$  Values; Partial Correlation.

### **Unit 5: Multiple Regression Problems and Forecasting (15 Hours)**

Multicollinearity: Perfect and Imperfect Multicollinearity; Consequences of Multicollinearity, Detection of Multicollinearity\*, Corrections for Multicollinearity. Heteroscedasticity\*; Nature of Heteroscedasticity, Consequences of Heteroscedasticity, Detection of Heteroscedasticity\*, Corrections for Heteroscedasticity\* ; Serial

Correlation; Nature of Serial Correlation, Consequences of Serial Correlation, Detection of Serial Correlation\*, Corrections for Serial Correlation\*; Regression on Dummy Explanatory Variables\*; Forecasting with a Single-Equation Regression Model.

\* In class exercise using software packages.

**References:**

**Mandatory:**

1. Gujarati, Damodar N. (latest edition), *Basic Econometrics*, McGraw Hill, Singapore.

**Supplementary:**

1. Ramanathan, Ramu (2002), *Introductory Econometrics with Applications*, Thomson Asia Pte Ltd., Singapore.
2. Gujarati, Damodar N. (1999), *Essentials of Econometrics*, Irwin/McGraw Hill, Singapore.
3. Studenmund, A. H. (1997), *Using Econometrics: A Practical Guide*, Addison-Wesley, Reading, Mass.

**Course Title: Labour Economics**

**Course Code: ECO-E-13**

**Marks: 100**

**Credits: 04**

**Duration: 60 Hours**

**Course outcomes:** Upon completion of the course students will be able to:

**CO1:** Recognize the characteristics of Indian labor market.

**CO2:** Review efficiency of Indian labor market.

**CO3:** Choose appropriate labor welfare policy for Indian labor.

**CO4:** Examine issue of labor in India with special reference to female & child labor force.

**CO5:** Analyze the data on Indian labor market & draw suitable findings.

**CO6:** Construct a labor laws and policies suitable in Globalised world,

## **SYLLABUS**

### **Unit 1: An Introduction to Labour Economics (10 Hours)**

Labour :Concept, significance and peculiarities; Nature, scope and importance of Labour Economics; Labour Markets: positive and normative aspects; Characteristics of Indian labour markets.

### **Unit 2: Efficiency of Labour (16 Hours)**

Determinants of Labour efficiency: Wages, education and training, other factors; Determination of wages: minimum wage and fair wage, alternative pay schemes, incentives; Investing in Education and Human Capital Formation; school inputs, school quality, student and teacher incentives, Human capital policy; training program; Competition and regulation.

### **Unit 3: Labour Welfare (12 Hours)**

Social security; need, statutory and non-statutory welfare measures; unemployment insurance, labour welfare funds: Health and insurance schemes.

### **Unit 4: Labour Market Policies in India (12 Hours)**

Exit Policy; Child Labour Policy in India; Problems and Policy of Female Workers in India; Contract Labour.

### **Unit 5: Trade, globalization and labour markets (10 Hours)**

Global dimension of human resource; Perspectives and emerging issues in employer-employee relations in India consequent to economic liberalization and globalization; Brain drain and brain gain.

Mandatory Reading:

1. Ronald G. Ehrenberg and Robert S. Smith (2012), *Modern Labor Economics: Theory and Public Policy*, Pearson Publication, Prentice Hall Boston.(mandatory economics)

#### **Reference:**

1. Puneker S.D, Deodhar S.D. and Sankaran Saraswathi (2011), *Labour welfare, trade unionism and industrial relations* ,Himalaya Publishing House, Mumbai.
2. Datt, G (1996), *Bargaining Power, Wages and Employment : An Analysis of Agricultural, Labour : Markets in India*, Sage Publications, New Delhi
3. Hajela, P.D. (1998), *Labour Restructuring in India: A Critique of the New Economic Policies*, Commonwealth Publishers, New Delhi.
4. Jhabvala, R.and R.K. Subrahmanya (Eds) (2000), *The Unorganised Sector: Work Security and Social Protection*, Sage Publications, New Delhi.
5. McConnell, C.R. And S.L. Brue (2009), *Contemporary Labour Economics*, McGraw-Hill, New York.

**Course Title: Actuarial Economics**

**Course Code: ECO-E-11**

**Marks: 100**

**Credit: 4**

**Duration: 60 Hours**

**Course Outcomes:** upon completion of the course students will be able to:

**CO1:** Understand concepts in actuarial economics

**CO2:** Identify the changes in financial sector due to globalization;

**CO3:** Calculate annuity and types of annuity.

**CO4:** Interpret life table for the purpose of calculation of premium.

**CO5:** Apply probability theory to insurance

**CO6:** Outline the role of regulatory bodies like IRDA

## **SYLLABUS**

### **Unit 1: Introduction to Actuarial Economics (5 Hours)**

Origin, nature and scope of Actuarial Economics : Its importance; Link between financial planning and risk management; Utility and risk preference.

### **Unit 2: Annuity and its Calculations (12 Hours)**

Annuity: ordinary annuity, annuity due, deferred annuity; Perpetuity: present value of immediate perpetuity, present value of perpetuity due, deferred perpetuity; annuity with frequency different from that with which interest is convertible; varying rates of interest; redemption of loan; average interest yield on the life fund.

### **Unit 3: Pricing (15 Hours)**

Basic elements in computation of life insurance premium; premium calculation; formulae for calculation of net premium.

### **Unit 4: Mortality Tables (14 Hours)**

Probability theory in insurance; mortality table; types: select and ultimate tables; stages involved in construction of mortality table.

### **Unit 5: Product Design and Actuarial Profession (14 Hours)**

Basic methodology and setting assumptions; product design; actuarial standards and regulations, role of IRDA.

## **References:**

**Mandatory:** Mishra K.C. & Kumar C.S., (2009), *Elements of Actuarial Science*, Cengage Learning, Delhi

## **Supplementary:**

4. Booth, P.M. et al., (1999), *Modern Actuarial Theory and Practice*, Chapman and Hall, London
5. Newton Bowers et al., (1997), *Actuarial Mathematics*, Society of Actuaries, (second edition), Illinois.
6. Sherris, Michael, (2001), *Principles of Actuarial Science*, **PDF**

**Course Title: Microeconomic Analysis**

**Course Code: ECO-E-12**

**Marks: 100**

**Credits: 4**

**Duration: 60 Hours**

**Course outcomes:** Upon completion of the course students will be able to:

**CO1:** Outline the theory of oligopoly.

**CO2:** Classify and describe pricing policies in competitive and non competitive market structures.

**CO3:** Define general equilibrium & welfare economics.

**CO4:** Compare & contrast partial equilibrium with general equilibrium.

**CO5:** Examine facets of welfare economics.

**CO6:** Evaluate given economic situation through tools of microeconomic analysis.

## **SYLLABUS**

### **Unit 1: Oligopoly (15 Hours)**

Cournot & kinked demand curve models, Collusion: cartel & price leadership model; long run adjustments & efficiency implications of oligopoly; other oligopolistic pricing practices; Prisoners' dilemma; Price & non price competition & cartel cheating.

### **Unit 2: Pricing & employment of inputs (15 Hours)**

Perfect competition: Demand & supply curve for input, pricing & employment of input; analysis of labor market; Imperfect competition: Demand curve of firm for an input, monopsony pricing & employment of one variable input; analysis of imperfect input markets.

### **Unit 3: Equilibrium Analysis (15 Hours)**

Partial equilibrium; Walrasian general equilibrium of exchange & production; Pareto optimality; perfect competition; economic efficiency & equity; Rawl's theory of justice.

### **Unit 4: Welfare Economics (15 Hours)**

Pigouvian welfare economics; Utility possibility frontier, Pareto optimal conditions; Value judgment; Social welfare, Social policy criteria: Compensation principle, Arrow's impossibility theorem; Inability to obtain optimum welfare: Imperfections, market failure, decreasing costs, uncertainty and non-existent and incomplete markets.

## **References:**

### **Mandatory:**

2. Salvatore, Dominick, Principles of Microeconomics, Oxford International student edition, Eighth Edition

### **Supplementary:**

7. Gravelle, H and Ray Rees, (2004), *Microeconomics*, Pearson Education Limited, England.
8. Hal R Varian, (2010), *Microeconomic Analysis*, W W Norton & Company, New York.
9. Mas-colell, A, Michael D. Wiston and Jerry G. Green (1995), *Microeconomics*, 3rd edition, Prentice Hall Longman, London.
10. Sen, A.,(1999), *Microeconomic Theory*, OUP, New York.
11. Stigler, G., (1996), *Microeconomics: Theory and Applications*, Oxford University Press, New Delhi.
12. Varian, H., (2004), *Theory of Price*, (4th Edition), Prentice Hall of India, New Delhi.

**Course Title: Evolution of Methods in Economic Analysis**

**Course Code: ECO-E-18**

**Marks: 100**

**Credits: 4**

**Duration: 60 Hours**

**Course outcomes:** upon completion of the course students will be able to

**CO1:** Describe evolution of economic thought.

**CO2:** state Philosophical orientation of economics

**CO2:** List out the contribution of all classical economists.

**CO3:** Differentiate between approaches adopted by positive and normative economics

**CO4:** Classify different theory of Economics on the timeline with the specific contribution of all the economists as mentioned in the syllabus.

**CO5:** Analyze the contribution of Keynes and post Keynesian to economic thought.

**CO6:** Appraise the emergence of Economics as a discipline.

## **SYLLABUS**

**Unit 1: Philosophical Orientation of Economics (12 Hours)**

Smith; Ricardo; Malthus; Mill, Marx: Beginnings of Classical Political Economy.

**Unit 2: Historical Analysis in Political Economy (12 Hours)**

Classical school; German school: Schmoller, Knapp, Weber etc.

**Unit 3: Marginalist Methods of Analysis (12 Hours)**

Emergence of Economics as a Science :A critical view

**Unit 4: Positivism and the Emergence of Economics as a Discipline (12 Hours)**

Menger to Hayek: the Austrian School.

**Unit 5: General Theory to General Equilibrium (12 Hours)**

Keynes and beyond

## **References:**

### **Mandatory:**

1. Milonakis, Dimitris and Fine, Ben (2009), *From Political Economy to Economics Method, the Social and the Historical in the Evolution of Economic Theory*, Routledge, London.

### **Supplementary:**

1. Backhouse, Roger E. (1985), *A History of Modern Economic Analysis*, Basil Blackwell, Oxford
2. Blaug, Mark (1997), *Economic Theory in Retrospect*, Blaug, Cambridge University Press, Cambridge, U.K.
3. Blaug, Mark (1992): “ *The Methodology of Economics: Or How Economists Explain*”, Cambridge University Press, Cambridge, U.K.

**Course Title: Introduction to Operations Research for Economists**

**Course Code: ECO-E-10**

**Marks: 100**

**Credits: 04**

**Duration: 60 Hours**

**Course Outcomes:** Upon completion of the course students will be able

**CO1:** To identify best techniques to solve a specific problem

**CO2:** To understand the mathematical tools that are needed to solve optimisation problems.

**CO3:** To explain a real-world problem, given in words, into a mathematical formulation

**CO4:** To analyze the best choice using decision tree

**CO5:** To evaluate linear programming, transportation and assignment problems

**CO6:** To interpret and discuss the results of solutions to the problems

## **SYLLABUS**

**Unit 1: Linear Algebra** (15 Hours)

Systems of equations; Matrices and determinants; Matrix inversion method and its uses.

**Unit 2: Linear Programming** (15 Hours)

Elements of Linear Programming; Solution to LPP: Graphical, Simplex and the Big M methods.

**Unit 3: Transportation and Assignment Problems** (15 Hours)

Initial allocation methods; Optimization methods.

**Unit 4: Statistical Decision-Making** (15 Hours)

Probability analysis; Decision Trees; Expected Value; Economic and commercial applications.

## **References:**

1. Kantisawrup et al, (2005), *Operations Research*, S Chand & sons, New Delhi
2. Tulsian P.C., Pandey V., (2006), *Quantitative Techniques*, Pearson India.
3. Taha H., (2006), *Operation Research: An Introduction*, Pearson, 7<sup>th</sup> Edition



**Course Title: Environmental Economics**

**Course Code: ECO- E-14**

**Marks: 100**

**Credits: 4**

**Duration: 60 Hours**

### **Course Objectives:**

**Course Outcome:** Upon completion of the course students will be able to

**CO1:** Define scope of environmental economics

**CO2:**List out the differences between national income accounting & green accounting procedures

**CO3:** Identify different environmental damage functions.

**CO4:** Apply law of equi-marginal principle to environmental pollution reduction.

**CO5:** Choose appropriate environment evaluation technique to a given environmental problem

**CO6:** Select appropriate tools of Micro Economics for providing solutions to Environmental problems.

### **SYLLABUS**

#### **Unit 1: Economics and the Environment (15 Hours)**

Economic Perspectives on the Environment; National Income and Environmental Accounting; Economic activity and problem of residuals; Issues of Environmental economics; Externality and Market Failure.

#### **Unit 2: Economics of Environmental Quality (15 Hours)**

Pollution Damage and Abatement Costs; damage and ambient functions; Efficient Level of Emissions; Application of Equi-marginal Principle to Emission Reductions; Enforcement Cost; Pollution control models.

#### **Unit 3: Environmental Evaluation (15 Hours)**

Use and non-use value of environmental resources; Market and non-market evaluation techniques; Impact analysis, Cost-effectiveness analysis, Benefits and Costs analysis.

#### **Unit 4: Environmental Policy (15 Hours)**

Criteria for Evaluating Environmental Policies, Decentralized Policies: Liability Laws, Property Rights, Moral Suasion, Command-and-Control Strategies: The Case of Standards; Incentive-Based Strategies: Emission Charges and Subsidies, Transferable Discharge Permits.

### **References:**

#### **Mandatory:**

1. Field, Berry and Field, Martha (2001), *Environmental Economics*, McGraw-Hill/Irwin

#### **Supplementary:**

- 1.Hanely, Nick, Shorgen, Jason F. and White, Ben (1999), *Environmental Economics: In Theory and Practise*, MacMillian.
2. Kolstad, C, D. (2003), *Environmental Economics*, Oxford University Press.
3. Matthew Kahn, *Fundamentals of Environmental Economics: Solving Urban Pollution Problems*,(Kindle Edition).
4. Titenberg Tom and Lynne, Lewis (2012), *Environmental and Natural resource economics*, 9<sup>th</sup> edition, Pearson
5. Wallace Oates (Editor) (2006), *The RFF Reader in Environmental and Resource Policy*, 2nd edition, RFF Press

**Course Title: Introduction to Industrial Economics**

**Course Code: ECO- E-15**

**Marks: 100**

**Credits: 04**

**Duration: 60 Hours**

**Course outcomes:** upon completion of the course students will be able to

**CO1:** Define the scope of industrial economics.

**CO2:** Discuss the theories of firms.

**CO3:** Identify various market structures, their conduct and performance.

**CO4:** Examine the industrial policies in India post globalization and their relevance.

**CO5:** Analyze labor regulatory mechanism and competition framework with respect to India.

**CO6:** Choose the right industrial structure for Indian economy in the globalised world.

## **SYLLABUS**

### **Unit 1: Introduction to Industrial economics and Theory of the Firm (15 Hours)**

Meaning, scope, need and significance of industrial economics; Size and Structure of firms: technological view of the firm; investment size; vertical integration; transaction cost. Separation of ownership and control: implications.

### **Unit 2: Structure, Conduct and Performance (15 Hours)**

Determinants of market structure; Price and non-price competition; product differentiation.

### **Unit 3: Industrial Policy and Reforms (15 Hours)**

Industrial policy in a global economy; industrial policy for inclusive growth; India's industrial policy pre and post globalization.

### **Unit 4: Regulatory Mechanism and Competition Framework (15 Hours)**

Need for reforms in regulatory mechanisms; Competition Law and Policy; role of Competition Commission in India; Introduction to labour reforms.

## **References:**

1. Addison J.T Schnabei C., (2003), *International Handbook Of Trade Unions*, Edward Edgar.
2. Bhatia S.K, (2006)*Industrial relations and collective bargaining, Theory and practice*, deep and Deep Publications, New Delhi,
3. Mamoria C.B & Mamoria S, (2005),*Dynamics of Industrial Relation*,Himalaya Publishing House, Mumbai.
4. SenRatna,(2003), *Industrial Relations In India*, Macdonald and Evans, G. Britain.
5. VenkataRatnam, C.S., (2001), *Globalization and Labour- Management Relations: Dynamics of Changes*, Sage Publications/Response Books, New Delhi.

**Course Title: Financial Economics**

**Course Code: ECO- E-16**

**Marks: 100**

**Credits: 04**

**Duration: 60 Hours**

**Course outcomes:** Upon completion of the course students will be able to

**CO1:** State the different types of financial instruments and techniques of asset management

**CO2:** Interpret various ratios used in the course

**CO3:** Develop insights into the role played by time, uncertainty, information and inflation in evaluating financial instruments

**CO4:** Classify various instruments and inspect the feasible

**CO5:** Measure risks, returns, value of investments & assets,

**CO6:** Propose solutions to specific financial issues or problems of corporate financial decisions

## **SYLLABUS**

### **Unit 1: Types of Financial Securities (12 Hours)**

Introduction to financial economics; types of financial markets their features;

Types of money market securities; Capital market securities: common and preferred stock; Rights and Warrants; Bonds: corporate, government and public sector bonds; Mutual funds.

### **Unit 2: Valuation of Financial Securities (20 Hours)**

Discount rates and the time value of money: Present value (PV) and net present value (NPV); Mechanics of NPV calculations; Compound interest, annuity and perpetuity formulas; Real vs. nominal cash flows, Fixed income markets, Bond Valuation; Discount bond and Coupon bond.

### **Unit 3: Return and Risk Analysis (20 Hours)**

Investment and returns: Interest rates, dividends, capital gains; Time value of money; Inflation and returns; Measuring investment returns; Risk and Risk factors; Measuring investment risks; Diversification; Systematic and idiosyncratic risk; Portfolio mean and variance; Covariance and correlation of returns; feasible combinations of mean and variance; Portfolio optimization; Efficient risk/return trade-offs.

### **Unit 4: Financial Statement Analysis (08 Hours)**

Introduction to Financial Statements; Importance of Financial ratios; Calculations and Interpretation of Liquidity ratios, Leverage ratios, Turnover ratios, Profitability ratios, Capital Gearing ratios: Limitations.

## **References:**

### **Mandatory**

1. Francis J C & R.W Taylor (1992), *Theory and Problems of Investments*, McGraw Hill, Schaum's Outline Series, Singapore.

### **Supplementary :**

1. Bodie, Zvi Kane, Alex Marcus Alan (2012), *Essentials of Investments, 9<sup>th</sup> Edition*, McGraw Hill Higher Education.
2. Avadhani V. A 2012, *Financial Economics, Theory and Practice*, Himalaya Publications.
3. Kohn, Meir (1994), *Financial Institutions and Markets*, McGraw Hill, New York.
4. Richard A. Brealey and Stewart C. Myers (2002), *Principles of Corporate Finance*, McGrawHill, 7th edition.
5. Thomas E. Copeland, J. Fred Weston and Kuldeep Shastri (2003), *Financial Theory and Corporate Policy*, Prentice Hall, 4th edition.

**Course Title: Macroeconomic Analysis**

**Course Code: ECO- E-17**

**Marks: 100**

**Credit: 4**

**Duration: 60 Hours**

**Course outcomes:** Upon completion of the course students will be able to:

**CO1:** Describe consumption, investment, business behaviors; & concepts of inflation, monetary policy, unemployment, interest rate determination.

**CO2:** explain and summarize the various macroeconomic theories included in the course.

**CO3:** Utilize the macroeconomic frameworks to develop insights into the dynamics of the economy

**CO4:** Examine the working of banking sector, the inflation-unemployment trade off and the liquidity trap

**CO5:** Evaluate the merits and limitations of monetary and fiscal policy

**CO6:** Solve macroeconomic problems with the insights gained from the course

## **SYLLABUS**

### **Unit 1: Theories of Consumption and Investment (15 Hours)**

General theories of spending behavior, Absolute, Relative Permanent Income Hypothesis, Life cycle hypothesis; Motivation for Investment: Marginal Efficiency of capital, supply price; expected income streams; MEC and rate of interest; Principle of Acceleration

### **Unit 2: Frameworks for Interest Rate Determination (15 Hours)**

Keynesian theory of interest; determination of rate of interest; Changes in levels of income, speculative demand and money supply and their effect on equilibrium rate of interest; liquidity trap and policy implications; IS-LM approach to the determination of equilibrium rate of interest; elasticity of LM schedule and shift in LM curve; interest elasticity of IS schedule and equilibrium.

### **Unit 3: Theory of Inflation and Business Cycle (15 Hours)**

Theories of Inflation: demand pull, cost push, wage push, profit push; the Phillips curve, trade-off between inflation and unemployment, stagnation; concept and phases of trade cycle; Innovation theory; Hicks' theory.

### **Unit 4: Banking System (15 Hours)**

Role of Central Bank: functions, credit control methods; monetary policy; Commercial banking: functions, credit creation, social banking; banking sector reforms in India.

## **References:**

### **Mandatory:**

1. Begg D., Dornbusch R., Fischer S. *Economics*, McGraw-Hill, 9th edition.

### **Supplementary:**

1. Mankiw N. G. (2010), *Macroeconomics*, 7<sup>th</sup> edition, Worth Publishers, NY
2. Bhole L.M. (1999), *Financial Institutions and Markets*, Tata Mcgraw Hill
3. Lipsey R.G., Chrystal K. *An Introduction to Positive Economics*, Oxford University Press.
4. Reddy Y.V. (2000), *Monetary and Financial Sector Reforms in India*, UBSPD, New Delhi
5. Samuelson, Paul A and Nordhaus, William d. (2010). *Economics*, Tata McGraw – Hill, New Delhi.

**Course Title: Entrepreneurship**

**Course Code: ECO-E-6**

**Marks: 100**

**Credits: 4**

**Duration: 60 Hours**

**Course outcomes:** Upon completion of the course students will be able:

**CO1:** Understand basic concepts in entrepreneurship.

**CO2:** Evaluate risks faced by entrepreneurs

**CO3:** Identify the sources of funds & manage human resources.

**CO4:** Understand costing, pricing & marketing strategies.

**CO5:** Identify and evaluate business opportunities.

**CO6:** Design and execute a business plan.

## **SYLLABUS**

### **Unit I. Introduction to entrepreneurship (15 Hours)**

Entrepreneurship: meaning, definition, Types, qualities, skills and functions;

Analysis of Business Environment & Policies: Market, Resources & Competition;

Use of SWOT and Porter's Five Forces Analysis.

### **Unit 2: Risk and Innovation (15 Hours)**

Importance and management of risk; market/commercial risk, technological risk, financial risk, social risk, political risk, personal risk; Differences between Risk and Uncertainty; Schumpeter's, Drucker's and other's views; Types and forms of innovations; innovation & imitation; Patents and Copyrights; Start-up, Incubation centre: Role, status in Goa

### **Unit 3: Sources, Uses and Management of Resources (10 Hours)**

Financial Resources :Sources of funds; Uses of funds; Fixed and Working Capital; Material Resources: Supply and distribution chains; Government and local resources; Human Resources.

### **Unit 4: Costing, Pricing and Marketing (10 Hours)**

Costing Strategies: Absorption and marginal costing; Costing for inventories; Pricing and pricing strategies(skimming price, penetration price, mark-up, marginal-cost price); Break- even analysis and break- even chart; Marketing techniques and strategies.

### **Unit 5: Preparing the Business Plan\* (10 Hours)**

Components and Uses of the Business Plan; Creating a Business Plan; Sources of funds; Marketing Plan Expenditures and Revenues; Profitability; Growth Rate of the business and the Rate of Return.

\*students will submit a business plan: (10 hours)

## **References:**

### **Mandatory:**

1. Charantimath, Poornima M. (2014), *Entrepreneurship Development and Small Business Enterprises*, Pearson, Chennai.
2. Colombo Plan Staff College for Technical Education, Manila (1999), *Entrepreneurship Development*, Tata McGraw Hill, New Delhi.

**Supplementary:**

7. Chandra, Prasana (1995), *Projects: Planning, Analysis, Selection, Implementation & Review*, Tata McGraw Hill, New Delhi.
8. Kuriloff, Arthur H; Hemphill, John M. (1988), *Starting and Managing the Small Business*, McGraw-Hill, New York.
9. <https://up.startupindia.gov.in/content/sih/en/home-page.html>
10. <http://www.ciba.org.in/>
11. <https://www.goa.gov.in/wp-content/uploads/2017/09/Goa-IT-Start-up-Policy-2017.pdf>

**Course Title: Gandhian Economic Thought**

**Course Code: ECO-INT -2**

**Marks: 100**

**Credits: 4**

**Duration: 60 Hours**

**Course outcomes:** Upon completion of the course students will be able to

**CO1:** Define Gandhian economics

**CO2:** Explain basic principles of Gandhian economy

**CO3:** Apply Gandhi's theory of Agriculture and industrialization to Indian situation

**CO4:** Analyze the principle of trusteeship

**CO5:** Appraise the principle of sarvodaya

**CO6:** Propose alternative solution based on Gandhian economic thought to any economic problem

## **SYLLABUS**

### **Unit 1: Basic Principles of Gandhian Economy (10 Hours)**

Motives; Mother economy; Natural resources; product; Methods of production; exchange and trade; cooperation; standard of living ;Trusteeship; Swadeshi and its present relevance to India; Trusteeship; Principle of Sustainability: economic, environmental and social.

### **Unit 2: Agriculture Economy (10 Hours)**

Agriculture as occupation, Manures, agricultural prices, ownership, labour, social effects, distribution of produce, self-sufficient village economy, Solutions to issues of poverty and unemployment in India.

### **Unit 3: Industrial Economy (20 Hours)**

Industrial economy: Efficiency, power, tractors, electricity, diffusion, work, development of personality; Agro and Village industries: Introduction, Purpose, Public Utilities; Importance of Village and Cottage Industries in National Economy; Comparative study of large and small scale industries; Economics of Khadi, Charkha, and its relevance to Indian economy.

### **Unit 4: Human Resource Development (5 Hours)**

Gandhian perspective on the policy of education; vocational training and status of women.

### **Unit 5: Principle of Sarvodaya (15 Hours)**

Sarvodaya Economics: Bhoodan, Gramdan, Contribution of Vinoba Bhave to Sarvodaya movement; Sarvodaya and Globalization: Relevance.

## **References:**

### **Mandatory:**

1. Kumarappa, J.C.(1987), *Gandhian economic thought*, SarvaSevaSanghPrakasham, RajghatVaransi.

### **Supplementary:**

1. Bose, N.K. (1966), *Gandhi the man and his mission*, BhartiyaVidyaBhawan, Bombay.
2. Datta, Amlan. (1986), *The Gandhian Way*, N.E. Hill University publications, Shillong.
3. Diwarkar, R.R. (1963), *Gandhiji's basic Ideas and some modern problems*, BharatiyaVidyaBhawan.
4. Iyer, Raghavan. (1963), *Moral and Political Thought of Gandhi*, Oxford Univ. Press, New York.

**Online Source:**

1. *The Official Mahatma Gandhi e Archive & Reference Library, Mahatma Gandhi Foundation - India.* Available from: <[www.mahatma.org.in/books](http://www.mahatma.org.in/books) >(for exhaustive list)



**Course Title: Financial Investments for All**

**Course Code: ECO-INT-3**

**Marks: 100**

**Credits: 4**

**Duration: 60 Hours**

**Course outcomes:** upon completion of the course students will be able to:

**CO1:** State the different types of financial markets and financial instruments

**CO2:** Explain the organisation and institutional details of financial markets and banks

**CO3:** Apply the theoretical concepts to the actual working of the financial markets

**CO4:** Analyze the fundamental operations of financial markets, instruments and derivatives

**CO5:** Evaluate returns, value of investments & assets, and various financial ratios

**CO6:** Formulate strategies to create & manage an initial investment portfolio

## **SYLLABUS**

### **Unit 1: Introduction to the financial system (15 Hours)**

Meaning; financial system: an overview, flow of funds, financial institutions, financial markets, financial instruments, financial services, regulators; Primary markets: types of issues, public issues: IPO-FPO, right issues, bonus issue: private placement, preferential allotment, qualified institutions placement, documents, prospectus, letter of offer, placement document, types of financial markets: security markets, money markets, foreign exchange markets, commodity markets, insurance market, differences between investing in low risk vs. high risk instruments.

### **Unit 2: The Banking system: (10 Hours)**

Time value of money: present and future value,\*calculation, importance of a banking system; bank deposits as low risk asset class; types of bank deposits; bank loans; types of loan instruments; interest rate spread, \*EMI calculations; other facilities provided by the banks; effects of interest rates on the banking system; role of central bank as a regulator of the banking system.

### **Unit 3: Security markets: (15 Hours)**

Definition of securities; functions of security markets; Market segments in security markets: primary and secondary markets; Participants in security markets: investors, issuers, intermediaries, regulators; Offer document; SEBI regulations, issue requirements; Corporate actions: dividends, stock split, buy back, mergers and acquisitions, rights issues, bonus issues. Demat account.

### **Unit 4: Stock market indicators, trends and behavior (8 Hours)**

Meaning of a stock market Index: Sensex, Nifty; Stock market indicators: fundamental and technical analysis market capitalization, turnover, turnover ratio, market capitalization ratio trade value ratio, types of financial derivatives.

### **Unit 5: Mutual Funds: (12 Hours)**

Meaning and types of mutual funds; Systematic Investment Plans;benefits of investing in mutual funds; tax benefits on selected mutual fund investments; types of MF/schemes;\*Calculation of NAV; \*Steps in creation of an initial investment Portfolio.

## **References:**

1. Chandra. P. (2014), *Investment Analysis and Portfolio Management*, Tata McGraw-Hill, New Delhi
2. Graham, B. (2008), *The Intelligent Investor*, Harper
3. Khan M. Y. ; Jain P. K. (2015), *Financial Management*, Tata McGraw-Hill Publishing, New Delhi
4. Siegel, Jeremy J. (1998) *Stocks for the Long Run*, McGraw-Hill. New York

5. Van Horne J., Wachowicz, John M., Van Horne JR (2008), *Fundamentals of Financial Management*, Prentice Hall
6. *Practical checks* [www.moneycontrol.com](http://www.moneycontrol.com)

**Course Title: Taxation for All**

**Course Code: ECO-INT-4**

**Marks: 100**

**Credits: 4**

**Duration: 60 Hours**

**Course outcomes:** Upon completion of the course students will be able to

**CO1:** Explain the importance of different types of taxes in India

**CO2:** Interpret provisions of direct and indirect tax legislations

**CO3:** Apply the tax laws to derive solutions

**CO4:** Analyze direct and indirect tax structures

**CO5:** Assess different types of taxes

**CO6:** Formulate tax returns for individuals and corporations

## **SYLLABUS**

### **Unit 1. Introduction to Taxation (15 Hours)**

Importance of taxation; Principles of taxation; Impact and incidence of a tax; equity and ability-to-pay; tax rates and structure of tax rates; direct and indirect taxes, advantages and disadvantages; efficient and inefficient taxes; Shifting and Evasion, Legal basis for the introduction of a Tax.

### **Unit 2. Income Tax (15 Hours)**

Importance of Income Tax; Legislation supporting the Imposition of Income Tax; Features and Important Provisions; Income tax Rate structure; Taxable Incomes; Avoidance and Evasion of Taxes; \*Calculation of Income Tax and Corporate Tax and Filing Tax Returns.

### **Unit 3. Goods and Service Tax (15 Hours)**

Evolution of Indirect Taxation in India; Types of Indirect Taxes in India; Importance of Goods and Service Tax; Legislation supporting the Imposition of Goods and Service Tax; Features and Important Provisions; GST Tax Structure; \*Calculations of Taxes under GST and Filing of Tax Returns.

### **Unit 4. Customs Duties (15 Hours)**

Importance of Customs Duties; Legislation supporting the Imposition of Custom Duties; Features and Important Provisions; Treatment of Exports and Imports; Custom Valuation Procedures; Structure of Customs Duties; \*Calculations and Clearance of Custom Duties. Auctions and Customs.

\*practical component

## **References:**

1. Jain R K (2017) *Customs Tariff of India 2017-18*, Vol. 1 and Vol. 2, CENTAX
2. Rosen S.H., *'Public Finance'*, Irwin /McGraw- Hill.
3. Saraogi CA Vishal (2017) *Goods and Services Tax Laws Practice & Procedure with Commentary*, Lawpoint Publications
4. Singhanian, Monica; Singhanian Vinod K (2017) *Student's Guide to Income Tax* (University Edition), Taxman
5. Sreekantaradhya B.S., *'STRUCTURE AND REFORMS OF TAXATION IN INDIA'*, Deep & Deep, New Delhi.
6. GST India <http://www.gstindia.com/about/>
7. Taxmann Goods and Service tax <https://gst.taxmann.com/>
8. Cleartax on GST <https://cleartax.in/s/gst-law-goods-and-services-tax>

**ENGLISH**

**PARVATIBAI CHOWGULE COLLEGE OF ARTS AND SCIENCE**

**AUTONOMOUS**

**DEPARTMENT OF ENGLISH**

**SYLLABI OF SEMESTER I AND SEMESTER II FOR THE ACADEMIC YEAR 2015 - 2016**

**F.Y.B.A – SEMESTER 1 – CORE PAPER**

**Paper Title:** Understanding Poetry & Drama

**Paper Code:** ENG-1.C-1

**Name of Faculty:** Associate Professor Ms. Rajashree R. Desai

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To acquaint students with major poetic forms and trends in English Poetry.
2. To enable students to read and appreciate poems.
3. To improve the literary and critical competence of the students.
4. To teach students to appreciate English Drama.
5. To instill the appreciation of Drama and the universality of its reach.
6. To train students to identify basic elements in a Drama.

**2. Learning outcomes:**

Upon completion of the course the student should be able:

1. Recognize and define major poetic forms such as lyric poetry, narrative poetry.
2. Know and identify rhyme, rhythm and meter.
3. Understand and appreciate the literal and symbolic/inner meaning (connotative and denotative meaning) of a poem.
4. Identify and analyze special stylistic features of poetry such as imagery, tone, atmosphere, special linguistic and stylistic features, imagery.

5. To recognize and appreciate various elements of a drama: Plot, Character, Dialogue, Setting, Theme, and Act-Scene Division.
6. To understand and be knowledgeable about the evolution of two major forms of Drama – Tragedy and Comedy.

**3. Number of Lectures: 04 Lectures per week**

**4. Course Content:**

**Unit I: Background to Poetry & Drama**

**Number of Lectures: 12**

1. Poetry as a Literary form
2. Nature and types of lyric poetry
3. Evolution of lyric as a literary form
4. Nature and forms of narrative poetry
5. Evolution of the English Drama
6. Nature of Tragedy & Comedy in Drama

**Unit 2: Lyric Poetry: Songs, Sonnets, Odes, Elegies and Dramatic Monologues**

**Number of Lectures: 12**

1. Edmund Spenser: Whilst in Prime
2. Sir Philip Sidney: His Lady's Cruelty
3. William Shakespeare: Marriage of True Minds
4. John Donne: Batter my Heart
5. George Herbert: Easter Wings
6. Robert Herrick: To Daffodils
7. William Blake: *Lamb* and *Tyger*
8. William Wordsworth: The Daffodils
9. P. B. Shelley: Mutability
10. John Keats: Ode on a Grecian Urn
11. Robert Browning: My Last Duchess
12. Lord Alfred Tennyson - *Prologue of In Memoriam*

**Unit 3: Narrative Poetry: Ballads, Epic, Mock Epic**                      **Number of Lectures: 12**

1. S T Coleridge : The Rime of the Ancient Mariner : (Sections 1, 5 or 6, 8)
2. John Milton: Paradise Lost Bk. I (Lines 1-124)
3. Alexander Pope- Rape of the Lock (Canto I)

**Unit 4: Drama:Comedy**    **Number of Lectures: 12**

1. Text: J. M. Barrie – The Admirable Crichton

**Unit 5: Drama:Tragedy**    **Number of Lectures: 12**

- 1.Text: Henrik Ibsen: An Enemy of the People

**5. Reference Books :**

**(Please Note: References to the changed Primary texts in drama will be added later. To be approved in the next B.O.S. meeting)**

**Primary References:**

1. Ibsen, Henrik. *An Enemy of the People*.
2. Barrie. J. M. *The Admirable Crichton*

**Secondary References:**

1. Abrams, M. H. *A Glossary of Literary Terms*. 11<sup>th</sup>. Cengage Learning, 2014.
2. Bowra C.M. *Heroic Poetry*. Macmillan, 1966.
3. Ed. Bloom Harold. *William Shakespeare's Sonnets*. Viva Books, 2007.
4. Ed. Bottrall Margaret. *William Blake: Songs & Innocence & Experiences*. Macmillan, 1970.

5. Bradley. A.C. *Oxford Lectures on Poetry*. Atlantic, 2009.
6. Broadbent J.B. *Poetic Love*. Chatto & Windus London, 1964.
7. Chandra NDR, Sebastian A.J. *Literary Terms in English Poetry*. Authors Press, Delhi, 2001.
8. Cuddon J A. *The Penguin Dictionary of Literary Terms and Literary Theory*. Penguin Books, 1999.
9. Dobson, Michael and Wells, Stanley. *The Oxford Companion to Shakespeare*. Oxford, 2001.
10. Gardner Stanley. *Blake*. P. Evans Brothers Ltd, 1968.
11. Jump, John D.(Ed.) *Critical Idiom Series*. Law Book Co of Australasia, 1974.
12. Gridley Roy E. *Browning*. Routledge & Kegan Paul, 1972.
13. Ed. Grose Kenneth H. *Keats*. Evans Brother Ltd, 1969.
14. Hudson, W. H. *An Introduction to the Study of Literature*. B.I. Publications, 1972.
15. Klarer Mario. *An Introduction to Literary Studies*. Routledge, 2004.
16. Lever J.W. *The Elizabethan Love Sonnets*. Methuen & Co. Ltd, 1966.
17. Ed. O'Neill Judith. *Critics on Keats*. George Allen & Unwin Ltd, 1967.
18. O'Neill Judith. *Critics of Pope*. George Allen & Unwin Ltd., London, 1968.
19. Prasad, B. *Background to the Study of English Literature for Indian Students*. Trinity Press, 2014.
20. Read Herbert. *Wordsworth*. Faber & Faber Ltd, 1957.
21. Sarker Sunil Kumar. *Shakespeare's Sonnets*. Atlantic Publisher, 2006.
22. Smith Hallett. *Elizabethan Poetry*. Ann Arbor Paperbacks, 1968.
23. Ed. Ward Sir W. & Walter A.R. *The Cambridge History of English Literature*. Cambridge University Press, 1914.
24. Westland Peter. *Literary Appreciation*. The English University Press Ltd, 1964.
25. Rees, R. J. *Introduction to English Literature*. New Delhi: Macmillan India, 1973.



## **F.Y.B.A – SEMESTER 1 – CORE PAPER**

**Paper Title:** History of English Literature from Fourteenth Century to the Twentieth Century (1901-1939)

**Paper Code:**ENG-I.C-2

**Name of Faculty:**Associate Professor Ms. Rajashree R. Desai

**Marks:** 100

**Credits:**4

### **1. Course Objectives:**

1. To provide a comprehensive overview of major periods in the History of English literature.
2. To introduce to the students to historical and cultural contexts in which English literature has been produced through the ages.
3. To provide a view of major writers and their works in different ages.
4. To explore the complex relationship between literature and its context through discussion of particular literary trends, texts and issues within each period.

### **2. Learning outcomes:**

1. Students should be able to perceive the complex relationship between literature and society.
2. The learner should be able to explain how and why particular types of literature emerged from particular set of historical circumstances.
3. The students should be able to critically appreciate representative literary works written in different ages.
4. They should be able to read independently literary texts of different periods.

### **3. Number of Lectures: 04 Lectures per week**

#### 4. Course Content:

1. The age of Chaucer/From Chaucer to Renaissance (1350- 1516)-Age of unrest and transition, Religious movements, new learning of classical antiquity- Petrarch, Giovanni Boccaccio

Major prose writers- John Wyclif, Sir John Mandeville

Major Poets- Geoffrey Chaucer, William Langland, John Gower

**Number of lectures- 05**

2. The English Renaissance/ The age of Shakespeare (1578-1625)

Renaissance and Reformation, Humanism, Geographical discoveries,

Elizabethan Poetry- Songs and sonnets of the sixteenth century

Development of drama from Miracle and Morality Plays, Interludes to University Wits  
Bacon's Essays

Prose- Translations (Wyclif, Tyndale, Coverdale, Authorized Version of 1611),  
Historical and biographical works, Literary Criticism, Religious writings,  
Humanistic writings, Elizabethan satirical writings (Nash, Lodge, etc.)

**Number of lectures- 12**

3. The seventeenth Century: The age of John Milton and John Dryden (1625- 1700) -  
England under Charles I and Commonwealth, the triumph of Puritanism,  
Restoration

Prose- Sir Thomas Browne, The Anglican clergy, The Puritan writers,  
Rationalism and Restoration prose (Hobbes, Newton), Diarist of the Age (Samuel  
Pepy, John Evelyn), Moral Essays (Cowley, Temple), John  
Bunyan, George Cox, Thomas Ellwood, Establishment of Royal Society and  
the development of modern prose

Poetry- The Cavalier Poets, the Metaphysical Poets, John Milton, Dryden

Restoration Drama: William Congreve, John Vanburgh, George Farquhar,  
William Wycherley, George Etherege

Literary Criticism: Dryden

**Number of lectures- 13**

4. The Eighteenth century: The Age of Alexander Pope and Dr. Samuel Johnson (1700-1789)- Reign of Queen Anne, The Coffee House Culture and the Periodical Essays,

The Age of Prose and Reason, Satires of the age – Johnathan Swift

Neoclassicism

Augustan Reflective poetry - Alexander Pope, Lady Anne Finch of Winchilsea, Thomas Collins, Thomas Gray and Oliver Goldsmith

Precursors of Romantic Poetry - Robert Burns and William Cooper

The rise of the novel

Sentimental Comedy

**Number of lectures-10**

5. The Nineteenth century:

The age of Wordsworth: French Revolution and Romanticism, William Blake, William Wordsworth, S. T. Coleridge, John Keats, P.B. Shelley, Lord Byron

Prose: Personal Essayist: Charles Lamb, William Hazlitt, Leigh Hunt, etc.

The Age of Alfred Lord Tennyson: Rapid growth of science and industry, religion and science, religion and sex and its impact on literature, Victorianism, , Advance of democracy

Victorian Poets: Tennyson, Matthew Arnold, Robert Browning; Late Victorian Poets: Thomas Hardy, G. M. Hopkins

'Pre-Raphaelites' – D. G. Rossetti, Walter Pater, William Morris

*Georgian Poets* – Maysfield, John Drinkwater, R. Loius Stevenson

The Novelists of the Nineteenth Century – Charles Dickens, William Thackeray, Charlotte and Emily Bronte, Thomas Hardy and George Eliot.

**Number of lectures-10**

6. The Twentieth Century (1901-1939): Impact of Sigmund Freud, Karl Marx, Henri Bergson on literature; Moral perplexities, economic and social change, the search for values

Poetry – Georgian Poetry, War Poetry, George Eliot/ W. B. Yeats/ Ezra Pound, Socialist Poetry – W. H. Auden/ Stephen Spender/ Louis Macneice and Dylan Thomas

Drama – Oscar Wilde, John Galsworthy, G. B. Shaw

Poetic Drama – T. S. Eliot/ George Isherwood

Existential Drama – Ionesco

Angry Youngman Drama – John Osborne/Arnold Wesker

Novel form – Henry James, John Galsworthy, H. G. Wells, D. H Lawrence

Stream of Consciousness – Virginia Woolf, James Joyce, E. M. Forster, George Orwell,

Graham Greene, Rudyard Kipling, William Golding, Somerset Maugham, P. G. Wodehouse.

### **Number of lectures-10**

#### **5. Reference Books:**

##### **Primary References:**

1. Daiches David. *A Critical History of English Literature*. Allied Publishers Ltd. New Delhi, 1999.
2. Ford Boris Ed. *The Pelican Guide to English Literature*. Penguin Books UK, 1964
3. Hudson William. *An Outline History of English Literature*. B I Publications, Bombay, 1972.
4. Poplawski Paul ed. *English Literature in Context*. New Delhi: Cambridge University Press, 2008.

##### **Secondary References:**

1. Compton-Rickett Arthur. *A History of English Literature*. Universal Book Stall, Delhi, 1969.
2. Evans Ifor. *A Short History of English Literature*. The English Language Book Society & Penguin Books, 1970.
3. Legouis Emile, and Cazamian Louis, Vergnas Raymond. *A History of English Literature*. London: J.M. Dent and Sons LTD, 1964.

## **F.Y.B.A – SEMESTER II – CORE PAPER**

**Paper Title:** An Introduction to Linguistics and Stylistics

**Paper Code:** ENG-II.C-4

**Name of Faculty:** Associate Professor Ms. Rajashree R. Desai

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To acquaint the students with the basic concepts in linguistics.
2. To introduce the students to various sub disciplines of linguistics.
3. To know the connection between linguistics and stylistics.
4. To understand the concept of style in literature.
5. To provide hands on experience in analysing texts, fiction and poetry.

### **2. Learning Outcome:**

1. The Students should be able to identify and classify English sounds.
2. Produce utterances with correct stress and rhythm.
3. Ability to distinguish between different registers of English, international varieties of English.
4. Ability to analyse stylistic features of prose and poetry.
5. Ability to analyse English syntax

**3. Number of Lectures:            04 Lectures per week**

### **4. Course Content:**

#### **Unit 1 - Nature of Language**

**(05 lectures)**

1. Language and communication
2. Origin of language
3. Characteristics of human language
4. Language varieties: standard and non-standard language, dialect, register, slang, pidgin, Creole; International varieties of English
5. Language change

**Unit 2 - English Phonetics and Phonology** (10 Lectures)

1. The Speech mechanism
2. Phonemes of English: Description and Classification
3. Syllable : Structure and Types
4. Word Stress, Degrees of Stress, Stress Shift, Grammatical Stress
5. Sentence Stress: Use of Weak and Strong Forms,
6. Intonation Patterns/Uses of Tones

**Unit 3- English Morphology** (10 Lectures)

1. Morphemes: Free and bound morphemes; Morphs and allomorphs
2. Word Formation in English: Simple, complex, compound, and compound-complex words; affixes, stems, roots; inflectional vs. derivational morphology
3. The process of word formation: Backformation, reduplication, blends, clippings, acronyms
4. Meaning change: Generalization, specialization, change in connotations

**Unit 4- Syntax and Grammar** (10 Lectures)

1. Different approaches to syntax
2. Types of grammar
3. Parts of speech, Basic sentence structures, Types of sentences, clauses, phrases

**Unit 5– Semantics** (10 Lectures)

1. Words as signs, transparent and opaque words
2. Conceptual vs. associative meaning
3. Lexical relations: synonymy, antonymy, hyponymy, homophony, homonymy, polysemy

**Unit 6- Applied Linguistics** (15 Lectures)

1. Linguistic approach to literature: Difference between ordinary language and language of literature  
Use of linguistics in the study of literature (stylistics): Figurative language; linguistic deviations; Phonological patterns of rhyme metre, alliteration, assonance, clustering of vowel and consonant sounds
2. Linguistics and language teaching: First language acquisition; Second language learning, barriers in learning second language, Methods of teaching second language: Grammar-translation method, Direct method, audio-lingual method, the communicative approach

## 5. Reference Books:

### Primary References:

1. Akmajian, Demers, Farmer, Harnish. Linguistics. *An Introduction to Language and Communication*. PHI Learning Private Limited, New Delhi, 2009.
2. Leech Geoffrey. *Linguistic Guide to Poetry*. Routledge London, 1969.
3. Jones Daniel. *An Outline of English Phonetics*. Cambridge Uni. Press, 1972.
4. Lyons John. *Language and Linguistics an Introduction*. Cambridge University Press, 2003.
5. Quirk Randolph, Greenbaum Sidney. *A university Grammar of English*. Pearson Education Ltd. 2012
6. Wallwork J F. *Language and Linguistics: An Introduction to the study of Language*. Heinemann Educational Books London, 1969.
7. Yule George. *The Study of Language: An Introduction*. Cambridge University Press, 1985.

### Secondary References:

1. Aarts, Bas and April McMahon, *The Handbook of English Linguistics*. Malden: Blackwell Publishing, 2006.
2. Broderick, John P. *Modern English Linguistics - A Structural and Transformational Grammar*. Thomas Y. Crowell Company, 1975.
3. Copley, Paul, ed. *Semiotics and Linguistics*. London: Routledge, 2001.
4. Dixon, R. M. W. *A Semantic Approach to English Grammar*. 2nd. Oxford University Press, 2005.
5. Hyland, Ken, ed. *English for Academic Purposes - An advanced resource book*. New York: Routledge, 2006.



6. Kretzschmar Jr, William A. *The Linguistic of Speech*. New York: Cambridge University Press, 2009.
7. Meyer, Charles. *Introducing English Linguistics*. Edinburgh: Cambridge University Press, 2009.
8. Radden, Gunter and Rene Dirven. *Cognitive English Grammar*. John Benjamins Publishing Company, 2007.
9. Trask, R. L. *Language & Linguistics - The Key Concepts*. Ed. Peter Stockwell. New York: Routledge, 2007.
10. Trousdale, Graeme and Nikolas Gisborne, *Constructional Approaches to English Grammar*. Berlin: Mouton de Gruyter, 2008.

## **F.Y.B.A – SEMESTER I – OPTIONAL ENGLISH PAPER I**

**Paper Title:** Communicative English

**Paper Code:**

**Name of Faculty:**Asst. Prof. Sandhya Joseph

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To help students develop proficiency in oral communication in English.
2. To increase students' confidence in using English for routine interactions with people.
3. To help students understand the importance of developing good listening skills.
4. To help students become proficient in required written communication like Letters, Business Proposals, Notice, Agenda and Minutes of a Meeting, Resume.
5. To assist students in improving their English Language proficiency.

### **2. Learning outcomes:**

Upon completion of the course the student should be able:

1. To be confident about their ability to use English proficiently.
2. To understand importance of developing good listening skills.
3. To draft letters, representations, Notices, Agendas & Minutes of Meetings.
4. Oral Presentation Skills.
5. Confidence in speaking to others in groups.
6. Ability to communicate effectively through written communication.
7. Ability to write a resume.
8. To demonstrate competence in the technicalities of clear, concise writing through the use of accurate grammar, punctuation, spellings and writing style.

**3. Number of Lectures:            04 Lectures per week**

#### **4. Course Content :**

##### **Unit I – Speaking & Listening& Reading Skills**

**35 lectures**

Listening and Reading Skills need to be incorporated within the Individual Presentation and group based activities

##### **Unit 1.1 – Individual Presentation Skills**

**12 lectures**

Students will be taught public speaking to use Presentation skills through application based teaching, where students will be taught public speaking and how to utilize the skills in formal settings.

##### **Concepts:**

1. Importance of Body Language and Eye Contact in Spoken Communication
2. Ways to Overcome Fear of Speaking
3. Pace, Tone and Intonation
4. Listening as an Essential Part of Communication. How to be an Effective Listener

##### **Applied:**

Students will be given topics to present before the class. They can use a host of methods to do so

1. Presentation with material - Formal,
2. Oral presentation
3. Audio-Video presentations (Digital Story Telling format)
4. Formal Speeches – Welcome, Introduction to a dignitary, Chief Guest’s Speech

## Unit 1.2 – Pair Based & Group Based Spoken Activities

23 lectures

1. Telephone Etiquette
2. Speaking and Listening Classroom Practice Exercises in Pairs and Groups.

Students will listen to relevant recordings under each topic listed below and then practice oral exercises in pairs and groups.

- 1) Dealing with a Wrong Number
- 2) Taking and leaving messages
- 3) Making Inquiries on the phone
- 4) Calling for help in an emergency
- 5) Interrupting someone politely
- 6) Giving instruction and seeking clarification
- 7) Making requests and responding to requests.
- 8) Asking for Directions and Giving Directions
- 9) Thanking someone and responding to thanks
- 10) Inviting and accepting/refusing invitation.
- 11) Asking for and giving an opinion
- 12) Agreeing and disagreeing with opinions
- 13) Seeking and giving Advice/Making Suggestions
- 14) Persuading and dissuading
- 15) Expressing hopes, wishes, regrets and concerns
- 16) Offering condolences and expressing sympathy.
- 17) Assuming and inferring
- 18) Talking about future events
- 19) Talking about intentions and plans
- 20) Talking about arrangements
- 21) Reporting what other people said.
- 22) Expressing Probability and Improbability
- 23) Expressing Ability and inability.
- 24) Expressing probability and improbability
- 25) Expressing obligation and necessity.
- 26) Expressing ability and inability.
- 27) Mock Job Interviews.

3. Meeting – as a group based activity- Can be used as a group activity and teach Minutes of a meeting.

## Unit II -Writing Skills

20 lectures

- A) Letters
  - 1) Job Application Letters
  - 2) Enquiry Letters
  - 3) Orders and Complaints letters
  - 4) RTI
  - 5) Representations
- B) Agenda and Minutes Of a Meeting
- C) Paragraph Writing
- D) Note making
- E) Précis Writing
- F) Essay Writing
- G) Writing a resume
- H) E-mail & Social Media Etiquette

## Unit III – Grammar

5 lectures

Students need to have a basic proficiency in Grammar to complete this course.

Pre-requisite to the course: Knowledge of Basic grammar – Articles, Adjectives, adverbs, Conjunctions, Sentence structures – SVO etc

The above can be revised briefly. Grammar component will be taught incidentally.

- 1. Parts of Speech
- 2. Reported Speech
- 3. Punctuation
- 4. Phrases and Clauses
- 5. Active and Passive

## 5. Reference Books:

### Primary References:

1. Azar, Betty Schramper. *Basic English Grammar*. New York: Pearson Education, 1996.
2. Biber, Douglas, Susan Conrad and Geoffrey Leech. *Longman Student Grammar of Spoken and Written English*. Edinburgh: Pearson Education Limited, 2002.
3. Mohan, Krishna and Singh, N. P. *Speaking English Effectively* Macmillan India Ltd.

4. Sadanand, Kamelesh, and SusheelaPunitha. *Spoken English: A Foundation Course-Part 1*. Hyderabad: Orient Blackswan Private Limited, 2009.
5. Sadanand, Kamelesh, and SusheelaPunitha. *Spoken English: A Foundation Course-Part 2*. Hyderabad: Orient Blackswan Private Limited, 2009.
6. Jain, A.K. and Dr.Pravin S.R. Bhatia. *Professional Communication Skills*. New Delhi: S.Chand& Company Ltd, 2000.
7. Stanek, William. *Effective Writing for Business, College and Life*. Reagent Press, 2005.
8. Wilkie, Helen. *Writing, Speaking, Listening*. Oxford: How to Books Ltd, 2001.

**Secondary References:**

1. Anker, Susan. *Real Essays with Readings: Writing Projects for College, Work, and Everyday Life*. 3<sup>rd</sup>. Boston: Bedford/St. Martin's, 2009.
2. Bullock, Richard. *The Norton Field Guide to Writing*. New York: W.W. Norton & Company, 2009.
3. Chakravarty, Auditi and Bonnie Boehme. *Grammar & Usage for Better Writing*. New York: Amsco School Publications, 2004.
4. Downing, Angela and Philip Locke. *English Grammar A University Course*. London and New York: Routledge, 2006.
5. Dutwin, Phyllis. *English Grammar Demystified*. McGraw Hill, 2010.
6. Hewings, Martin. *Advanced Grammar in Use*. 2nd. Great Britain: Cambridge University Press, 2005.
7. Kroeger, Paul. *Analyzing Grammar An Introduction*. Edinburgh: Cambridge University Press, 2005.

8. Naylor, Helen and Raymond Murphy. *Grammar in Use Supplementary Exercises*. Edinburgh: Cambridge University Press, 2001.
9. Nelson, Gerald. *English An Essential Grammar*. London: Routledge, 2001.
10. Penston, Tony. *A Concise Grammar for English Language Teachers*. Wicklow: TP Publications, 2005.
11. Quirk, Randolph, et al. *A Comprehensive Grammar of the English Language*. New York: Longman, 1985.
12. Rollason, Jane. *50 Mixed- Ability Grammar Lessons*. Scholastic, n.d.
13. Rozakis, Laurie Ph. D. *English Grammar for the Utterly Confused*. New York: McGraw - Hill, 2003.
14. Thomson, A.J. and A.V. Martinet. *A Practical English Grammar*. 3rd. Edinburgh: Oxford University Press, n.d.
15. Vorobej, Mark. *The Theory of Argument*. Edinburgh: Cambridge University Press, 2006.
16. Willis, Dave. *Grammar and Lexis in English Language Teaching*. Edinburgh: Cambridge University Press, 2003.

**F.Y.B.A – SEMESTER II – OPTIONAL ENGLISH PAPER II**

**Paper Title:** Effective Use of English

**Paper Code:**

**Name of Faculty:** Asst. Prof. Andrew Barreto

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To help students proficiency in oral communication in English.
2. To increase students' confidence in using English for routine interactions with people.
3. To help students understand the importance of developing good Listening Skills.
4. To introduce and expose learners to different genres of literature.
5. To develop the skill of critical appreciation among learners.
6. To encourage creative use of language to express both literary and non- literary ideas.

**2. Learning outcomes :**

Upon completion of the course the student should be able:

1. To be confident about their ability to use English proficiently.
2. To understand importance of developing good listening skills.
3. To enhance students' communication skills through building better word power.
4. To have the ability to use the English language in creative Writing as well as Social Letters and Feature Articles.
5. To demonstrate competence in the technicalities of clear, concise writing through the use of accurate grammar, punctuation, spellings and writing style.

**3. Number of Lectures:            04 Lectures per week**



#### **4. Course Content:**

**Unit I – Speaking & Listening & Reading Skills** **25 lectures**

**Unit 1.1 – Individual Presentation Skills** **10 lectures**

Students will be expected to use concepts taught in Optional 1 Course in its application.

#### **Applied:**

Students will be given topics to present before the class. Emphasis will be given to the reading and recitation areas. They can use a host of methods to do so -

Short Stories, Poems

Audio-Video presentations (Digital Story Telling format)

Informal Speeches – Toasts, Farewell Speech, Thank you & Congratulatory Speech

**Unit 1.2 – Pair Based & Group Based Spoken Activities** **15 lectures**

1. Social Debates can be used as group based activity
2. Pair based activities will focus on social settings

**Unit II - Writing Skills** **30 lectures**

#### A) Social Letters

- |                       |                            |
|-----------------------|----------------------------|
| 1) Invitation & reply | 3) Congratulations & Reply |
| 2) Condolence & Reply | 4) Thank you & Reply       |

B) Descriptive Writing – (Open to the Teacher to explore this writing in various areas Fiction and Non-Fiction and creative expression of personal writing)

C) Personal Writing - Diary Writing/Journal Entries/Blogs/podcasts

- D) Social Speeches – Toasts – Weddings, Anniversaries; Farewell, Roasts
- E) Writing for Print Media – Feature Writing, Letters to the Editor, Copy for advertisements
- F) Writing for Comics – Dialogue and narration

### **Unit III – Grammar**

**05 lectures**

- 1. Basic Errors in English Language
- 2. Spotting Errors and correcting them
- 3. Revising and Editing

### **5. Reference Books:**

#### **Primary References:**

- 1. Anker, Susan. *Real Essays with Readings – Writing Projects for College, Work, and Everyday Life*. 3<sup>rd</sup>. Boston: Bedford/St. Martin's, 2009.
- 2. Azar, Betty Schramper. *Basic English Grammar*. New York: Pearson Education, 1996.
- 3. Biber, Douglas, Susan Conrad and Geoffrey Leech. *Longman Student Grammar of Spoken and Written English*. Edinburgh: Pearson Education Limited, 2002.
- 4. Bullock, Richard. *The Norton Field Guide to Writing*. New York: W.W. Norton & Company, 2009.
- 5. Chakravarty, Auditi and Bonnie Boehme. *Grammar & Usage for Better Writing*. New York: Amsco School Publications, 2004.
- 6. Jain, A.K. and Dr.Pravin S.R. Bhatia. *Professional Communication Skills*. New Delhi: S.Chand& Company Ltd, 2000.
- 7. Marx, Christy. *Writing for Animation, Comics and Games*. Focal Press, 2006.
- 8. Mohan, Krishna and Singh, N. P. *Speaking English Effectively* Macmillan India Ltd.

9. Ruberg, Michelle and Yagoda, Ben. *Handbook of Magazine Article Writing*. 2<sup>nd</sup>. Cincinnati: Writer's Digest Books, 2009.
10. Sadanand, Kamelesh, and SusheelaPunitha. *Spoken English: A Foundation Course-Part 1*. Hyderabad: Orient Blackswan Private Limited, 2009.
11. Sadanand, Kamelesh, and SusheelaPunitha. *Spoken English: A Foundation Course-Part 2*. Hyderabad: Orient Blackswan Private Limited, 2009.
12. Stanek, William. *Effective Writing for Business, College and Life*. Reagent Press, 2005.

**SecondaryReferences:**

6. Downing, Angela and Philip Locke. *English Grammar A University Course*. London and New York: Routledge, 2006.
7. Dutwin, Phyllis. *English Grammar Demystified*. McGraw Hill, 2010.
8. Hewings, Martin. *Advanced Grammar in Use*. 2nd. Great Britain: Cambridge University Press, 2005.
9. Kroeger, Paul. *Analyzing Grammar An Introduction*. Edinburgh: Cambridge University Press, 2005.
10. Naylor, Helen and Raymond Murphy. *Grammar in Use Supplementary Exercises*. Edinburgh: Cambridge University Press, 2001.
11. Nelson, Gerald. *English An Essential Grammar*. London: Routledge, 2001.
12. Penston, Tony. *A Concise Grammar for English Language Teachers*. Wicklow: TP Publications, 2005.
13. Quirk, Randolph, et al. *A Comprehensive Grammar of the English Language*. New York: Longman, 1985.

14. Rollason, Jane. *50 Mixed- Ability Grammar Lessons*. Scholastic, n.d.
15. Rozakis, Laurie Ph. D. *English Grammar for the Utterly Confused*. New York: McGraw - Hill, 2003.
16. Thomson, A.J. and A.V. Martinet. *A Practical English Grammar*. 3rd. Edinburgh: Oxford University Press, n.d.
17. Vorobej, Mark. *The Theory of Argument*. Edinburgh: Cambridge University Press, 2006.
18. Willis, Dave. *Grammar and Lexis in English Language Teaching*. Edinburgh: Cambridge University Press, 2003.
19. Wilkie, Helen. *Writing, Speaking, Listening*. Oxford: How to Books Ltd, 2001.

**F.Y.B.A – SEMESTER I – GENERAL COMPULSORY PAPER**

**Paper Title:** Academic Writing

**Paper Code:**

**Name of Faculty:** Asst. Prof. Dr. Sonia Da Costa

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

This course is devised:

- 1) To enhance students' academic skills by giving adequate exposure in reading and writing skills.
- 2) To teach the different stages of writing an essay or an article.
- 3) To enable them to draft, plan, analyze and synthesise information in an organised manner.
- 4) To enhance variety of reading skills such as deducing meaning from the context, skimming and making inferences.

**2. Learning outcomes:** At the end of this course the students should be able to

- 1) Think, write and analyse critically.
- 2) Write in an effective manner their academic assignments by acknowledging the quotations and references.
- 3) Avoid committing plagiarism by following the rules prescribed in MLA style sheet (Arts) and APA (Science)

**3. Number of Lectures:            04 Lectures per week**

#### 4. Course Content:

##### Unit I Grammar

08 lectures

- a. Agreement
- b. Voice
- c. Tenses and verb forms,
- d. Gerunds and infinitives,
- e. Reported speech,
- f. Punctuation,
- g. Pronouns,
- h. Prepositions,
- i. Complex sentences,
- j. Combining sentences.
- k. Jargon & Clichés

##### Unit II

10 lectures

Reading and Comprehension

##### Unit III

15 lectures

Descriptive writing.

Summarising / paragraph writing

##### Unit IV

12 lectures

Understanding the process of writing

Making notes and synthesising information gathered from more than one source.

Use of references and quotations from library sources and internet sources

##### Unit V Essay Writing

15 lectures

Understanding the stages of writing process

Writing different types of essays like: Expository, Comparison and contrast, Cause - effect and argumentative.

## **5. Reference Books:**

### **Primary References:**

- 1) Monippally. M. Mathukutty. *Academic Writing: A Guide for Management Students and Researchers*. Publications India Private Limited, New Delhi, 2010.
- 2) Murphy, Raymond. *Essential English Grammar*. Cambridge University Press: New Delhi, 2009.
- 3) SoodMadan. *Advanced Essays*. Goodwill Publishing House: New Delhi, 2011.
- 4) *MLA Handbook for Writers of Research Papers*, 7<sup>th</sup> edition.

### **Secondary References:**

- 1) Bailey. S. *Academic Writing: A Handbook for International Students*. Routledge: London and New York, 2001.
- 2) Murray. N. *Writing Essays in English Language and Linguistics*. Cambridge University Press, 2012.
- 3) Jordan, R.R. *Academic Writing Course*. : Nelson/Longman: London, 1999.

## **F.Y.B.A – SEMESTER I– INTERDISCIPLINARY PAPER**

**Paper Title:** Introduction to Mass Media

**Paper Code:**

**Name of Faculty:** Asst. Prof. Andrew Barreto

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To give students an overview of Mass Media in today's world.
2. To introduce them to the world of communication in Media, through the fields of Print Media, Radio, Television, Film, Digital Media/New Media.
3. To develop an understanding of Mass Media and related concepts through a practical hands-on approach.
4. To introduce students to the various equipment and software required in the field.
5. To create a foundation and a broad base knowledge for further studies and careers in Media as an option for students.

### **2. Learning outcomes :**

Upon completion of the course the student should be able:

1. To comprehend the field of Mass Media - from print to Digital Media.
2. To understand a few theoretical perspectives behind mass media and the jargon associated with the field.
3. To be comfortable around the various equipment and software required for various media
4. To demonstrate competence in the field of Mass Media – be it in the ideation or execution stage.

**3. Number of Lectures:            04 Lectures per week**



#### 4. Course Content:

**NOTE:** To ensure the competency of students in the field after graduation, emphasis should be given to the APPLIED aspect of the course, while ensuring that the students understand various concepts of each field along with key-terms.

##### **Unit I – Mass Communication & Media Studies**

**05 Lectures**

**Concepts:** Mass Communications; Other forms of Communications; Technologies and Communications; Mass Media and Contemporary Culture; Media Studies – Encoding messages; Audience responses; Agenda

##### **Unit II – Advertising**

**11 Lectures**

**Concepts:** Brief History; Target Audience; Buying Motives; Advertising Message; Advertising Ethics; Advertisements in Different Media (Print; TV; Radio; New Media); Future in Advertising; Careers

**Applied:** Radio ad; Print ads – Newspapers/magazines – Product/info-ads; copy/layout/design; TV ad; Advertisements in New Media; PSA's

##### **Unit III – Print Media – Newspapers & Magazines**

**12 Lectures**

**Concepts:** Brief history of Newspapers & Magazines; Types of Magazines & Newspapers; Layout/Design of Newspapers & Magazines; Reports – Different formats; Photography and Print

**Applied:** Creation of Magazine/Newspaper; Layout/composition

##### **Unit IV – Radio & Music**

**11 Lectures**

**Concepts:** Brief History of Radio & Music; Radio Today: Internet and Music; Types of Radio Formats; Types of Music Formats; Digital Radio & Music; Future of Radio & Music; Careers

**Applied:** Radio Shows; Radio Editing; Radio Plays; Music and Composing

## **Unit V – Television, Cinema & Video**

**11 Lectures**

**Concepts:** Brief History of Broadcast TV & Cable TV; Cinematic History; Cinema & TV industry today; Future of TV & Cinema; Types of TV formats/shows etc; Types of Cinema; Internet and the Age of Streaming; Careers

**Applied:** TV Shows; Documentaries; Basic Shots; Editing; 3 Act movie; Short movie

## **Unit VI - Internet& New Media**

**10 Lectures**

**Concepts:** Brief History of Internet & New Media; Internet in the new age; Internet and Disruption; Mobile Phones; Blogging; Video games; New Media Careers; Future of the internet

**Applied:** New Media – Blogging, Podcasting, Social Media

## 5. Reference Books:

### Primary References:

1. Campbell, Richard. Martin, Christopher. Fabos, Bettina. *Media & Culture – An Introduction to Mass Communication (8<sup>th</sup> Ed.)*. Bedford. 2012.
2. Dominick, Joseph. *The Dynamics of Mass Communications (8<sup>th</sup>ed.)*. Mcgraw-Hill, 2005.
3. Paxson, Peyton. *Mass Communications and Media Studies – An Introduction*. Continuum, 2010.
4. Thompson, Ray. *Grammar of the Edit*. Burlington: Focal Press,1993.

### Secondary References:

1. Mcquail, Denis. *Mass Communication Theory*. Vistaar Publications. 2007.
2. *The Associated Press Style Book and Libel Manuel* Norm The A.P, 1994.
3. Hilliard, Robert. *Writing for Television, Radio and New Media (Seventh Ed.)*. Wadsworth. 2006.
4. Pavlik, J.V. *Media in the Digital Age*. 2008.
5. Perry, David K. *Theory and Research in Mass Communication*. Lawrence Erlbaum Associates, 2002.
6. Ruberg, Michelle. *Handbook of Magazine Article Writing*. Writer's Digest. 2009
7. Stadler, Jane and McWilliam, Kelly. *Screen Media – Analysing Film and Television*. Allen & Unwin. 2009.
8. White, Ted. *Broadcast News Writing, Reporting & Production*. Macmillan.

## **F.Y.B.A – SEMESTER II – INTERDISCIPLINARY PAPER**

**Paper Title:** Creative Writing for Beginners

**Paper Code:**

**Name of Faculty:** Asst. Prof. Sandhya Joseph

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To expose students to a variety of literary genres, authors and styles through reading, discussion and analysis.
2. To experiment with a variety of writing genres like short story, poetry, novella, drama etc.
3. To help students understand the process of revision, editing and proofreading.
4. To develop the skills to self-critique one's own writing through a process of giving and receiving criticism on one's own and others' writings.
5. To encourage students to publish their works in the college magazine, college newsletters, local newspapers etc.

### **2. Learning Objectives :**

By the end of the course

1. Students will demonstrate an understanding of literary conventions like plot, character, theme etc.
2. Students will develop a basic understanding of various prose fiction genres.
3. Students will learn to use current events as inspiration for Creative Writing.
4. Students will understand the importance of proof reading, editing and rewriting.
5. Students will become confident about their ability to voice their opinion, desires, world-view etc through writing.
6. Students will learn to critique the writings of their peers.
7. Students will improve their vocabulary and sentence structures.
8. Students will learn to think and write creatively.

**3. Number of Lectures:            04 Lectures per week**

#### **4. Course Content :**

- 1) How to Get Started? **5 lectures**
  - i) Journal Writing (Recording Personal Experiences).
  - ii) Free Writing.
  - iii) Clustering.
  - iv) Badly Written First Drafts as Helpful a Starting Point.
  
- 2) How to find Subject Matter? **5 lectures**
  - i) Be inspired by events in personal life.
  - ii) Draw inspiration from people one comes across.
  - iii) Be moved by injustice.
  - iv) Draw on current events in Politics, Society etc.
  - v) Look at genres of fiction one loves to read etc.
  
- 3) How to make a story interesting? **5 lectures**
  - i) Introduce conflict, complications, trouble, crisis, resolution.
  - ii) Create feeling of suspense.
  - iii) Appeal to emotions.
  - iv) Surprise reader with unexpected ending.
  
- 4) Difference between 'Story' and 'Plot.' **5 lectures**
  
- 5) Characterization. **5 lectures**
  - i) Memorable characters have 'Credibility', 'Purpose' and 'Complexity.'
  - ii) 'Indirect Method' or 'Telling' method of Character Presentation  
– Authorial Interpretation
  - iii) Direct Method or 'Showing Method' of Character Presentation.
    - Showing appearance
    - Showing action
    - Portraying speech
  - iv) Checklist for Creating Character.  
Age, gender, race, nationality, marital status, region, education, religion, profession, memories, dietary habits, ideology, likes, dislikes etc.
  
- 6) Importance of Atmosphere and Setting in Fiction **5 lectures**

- 7) Point of View/Narrative voice **5 lectures**
- i) Who speaks :
- First Person Narrative
  - Second Person narrative
  - Third Person Narrative
- ii) To whom :
- To The Reader?
  - To Another character in the Story?
- 8) The Concept of Authorial Distance or Psychic Distance. **5 lectures**
- 9) Difference between types of Prose Fiction [Novel, Short Story, Play]. **5 lectures**
- 10) The Importance of Proofreading, Editing, Rewriting. **5 lectures**
- 11) Poetry: Prosodic Features-Rhyme. Rhythm, Metre, Stanzaic Forms, Figurative Language, Symbolism, Special Linguistic Features etc. **10 lectures**

## **5. Reference Books:**

### **Primary Reference:**

1. Burroway, Janet. *Writing Fiction: A Guide To Narrative Craft*. New York: Longman Publishers, 2000.
2. Earnshaw, Steven. *The Handbook of Creative Writing*, 2007: Edinburgh University Press, Edinburgh.
3. Morley, David. *The Cambridge Introduction to Creative Writing*, New York: Cambridge University Press, 2007.
4. Strunk, William, and E.B.White. *The Elements of Style*. New York: Longman, 2000.

1. Boden, Margaret. *the creative mind - myths and mechanisms*. 2nd. New York: Routledge, 2004.
2. Bolton, Gille. *Write Yourself - Creative Writing and Personal Development*. London: Jessica Kingsley Publishers, 2011.
3. Hamand, Maggie. *Creative Writing For Dummies*. West Sussex: John Wiley & Sons, Ltd, 2009.
4. Harper, Graeme. *On Creative Writing*. London: Short Run Press, 2010.
5. Kaufman, Scott Barry and James Kaufman, *The Psychology of Creative Writing*\_ New York: Cambridge University Press, 2009.
6. May, Steve. *doing creative writing*\_ Oxon: Routledge, 2007.
7. Mills, Paul. *The Routledge Creative Writing Coursebook*\_ Routledge, 2006.
8. Neale, Derek. *A Creative Writing Handbook: Developing Dramatic Technique, Individual Style and Voice*. London: A & C Black Publishers Ltd., 2009.

**Additional Online Reading:**

1. <http://io9.com/10-tips-and-tricks-for-creating-memorable-characters-1616544190>
2. <http://thewritepractice.com/resources/characterization/>
3. <http://ladylovelace.hubpages.com/hub/The-Difference-Between-Story-and-Plot>
4. <http://www.learningnerd.com/the-difference-between-plot-and-story/>
5. <http://literarydevices.net/point-of-view/>

**F.Y.B.A – SEMESTER II – INTERDISCIPLINARY PAPER**

**Paper Title:** Introduction to Translation Studies

**Paper Code:**

**Name of Faculty:** Asst. Prof. Dr. Sonia Da Costa

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To introduce students to Translation Studies.
2. To sensitize students on the importance of translation studies.
3. To train students in translation.

**2. Learning Outcomes:** By the end of the course the students:

1. Will understand the importance of Translation Studies.
2. Will gain confidence to translate into other languages or vice versa.
3. Will be aware of the nature of translation and be interested to independently pursue issues related to translation theory.

**3. Number of Lectures:            04 Lectures per week**

**4. Course Content:**

**Unit I**

**04 Lectures**

- a. Introduction to Translation
- b. History of translation. The rise and development of translation
- c. The nature of translation

**Unit II**

**06 Lectures**

- a. Indian and Western concept of Translation
- b. Basic concepts and terminology of Translation Studies.



### Unit III

### 15 Lectures

- a. The Contexts of Translation ( social, political, historical, literary and cultural contexts of translation and their impact on the process.)
- b. Methods of Translation

### Unit IV 15 Lectures

Translation practice (text from journalistic writing , literary writing and scientific writing and advertisements)

### Unit V

### 20 Lectures

Analyzing translated works as models.

- a. Pundalik Naik - **The Upheaval** - Trans. by Vidya Pai
- b. 'Poisoned Bread' Arjun Dange (Selected texts from the Anthology).

### 5. Reference Books:

#### Primary References:

- 1) Das, Bijay Kumar. *The Horizon of Translation*. Atlantic: New Delhi, 1998.
- 2) Mukherjee, Tulu ed. *From Periphery to Centre stage*. Prestige: New Delhi, 1998.
- 3) Talgeri, Pramod and S. B. Verma, eds. *Literature in Translation: From Cultural Transference to Metonymic Displacement*. Popular Prakashan; Bombay, 1988.
- 4) Gentzler, Edwin. *Contemporary Translation Theories*. Routledge: London, 1993.

#### Secondary References:

- 1) Bassnett, Susan. *Translation Studies*. Routledge: London and New York, 1991.
- 2) Bell, Roger T. *Translation and Translating, Theory and Practice*. Longman: London, 1991.
- 3) Hatim, B. and I. Mason. *Discourse and the Translator*. Longman: London and New York, 1990.
- 4) Baker, Mona, ed. *The Routledge Encyclopaedia of Translation Studies*. London: Routledge, 1998.
- 5) Trivedi, Harish Susan Bassnet. *Postcolonial Translation: Theory and Practice*. London: Routledge, 1999.
- 6) Gayatri . C. Spivak . "The Politics of Translation".

**Parvatibai Chowgule College of Arts and Science  
(Autonomous)**

**DEPARTMENT OF ENGLISH  
COURSE STRUCTURE  
THREE YEAR B.A. DEGREE COURSE IN ENGLISH**

<b>SEMESTER</b>	<b>CORE COMPULSORY</b>		<b>CORE ELECTIVE</b>				<b>Interdisciplinary Paper</b>
I	<b>ENG-I.C-1</b> Understanding Poetry & Drama	<b>ENG-I.C-2</b> History of English Literature from Fifth Century to the Eighteenth Century	----	----	----	----	----
II	<b>ENG-II.C-3</b> Understanding Fiction	<b>ENG-II.C-4</b> An Introduction to Linguistics & Stylistics	----	----	----	----	----
III	<b>ENG-III.C-5</b> Contemporary Indian English Literature	----	<b>ENG-III. E-1</b> Goan Literature and Culture	<b>ENG-III. E-2</b> American Literature of the Twentieth Century	<b>ENG-III. E-3</b> Writing for the Media	<b>ENG-III.E-4</b> New Literatures in English	Creative Writing for Beginners
IV	<b>ENG-IV.C- 6</b> Literary Criticism	----	<b>ENG-IV.E-5</b> The Literature of the Indian Diaspora	<b>ENG-IV.E-6</b> Creative Writing	<b>ENG-IV.E-7</b> Visual Literature	<b>ENG-IV.E-8</b> Representation of Gender & Sexuality in Literature	Introduction to Mass Media
V	<b>ENG-V.C-7</b> Nineteenth Century English Literature	-----	<b>ENG-V.E-9</b> Shakespeare Today	<b>ENG-V.E-10</b> Ancient Indian Classics in Translation	<b>ENG-V.E-11</b> Film Studies	<b>ENG-V.E-12</b> Women's Writing in India	----
VI	<b>ENG-VI. C-8</b> Twentieth Century English Literature	-----	<b>ENG-VI.E-13</b> English Language and Literature Teaching	<b>ENG-VI.E-14</b> Latin American Literature	<b>ENG-VI.E-15</b> Contemporary Literary Theory	<b>ENG-VI.E-16</b> World Literature	----

<b>SEMESTER</b>	<b>OPTIONAL</b>	<b>GENERAL COMPULSORY</b>
I	Communicative English	Academic Writing (Science Stream)
II	Effective Use of English	Academic Writing (Arts Stream)
III	-----	Research Writing (Arts Stream)
IV	-----	Research Writing (Science Stream)
V	-----	-----
VI	-----	-----

**PARVATIBAI CHOWGULE COLLEGE OF ARTS AND SCIENCE  
AUTONOMOUS  
DEPARTMENT OF ENGLISH**

**APPROVED SYLLABUS OF SEMESTER I FOR THE ACADEMIC YEAR  
2016 – 2017**

**F.Y.B.A – SEMESTER I – CORE PAPER**

**Paper Title:** Understanding Poetry & Drama

**Paper Code:** ENG-I.C-1

**Name of Faculty:** Associate Professor Ms. Rajashree R. Desai

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To acquaint students with major poetic forms and trends in English Poetry.
2. To enable students to read and appreciate poems.
3. To improve the literary and critical competence of the students.
4. To teach students to appreciate English Drama.
5. To instill the appreciation of Drama and the universality of its reach.
6. To train students to identify basic elements in a Drama.

**2. Learning outcomes:**

Upon completion of the course the student should be able:

1. Recognize and define major poetic forms such as lyric poetry, narrative poetry.
2. Know and identify rhyme, rhythm and meter.
3. Understand and appreciate the literal and symbolic/inner meaning (connotative and denotative meaning) of a poem.
4. Identify and analyze special stylistic features of poetry such as imagery, tone, atmosphere, special linguistic and stylistic features, imagery.
5. To recognize and appreciate various elements of a drama: Plot, Character, Dialogue, Setting, Theme, and Act-Scene Division.
6. To understand and be knowledgeable about the evolution of two major forms of Drama – Tragedy and Comedy.

**3. Number of Lectures:            04 Lectures per week**

#### 4. Course Content:

##### **Unit 1: Background to Poetry & Drama**

**Number of Lectures: 12**

1. Poetry as a Literary form
2. Nature and types of lyric poetry
3. Evolution of lyric as a literary form
4. Nature and forms of narrative poetry
5. Evolution of the English Drama
6. Nature of Tragedy & Comedy in Drama

##### **Unit 2: Lyric Poetry: Songs, Sonnets, Odes, Elegies and Dramatic Monologues**

**Number of Lectures: 12**

1. Edmund Spenser: Whilst in Prime
2. Sir Philip Sidney: His Lady's Cruelty
3. William Shakespeare: Marriage of True Minds
4. John Donne: Batter my Heart
5. Robert Herrick: To Daffodils
6. William Blake: *Lamb* and *Tyger*
7. William Wordsworth: The Daffodils
8. P. B. Shelley: Mutability
10. John Keats: Ode on a Grecian Urn
11. Robert Browning: My Last Duchess

##### **Unit 3: Narrative Poetry: Ballads, Epic, Mock Epic**

**Number of Lectures: 12**

1. S T Coleridge : The Rime of the Ancient Mariner : (Sections 1,2,3)
2. John Milton: Paradise Lost Bk. I (Lines 1-124)
3. Alexander Pope- Rape of the Lock (Canto I)

##### **Unit 4: Drama: Comedy**

**Number of Lectures: 12**

1. Text: J. M. Barrie – The Admirable Crichton

## Unit 5: Drama: Tragedy

Number of Lectures: 12

1. Text: Henrik Ibsen: *An Enemy of the People*

### 5. Reference Books :

**(Please Note: References to the changed Primary texts in drama will be added later. To be approved in the next B.O.S. meeting)**

#### Primary References:

1. Ibsen, Henrik. *An Enemy of the People*.
2. Barrie. J. M. *The Admirable Crichton*

#### Secondary References:

1. Abrams, M. H. *A Glossary of Literary Terms*. 11<sup>th</sup>. Cengage Learning, 2014.
2. Bowra C.M. *Heroic Poetry*. Macmillan, 1966.
3. Ed. Bloom Harold. *William Shakespeare's Sonnets*. Viva Books, 2007.
4. Ed. Bottrall Margaret. *William Blake: Songs & Innocence & Experiences*. Macmillan, 1970.
5. Bradley. A.C. *Oxford Lectures on Poetry*. Atlantic, 2009.
6. Broadbent J.B. *Poetic Love*. Chatto & Windus London, 1964.
7. Chandra NDR, Sebastian A.J. *Literary Terms in English Poetry*. Authors Press, Delhi, 2001.
8. Cuddon J A. *The Penguin Dictionary of Literary Terms and Literary Theory*. Penguin Books, 1999.
9. Dobson, Michael and Wells, Stanley. *The Oxford Companion to Shakespeare*. Oxford, 2001.
10. Gardner Stanley. *Blake*. P. Evans Brothers Ltd, 1968.
11. Jump, John D.(Ed.) *Critical Idiom Series*. Law Book Co of Australasia, 1974.

12. Gridley Roy E. *Browning*. Routledge&Kegan Paul, 1972.
13. Ed. Grose Kenneth H. *Keats*. Evans Brother Ltd, 1969.
14. Hudson, W. H. *An Introduction to the Study of Literature*. B.I. Publications, 1972.
15. Klarer Mario. *An Introduction to Literary Studies*.Routledge, 2004.
16. Lever J.W. *The Elizabethan Love Sonnets*. Methuen & Co. Ltd, 1966.
17. Ed. O'Neill Judith. *Critics on Keats*. George Allen &Unwin Ltd, 1967.
18. O'Neill Judith. *Critics of Pope*. George Allen &Unwin Ltd., London, 1968.
19. Prasad, B. *Background to the Study of English Literature for Indian Students*. Trinity Press, 2014.
20. Read Herbert. *Wordsworth*. Faber & Faber Ltd, 1957.
21. Sarker Sunil Kumar. *Shakespeare's Sonnets*. Atlantic Publisher, 2006.
22. Smith Hallett. *Elizabethan Poetry*. Ann Arbor Paperbacks, 1968.
23. Ed. Ward Sir W. & Walter A.R. *The Cambridge History of English Literature*.Cambridge University Press, 1914.
24. Westland Peter. *Literary Appreciation*. The English University Press Ltd, 1964.
25. Rees, R. J.*Introduction to English Literature*. New Delhi: Macmillan India, 1973.

**F.Y.B.A – SEMESTER I – CORE PAPER**

**Paper Title:** History of English Literature from Fifth Century to the Eighteenth Century

**Paper Code:** ENG-I.C-2

**Name of Faculty:** Associate Professor Ms. Rajashree R. Desai

**Marks:** 100

**Credits:**4

**1. Course Objectives:**

1. To provide a comprehensive overview of major periods in the History of English literature.
2. To introduce to the students to historical and cultural contexts in which English literature has been produced through the ages.
3. To provide a view of major writers and their works in different ages.
4. To explore the complex relationship between literature and its context through discussion of particular literary trends, texts and issues within each period.

**2. Learning outcomes:**

1. Students should be able to perceive the complex relationship between literature and society.
2. The learner should be able to explain how and why particular types of literature emerged from particular set of historical circumstances.
3. The students should be able to critically appreciate representative literary works written in different ages.
4. They should be able to read independently literary texts of different periods.

**3. Number of Lectures: 04 Lectures per week**



#### 4. Course Content:

1. Anglo Saxon Age/The age of Chaucer/From Chaucer to Renaissance (1350- 1516)-Age of unrest and transition, Religious movements, new learning of classical antiquity- Petrarch, Giovanni Boccaccio

Anglo Saxon Literature- Beowulf

Major prose writers- John Wyclif, Sir John Mandeville

Major Poets- Geoffrey Chaucer, William Langland, John Gower

**Number of lectures- 12**

2. The English Renaissance/ The age of Shakespeare (1578-1625) Renaissance and Reformation, Humanism, Geographical discoveries, Elizabethan Poetry- Songs and sonnets of the sixteenth century

Development of drama from Miracle and Morality Plays, Interludes to University Wits  
Bacon's Essays

Prose- Translations (Wyclif, Tyndale, Coverdale, Authorized Version of 1611), Historical and biographical works, Literary Criticism, Religious writings, Humanistic writings, Elizabethan satirical writings (Nash, Lodge, etc.)

**Number of lectures- 18**

3. The Seventeenth Century: The age of John Milton and John Dryden(1625- 1700) - England under Charles I and Commonwealth, the triumph of Puritanism, Restoration

Prose- Sir Thomas Browne, The Anglican clergy, The Puritan writers, Rationalism and Restoration prose(Hobbes, Newton), Diarist of the Age(Samuel Pepy, John Evelyn),MoralEssays(Cowley, Temple), John Bunyan,GeorgeCox,Thomas Ellwood, Establishment of Royal Society and thedevelopment of modern prose Poetry-The Cavalier Poets, the Metaphysical Poets, John Milton,Dryden Restoration Drama: William Congreve, John Vanburgh, George Farqahar, William Wycherley, George Etherege

Literary Criticism:Dryden

**Number of lectures-18**

4. The Eighteenth Century: The Age of Alexander Pope and Dr. Samuel Johnson (1700-1789)-

Reign of Queen Anne, The Coffee House Culture and the Periodical Essays,

The Age of Prose and Reason, Satires of the age – Johnathan Swift

Neoclassicism

Augustan Reflective poetry - Alexander Pope, Lady Anne Finch of Winchilsea, Thomas Collins, Thomas Gray and Oliver Goldsmith

Precursors of Romantic Poetry - Robert Burns and William Cooper The rise of the novel

Sentimental Comedy

**Number of lectures-12**

5. **Reference Books:**

**Primary References:**

1. Daiches David. *A Critical History of English Literature*. Allied Publishers Ltd. New Delhi, 1999.
2. Ford Boris Ed. *The Pelican Guide to English Literature*. Penguin Books UK, 1964
3. Hudson William. *An Outline History of English Literature*. B I Publications, Bombay, 1972.
4. Poplawski Paul ed. *English Literature in Context*. New Delhi: Cambridge University Press, 2008.

**Secondary References:**

1. Compton-Rickett Arthur. *A History of English Literature*. Universal Book Stall, Delhi, 1969.
2. Evans I for. *A Short History of English Literature*. The English Language Book Society & Penguin Books, 1970.
3. Legouis Emile, and Cazamian Louis, Vergnas Raymond. *A History of English Literature*. London: J.M. Dent and Sons LTD, 1964.

## **F.Y.B.A – SEMESTER I – OPTIONAL ENGLISH PAPER I**

**Paper Title:** Communicative English

**Paper Code:**

**Name of Faculty:** Asst. Prof. Sandhya Joseph

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To help students develop proficiency in oral communication in English.
2. To increase students' confidence in using English for routine interactions with people.
3. To help students understand the importance of developing good listening skills.
4. To help students become proficient in required written communication like Letters, Business Proposals, Notice, Agenda and Minutes of a Meeting, Resume.
5. To assist students in improving their English Language proficiency.

### **2. Learning outcomes:**

Upon completion of the course the student should be able:

1. To be confident about their ability to use English proficiently.
2. To understand importance of developing good listening skills.
3. To draft letters, representations, Notices, Agendas & Minutes of Meetings.
4. Oral Presentation Skills.
5. Confidence in speaking to others in groups.
6. Ability to communicate effectively through written communication.
7. Ability to write a resume.
8. To demonstrate competence in the technicalities of clear, concise writing through the use of accurate grammar, punctuation, spellings and writing style.

**3. Number of Lectures:            04 Lectures per week**

#### **4. Course Content :**

##### **Unit I – Speaking & Listening& Reading Skills**

**35 lectures**

Listening and Reading Skills need to be incorporated within the Individual Presentation and group based activities

##### **Unit 1.1 – Individual Presentation Skills**

**12 lectures**

Students will be taught public speaking to use Presentation skills through application based teaching, where students will be taught public speaking and how to utilize the skills in formal settings.

##### **Concepts:**

1. Importance of Body Language and Eye Contact in Spoken Communication
2. Ways to Overcome Fear of Speaking
3. Pace, Tone and Intonation
4. Listening as an Essential Part of Communication. How to be an Effective Listener

##### **Applied:**

Students will be given topics to present before the class. They can use a host of methods to do so

1. Presentation with material - Formal,
2. Oral presentation
3. Audio-Video presentations (Digital Story Telling format)
4. Formal Speeches – Welcome, Introduction to a dignitary, Chief Guest’s Speech

## Unit 1.2 – Pair Based & Group Based Spoken Activities

23 lectures

1. Telephone Etiquette
2. Speaking and Listening Classroom Practice Exercises in Pairs and Groups.

Students will listen to relevant recordings under each topic listed below and then practice oral exercises in pairs and groups.

- |  |   |
|--|---|
| -1) Dealing with a Wrong Number                    | -15) Expressing hopes, wishes, regrets and concerns |
| -2) Taking and leaving messages                    | -16) Offering condolences and expressing sympathy.  |
| -3) Making Inquiries on the phone                  | -17) Assuming and inferring                         |
| -4) Calling for help in an emergency               | -18) Talking about future events                    |
| -5) Interrupting someone politely                  | -19) Talking about intentions and plans             |
| -6) Giving instruction and seeking clarification - | -20) Talking about arrangements                     |
| 7) Making requests and responding to requests. -   | -21) Reporting what other people said.              |
| 8) Asking for Directions and Giving Directions -   | -22) Expressing Probability and Improbability       |
| 9) Thanking someone and responding to thanks -     | -23) Expressing Ability and inability.              |
| 10) Inviting and accepting/refusing invitation.    | -24) Expressing probability and improbability       |
| -11) Asking for and giving an opinion              | -25) Expressing obligation and necessity.           |
| -12) Agreeing and disagreeing with opinions        | -26) Expressing ability and inability.              |
| -13) Seeking and giving Advice/Making Suggestions  | -27) Mock Job Interviews.                           |
| -14) Persuading and dissuading                     |   |

3. Meeting – as a group based activity- Can be used as a group activity and teach Minutes of a meeting.

## Unit II -Writing Skills

20 lectures

- |                                    |                                    |
|------------------------------------|------------------------------------|
| A) Letters                         | C) Paragraph Writing               |
| 1) Job Application Letters         | D) Note making                     |
| 2) Enquiry Letters                 | E) Précis Writing                  |
| 3) Orders and Complaints letters   | F) Essay Writing                   |
| 4) RTI                             | G) Writing a resume                |
| 5) Representations                 | H) E-mail & Social Media Etiquette |
| B) Agenda and Minutes Of a Meeting |                                    |

## Unit III – Grammar

5 lectures

Students need to have a basic proficiency in Grammar to complete this course.

Pre-requisite to the course: Knowledge of Basic grammar – Articles, Adjectives, adverbs, Conjunctions, Sentence structures – SVO etc

The above can be revised briefly. Grammar component will be taught incidentally.

- |                    |                        |
|--------------------|------------------------|
| 1. Parts of Speech | 4. Phrases and Clauses |
| 2. Reported Speech | 5. Active and Passive  |
| 3. Punctuation     |                        |

## 5. Reference Books:

### Primary References:

1. Azar, Betty Schramper. *Basic English Grammar*. New York: Pearson Education, 1996.
2. Biber, Douglas, Susan Conrad and Geoffrey Leech. *Longman Student Grammar of Spoken and Written English*. Edinburgh: Pearson Education Limited, 2002.
3. Mohan, Krishna and Singh, N. P. *Speaking English Effectively* Macmillan India Ltd.

4. Sadanand, Kamelesh, and SusheelaPunitha. *Spoken English: A Foundation Course-Part 1*. Hyderabad: Orient Blackswan Private Limited, 2009.
5. Sadanand, Kamelesh, and SusheelaPunitha. *Spoken English: A Foundation Course-Part 2*. Hyderabad: Orient Blackswan Private Limited, 2009.
6. Jain, A.K. and Dr.Pravin S.R. Bhatia. *Professional Communication Skills*. New Delhi: S.Chand& Company Ltd, 2000.
7. Stanek, William. *Effective Writing for Business, College and Life*. Reagent Press, 2005.
8. Wilkie, Helen. *Writing, Speaking, Listening*. Oxford: How to Books Ltd, 2001.

**Secondary References:**

1. Anker, Susan. *Real Essays with Readings: Writing Projects for College, Work, and Everyday Life*. 3<sup>rd</sup>. Boston: Bedford/St. Martin's, 2009.
2. Bullock, Richard. *The Norton Field Guide to Writing*. New York: W.W. Norton & Company, 2009.
3. Chakravarty, Auditi and Bonnie Boehme. *Grammar & Usage for Better Writing*. New York: Amsco School Publications, 2004.
4. Downing, Angela and Philip Locke. *English Grammar A University Course*. London and New York: Routledge, 2006.
5. Dutwin, Phyllis. *English Grammar Demystified*. McGraw Hill, 2010.
6. Hewings, Martin. *Advanced Grammar in Use*. 2nd. Great Britain: Cambridge University Press, 2005.
7. Kroeger, Paul. *Analyzing Grammar An Introduction*. Edinburgh: Cambridge University Press, 2005.

8. Naylor, Helen and Raymond Murphy. *Grammar in Use Supplementary Exercises*. Edinburgh: Cambridge University Press, 2001.
9. Nelson, Gerald. *English An Essential Grammar*. London: Routledge, 2001.
10. Penston, Tony. *A Concise Grammar for English Language Teachers*. Wicklow: TP Publications, 2005.
11. Quirk, Randolph, et al. *A Comprehensive Grammar of the English Language*. New York: Longman, 1985.
12. Rollason, Jane. *50 Mixed- Ability Grammar Lessons*. Scholastic, n.d.
13. Rozakis, Laurie Ph. D. *English Grammar for the Utterly Confused*. New York: McGraw - Hill, 2003.
14. Thomson, A.J. and A.V. Martinet. *A Practical English Grammar*. 3rd. Edinburgh: Oxford University Press, n.d.
15. Vorobej, Mark. *The Theory of Argument*. Edinburgh: Cambridge University Press, 2006.
16. Willis, Dave. *Grammar and Lexis in English Language Teaching*. Edinburgh: Cambridge University Press, 2003.



## **F.Y.B.A – SEMESTER I – GENERAL COMPULSORY PAPER**

**Paper Title:** Academic Writing

**Paper Code:**

**Name of Faculty:** Asst. Prof. Dr. Sonia Da Costa

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

This course is devised:

- 1) To enhance students' academic skills by giving adequate exposure in reading and writing skills.
- 2) To teach the different stages of writing an essay or an article.
- 3) To enable them to draft, plan, analyze and synthesise information in an organised manner.
- 4) To enhance variety of reading skills such as deducing meaning from the context, skimming and making inferences.

### **2. Learning outcomes:** At the end of this course the students should be able to

- 1) Think, write and analyse critically.
- 2) Write in an effective manner their academic assignments by acknowledging the quotations and references.
- 3) Avoid committing plagiarism by following the rules prescribed in MLA style sheet (Arts) and APA (Science)

### **3. Number of Lectures:            04 Lectures per week**

#### **4. Course Content:**

##### **Unit I Grammar**

**08 lectures**

- a. Agreement
- b. Voice
- c. Tenses and verb forms,
- d. Gerunds and infinitives,
- e. Reported speech,
- f. Punctuation,
- g. Pronouns,
- h. Prepositions,
- i. Complex sentences,
- j. Combining sentences.
- k. Jargon & Clichés

##### **Unit II**

**10 lectures**

Reading and Comprehension

##### **Unit III**

**15 lectures**

Descriptive writing.

Summarising / paragraph writing

##### **Unit IV**

**12 lectures**

Understanding the process of writing

Making notes and synthesising information gathered from more than one source.

Use of references and quotations from library sources and internet sources

##### **Unit V Essay Writing**

**15 lectures**

Understanding the stages of writing process

Writing different types of essays like: Expository, Comparison and contrast, Cause - effect and argumentative.

#### **5. Reference Books:**

**Primary References:**

- 1) Monippally. M. Mathukutty. *Academic Writing: A Guide for Management Students and Researchers*. Publications India Private Limited, New Delhi, 2010.
- 2) Murphy, Raymond. *Essential English Grammar*. Cambridge University Press: New Delhi, 2009.
- 3) SoodMadan. *Advanced Essays*. Goodwill Publishing House: New Delhi, 2011.
- 4) *MLA Handbook for Writers of Research Papers*, 7<sup>th</sup> edition.

**Secondary References:**

- 1) Bailey. S. *Academic Writing: A Handbook for International Students*. Routledge: London and New York, 2001.
- 2) Murray. N. *Writing Essays in English Language and Linguistics* . Cambridge University Press, 2012.
- 3) Jordan, R.R. *Academic Writing Course*. : Nelson/Longman: London, 1999.

## **F.Y.B.A – SEMESTER II – CORE PAPER**

**Paper Title:** Understanding Fiction

**Paper Code:** ENG-II.C-3

**Name of Faculty:** Asst. Prof. Sandhya Joseph

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To help students understand the evolution of the Novel and Short Story as distinct Literary Forms.
2. To help students understand the contribution of various other literary forms like Medieval Romances, Character Sketch etc. to the evolution of the novel.
3. To help students understand how the socio-economic conditions prevalent in the 18<sup>th</sup> century contributed to the rise of the Novel, and how the conditions prevalent in the 19<sup>th</sup> century contributed to the rise of the Short Story.
4. To help students understand the contribution of various other literary forms like Parables, Fables etc. to the evolution of the Short Story.
5. To help students understand the characteristics of the short story through the study of few popular short stories.
6. To teach students to appreciate English Fiction.
7. To instill the ability of recognizing the various elements of Fiction.

### **2. Learning Outcomes:** But the end of the course the student will be able:

1. To understand the various elements of the Novel and the Short Story.
2. To recognize the characteristics of the Novel and the Short Story.
3. To have the ability to analyze Short Stories and Novels critically.

### **3. Number of Lectures: 04 Lectures per week**

#### **4. Course Content:**

##### **Background: [10 lectures]**

1. Contribution Of Medieval Prose Romances to evolution of English Novel
2. Other Literary Forms That Contributed to the Novel (diaries and journals, biographies/autobiographies, letters, character sketch)
3. Reasons for Emergence and Growth of the Novel as a Distinct Literary Genre In the 18<sup>th</sup> Century
4. Characteristics of the contemporary novel.
5. Elements of the Novel.
6. Contribution of writers of Asian, African, Latin American origin to the Contemporary English Novel.
7. **Ancient Roots/origins of the short story** (Stories of the Old Testament, Parables Of the New Testament, Fables, Panchatantra Stories, Boccaccio's Decameron etc.)
8. Reasons for the emergence of the short story in the 19<sup>th</sup> century
9. Characteristics Of the short Story
10. Difference between Novella and Short Story.

##### **Texts to be Studied**

###### **Novel [25 lectures]**

The Great Indian Novel by Sashi Tharoor

###### **Short stories [10 lectures]**

1. The Gift Of the Magi' by O Henry
2. 'The Cask Of Amontillado' by Edger Alan Poe
3. 'Darling' By Chekov
4. A Wrong Man in Workers Paradise by Rabindranath Tagore
5. The Third and Final Continent by Jumpa Lahari
6. Hair by Chandrakant Bakshi.

7. The Tiger In the Tunnel by Ruskin Bond.
8. Draupadi by Mahashweta Devi
9. The Doctor's word by R K Narayan
10. Vengeful Creditor by Chinua Achebe

### Novella [15 lectures]

‘*The Time Machine*’ by H.G Wells

### 5. References:

#### Primary References:

1. Cross, Wilbur. *The Development of the English Novel*. New York: Atlantic Publishers and Distributors, 2001. Print.
2. Hunter, Adrian. *The Cambridge Introduction To The Short Story In English*. New Delhi: Cambridge University Press, 2007. Print
3. Kohli. Suresh (ed). *Modern Indian Short Stories: An Anthology*. New Delhi: Arnold Heinemann Publishers, 1974. Print.
4. Achebe, Chinua. *Girls At War*. Johannesburg, South Africa: Penguin Books, 2009. Print.
5. Wells. H.G. *The Time Machine*. New Delhi: Signet Classic. 2002. Print.
6. Marquez, Gabriel. *One Hundred Years Of Solitude*. London: Penguin books, 1972. Print.
7. Desai, Anita. *Fasting, Feasting*. New York: Mariner Original, 1999. Print.
8. Lahari, Jumpa. *Interpreter Of Maladies*. New Delhi: Harper Collins Publishers India, 1999. Print.

#### Secondary References:

1. Reid, Ian. *The Short Story*. New York: Barnes and Nobel, 1977. Print
2. Daiches, David. *A Critical History Of English Literature Vol 1. 2<sup>nd</sup> ed*. New Delhi: Allied Publishers Pvt. Ltd., 2004. Print.
3. Abrams M. H. *A Glossary of Literary Terms*. Bangalore. Prism Books. 1999.

## **F.Y.B.A – SEMESTER II – CORE PAPER**

**Paper Title:** An Introduction to Linguistics and Stylistics

**Paper Code:** ENG-II.C-4

**Name of Faculty:** Associate Professor Ms. Rajashree R. Desai

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To acquaint the students with the basic concepts in linguistics.
2. To introduce the students to various sub disciplines of linguistics.
3. To know the connection between linguistics and stylistics.
4. To understand the concept of style in literature.
5. To provide hands on experience in analysing texts, fiction and poetry.

### **2. Learning Outcome:**

1. The Students should be able to identify and classify English sounds.
2. Produce utterances with correct stress and rhythm.
3. Ability to distinguish between different registers of English, international varieties of English.
4. Ability to analyse stylistic features of prose and poetry.
5. Ability to analyse English syntax

**3. Number of Lectures:            04 Lectures per week**

### **4. Course Content:**

#### **Unit 1 - Nature of Language**

**(05 lectures)**

1. Language and communication
2. Origin of language
3. Characteristics of human language
4. Language varieties: standard and non-standard language, dialect, register, slang, pidgin, Creole; International varieties of English
5. Language change

**Unit 2 - English Phonetics and Phonology** (10 Lectures)

1. The Speech mechanism
2. Phonemes of English: Description and Classification
3. Syllable : Structure and Types
4. Word Stress, Degrees of Stress, Stress Shift, Grammatical Stress
5. Sentence Stress: Use of Weak and Strong Forms,
6. Intonation Patterns/Uses of Tones

**Unit 3- English Morphology** (10 Lectures)

1. Morphemes: Free and bound morphemes; Morphs and allomorphs
2. Word Formation in English: Simple, complex, compound, and compound-complex words; affixes, stems, roots; inflectional vs. derivational morphology
3. The process of word formation: Backformation, reduplication, blends, clippings, acronyms
4. Meaning change: Generalization, specialization, change in connotations

**Unit 4- Syntax and Grammar** (10 Lectures)

1. Different approaches to syntax
2. Types of grammar
3. Parts of speech, Basic sentence structures, Types of sentences, clauses, phrases

**Unit 5– Semantics** (10 Lectures)

1. Words as signs, transparent and opaque words
2. Conceptual vs. associative meaning
3. Lexical relations: synonymy, antonymy, hyponymy, homophony, homonymy, polysemy

**Unit 6- Applied Linguistics** (15 Lectures)

1. Linguistic approach to literature: Difference between ordinary language and language of literature  
  
Use of linguistics in the study of literature (stylistics): Figurative language; linguistic deviations; Phonological patterns of rhyme metre, alliteration, assonance, clustering of vowel and consonant sounds
2. Linguistics and language teaching: First language acquisition; Second language learning, barriers in learning second language, Methods of teaching second language: Grammar-translation method, Direct method, audio-lingual method, the communicative approach



## 5. Reference Books:

### Primary References:

1. Akmajian, Demers, Farmer, Harnish. *Linguistics. An Introduction to Language and Communication*. PHI Learning Private Limited, New Delhi, 2009.
2. Leech Geoffrey. *Linguistic Guide to Poetry*. Routledge London, 1969.
3. Jones Daniel. *An Outline of English Phonetics*. Cambridge Uni. Press, 1972.
4. Lyons John. *Language and Linguistics an Introduction*. Cambridge University Press, 2003.
5. Quirk Randolph, Greenbaum Sidney. *A university Grammar of English*. Pearson Education Ltd. 2012
6. Wallwork J F. *Language and Linguistics: An Introduction to the study of Language*. Heinemann Educational Books London, 1969.
7. Yule George. *The Study of Language: An Introduction*. Cambridge University Press, 1985.

### Secondary References:

1. Aarts, Bas and April McMahon, *The Handbook of English Linguistics*. Malden: Blackwell Publishing, 2006.
2. Broderick, John P. *Modern English Linguistics - A Structural and Transformational Grammar*. Thomas Y. Crowell Company, 1975.
3. Copley, Paul, ed. *Semiotics and Linguistics*. London: Routledge, 2001.
4. Dixon, R. M. W. *A Semantic Approach to English Grammar*. 2nd. Oxford University Press, 2005.
5. Hyland, Ken, ed. *English for Academic Purposes - An advanced resource book*. New

York: Routledge, 2006.

6. Kretschmar Jr, William A. *The Linguistic of Speech*. New York: Cambridge University Press, 2009.
7. Meyer, Charles. *Introducing English Linguistics*. Edinburgh: Cambridge University Press, 2009.
8. Radden, Gunter and Rene Dirven. *Cognitive English Grammar*. John Benjamins Publishing Company, 2007.
9. Trask, R. L. *Language & Linguistics - The Key Concepts*. Ed. Peter Stockwell. New York: Routledge, 2007.
10. Trousdale, Graeme and Nikolas Gisborne, *Constructional Approaches to English Grammar*. Berlin: Mouton de Gruyter, 2008.

## **F.Y.B.A – SEMESTER II – OPTIONAL ENGLISH PAPER II**

**Paper Title:** Effective Use of English

**Paper Code:**

**Name of Faculty:** Asst. Prof. Andrew Barreto

**Marks:** 100

**Credits:** 4

### **1) Course Objectives:**

1. To help students proficiency in oral communication in English.
2. To increase students' confidence in using English for routine interactions with people.
3. To help students understand the importance of developing good Listening Skills.
4. To introduce and expose learners to different genres of literature.
5. To develop the skill of critical appreciation among learners.
6. To encourage creative use of language to express both literary and non- literary ideas.

### **2) Learning outcomes :**

Upon completion of the course the student should be able:

1. To be confident about their ability to use English proficiently.
2. To understand importance of developing good listening skills.
3. To enhance students' communication skills through building better word power.
4. To have the ability to use the English language in creative Writing as well as Social Letters and Feature Articles.
5. To demonstrate competence in the technicalities of clear, concise writing through the use of accurate grammar, punctuation, spellings and writing style.

**3) Number of Lectures:            04 Lectures per week**

#### 4) Course Content:

**Unit I – Speaking & Listening& Reading Skills** **25 lectures**

**Unit 1.1 – Individual Presentation Skills** **10 lectures**

Students will be expected to use concepts taught in Optional 1 Course in its application.

#### **Applied:**

Students will be given topics to present before the class. Emphasis will be given to the reading and recitation areas. They can use a host of methods to do so -

Short Stories, Poems

Audio-Video presentations (Digital Story Telling format)

Informal Speeches – Toasts, Farewell Speech, Thank you & Congratulatory Speech

**Unit 1.2 – Pair Based & Group Based Spoken Activities** **15 lectures**

1. Social Debates can be used as group based activity
2. Pair based activities will focus on social settings

**Unit II - Writing Skills** **30 lectures**

#### A) Social Letters

- |                       |                            |
|-----------------------|----------------------------|
| 1) Invitation & reply | 3) Congratulations & Reply |
| 2) Condolence & Reply | 4) Thank you & Reply       |

B) Descriptive Writing – (Open to the Teacher to explore this writing in various areas Fiction and Non-Fiction and creative expression of personal writing)

C) Personal Writing - Diary Writing/Journal Entries/Blogs/podcasts

- D) Social Speeches – Toasts – Weddings, Anniversaries; Farewell, Roasts
- E) Writing for Print Media – Feature Writing, Letters to the Editor, Copy for advertisements
- F) Writing for Comics – Dialogue and narration

### **Unit III – Grammar**

**05 lectures**

1. Basic Errors in English Language
2. Spotting Errors and correcting them
3. Revising and Editing

### **5) Reference Books:**

#### **Primary References:**

1. Anker, Susan. *Real Essays with Readings – Writing Projects for College, Work, and Everyday Life*. 3<sup>rd</sup>. Boston: Bedford/St. Martin's, 2009.
2. Azar, Betty Schramper. *Basic English Grammar*. New York: Pearson Education, 1996.
3. Biber, Douglas, Susan Conrad and Geoffrey Leech. *Longman Student Grammar of Spoken and Written English*. Edinburgh: Pearson Education Limited, 2002.
4. Bullock, Richard. *The Norton Field Guide to Writing*. New York: W.W. Norton & Company, 2009.
5. Chakravarty, Auditi and Bonnie Boehme. *Grammar & Usage for Better Writing*. New York: Amsco School Publications, 2004.
6. Jain, A.K. and Dr.Pravin S.R. Bhatia. *Professional Communication Skills*. New Delhi: S.Chand& Company Ltd, 2000.
7. Marx, Christy. *Writing for Animation, Comics and Games*. Focal Press, 2006.
8. Mohan, Krishna and Singh, N. P. *Speaking English Effectively* Macmillan India Ltd.

9. Ruberg, Michelle and Yagoda, Ben. *Handbook of Magazine Article Writing*. 2<sup>nd</sup>. Cincinnati: Writer's Digest Books, 2009.
10. Sadanand, Kamelesh, and Susheela Punitha. *Spoken English: A Foundation Course-Part 1*. Hyderabad: Orient Blackswan Private Limited, 2009.
11. Sadanand, Kamelesh, and Susheela Punitha. *Spoken English: A Foundation Course-Part 2*. Hyderabad: Orient Blackswan Private Limited, 2009.
12. Stanek, William. *Effective Writing for Business, College and Life*. Reagent Press, 2005.

### **Secondary References:**

- 1) Downing, Angela and Philip Locke. *English Grammar A University Course*. London and New York: Routledge, 2006.
- 2) Dutwin, Phyllis. *English Grammar Demystified*. McGraw Hill, 2010.
- 3) Hewings, Martin. *Advanced Grammar in Use*. 2nd. Great Britain: Cambridge University Press, 2005.
- 4) Kroeger, Paul. *Analyzing Grammar An Introduction*. Edinburgh: Cambridge University Press, 2005.
- 5) Naylor, Helen and Raymond Murphy. *Grammar in Use Supplementary Exercises*. Edinburgh: Cambridge University Press, 2001.
- 6) Nelson, Gerald. *English An Essential Grammar*. London: Routledge, 2001.
- 7) Penston, Tony. *A Concise Grammar for English Language Teachers*. Wicklow: TP Publications, 2005.
- 8) Quirk, Randolph, et al. *A Comprehensive Grammar of the English Language*. New York: Longman, 1985.

- 9) Rollason, Jane. *50 Mixed- Ability Grammar Lessons*. Scholastic, n.d.
- 10) Rozakis, Laurie Ph. D. *English Grammar for the Utterly Confused*. New York: McGraw - Hill, 2003.
- 11) Thomson, A.J. and A.V. Martinet. *A Practical English Grammar*. 3rd. Edinburgh: Oxford University Press, n.d.
- 12) Vorobej, Mark. *The Theory of Argument*. Edinburgh: Cambridge University Press, 2006.
- 13) Willis, Dave. *Grammar and Lexis in English Language Teaching*. Edinburgh: Cambridge University Press, 2003.
- 14) Wilkie, Helen. *Writing, Speaking, Listening*. Oxford: How to Books Ltd, 2001.

**PARVATIBAI CHOWGULE COLLEGE OF ARTS AND SCIENCE  
AUTONOMOUS  
DEPARTMENT OF ENGLISH**

**APPROVED SYLLABUS OF SEMESTER III FOR THE ACADEMIC YEAR  
2016 – 2017**

**S.Y. B.A. – SEMESTER III – Core Compulsory**

**Paper Title:** Contemporary Indian English Literature

**Paper Code:** Eng-III. C- 5

**Name of the Faculty:** Asst. Prof. Dr. Sonia Fernandes Da Costa

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

- a. To introduce the students to different genres of contemporary Indian writing in English.
- b. To acquaint the students with the narrative of India' struggle for independence.
- c. To familiarize the students with various themes and cultural contexts of Contemporary Indian English Writing.

**2. Learning Objectives:**

By the end of this course students:

- a. Will be acquainted with literature of Contemporary Indian English Literature.
- b. Will be aware of the different genres employed by Contemporary Indian English Writers.
- c. Will sharpen their critical reading skill.
- d. Will be familiar with the various themes and narrative techniques of the Contemporary Indian English writers.

**3. Number of Lectures:** 04 per week.



**4. Course Content:**

Total Number of Lectures: 60

**Unit I - Poetry:**

**Number of Lectures: 15**

1. Keki Daruwala a) Boat-ride Along The Ganga  
b) Hawk  
c) Crossing Rivers
2. Adil Jussawala – a) On First Approaching Santacruz Airport, Bombay  
b) Land's End  
c) Karate
3. Nissim Ezekiel – a) Goodbye Party for Miss Pushpa T.S.  
b) Background casually  
c) Poet, Lover, Birdwatcher
4. Arun Kolatkar – a)The Bus  
b) An Old Woman  
c) Ajamil and the Tigers
5. Jayanta Mahapatra – a) Hunger  
b) Indian Summer Poem  
c) A Rain of Rites
6. A.K. Ramanujan – a) Love Poem for A Wife  
b) Looking for a cousin on a swing  
c) A River
7. Kamala Das - a) Introduction  
b) My grandmother's House  
c) Summer in Calcutta

**Unit II- Drama****Number of Lectures: 18**

1. Mahesh Dattani- Final Solutions
2. Girish Karnad- Yayati

**Unit III- Prose****Number of Lectures: 12**

## a) Short Stories

- a) R. K. Narayan's -A Horse and Two Goats
- b) Ruskin Bond's -The Blue Umbrella
- c) Khushwant Singh's - Portrait of a Lady
- d) Vilas Sarang's -A revolt of the Gods

## b) Novel

**Number of Lectures: 15**Salman Rushdie's. *Shame*.**5. Reference Books:****Primary References:**

1. David Davidar. *A Clutch of Indian Masterpieces*. New Delhi: Aleph Book Company, 2014.
2. Girish Karnad. *Yayati*. New Delhi: Oxford University Press, 2007.
3. Salman Rushdie. *Shame*. New Delhi: Random House Trade Paperbacks, 2008.

**Secondary References:**

1. Iyengar, K. R. S. *Indian Writing in English*. New Delhi: Sterling Publishers Pvt. Ltd., fourth edition, 1984.
2. Joshi, Dr. Rakesh. *Girish Karnad's Plays*. Jaipur: Mark Publishers, 2011.
3. Khair Tabish . *Babu Fictions: Alienation in Contemporary Indian English Novels*. UP: Oxford UP, 2001.
4. King, Bruce. *Modern Indian Poetry in English*. USA: Oxford University Press, 2005.

5. Mehrotra Arvind Krishna. *Twelve Modern Indian Poets*. New Delhi: Oxford India Paperback, 1993.
6. Naik, M. K, S. K. Desai and G. S. Amur. *Critical Essays on Indian Writing in English*. New Delhi: MacMillan, 1968.
7. Paranjape, Makarand R. *Indian poetry in English*. New Delhi: Macmillan, 1993.
8. Parthasarathy, R.(ed.).*Ten Twentieth - Century Indian Poets* (New Poetry in India). New Delhi: Oxford University Press, 1976.
9. Shama, Ram. *Recent Indian English Literature*. Delhi: Manglam Publications, 2012.
10. Warma, Monica. *Modern Indian Poetry in English*. New Delhi: Oxford University Press, 2010.

**S.Y.B.A. – SEMESTER III – ELECTIVE PAPER**

**Paper Title:** Goan Literature & Culture

**Paper Code:** ENG-III.E.1

**Name of the Faculty:** Asst. Prof. Dr. Sonia Fernandes Da Costa

**Marks:** 100

**Credits:** 4

**1. Course Objectives**

1. To introduce students to different genres of literary works of Goan Literature in English and translated works by Goan writers.
2. To acquaint students with Goan ethos and culture through the exploration of selected texts of Goan literature
3. To examine selected texts of Goan Literature and folk lore to establish Goan identity.

**2. Learning Objectives:**

By the end of this course students:

1. Will be sensitized to Goan ethos and culture.
2. Will be aware of the historical, psychological, religious and political realities of the times.
3. Will be familiar with diverse literary and cultural trends that helped form Goan Literature.
4. Will be enriched and knowledgeable about their cultural heritage.
5. Will be able to think clearly and critically.
6. Will sharpen critical reading and writing skills.

**3. Number of Lectures: 04 Lectures per week**

#### 4. Course Content :

**Total Number of lectures:60**

#### **Unit 1:** Background (Socio- Political and cultural)

**Number of Lectures: 06**

1) Historical

a) Colonialism

b) Post colonialism

2) Art and Artists of Goa (Folklore, Folkdance and Cartoonists)

a) Tiatr (difference between KHELL and Tiatr, Origin and development)

b) Folklore (teacher can select any four folklores)

c) Folk dances and Songs (any four forms to be selected.)

d) Cartoonists of Goa (Alexzy and Mario Miranda)

#### **Unit 2:** Short stories-

**Number of Lectures: 12**

I. Lambert Mascarenhas - The Little Fellow

- Blood and Lily

II. Victor Rangel-Riberio- Lonely Aging Chinese -American New York Neighbour Lady

-Loving Ayesha

III. Ben Antao- The Guardian Angel

- The Curse

IV. Damodar Mauzo- The Vignahatra,

- A Writer's Tale

V. Laxmanrao Sardessai- The Hour's End

- The Africa Boat

VI. Pundalik Naik- The Turtle

#### Unit 3: Novels

**Number of Lectures: 28**

Francisco Luis Gomes -*Os Brahmanes* (translated from Portuguese)

Pundalik Naik- The Upheaval (translated from Konkani)

**Unit 4: Poetry**

**Number of Lectures: 14**

1. Joseph Furtado- The Secret,  
- Brahmin Girls  
-The Neglected wife
2. R.V.Pandit- His Immortal Land  
- I'm a Gaudo
3. Eunice De Souza: - One Man's Poetry  
-Autobiographical  
- He Speaks  
- Advice to women
4. B. B. Borkar - Ebony Black  
- Towards the horizon  
- Cemetery
5. Manohar Sardesai - We are the world wanderers  
- The end of exile  
- Tristao De Braganca Cunha
6. Robert De Souza- The Village Baker.
7. Manohar Shetty - Jigsaw  
- One morning  
- Bearings

**6. Reference Books:**

**Primary References:**

- 1) Antao, Ben. *Mad House and other nine stories*. Margao: Cinnamon Teal Publishing, 2012.
- 2) Luis de Assis Correia. *Francisco Luís Gomes, 1829-1869: A Select Reader*. Saligao: Goa 1556, 2011.
- 3) Mascarenhas, Lambert. *In the Womb of Saudade -Stories of Goan Life*. New Delhi: Rupa Publishing House, 1994.

- 4) Mauzo, Damodar - *Theresa's Man and other Stories from Goa*. Trans Xavier Cota. New Delhi: Rupa Publications, 2014.
- 5) Naik, Pundalik - *The Upheaval*. Trans Vidya Pai. New Delhi: Oxford University Press, 2012.
- 6) Rangel-Riberio, Victor. *Loving Ayesha and Other Stories*. New Delhi: HarperCollins Publishers, 2003.
- 7) Shetty Manohar, ed. *Ferry Crossing*. New Delhi: Penguin Books, 1998.

**Secondary References:**

- 1) Couto, Maria Aurora. *Goa- A Daughter's Story*. New Delhi: Penguin Books, 2004.
- 2) Fernandes, Andre Rafael. *When the Curtains Rise*. Saligao: Tiatr Academy of Goa & Goa 1556, 2010.
- 3) Gomes, Cynthia James. "Tiatr : An unlimited Engagement," *Reflected in Water*. Jerry Pinto, ed. New Delhi: Penguin Books, 2006.
- 4) Gomes, Olvinho J.F, (retold). *Konkani Folktales*. New Delhi: National Book Trust, 2008
- 5) Mauzo, Damodar. *Teresa's Man and other stories from Goa*. Trans Xavier Cota. Delhi: Rupa Publications, 2014.
- 6) Menezes, Juliao. *Goa's Freedom Struggle*. Velim: Mrs. Alzira da Almeida Charitable Trust, 2011.
- 7) Nazareth Peter, ed. *Pivoting on the Point of Return: Modern Goan Literature*. Saligao: Goa 1556 & Broadway Book Centre, 2010.
- 8) Pinto Jerry, ed. *Reflected in Water*. New Delhi: Penguin Books, 2006.

**S.Y. B.A – SEMESTER III – ELECTIVE PAPER**

**Paper Title:** American Literature of the Twentieth Century

**Paper Code:** ENG-III.E.2

**Name of the Faculty:** Asst. Prof. Dr. Sonia Fernandes Da Costa

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

- A. To study the American Experience as captured in the seminal works of masters of American Literature of the twentieth century.
- B. To expose the students through prose and poetry and drama to the various main trends, ideas and forces that shaped the writing of those times.
- C. To acquaint students with the following literary movements in America – Realism, Modernism and Harlem Renaissance.

**2. Learning Outcomes:**

By the end of the course the students:

- A. Will learn to appreciate American culture and literature
- B. Will be sensitized to the American literature and culture during the twentieth century.
- C. Will be aware of the experimental nature of American literature like meta fiction, magical realism and confessional literature
- D. Will be knowledgeable about the various socio-political issues that took place in America during the period.
- E. Will develop critical thinking and improve communication capabilities.

**3. Number of Lectures: 04 Lectures per week**



#### **4. Course Content**

**Total Number of Lectures: 60**

##### **Unit I Prose:**

**Number of Lectures: 30**

- a) Novel - Alice Walker's *The Colour Purple*.
- b) Drama - Arthur Miller's *Death of a Salesman*.

##### **Unit II Poetry:**

**Number of Lectures: 15**

- 1. Robert Frost- Mending Wall
  - Stopping by the Woods
  - The Road not taken
- 2. W.H.Auden - The Unknown citizen
  - The Shield of Achilles
- 3. Theodore Roethke - My Papa's Waltz
  - The Waking
- 4. Wallace Stevens- The Emperor of Ice Cream
- 5. John Crowe Ransom- Bells for John Whiteside's Daughter
- 6. Allen Ginsberg- America
  - Ode to Failure
- 7. Robert Lowell- To Speak of Woe that is Marriage
- 8. Sylvia Path- Crossing the water
  - Lady Lazarus
- 9. Langston Hughes- Dreams
  - I Too

### **Unit III Background**

**Number of Lectures: 15**

(Some topics could be assigned for self study and presentations in class)

1. The American Dream
2. The Great Depression
3. Social Realism and the American Novel
4. Harlem Renaissance
5. Multi ethnic fiction
6. European Existentialism
7. Theatre of the Absurd
8. Magical realism
9. Beat Poets

### **6. Reference Books:**

#### **Primary References:**

1. Miller, Arthur. *Death of a Salesman*. Penguin UK, 2011.
2. Poulin. A. Jr & Michael Waters, ed. *Contemporary American Poetry*. 8<sup>th</sup> Edition. Houghton Mifflin Company, 2006.
3. Thomas. C.T. *Twentieth Century Verse- American Anthology*. Delhi: Macmillan India Ltd, 1999.
4. Walker, Alice. *The Colour Purple*. US: Mariner , 2006

#### **Secondary References:**

1. Brown, John Russell, ed. *American Theatre*. London, Edward Arnold, 1967.
2. Cullum, E. Linda, ed. *Contemporary American Ethnic Poets: Lives, works, sources*. Greenwood Publication group Inc, 2004.
3. Daniel Hoffman (ed.) Harward. *Guide to Contemporary American Writing*. New Delhi: Oxford University Press, 1979.
4. Gould, Jean. *Modern American Playwrights*. Bombay: Popular Prakashan, 1969.
5. Horto Rod, ed. *Background of American Literary Thought*. New Jersey: Prentice Hall, 1974.
6. Matthiessen F. O. *American Renaissance*. New York: Oxford University Press, 1941.

7. Pearce, Roy H. *The continuity of American Poetry*. Princeton University Press, 1979.
8. Shaw, R.B, ed. *American Poetry since 1960: Some Critical Perspectives*. 1974.

## **S.Y. B.A – SEMESTER III – ELECTIVE PAPER**

**Paper Title:** Writing for the Media

**Paper Code:** ENG-III.E-3

**Name of Faculty:** Asst. Prof. Andrew Barreto

**Marks :**100

**Credits :**4

### **1. Course Objectives**

1. To give students an overview of Media in today's world.
2. To promote interest in skilled Writing and to emphasize the importance of accurate use of English language in the field
3. To develop critical and analytical language skills to be applied in the field of Mass Media.
4. To train students to be self sufficient professionals capable of undertaking independent work and applying theoretical knowledge to real-life situations.
5. To prepare the foundation for careers in Media as an option for students.

### **2. Learning Outcomes**

Upon completion of the course the student should be able:

1. To comprehend the importance of good writing in the field of Mass Media - from print to Digital Media
2. To understand theoretical perspectives behind mass media and the jargon associated with the field.
3. To Master writing skills required for various media - from journalism in print and broadcast media to advertising and creative commercial media
4. To demonstrate competence in the technicalities of clear, concise writing through the use of accurate grammar, punctuation, spellings and writing style.

### 3. Total number of lectures:

60 (1 hour Lectures) considering a term/semester runs over 15 weeks PER WEEK 4 HOURS

### 4. Topics to be covered

**Note:** To ensure the competency of students in the field after graduation, emphasis should be given to the written aspect of the course, while ensuring that the students understand various aspects of each field along with key-terms, and the differences in the written aspect.

#### **Unit I – PRINT MEDIA : Newspapers and Magazines Theory (12 lectures)**

Introduction : The Media and the Message - Message depends on Medium Introduction to Print Media: Audience for the News

Story Ideation as basis of commercial Radio, T.V. and Cinematic production

Difference in writing styles between Print, Electronic and Digital Media

#### **Newspaper Writing:**

*Concepts:* **News Reporting-** (datelines/Credit-line/Bylines/Nut-graph/Headlines) **News Writing** – Appropriate angle for a news story – Structuring news (Lead/Climax form - Inverted Pyramid Form; Chronological form) – Qualities of effective leads –Using significant details – Effective revision Basic principles of AP Style (Associated Press Style Book) for Writing – Use of the Style Book – Style as a Manner of Writing – Clarity in Writing – Readability – Five ‘W’s and ‘H’ of Writing.

**Other Writing-** Features/Articles - Editorials – Letters to the Editor – Book and Film reviews – Interviews– Oped Pieces

**Basic Layout and Composition** - Balanced/Unbalanced/Circus Layout - column setups- photograph additions - final look

*Applied:* Reporting - Climax form - Inverted Pyramid Form; Chronological form Editorials- Letters to the Editor -Book and Film Reviews - Headlines - Oped Pieces - Layout & Composition

## **Writing for Magazines:**

*Concepts:* Demographics (Target Audience); Types of Magazines and How writing differs in them; Differences/Similarities in writing Between Newspaper writing and Magazine writing; Editorials; Layout and Composition **Article writing** – Structuring for greatest effect – Preparation and organization of article – Specific angle – specific audience.

Feature writing – structure – organisation – feature angles – simplicity in Style. *Applied:* Feature and Article Writing- Creation of a Magazine - Layout/Composition - Photographs to enhance written word

## **Editing:**

Concepts & Applied: Copy editing process – Guiding principles of editing Grammar – Punctuation – Subbing – Proof-reading (Proof-reading notations) – [The AP style book can be a great guide here.]

**Note:** *The Editing component is to be taught simultaneously along with the applied component of the paper. The teaching should be graded - Beginning with the basic knowledge of grammar and its application up to a level where the student is competent enough to not only edit their own written works but also others'. This part of component 1 should be taught over the rest of the components as well, ensuring an increase in the level of efficiency of the student.*

## **Unit 2 - ELECTRONIC MEDIA : Radio, T.V. and Cinema RADIO (18 lectures)**

*Concepts:* Radio as a Mass Medium – Radio Skills – Broadcast Writing – Broadcast Terms – Scripting for Radio – Story Structure – Lead, Body, Ending – Writing Radio News and Features - Programmes for Radio (Features, News, Interviews, Skits, Music Programmes, etc.)

*Applied:* Planning a Newscast – Radio Jockeying - Scripting for the Radio - Recording

## **TELEVISION**

*Concepts:* Television as a Mass Medium – Television Skills – Scripting for TV -  
Programmes for TV (Features, News, Interviews, Music Programmes, etc.)

*Applied* – Scripting for a show; Anchoring; Interviewing;

## **FILM**

*Concepts:* Fundamentals of Film Story Writing (The Three Act Story Structure), Scripting,  
Screenplay and Production, Documentary Film.

Writing for the screen – Writing effective film reviews

*Applied*– The Three Act Story Structure, Writing Short Screenplays, Film Reviews.

## **UNIT 3 – DIGITAL MEDIA - Internet and New Media (18 lectures)**

*Concepts:* Kinds of Digital Media & New Media

E-book/E-magazine – E-journal – E-newspaper – Internet – World Wide  
Web Mobile Media - Video Games

*Concepts:* Writing for Digital Media: An Interactive Media

Web Writing - Technical Writing – Blogging.- Introduction to  
Profile Writing – Broadcast News Analysis – Caption Writing –  
Copy Writing/Content Writing – Story Structure and Planning -  
Inverted Pyramid - Headline, Blurb, Lead - Digital Correspondence  
– Digital Editing

*Applied:* Web Writing - Technical Writing – Blogging; Caption Writing; Content Writing

## **UNIT 4 – ADVERTISING (12 lectures)**

*Concepts:* Advertisements in Different Media (Print; TV; Radio; Digital) – An  
Overview Promotional Literature: Copywriting for Leaflets, Pamphlets,  
Brochures, Classifieds – Text, Captions, Logo – Story-board.

T.V. Advertisements - Story Idea to story board to screenplay to  
shoot. writing for advertising –

*Applied:* copywriting for Print Advertisements; The 3 shot ad movie; PSA's; Parody ads

## **5. List of Books/CDs/Websites for reference**

### **Primary References:**

1. *Writing for Television, Radio and New Media (Seventh Ed.)*. Hilliard, Robert - Wadsworth 2006
2. *Writing for the Mass Media* (Sixth edition). James Glen Stovall Pearson Education, 2006
3. *Basic News Writing* Melvin Menchar William. C.Brown Co., 1983
4. *Writing and Reporting News: A Coaching Method* Carole Rich Wadsworth/ Thomson Learning, 2003
5. *News Writing & Reporting* James A Neal & Suzane S Brown Surjeeth Publications, 2003
6. *Broadcast News Writing, Reporting & Production* Ted White Macmillan
7. *An Introduction to Digital Media* Tony Feldman (Blueprint Series) 1996
8. *Advertising* Ahuja & Chhabra Sujeeth Publications, 1989
9. *The Screenwriter's Workbook* Syd Field Dell Publishing, 1984
10. *E-Writing* Dianna Boother Macmillan, 2008
11. *Mass Communication Theory* Denis Mcquail Vistaar Publications, 2007
12. *The Associated Press Style Book and Libel Manual* Norm The A.P, 1994
13. *Handbook of Magazine Article Writing*, Michelle Ruberg, Writer's Digest, 2009

### **Secondary Reading:**

1. *Writing and Producing News* Eric Gormly Surjeet Publications, 2005
2. *A Crash Course in Screenwriting* David Griffith Scottish Screen, 2004
3. *Digital Media: An Introduction* Richard L Lewis Prentice Hall
4. *The Art of Editing the News* Robert.C McGiffort Chilton Book Co., 1978
5. *Digital Media Tools* Dr.Chapman Nigel (Paperback - 26 Oct 2007)
6. *News reporting and Editing* K.M Srivastava Sterling Publications
7. *The News Writer's Handbook: an Introduction to Journalism* M.L Stein, , Paterno, Susan.F
8. Surjeeth Publications, 2003
9. *The TV Writer's Workbook : A Creative Approach to Television* Ellen Sandler Delta, 2007
10. *Understanding Journalism* Lynette Sheridan Burns Vistaar Publications, 2004
11. *Media and Society in the Digital Age* Kevin Kawamoto Pearson Education, 2002
12. *Media in the Digital Age* J.V Pavlik (Paperback - 1 May 2008)



**S.Y.B.A. – SEMESTER III – ELECTIVE PAPER**

**Paper Title:** New Literatures in English

**Paper Code:** ENG-III.E-4

**Name of Faculty:** Asst. Prof. Andrew Barreto

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To introduce students to the marginalized voices in society through their literatures.
2. To help students understand the contribution of the marginalized to mainstream literature.
3. To establish the voices of the marginalized through their representative texts, authors and movements.
4. To inculcate an atmosphere of cultural acceptance through the texts
5. To introduce students to the marginalization of the female gender through their works in literature

**2. Learning Outcomes:** But the end of the course the student will be able:

- 1.To understand the concept of the marginalized segments in society.
- 2.To recognize writers, forms, and movements associated with the marginalized.
- 3.To have the ability to analyze works of literatures critically, keeping in mind the segmented.

**3. Number of Lectures: 04 Lectures per week**

#### 4. Course Content:

Total number of lectures: 60

##### Unit 1: Contextual Study:

[8 lectures]

Note: The following areas will be covered along with their representative texts

1. American Civil War and its consequences
2. The Harlem Renaissance - the rise and fall of the Black cultural movement with reference to the Black Panthers
3. Feminism - the waves and the main proponents of Feminism
4. Introduction to post-colonial themes

##### Unit 2: Play:

[20 lectures]

1. *The Lion and the Jewel* by Wole Soyinka
2. *Pantomime* by Derek Walcott

##### Unit 3: Poetry

[18 lectures]

1. Langston Hughes - The Weary Blues/ / The Negro Speaks of Rivers  
Secondary poems - Black Panther/Dinner Guest:  
Me
2. Countee Cullen- Heritage/Karenge ya Mareng/A Brown Girl  
Dead/Incident  
Secondary Poems - Yet do I Marvel/Mood
3. Paul Lawrence Dunbar - The Plantation Child's Lullaby/The  
wraith  
Secondary Poems - We Wear the Mask
4. Edward Braithwaite –Bread  
Secondary poems - Prelude
5. Claude McKay America/ Tormented  
Secondary poems -If we must die/The Barrier
6. Imamu Amiri Baraka- Incident/In memory of Radio/Notes for a  
Speech  
Secondary Poems - At the National Black Assembly
7. Hilarie Lindsay –Barren Harvest/Monuments of Men
8. Maya Angelou- Caged bird/Women Work  
Secondary poems - Phenomenal Woman/Still I Rise

9. AD Hope – Australia/ the Death of Hope
10. Derek Walcott – A Far Cry from Africa/ Ruins of a great House
11. Judith Wright – Nigger’s Leap
12. Louise Bennet – Colonization in Reverse
13. David Dabydeen – Coolie Odyssey / Slave Song

**Board of studies suggested that the following could also be included later - Leslie Murray and Seamus Heaney (selection of poems)**

#### **Unit 4: Short Stories**

**(14 lectures)**

1. *Miguel Street* by V.S. Naipaul
  1. Bogart
  2. The Thing without a name
  3. George and the Pink House
  4. His chosen Calling
  5. Man-Man
  6. B. Wordsworth
  
2. *The Tomorrow-Tamer* by Margaret Laurence
  1. The Tomorrow-Tamer
  2. The Merchant of Heaven
  
3. *Lives of Girls and Women* by Alice Munro
  1. The Flats-Land
  2. Lives of Girls and Women

#### **5. References:**

##### **Primary References:**

1. Bajaj, Nirmal. *Search for Identity in Black Poetry*. Atlantic Publications
2. Chavan, Sunanda. *The Fair Voice-A Study of Women Poets in English*. Sterling.
3. Kulkarni, Harihar. *Black Feminist Fiction*. Creative Books
4. Loomba, Ania. *Colonialism/Postcolonialism -The New Critical Idiom*. Routledge.
5. Naipaul V.S. *Miguel Street*. New York Vintage International Edition, 1984.
6. Pushpa, M. *The Plays of Wole Soyinka*. Prestige.
7. Rehman, Anisur. *New Literatures in English*. Creative.

8. Sumana, K. *The Novels of Toni Morrison- A study in Race, Gender & Class*. New Delhi: Prestige Books.
9. V.S. Naipaul. *Miguel Street*. New York: Vintage International Edition, 1984.

**Secondary References:**

1. Bhelande, Anjali; Pandurang, Mala (ed). *Articulating Gender*. Delhi: Pencraft International
2. Kearns, Francis. *Black Identity*. N.Y.: Holt, Rinehart & Winston.
3. Ray, Mohit; Kundu, Rama, Kundu. *Studies in Women Writers in English*. Atlantic.
4. Wright, Derek. *Wole Soyinka revisited*. N.Y. Twayne Pubs.

## **SEMESTER III – INTERDISCIPLINARY PAPER**

**Paper Title:** Creative Writing for Beginners

**Paper Code:**

**Name of Faculty:** Asst. Prof. Sandhya Joseph

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To expose students to a variety of literary genres, authors and styles through reading, discussion and analysis.
2. To experiment with a variety of writing genres like short story, poetry, novella, drama etc.
3. To help students understand the process of revision, editing and proofreading.
4. To develop the skills to self-critique one's own writing through a process of giving and receiving criticism on one's own and others' writings.
5. To encourage students to publish their works in the college magazine, college newsletters, local newspapers etc.

### **2. Learning Objectives :**

By the end of the course

1. Students will demonstrate an understanding of literary conventions like plot, character, theme etc.
2. Students will develop a basic understanding of various prose fiction genres.
3. Students will learn to use current events as inspiration for Creative Writing.
4. Students will understand the importance of proof reading, editing and rewriting.
5. Students will become confident about their ability to voice their opinion, desires, world-view etc through writing.
6. Students will learn to critique the writings of their peers.
7. Students will improve their vocabulary and sentence structures.
8. Students will learn to think and write creatively.

**3. Number of Lectures:                      04 Lectures per week**

#### **4. Course Content :**

- 1) How to Get Started? **5 lectures**
  - i) Journal Writing (Recording Personal Experiences).
  - ii) Free Writing.
  - iii) Clustering.
  - iv) Badly Written First Drafts as Helpful a Starting Point.
  
- 2) How to find Subject Matter? **5 lectures**
  - i) Be inspired by events in personal life.
  - ii) Draw inspiration from people one comes across.
  - iii) Be moved by injustice.
  - iv) Draw on current events in Politics, Society etc.
  - v) Look at genres of fiction one loves to read etc.
  
- 3) How to make a story interesting? **5 lectures**
  - i) Introduce conflict, complications, trouble, crisis, resolution.
  - ii) Create feeling of suspense.
  - iii) Appeal to emotions.
  - iv) Surprise reader with unexpected ending.
  
- 4) Difference between ‘Story’ and ‘Plot.’ **5 lectures**
  
- 5) Characterization. **5 lectures**
  - i) Memorable characters have ‘Credibility’, ‘Purpose’ and ‘Complexity.’
  - ii) ‘Indirect Method’ or ‘Telling’ method of Character Presentation  
– Authorial Interpretation
  - iii) Direct Method or ‘Showing Method’ of Character Presentation.
    - Showing appearance
    - Showing action
    - Portraying speech
  - iv) Checklist for Creating Character.  
Age, gender, race, nationality, marital status, region, education, religion, profession, memories, dietary habits, ideology, likes, dislikes etc.

- 6) Importance of Atmosphere and Setting in Fiction **5 lectures**
- 7) Point of View/Narrative voice **5 lectures**
- i) Who speaks :
- First Person Narrative
  - Second Person narrative
  - Third Person Narrative
- ii) To whom :
- To The Reader?
  - To Another character in the Story?
- 8) The Concept of Authorial Distance or Psychic Distance. **5 lectures**
- 9) Difference between types of Prose Fiction [Novel, Short Story, Play]. **5 lectures**
- 10) The Importance of Proofreading, Editing, Rewriting. **5 lectures**
- 11) Poetry: Prosodic Features-Rhyme. Rhythm, Metre, Stanzaic Forms, Figurative Language, Symbolism, Special Linguistic Features etc. **10 lectures**

## **5. Reference Books:**

### **Primary References:**

1. Burroway, Janet. *Writing Fiction: A Guide To Narrative Craft*. New York: Longman Publishers, 2000.
2. Earnshaw, Steven. *The Handbook of Creative Writing*. 2007: Edinburgh University Press, Edinburgh.
3. Morley, David. *The Cambridge Introduction to Creative Writing*. New York:

Cambridge University Press, 2007.

4. Strunk, William, and E.B.White. *The Elements of Style*. New York: Longman, 2000.

**Secondary References:**

1. Boden, Margaret. *the creative mind - myths and mechanisms*. 2nd. New York: Routledge, 2004.
2. Bolton, Gille. *Write Yourself - Creative Writing and Personal Development*. London: Jessica Kingsley Publishers, 2011.
3. Hamand, Maggie. *Creative Writing For Dummies*. West Sussex: John Wiley & Sons, Ltd, 2009.
4. Harper, Graeme. *On Creative Writing*. London: Short Run Press, 2010.
5. Kaufman, Scott Barry and James Kaufman, *The Psychology of Creative Writing*. New York: Cambridge University Press, 2009.
6. May, Steve. *doing creative writing*. Oxon: Routledge, 2007.
7. Mills, Paul. *The Routledge Creative Writing Coursebook*. Routledge, 2006.
8. Neale, Derek. *A Creative Writing Handbook: Developing Dramatic Technique, Individual Style and Voice*. London: A & C Black Publishers Ltd., 2009.

**Additional Online Reading:**

1. <http://io9.com/10-tips-and-tricks-for-creating-memorable-characters-1616544190>
2. <http://thewritepractice.com/resources/characterization/>
3. <http://ladylovelace.hubpages.com/hub/The-Difference-Between-Story-and-Plot>
4. <http://www.learningnerd.com/the-difference-between-plot-and-story/>
5. <http://literarydevices.net/point-of-view/>



**PARVATIBAI CHOWGULE COLLEGE OF ARTS AND SCIENCE**

**AUTONOMOUS**

**DEPARTMENT OF ENGLISH**

**APPROVED SYLLABUS OF SEMESTER IV FOR THE ACADEMIC YEAR  
2016 - 2017**

**S.Y.B.A. – SEMESTER IV – CORE PAPER**

**Paper Title:** Literary Criticism

**Paper Code:** ENG-IV.C-6

**Name of Faculty:** Associate Professor Ms. Rajashree R. Desai

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To enable the students understand nature of literary criticism.
2. To acquaint them with the terminology of literary criticism.
3. To provide them the knowledge of the important schools of literary criticism with the help of representative texts.
4. To help the students grasp methods and techniques of interpreting literature.
5. To be able to apply literary theory to text.

**2. Learning outcomes:**

Upon completion of the course the student will be able to:

1. To understand the nature and functions of literary criticism.
2. To read the writings of literary scholars and critics with understanding and judicious appreciation.
3. To recognize and define major critical schools.
4. To generate and articulate personal responses to literary and critical texts.
5. To explain the premises and assumptions underlying such personal responses.

**3. Number of Lectures:            04 Lectures per week**

#### 4. Course Content:

##### Unit 1: Introduction to literary Criticism

Number of Lectures: 05

- a) What is literature?
- b) Difference between Literary Theory and Literary Criticism.
- c) Functions of literary Criticism
- d) Types of literary Criticism.
- e) A brief survey of major critical schools

##### Unit 2: Classical Criticism

Number of Lectures: 14

- a) Features of Classical Criticism
- b) Plato on Imitation and Art
- c) Aristotle's *Poetics*
- d) Longinus' *On the Sublime*

##### Unit 3: Neo classical Criticism

Number of Lectures: 13

- a) Features of Neo Classical Criticism
- b) Dryden's *Essay of Dramatick Poesie*
- c) Pope's *Essay on Criticism*
- d) Dr. Samuel Johnson's *Preface to Shakespeare*

##### Unit 4: Romantic Criticism

Number of Lectures: 14

- a) Features of Romantic Criticism
- b) William Wordsworth's *Preface to Lyrical Ballads*.
- c) Coleridge's *Biographia Literaria*—His concept of fancy and imagination, language of poetry.
- d) P. B. Shelley's *A Defence of Poetry*- Poetry as an essential part of the fabric of society.

##### Unit 5: New Criticism

Number of Lectures: 14

- a) Features of New Criticism
- b) T. S. Eliot *Tradition and the Individual Talent*
- c) I. A. Richards *Four Kinds of Meaning*
- d) F. R. Leavis *Literary Criticism and Philosophy/ Revaluation* –Keats

#### 5. Reference

##### Books: Primary

##### References:

1. Aristotle. *The Poetics of Aristotle*. Emereo Publishing, Australia, 2012.

2. Aivanhov, Omraam Mikhael. *T. S. Eliot: Tradition and the Individual Talent*. Prakash Book Depot Bareilly, U.P., 2012.
3. Arnold, Thomas. *Dryden: An Essay of Dramatic Poesy*. Atlantic Publisher, New Delhi, 2006.
4. Daiches, David. *Critical Approaches to Literature*. Orient Longman, Mumbai, 1967.
5. Giles, Herbert Allen. *Longinus on the Sublime*. Kessinger Publishing, U.S., 2010.
6. Habib M. A. R. *A History of Literary Criticism and Theory*. Blackwell Publishing, U.S.A., 2008.
7. Leavis F.R. *Revaluation: Tradition and Development in English Poetry*. Ivan R. Dee Publisher, Chicago, 1998
8. Nandwani Aditya. *S.T. Coleridge-Biographia Literaria*. Anmol Publications Pvt. Ltd., New Delhi, 2009
9. Narasimhaiah C. D (ed). *Indian response to American literature*. UEFI, New Delhi, 1967 .
10. Plato. *The Republic*. Rupa Publications, India, 2013
11. Ransom J. C. - *The New Criticism Essay*. New Directions, New York, 1941.
12. Richards I. A. *Four Kinds of Meaning*. Transaction Publishers, 2004.
13. Samuel Johnson. *Preface to Shakespeare*. Hardpress Publishing, U.S.A., 2010
14. Scott James R.A. *The Making of Literature*. Nabu Press, South Carolina, 2011.
15. Warren Robert Penn. *A Poem of Pure Imagination: An Experiment in Reading*. Renal & Hitchcock, New York, 1946.
16. Wellek Rene. *A History of Modern Criticism*. Yale University Press, U.S., 1986

### **Secondary References:**

1. Brooks Cleanth. *The Well Wrought Urn*. Mariner Books, 1956.
2. Butcher S.H. *Aristotle's Theory of Poetry and Fine Art*. Dover P, USA, 1951.
3. Lodge David, Nigel Wood. *Modern Criticism and Theory*. Pearson Publishing, UP India, 2007.
4. Richards I. A. *Practical Criticism*. London, 1929.
5. Shawcross, John(ed). *Shelley's Literary and Philosophical Criticism*. Oxford, U.K. 1909.
6. Wimsat W. K. and Cleanth Brooks. *Literary Criticism: A Short History*. Routledge Kegan Paul, London, 1957.

**S.Y.B.A. – SEMESTER IV – ELECTIVE PAPER**

**Paper Title:** The Literature of the Indian Diaspora

**Paper Code:** ENG–IV.E-5

**Name of Faculty:** Asst. Prof Mr. Eltrin D’Souza

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To introduce to the students the types of Diaspora theories and writings
2. To enable students to read and appreciate Diaspora themes, identity and culture
3. To teach students to appreciate cross-cultural and multicultural studies
4. To understand multiple consciousness in Diaspora writings.

**2. Learning Outcomes:**

Upon completion of the course the student should be able:

1. Understand Diaspora
2. Understand Indian Diaspora through Arts and literature
3. Identify and analyze Diaspora themes through short stories and poems

**3. Number of Lectures:                    04 Lectures per week**

**4. Total lectures:                         60**

**Unit I: Background (07 lectures)**

1. Nature and themes of Diasporic writings
  - a) Exile literature
  - b) Displacement and the Disaporic identity
  - c) Culture and hybridity
2. Gender and Diaspora politics
3. Major Diaspora writers of India

## **Unit II: Poetry (15 lectures)**

### I. Sujata Bhatt

1. The Voices
2. The Dream
3. Search for my

### tongue II. Meena Alexander

1. On Indian Road
2. Birthplace with Buried Stones

### III. Chitra Banerjee Divakaruni

1. Indigo
2. Tiger Mask Ritual

### IV. Saleem Peeradina

1. Exhibit C
2. To whom it may concern
3. Song of the makeover

### V. Ratin Bhattacharjee

1. The Indian Diaspora

## **Unit III: Novel (15 lectures)**

1. A River Sutra by Geeta Mehta

Bye Bye blackbird by Anita Dessai (**Non –evaluative Secondary text**)

## **Unit IV: Short stories (15 Lectures)**

1. Interpreter of Maladies by Jhumpa Lahiri

## **Unit V: Essays (08 lectures)**

1. Salman Rushdie
  - a) Imaginary Homelands
  - b) New empire within Britain

## Unit VI: Films

1. Anita and Me (film) by Meera Syal. Directed by Metin Hüseyin and Produced by Paul Raphael (UK) 2002 (Non Evaluative)
2. Namesake (film) by Jhumpa Lahiri. Produced and Directed by Meera Nair (India) 2007 (Non Evaluative)

## 5. References:

### Primary Texts:

1. Bhatt Sujatha. *Collected Poems*. Carcanet Press Limited, 2013.
2. Bhatt Sujatha. *Point No Point: Selected Poems*. Carcanet Press Limited, 1997.
3. Dessai Anita. *Bye Bye Black Bird*. Orient Paperbacks, New Delhi, 2005.
4. Lahiri Jhumpa. *Interpreter of Maladies*. Harper Collins Publishers, 2008.
5. Mehta Gita. *A River Sutra*. Penguin, 2000.
6. Peeradina Saleem. *Contemporary Indian English Poetry*. Macmillan, Chennai, 2010.
7. Rushdie Salman. *Imaginary Homelands: Essays and Criticism* RHUK, 2004

### Secondary References:

1. Agarwal Beena. *Women Writers and Indian Diaspora*. Authorspress, 2011.
2. Agarwal Malti. *English Literature: Voices of Indian Diaspora*. Atlantic Publisher, 2009.
3. Bande Usha and Jasbir Jain (series ed). *Gita Mehta- Writing Home/Creating Homeland*. New Delhi: Rawat Publication, 2008.
4. Chakrabarti A. S. A. P. T Kavita . *Contextualizing Nationalism, Transnationalism and Indian Diaspora*. Creative Publisher, 2010.
5. Das Nigamananda. *Jhumpa Lahiri: Critical Perspectives*. Pencraft International, 2008.
6. Deb Kushal. *Mapping Multiculturalism (1<sup>st</sup> Edition)*. Rawat Publications , 2002.
7. Gupta K. Surendra. *Specifications of Indian Diaspora Study of Emerging Sandwich Cultures*. Atlantic Publisher, 2012.
8. Jain Jasbir. *Dislocations and Multiculturalisms: (1st Edition)*. Rawat Publications, 2004.
9. Jain Jasbir. *Writers of the Indian Diaspora*. Rawat Publications, 1998.
10. Kadekar Narayan Laxmi and Sahoo Kumar Ajaya .*Global Indian Diaspora: History, Culture and Identity*. Rawat Publications, 2012.

11. Knott Kim. *Diasporas: Concepts, Intersections, Identities*. Rawat Publications, 2011.
12. Tiffin Griffiths Ashcroft Menin. *The Empire writes back*. Taylor & Francis Ltd, 2002.

## **S.Y.B.A – SEMESTER IV – ELECTIVE PAPER**

**Paper Title:** Creative Writing

**Paper Code:** ENG-IV.E-6

**Name of Faculty:** Asst. Prof. Andrew Barreto

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To explore creative writing genres (Poetry, Drama, Fiction) through practical writing classes
2. To build on the foundation of basic knowledge and interest of students in creative writing
3. To develop ones' own style of writing through reading, discussion and experimenting in writing culminating in a student's work portfolio
4. To encourage students' to get their works published using traditional means and modern media
5. To write with the aid of the senses

### **2. Learning Outcomes:** By the end of the course the student will:

1. Have a sample of their own creative output (individual/group)
2. Demonstrate an understanding of concepts related to the creative writing genres
3. Be confident to put forward their ideas/opinions through creative writing genres
4. Develop ability to critique and edit their own work as well as others'
5. Have the ability to use technology in their creative endeavour

### **3. Number of Lectures:** 04 Lectures per week



#### 4. Course Content:

**Note:** This course will focus on the creative *writing* process. Thus, emphasis will be given to the written aspect of the course. Theoretical concepts, learnings, and innovations in the forms and fields will be imparted through praxis. Students will maintain a journal and submit a final portfolio of their creative output. The journal should mandatorily contain *all* the drafts of their works. The editing aspect of the writing process (revision, editing and proofreading) is to be taught concurrently with the units, while focusing on the particular needs of the forms.

#### Unit I: *Poetry*

20 lectures

*Concepts:* Metre and rhyme; Meaning and being of language- power of reference/pop culture/allusions; form (and subverting form); free verse; syllabics; shaping a sequence and collection; figures of speech and its use

Spoken Word -writing, speaking, and performing; Reading techniques – charm, set, space, cold open, silence, blending music

Use of technology in performance, exposing your work to others; *transaesthetics*

*Applied:* Students will apply some strategies of contemporary poetry in the writing of several poems and the analysis of published poetry. They will demonstrate, through the writing and performing of several poems, an understanding of some of the aesthetic aspects of contemporary poetry, such as manipulation of stanzas and line lengths, figures of speech, symbolism, setting, tone, and imagery. They will identify the aesthetic aspects of poetry in published poems and poems written by classmates.

*Portfolio:* Rhyming poems (with various rhyme scheme and forms), free verse, Slam poetry, Spoken word

**Note:** Instructor may use a selection of poetry (established poets) to illustrate the range and variety of poetry. Focus should be on cultivating the student's poetry writing skills.

#### Unit II: *Drama*

20 lectures

*Concepts:* Structures of a stage plays (physical/written); Acts/scenes; Scripting a stage play; Original v/s adapted; story/dialogue/description; Contrast creating conflict; characters and idiom; overwriting; individual voice

Exposition - Using monologues; subtext; dramatic irony; status

Staging - Action; Sets; stage directions and visual narrative; Using offstage effectively; Dramatic action; Staging scenes

Radio Drama: creating pictures with sound; constraints of the medium; Radio drama script; Adaptation; using voices

*Applied:* Students will apply strategies of storytelling in the medium of a play and the analysis of published drama. They will demonstrate, through the writing of a play (one act/two act/three act) an understanding of some of the aesthetic aspects of drama, such as scripting action for the stage, use of dialogue and creating powerful characters through use of monologues and dramatic irony. They will have the ability identify these aspects of drama in published plays and work written by classmates.

*Portfolio:* One act play, three act play, Radio play

**Note:** Instructor may use a selection of drama (established playwrights) to illustrate the range and variety of drama. Focus should be on cultivating the student's writing skills.

### **Unit III: Fiction**

**20 lectures**

*Concepts:* Short Fiction – Short Stories, Flash Fiction, Novella, and Novel

Form/Structure; Plot/Scenes; Character; point of view/narrative voice; conflict/crises; Setting/time

Micro-tales/Nano-tales – analysis of social media and innovative storytelling techniques

Novella/Novel: literary novel v/s genre novels exploring storylines, multiple/parallel plots; reality /s imagination; research and its importance; structuring your chapters vis-à-vis your novel

Creative Non – Fiction –Devices; Basic structure; Speaking with the reader – Your spoken voice; Passion involvement; Writing about yourself – You as a story; Memoir and memory; Writing about people and the world; finding a topic; fieldwork and interviews; literature of hope

*Applied:* Students will apply strategies of storytelling in the writing of at least one short story/flash fiction; novella/novel (or works of creative non-fiction, or graphic novels) and the analysis of published fiction. They will demonstrate, through the writing of an original work, an understanding of some of the following elements of storytelling: plot, characterization, setting, point of view, symbolism, and style. They will identify the narrative techniques and elements of storytelling used in published works of fiction and stories written by classmates.

*Portfolio:* Short-story, Flash Fiction, Novel/Novella (Structuring/idea conception and writing of at least 3 chapters)

**Note:** Instructor may use a selection of fiction (established writers) to illustrate the range and variety of fiction. Focus should be on cultivating the student's writing skills.

**N.B:** the number of lectures for each unit includes time for continuous assessment, portfolio building (with instructor feedback and review) as well as writing classes.

**Additional note:** As a supplementary skill, the students should be taught how to prepare and submit a piece of work for publication. They should display the ability of using a word-processor, and desk-top publishing software to format their manuscript so as to be print ready and ready for submission to an editor, or publisher. They should also be taught, if not given, opportunities for publication. These can be achieved using the students' works, collected in a portfolio, to assess their growth and competency. (Desk-top publishing software such as Adobe Indesign/Publisher/Illustrator)

Instructors should use peer editing and group workshop method within the classroom as a method of giving and receiving constructive criticisms. This will also open opportunities for students to perform and read out their work, thereby taking care of the spoken word aspect of creative writing, as and when it may apply.

## 5. References:

### Primary References:

1. Cheney, Theodore A. Rees. *Writing Creative Nonfiction - Fiction Techniques for Crafting Great Nonfiction*. California: Ten Speed Press, 1987. ebook.
2. Burroway, Janet. *Writing Fiction: A Guide to Narrative Craft*. New York: Longman Publishers, 2000.
3. Earnshaw, Steven. *The Handbook of Creative Writing*. Edinburgh University Press, Edinburgh. 2007.
4. Greenwell, Bill and Linda Anderson. *A Creative Writing Handbook - Developing Dramatic Technique, Individual Style and Voice*. Ed. Derek Neale. London: A & C Publishers Ltd., 2009.
5. Miller, Brenda and Suzanne Paola. *Tell it Slant - Writing and Shaping Creative Nonfiction*. Mcgraw-Hill, 2005.
6. Mills, Paul. *The Routledge Creative Writing Coursebook*. Routledge, 2006. ebook.
7. Morley, David. *The Cambridge Introduction to Creative Writing*. Cambridge: Cambridge University Press, 2007.
8. Smith, Marc Kelly and Joe Kraynak. *Take the Mic - The Art of Performance Poetry, Slam and the Spoken Word*. Illinois: Sourcebooks MediaFusion, 2009. ebook.
9. Strunk, William and E. B. White. *The Elements of Style*. New York: The Penguin Press, 2005.

### Secondary References:

1. Boden, Margaret. *The Creative Mind - Myths and Mechanisms*. 2nd. New York: Routledge, 2004.
2. Bolton, Gille. *Write Yourself - Creative Writing and Personal Development*. London: Jessica Kingsley Publishers, 2011.

3. Hamand, Maggie. *Creative Writing For Dummies*. West Sussex: John Wiley & Sons, Ltd, 2009.
4. Harper, Graeme. *On Creative Writing*. London: Short Run Press, 2010.
5. Kaufman, Scott Barry and James Kaufman, *The Psychology of Creative Writing*, New York: Cambridge University Press, 2009.
6. May, Steve. *Doing Creative Writing*. Oxon: Routledge, 2007.
7. Smith, Marc Kelly and Joe Kraynak. *Stage a Poetry Slam*. Illinois: Sourcebooks Media Fusion, 2009.

## **S.Y.B.A. – SEMESTER IV – ELECTIVE PAPER**

**Paper Title:** Visual Literature

**Paper Code:** ENG-IV.E-7

**Name of Faculty:** Asst. Prof. Andrew Barreto

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To introduce students to visual literature – in the form of graphic novels, comics and digital comics
2. To understand core concepts in the field of visual literature.
3. To understand how to read graphic novels, comics, and other forms of visual literature.
4. To establish the contribution of visual literature to literature on the whole.

### **2. Learning Outcomes:** By the end of the course the student will be able:

1. To understand visual literature - core concepts, how to read, and critically analyze it as well as establish it as no longer a para-literary form
2. To recognize writers, forms, and ages associated with graphic novels, comics and other forms of visual literature.
3. To have the ability to analyze works of visual literatures critically.

### **3. Number of Lectures: 04 Lectures per week**

#### 4. Course Content:

##### Unit 1: The Comics Genre – History, Formats to Key terms: [12 lectures]

- History of comics (from paper to digital), Graphic novels and other visual literature
- The major comics-creating nations and introduction to comics traditions
  - America - Titles from DC Comics, Marvel, Vertigo, Dark Horse and others
  - Europe - *Tintin; Asterix*, French and British Comics
  - Japan (Manga) - *Akira*
  - Indian Comics tradition - *Tinkle, Amar Chitra Katha, Jataka & Panchatantra tales*
- The single panel comic to syndication
  - R.K. Laxman's collection
  - *Calvin & Hobbes* - William Patterson
- Adapted Comics - *The League of Extraordinary Gentlemen* - Alan Moore
- Advent of Digital Comics/web comics -
  - Gavin Aung Than - [www.zenpencils.com](http://www.zenpencils.com)
  - Rob Denbleyker - [www.explosm.net](http://www.explosm.net)
- Key terms - Sequential Art, panel, gutter, tier, splash, spread, speech balloon, caption, sound effects, narration, formats, canon

[Please Note: Noted graphic novelists and comics creators will be introduced to students as they cover the history of the genre.]

##### Unit 2: The Modern Classic

[16 lectures]

1. *The Complete Maus* by Art Spiegelman

**Recommended Secondary Reading** -*Persepolis* by Marjane Satrapi

##### Unit 3: A Realistic look at the 'Superhero'

[16 lectures]

1. *Watchmen* by Alan Moore
2. *V for Vendetta* by Alan Moore

**Recommended Secondary Reading** - *Batman Year One* - Frank Miller

*The Dark Knight Returns*– Frank Miller

*Superman: Man of Steel* - John Byrne

**Unit 4: Alternative Comics/Graphic Novels**

**[16 lectures]**

1. *Fun Home* by Alison Bechdel
2. *A Contract with God* by Will Eisner

**Recommended Secondary Reading** -*Underwater Welder* by Jeff Lemire

**N.B:** The number of lectures for each unit includes time for continuous assessment.

Secondary Reading will not be evaluated in the Semester End Exam, but may be used for Continuous assessment if it is used as an extension of the scope of the course.

It is recommended for the students to read the suggested secondary readings in order to fully comprehend the material to be discussed in class.

**5. References:**

**Primary References:**

1. Bechdel, Alison. *Fun Home: A Family Tragicomic*. Boston: Houghton Mifflin, 2006.
2. Chaney, Michael A., ed. *Graphic Subjects: Critical Essays on Autobiography and Graphic Novels*. Wisconsin: University of Wisconsin Press, 2011.
3. Eisner, Will. *A Contract with God and Other Tenement Stories*. New York: DC Comics, 1996.
4. —. *Comics & Sequential Art*. Florida: PoorHouse Press, 1985.
5. Heer, Jeet and Kent Worcester. *Arguing Comics: Literary Masters on a Popular*



- Medium*. Jackson: University Press of Mississippi, 2004.
6. Liddo, Annalisa di. *Alan Moore: Comics as Performance, Fiction as Scalpel*. Mississippi: University Press of Mississippi, 2009.
  7. McCloud, Scott. *Making Comics- Story Telling Secrets of Comics, Manga and Graphic Novels*. New York: Harper Collins, 2006.
  8. —. *Understanding Comics: The Invisible Art*. New York: HarperCollins, 1993.
  9. McLaughlin, Jef, ed. *Comics as Philosophy*. Jackson: University Press of Mississippi, 2005.
  10. Miller, Frank. *Batman: Year One*. New York: DC Comics, 2005.
  11. Mills, Anthony R. *American Theology, Superhero Comics, and Cinema: The Marvel of Stan Lee and the Revolution of a Genre*. New York: Routledge, 2014.
  12. Moore, Alan (w) and David (a) Lloyd. *V for Vendetta*. DC Comics, 2008.
  13. Moore, Alan. *The League of Extraordinary Gentlemen*. La Jolla: CA: America's Best Comics, 2000.
  14. Moore, Alan and Dave Gibbons. *Watchmen*. New York: Warner Books, 1987.
  15. Morris, Tom and Matt Morris. *Superheroes and Philosophy: Truth, Justice and the Socratic Way*. Illinois: Open Court, 2005.
  16. Peterson, Robert S. *Comics, and Manga, Graphic Novels: A History of Graphic Narratives*. California: Praeger, 2011.
  17. Robb, Brian J. *Superheroes: From Superman to the Avengers, The Evolution of Comic Book Legends*. London: Robinson, 2014.
  18. Satrapi, Marjane. *Persopolis*. London: Vintage Books, 2008.
  19. Spiegelman, Art. *MetaMaus*. New York: Pantheon Books, 2011.

20. —. *The Complete Maus*. USA: Pantheon Books, 1996.

21. White, Mark D. *Watchmen and Philosophy: A Rorschach Test*. New Jersey: John Wiley & Sons, Inc, 2009.

### **Secondary References:**

1. Berninger, Mark, John Ecke and Gideon Haberkon. *Comics as a Nexus of Cultures: Essays on the Interplay of Media, Disciplines and International Perspectives*. London: McFarland & Company, Inc. Publishers, 2010.
2. Dalton, Russell. *Marvelous Myths: Marvel Superheroes and Everyday Faith*. Missouri: Chalice Press, 2011.
3. Daniels, Les. *DC Comics: A Celebration of the World's Favorite Comic Book Heroes*. New York: Bulfinch Press, 1995.
4. Hahn, Joel. "A Librarian's Guide to DC Comics." *Serials Review* (1998): 64-78.
5. Hatfield, Charles. *Alternative Comics: An Emerging Literature*. Jackson: University Press of Mississippi, 2005.
6. Lavin, Michael. "A Librarian's Guide to Dark Horse Comics." *Serials Review* (1998): 76-93.
7. —. "A Librarian's Guide to Marvel Comics." *Serials Review* (1998): 41-63.
8. Lopes, Paul. *Demanding Respect: The Evolution of the American Comic Book*. Philadelphia: Temple University Press, 2009.
9. MacWilliams, Mark W., ed. *Japanese Visual Culture-Explorations in the World of Manga and Anime*. New York: East Gate, 2008.
10. Than, Gavin Aung. *Zen Pencils: Cartoon Quotes from Inspirational Folks*. Missouri: Andrew McMeel Publishing, 2014.
11. —. *Zen Pencils-Volume Two - Dream the Impossible Dream*. Missouri: Andrew Mcmeel Publishing, 2015.

12. Weiner, Robert G. *Marvel: Graphic Novels and Related Publications- An Annotated Guide- Comics, Prose Novels, Children's books, Articles, Criticism and Reference Works, 1965 - 2005*. London: McFarland & Company, Inc., Publishers, 2008.

**S.Y. B.A – SEMESTER IV – ELECTIVE PAPER**

**Paper Title:** Representation of Gender and Sexuality in Literature

**Paper Code:** ENG-IV.E.8

**Name of the Faculty:** Asst. Prof. Ms. Rucha Kamat

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To acquaint the students with English literature that explores the dimensions of gender, its social constructs etc.
2. To unfold the concept of sexuality is through its various aspects.
3. To discover the notions of gender and sexuality and their interplay.
4. To enable the students to appreciate the various constructs of gender and sexuality.
5. To help students understand the fluid natures of gender and sexuality.
6. To reveal gender and sexuality as is prevalent with reference to society, psychology, morality etc.
7. To foster an appreciation for literature pertaining to interplay of gender and sexuality.

**2. Learning Outcomes:**

Upon completion of the course the student should be able to:

1. Appreciate the fluid nature of gender and sexuality.
2. Recognize the literal/ symbolic meanings depicted in literature related to gender and sexuality.
3. Decipher the interplay between gender and sexuality as seen through depictions, imagery etc.
4. Recognize various themes seen in literature pertaining to gender and sexuality.

**3. Number of Lectures: 04 Lectures per week**

**4. Course Content:**

**60 lectures**

**UNIT 1: BACKGROUND TOPICS**

**Number of Lectures: 10**

- o Feminist Movement:
  - Nature of Feminism
  - History of Feminism
  - Feminism Waves
  - Gynocriticism
  - Lesbian Feminism
  
- o Queer theory:
  - Nature and history of Queer
  - Theory Identity Politics
  - Gender Performativity

**UNIT 2: PROSE**

**Number of Lectures: 20**

**A. Essay:**

Kate Millett: Theory of Sexual Politics

**B. Novels:**

Raj Rao: The Boyfriend

**C. Short Stories:**

Katherine Mansfield: The Daughter of the Late Colonel.

Mahasweta Devi: Draupadi

**UNIT 3: PLAY**

**Number of Lectures: 20**

1. Gieve Patel: Mr. Behram
  
2. Mahesh Dattani: On a Muggy Night in Mumbai.

**UNIT 4: POEMS**

**Number of Lectures: 10**

1. Sappho:
  - o Come here to me from Crete
  - o To Aphrodite
  - o He is more than a hero

2. Suniti Namjoshi:
  - o I Give her the Rose
  - o Well then let slip the masks
3. Maya Angelou
  - o Phenomenal Woman
  - o Still I Rise
4. Kamala Das
  - o The Looking Glass
  - o The Old Playhouse
5. Sylvia Plath
  - o The Applicant
  - o Spinster

## 5. Reference Books:

### Primary References:

1. Dattani, Mahesh. *Mahesh Dattani: Collected Plays*. New Delhi: Penguin, 2000.
2. Gilbert, Sandra & Gubar Susan. *The Madwoman in the Attic*. UK: Yale University Press, 1984.
3. Jain, Jasbir (ed). *Women in Patriarchy: Cross – Cultural Readings*. New Delhi: Rawat Publications, 2005.
4. Millett, Kate. *Sexual Politics*. University of Illinois Press, 2000.
5. Rao, Raj. *Boyfriend*. Penguin India, 2003.
6. Ruth Vanita & Kidwai Saleem. *Same Sex Love in India: Readings from Literature and History*. New Delhi: Macmillan, 2000.
7. Sedgwick Eve Kosofsky. *Epistemology of the Closet*. University of California, 1990.
8. Tendulkar, Vijay. *Mitrachi Goshta: A Friend's Story: A Play in Three Acts*. Oxford University Press, 2000.

### **Secondary References:**

1. Brabon, Benjamin & Genz Stephanie. *Postfeminism*. Edinburgh University Press, 2009.
2. Bristow, Joseph. *Sexuality*. Routledge, 2013.
3. Butler, Judith. *Gender Trouble*. Routledge, 2012.
4. Shahni, Parmesh. *Gay Bombay: Globalization, Love and (be)longing in Contemporary India*. Sage Publications India Pvt. Ltd, 2008.
5. Sharma, Prabhat. *The Plays of Vijay Tendulker: Critical Explorations*. Sarup & Sons, 2008.
6. Wake, Paul & Malpas Simon. *The Routledge Companion to Critical Theory*. Routledge, 2008.

## **SEMESTER IV– INTERDISCIPLINARY PAPER**

**Paper Title:** Introduction to Mass Media

**Paper Code:**

**Name of Faculty:** Asst. Prof. Andrew Barreto

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To give students an overview of Mass Media in today's world.
2. To introduce them to the world of communication in Media, through the fields of Print Media, Radio, Television, Film, Digital Media/New Media.
3. To develop an understanding of Mass Media and related concepts through a practical hands-on approach.
4. To introduce students to the various equipment and software required in the field.
5. To create a foundation and a broad base knowledge for further studies and careers in Media as an option for students.

### **2. Learning outcomes :**

Upon completion of the course the student should be able:

1. To comprehend the field of Mass Media - from print to Digital Media.
2. To understand a few theoretical perspectives behind mass media and the jargon associated with the field.
3. To be comfortable around the various equipment and software required for various media
4. To demonstrate competence in the field of Mass Media – be it in the ideation or execution stage.

**3. Number of Lectures:            04 Lectures per week**



#### 4. Course Content:

**NOTE:** To ensure the competency of students in the field after graduation, emphasis should be given to the APPLIED aspect of the course, while ensuring that the students understand various concepts of each field along with key-terms.

##### **Unit I – Mass Communication & Media Studies**

**05 Lectures**

**Concepts:** Mass Communications; Other forms of Communications; Technologies and

Communications; Mass Media and Contemporary Culture; Media Studies – Encoding messages; Audience responses; Agenda

##### **Unit II – Advertising**

**11 Lectures**

**Concepts:** Brief History; Target Audience; Buying Motives; Advertising Message; Advertising Ethics; Advertisements in Different Media (Print; TV; Radio; New Media); Future in Advertising; Careers

**Applied:** Radio ad; Print ads – Newspapers/magazines – Product/info-ads; copy/layout/design; TV ad; Advertisements in New Media; PSA's

##### **Unit III – Print Media – Newspapers & Magazines**

**12 Lectures**

**Concepts:** Brief history of Newspapers & Magazines; Types of Magazines & Newspapers; Layout/Design of Newspapers & Magazines; Reports – Different formats; Photography and Print

**Applied:** Creation of Magazine/Newspaper; Layout/composition

##### **Unit IV – Radio & Music**

**11 Lectures**

**Concepts:** Brief History of Radio& Music; Radio Today: Internet and Music;

Types of Radio Formats; Types of Music Formats; Digital Radio & Music; Future of Radio& Music; Careers

**Applied:** Radio Shows; Radio Editing; Radio Plays; Music and Composing

**Unit V – Television, Cinema & Video**

**11 Lectures**

**Concepts:** Brief History of Broadcast TV & Cable TV; Cinematic History; Cinema & TV industry today; Future of TV & Cinema; Types of TV formats/shows etc; Types of Cinema; Internet and the Age of Streaming; Careers

**Applied:** TV Shows; Documentaries; Basic Shots; Editing; 3 Act movie; Short movie

**Unit VI - Internet& New Media**

**10 Lectures**

**Concepts:** Brief History of Internet & New Media; Internet in the new age; Internet and Disruption; Mobile Phones; Blogging; Video games; New Media Careers; Future of the internet

**Applied:** New Media – Blogging, Podcasting, Social Media

## 5. Reference Books:

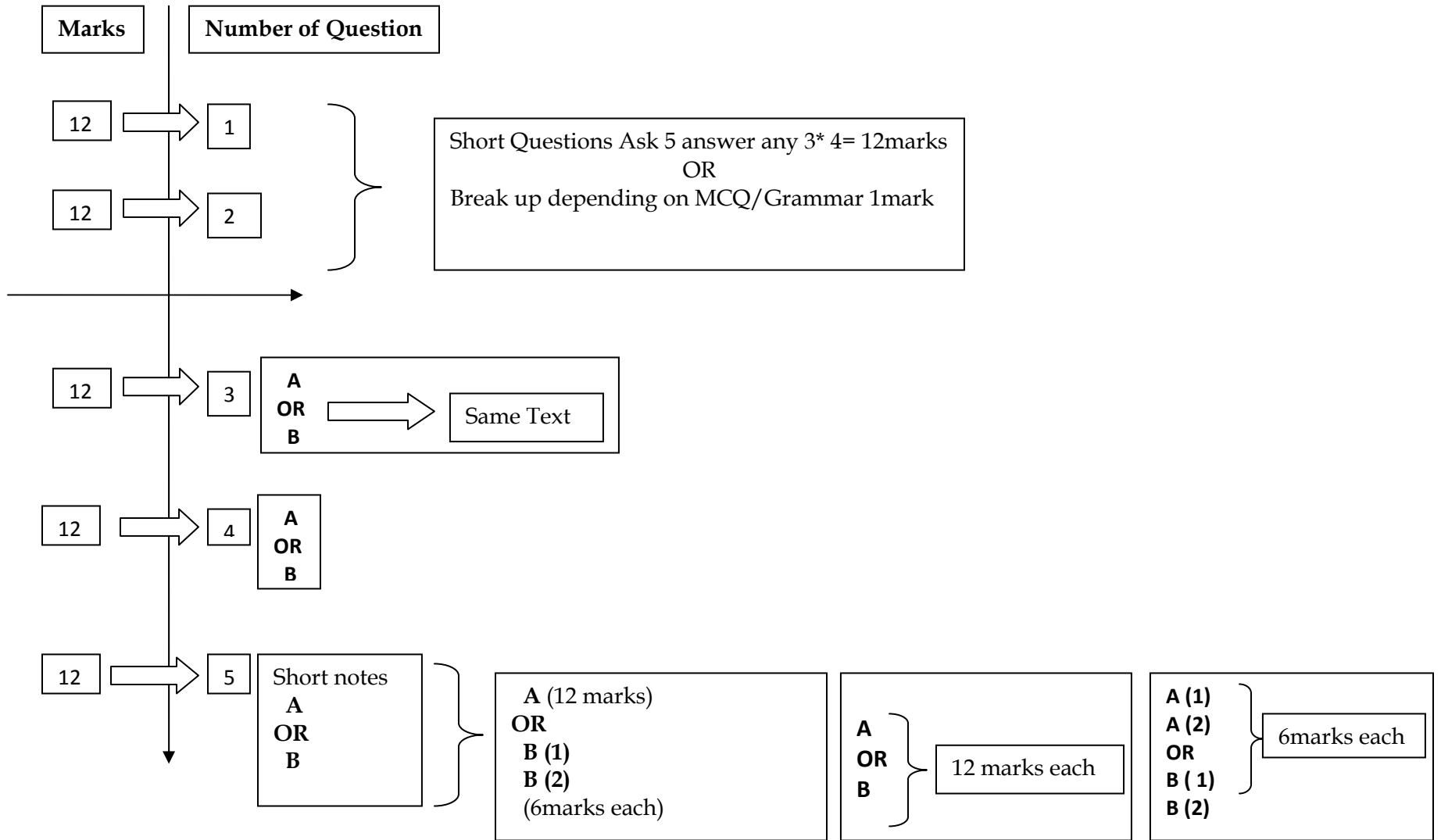
### Primary References:

1. Campbell, Richard. Martin, Christopher. Fabos, Bettina. *Media & Culture – An Introduction to Mass Communication (8<sup>th</sup> Ed.)*. Bedford. 2012.
2. Dominick, Joseph. *The Dynamics of Mass Communications (8<sup>th</sup> ed.)*. Mcgraw-Hill, 2005.
3. Paxson, Peyton. *Mass Communications and Media Studies – An Introduction*. Continuum, 2010.
4. Thompson, Ray. *Grammar of the Edit*. Burlington: Focal Press, 1993.

### Secondary References:

1. Mcquail, Denis. *Mass Communication Theory*. Vistaar Publications. 2007.
2. *The Associated Press Style Book and Libel Manual* Norm The A.P, 1994.
3. Hilliard, Robert. *Writing for Television, Radio and New Media (Seventh Ed.)*. Wadsworth. 2006.
4. Pavlik, J.V. *Media in the Digital Age*. 2008.
5. Perry, David K. *Theory and Research in Mass Communication*. Lawrence Erlbaum Associates, 2002.
6. Ruberg, Michelle. *Handbook of Magazine Article Writing*. Writer's Digest. 2009
7. Stadler, Jane and McWilliam, Kelly. *Screen Media – Analysing Film and Television*. Allen & Unwin. 2009.
8. White, Ted. *Broadcast News Writing, Reporting & Production*. Macmillan.

# Final Exam Framework For Language Department



**PARVATIBAI CHOWGULE COLLEGE OF ARTS AND SCIENCE  
AUTONOMOUS**

**DEPARTMENT OF ENGLISH  
REVISED SYLLABI OF SEMESTER I, II, III, IV, V & VI  
2017-2018**

**F.Y.B.A. – SEMESTER I – CORE PAPER**

**Paper Title:** Understanding Poetry & Drama

**Paper Code:** ENG-I.C-1

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To acquaint students with major poetic forms and trends in English Poetry.
2. To enable students to read and appreciate poems.
3. To improve the literary and critical competence of the students.
4. To teach students to appreciate English Drama.
5. To instill the appreciation of Drama and the universality of its reach.
6. To train students to identify basic elements in a Drama.

**2. Learning outcomes:**

Upon completion of the course the student should be able:

1. Recognize and define major poetic forms such as lyric poetry, narrative poetry.
2. Know and identify rhyme, rhythm and meter.
3. Understand and appreciate the literal and symbolic/inner meaning (connotative and denotative meaning) of a poem.
4. Identify and analyze special stylistic features of poetry such as imagery, tone, atmosphere, special linguistic and stylistic features, imagery.
5. To recognize and appreciate various elements of a drama: Plot, Character, Dialogue, Setting, Theme, and Act-Scene Division.
6. To understand and be knowledgeable about the evolution of two major forms of Drama – Tragedy and Comedy.

**3. Number of Lectures:            04 Lectures per week**

#### 4. Course Content:

##### **Unit 1: Background to Poetry & Drama**

**Number of Lectures: 12**

1. Poetry as a Literary form
2. Nature and types of lyric poetry
3. Evolution of lyric as a literary form
4. Nature and forms of narrative poetry
5. Evolution of the English Drama
6. Nature of Tragedy & Comedy in Drama

##### **Unit 2: Lyric Poetry: Songs, Sonnets, Odes, Elegies and Dramatic Monologues**

**Number of Lectures: 12**

1. Edmund Spenser: Whilst in Prime
2. Sir Philip Sidney: His Lady's Cruelty
3. William Shakespeare: Marriage of True Minds
4. John Donne: Batter my Heart
5. Robert Herrick: To Daffodils
6. William Blake: *Lamb* and *Tyger*
7. William Wordsworth: The Daffodils
8. P. B. Shelley: Mutability
9. John Keats: Ode on a Grecian Urn
10. Robert Browning: My Last Duchess

##### **Unit 3: Narrative Poetry: Ballads, Mock Epic**

**Number of Lectures: 12**

1. S T Coleridge : The Rime of the Ancient Mariner : (Sections 1,2,3)
2. Alexander Pope- Rape of the Lock (Canto I)

##### **Unit 4: Drama: Tragedy & Comedy**

**Number of Lectures: 24**

1. Henrik Ibsen: *An Enemy of the People*
2. J. M. Barrie – *The Admirable Crichton*

## 5. Reference Books :

### Primary References:

1. Barrie. J. M. *The Admirable Crichton*.
2. Ibsen, Henrik. *An Enemy of the People*.

### Secondary References:

1. Abrams, M. H. *A Glossary of Literary Terms*. 11<sup>th</sup> Cengage Learning, 2014.
2. Bowra C.M. *Heroic Poetry*. Macmillan, 1966.
3. Ed. Bloom Harold. *William Shakespeare's Sonnets*. Viva Books, 2007.
4. Ed. Bottrall Margaret. *William Blake: Songs & Innocence & Experiences*. Macmillan, 1970.
5. Bradley. A.C. *Oxford Lectures on Poetry*. Atlantic, 2009.
6. Broadbent J.B. *Poetic Love*. Chatto & Windus London, 1964.
7. Chandra NDR, Sebastian A.J. *Literary Terms in English Poetry*. Authors Press, Delhi, 2001.
8. Cuddon J A. *The Penguin Dictionary of Literary Terms and Literary Theory*. Penguin Books, 1999.
9. Dobson, Michael and Wells, Stanley. *The Oxford Companion to Shakespeare*. Oxford, 2001.
10. Gardner Stanley. *Blake*. P. Evans Brothers Ltd, 1968.
11. Jump, John D.(Ed.) *Critical Idiom Series*. Law Book Co of Australasia, 1974.
12. Gridley Roy E. *Browning*. Routledge & Kegan Paul, 1972.
13. Ed. Grose Kenneth H. *Keats*. Evans Brother Ltd, 1969.
14. Hudson, W. H. *An Introduction to the Study of Literature*. B.I. Publications, 1972.
15. Klarer Mario. *An Introduction to Literary Studies*. Routledge, 2004.
16. Lever J.W. *The Elizabethan Love Sonnets*. Methuen & Co. Ltd, 1966.
17. Ed. O'Neill Judith. *Critics on Keats*. George Allen & Unwin Ltd, 1967.

18. O'Neill Judith. *Critics of Pope*. George Allen & Unwin Ltd., London, 1968.
19. Prasad, B. *Background to the Study of English Literature for Indian Students*. Trinity Press, 2014.
20. Read Herbert. *Wordsworth*. Faber & Faber Ltd, 1957.
21. Sarker Sunil Kumar. *Shakespeare's Sonnets*. Atlantic Publisher, 2006.
22. Rees, R. J. *Introduction to English Literature*. New Delhi: Macmillan India, 1973.
23. Smith Hallett. *Elizabethan Poetry*. Ann Arbor Paperbacks, 1968.
24. Ed. Ward Sir W. & Walter A.R. *The Cambridge History of English Literature*. Cambridge University Press, 1914.
25. Westland Peter. *Literary Appreciation*. The English University Press Ltd, 1964.



## **F.Y.B.A – SEMESTER I – CORE PAPER**

**Paper Title:** History of English Literature from Fifth Century to the Eighteenth Century

**Paper Code:** ENG-I.C-2

**Marks:** 100

**Credits:**4

### **1. Course Objectives:**

1. To provide a comprehensive overview of major periods in the History of English literature.
2. To introduce to the students the historical and cultural contexts in which English Literature has developed through the ages.
3. To provide a view of major writers and their works in different ages.
4. To explore the complex relationship between literature and its context through discussion of particular literary trends, texts and issues within each period.

### **2. Learning outcomes:**

1. Students should be able to perceive the complex relationship between literature and society.
2. The learner should be able to explain how and why particular types of literature emerged from particular set of historical circumstances.
3. The students should be able to critically appreciate representative literary works written in different ages.
4. They should be able to read independently literary texts of different periods.

### **3. Number of Lectures: 04 Lectures per week**

#### **4. Course Content:**

##### **1. Anglo Saxon Age**

The dark ages and the Norman conquest^

Development of English Language (Old English and Middle English)^

The age of Chaucer/From Chaucer to Renaissance (1350- 1516)^

Age of unrest and transition, Religious movements, ^

New learning of classical antiquity Petrarch, Giovanni Boccaccio ^

Anglo Saxon Literature- Beowulf ^\*

Works of Major prose writers- John Wyclif, Sir John Mandeville ^\*

Works of Major Poets- Geoffrey Chaucer, William Langland, John Gower ^\*

**Number of lectures- 12**

##### **2. The English Renaissance/ The age of Shakespeare (1578-1625)**

a) Renaissance and Reformation

b) Development of drama from Miracle and Morality Plays#

c) War of the Roses, Anglican Clergy, Elizabethanage and Geographical discoveries

d) Interludes to University Wits^

e) Shakespeare# and Humanism

f) Poetry- Songs and sonnets of the 16th century, Bacon's Essays

g) Prose- Translations (Wyclif, Tyndale, Coverdale, Authorized Version of 1611),

Historical and biographical works, Literary Criticism, Religious writings, Humanistic writings, Elizabethan satirical writings (Nash, Lodge, etc.)#

**Number of lectures- 18**

##### **3. The Seventeenth Century:**

- Political Background:

England under James I (Jacobean Period) and Charles I (Cavaliers)^

Commonwealth, the triumph of Puritanism^

Restoration: Charles II^

- Literary Movements:

The age of John Milton and John Dryden 1625- 1700)^

- Religious Movement: Puritanism^

Prose- Sir Thomas Browne, ^(#)

The Puritan writers^(#)

Restoration prose: (Hobbes, Newton)^(#)

Diarist of the Age: Samuel Pepy, John Evelyn,^(#)

Moral Essays(Cowley, Temple)^, John Bunyan,^ George Fox,Thomas Ellwood,\*

Establishment of Royal Society and the development of modern prose Poetry – The Cavalier Poets^\*(#)

The Metaphysical Poet: John Donne^(#), John Milton,Dryden \*(#)

Restoration Drama: William Congreve^(#), John Vanburgh, George Farqahar, William Wycherley, George Etherege \*(#)

**4. The Eighteenth Century:**

- Political Background:  
Reign of Queen Anne ^
  
- Literary Movements:  
The Age Alexander Pope and Dr. Samuel Johnson (1700-1789)^  
Periodical Essays ^  
The Age of Prose and Reason^  
Satires of the age^  
The rise of the novel Sentimental Comedy^
  
- Society:  
The Coffee House Culture^(#)  
  
Periodical Essays: Thomas Addison\*(#) and Dr. Samuel Johnson^(#)  
Satires of the age – Johnathan Swift^(#)  
Neoclassicism Augustan Reflective poetry - Alexander Pope^(#), Lady Anne Finch of Winchilsea\*(#)  
Precursors of Romantic Poetry: Thomas Collins^(#), Thomas Gray\*(#) and Oliver Goldsmith\*(#) Robert Burns\*(#) and William Cowper \*(#)

**Number of lectures-12**

**NOTE:** There shall be further changes made to the syllabus wherein certain topics shall be assigned for self-study.

**Key:** \* -Self-study, ^ -Discussed in class by the Instructor, # -shall be given as Assignments and Presentations

**5. Reference Books:**

**Primary References:**

1. Daiches David. *A Critical History of English Literature*. Allied Publishers Ltd. New Delhi,1999.
2. Ford Boris Ed. *The Pelican Guide to English Literature*. Penguin Books UK, 1964.
3. Hudson William. *An Outline History of English Literature*. B I Publications, Bombay, 1972.
4. Poplawski Paul ed. *English Literature in Context*. New Delhi: Cambridge University Press, 2008.

**Secondary References:**

1. Compton-Rickett Arthur. *A History of English Literature*. Universal Book Stall, Delhi, 1969.
2. Evans I for. *A Short History of English Literature*. The English Language Book Society & Penguin Books, 1970.
3. Legouis Emile, and Cazamian Louis, Vergnas Raymond. *A History of English Literature*. London: J.M. Dent and Sons LTD, 1964.

## **F.Y.B.A./ F.Y.B.Sc. – SEMESTER I – OPTIONAL ENGLISH PAPER I**

**Paper Title:** Communicative English

**Paper Code:**

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To help students develop proficiency in oral communication in English.
2. To increase students' confidence in using English for routine interactions with people.
3. To help students understand the importance of developing good listening skills.
4. To help students become proficient in required written communication like Letters, Business Proposals, Notice, Agenda and Minutes of a Meeting, Resume.
5. To assist students in improving their English Language proficiency.

### **2. Learning outcomes:**

Upon completion of the course the student should be able:

1. To be confident about their ability to use English proficiently.
2. To understand importance of developing good listening skills.
3. To draft letters, representations, Notices, Agendas & Minutes of Meetings.
4. Oral Presentation Skills.
5. Confidence in speaking to others in groups.
6. Ability to communicate effectively through written communication.
7. Ability to write a resume.
8. To demonstrate competence in the technicalities of clear, concise writing through the use of accurate grammar, punctuation, spellings and writing style.

**3. Number of Lectures:            04 Lectures per week**

#### **4. Course Content:**

##### **Unit I – Speaking & Listening& Reading Skills**

**35 lectures**

Listening and Reading Skills need to be incorporated within the Individual Presentation and group based activities

##### **Unit 1.1 – Individual Presentation Skills**

**12 lectures**

Students will be taught public speaking to use Presentation skills through application based teaching, where students will be taught public speaking and how to utilize the skills in formal settings.

##### **Concepts:**

1. Importance of Body Language and Eye Contact in Spoken Communication
2. Ways to Overcome Fear of Speaking
3. Pace, Tone and Intonation
4. Listening as an Essential Part of Communication. How to be an Effective Listener

##### **Applied:**

Students will be given topics to present before the class. They can use a host of methods to do so

1. Presentation with material - Formal,
2. Oral presentation
3. Audio-Video presentations (Digital Story Telling format)
4. Formal Speeches – Welcome, Introduction to a dignitary, Chief Guest’s Speech

## Unit 1.2 – Pair Based & Group Based Spoken Activities

23 lectures

1. Telephone Etiquette
2. Speaking and Listening Classroom Practice Exercises in Pairs and Groups.

Students will listen to relevant recordings under each topic listed below and then practice oral exercises in pairs and groups.

- 1) Dealing with a Wrong Number
- 2) Taking and leaving messages
- 3) Making Inquiries on the phone
- 4) Calling for help in an emergency
- 5) Interrupting someone politely
- 6) Giving instruction and seeking clarification
- 7) Making requests and responding to requests.
- 8) Asking for Directions and Giving Directions
- 9) Thanking someone and responding to thanks
- 10) Inviting and accepting/refusing invitation.
- 11) Asking for and giving an opinion
- 12) Agreeing and disagreeing with opinions
- 13) Seeking and giving Advice/Making
- 14) Persuading and dissuading
- 15) Expressing hopes, wishes, regrets and concerns
- 16) Offering condolences and expressing sympathy.
- 17) Assuming and inferring
- 18) Talking about future events
- 19) Talking about intentions and plans
- 20) Talking about arrangements
- 21) Reporting what other people said.
- 22) Expressing Probability and Improbability
- 23) Expressing Ability and inability.
- 24) Expressing probability and improbability
- 25) Expressing obligation and necessity.
- 26) Expressing ability and inability.
- 27) Mock Job Interviews.

3. Meeting – as a group based activity- Can be used as a group activity and teach Minutes of a meeting.

## Unit II -Writing Skills

20 lectures

- |                                    |                                    |
|------------------------------------|------------------------------------|
| A) Letters                         | C) Paragraph Writing               |
| 1) Job Application Letters         | D) Note making                     |
| 2) Enquiry Letters                 | E) Précis Writing                  |
| 3) Orders and Complaints letters   | F) Essay Writing                   |
| 4) RTI                             | G) Writing a resume                |
| 5) Representations                 | H) E-mail & Social Media Etiquette |
| B) Agenda and Minutes Of a Meeting |                                    |

## Unit III – Grammar

5 lectures

Students need to have a basic proficiency in Grammar to complete this course.

Pre-requisite to the course: Knowledge of Basic grammar – Articles, Adjectives, adverbs, Conjunctions, Sentence structures – SVO etc

The above can be revised briefly. Grammar component will be taught incidentally.

- |                    |                        |
|--------------------|------------------------|
| 1. Parts of Speech | 4. Phrases and Clauses |
| 2. Reported Speech | 5. Active and Passive  |
| 3. Punctuation     |                        |

### 5. Reference Books:

#### Primary References:

1. Azar, Betty Schramper. *Basic English Grammar*. New York: Pearson Education, 1996.
2. Biber, Douglas, Susan Conrad and Geoffrey Leech. *Longman Student Grammar of Spoken and Written English*. Edinburgh: Pearson Education Limited, 2002.
3. Mohan, Krishna and Singh, N. P. *Speaking English Effectively* Macmillan India Ltd.



4. Sadanand, Kamelesh, and SusheelaPunitha. *Spoken English: A Foundation Course-Part 1*. Hyderabad: Orient Blackswan Private Limited, 2009.
5. Sadanand, Kamelesh, and SusheelaPunitha. *Spoken English: A Foundation Course-Part 2*. Hyderabad: Orient Blackswan Private Limited, 2009.
6. Jain, A.K. and Dr.Pravin S.R. Bhatia. *Professional Communication Skills*. New Delhi: S.Chand& Company Ltd, 2000.
7. Stanek, William. *Effective Writing for Business, College and Life*. Reagent Press, 2005.
8. Wilkie, Helen. *Writing, Speaking, Listening*. Oxford: How to Books Ltd, 2001.

**Secondary References:**

1. Anker, Susan. *Real Essays with Readings: Writing Projects for College, Work, and Everyday Life*. 3<sup>rd</sup>. Boston: Bedford/St. Martin's, 2009.
2. Bullock, Richard. *The Norton Field Guide to Writing*. New York: W.W. Norton & Company, 2009.
3. Chakravarty, Auditi and Bonnie Boehme. *Grammar & Usage for Better Writing*. New York: Amsco School Publications, 2004.
4. Downing, Angela and Philip Locke. *English Grammar A University Course*. London and New York: Routledge, 2006.
5. Dutwin, Phyllis. *English Grammar Demystified*. McGraw Hill, 2010.
6. Hewings, Martin. *Advanced Grammar in Use*. 2nd. Great Britain: Cambridge University Press, 2005.
7. Kroeger, Paul. *Analyzing Grammar An Introduction*. Edinburgh: Cambridge University Press, 2005.

8. Naylor, Helen and Raymond Murphy. *Grammar in Use Supplementary Exercises*. Edinburgh: Cambridge University Press, 2001.
9. Nelson, Gerald. *English An Essential Grammar*. London: Routledge, 2001.
10. Penston, Tony. *A Concise Grammar for English Language Teachers*. Wicklow: TP Publications, 2005.
11. Quirk, Randolph, et al. *A Comprehensive Grammar of the English Language*. New York: Longman, 1985.
12. Rollason, Jane. *50 Mixed- Ability Grammar Lessons*. Scholastic, n.d.
13. Rozakis, Laurie Ph. D. *English Grammar for the Utterly Confused*. New York: McGraw - Hill, 2003.
14. Thomson, A.J. and A.V. Martinet. *A Practical English Grammar*. 3rd. Edinburgh: Oxford University Press, n.d.
15. Vorobjev, Mark. *The Theory of Argument*. Edinburgh: Cambridge University Press, 2006.
16. Willis, Dave. *Grammar and Lexis in English Language Teaching*. Edinburgh: Cambridge University Press, 2003.

## **F.Y.B.A – SEMESTER II – CORE PAPER**

**Paper Title:** Understanding Fiction

**Paper Code:** ENG-II.C-3

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To help students understand the evolution of the Novel and Short Story as distinct Literary Forms.
2. To help students understand the contribution of various other literary forms like Medieval Romances, Character Sketch etc. to the evolution of the novel.
3. To help students understand how the socio-economic conditions prevalent in the 18<sup>th</sup> century contributed to the rise of the Novel, and how the conditions prevalent in the 19<sup>th</sup> century contributed to the rise of the Short Story.
4. To help students understand the contribution of various other literary forms like Parables, Fables etc. to the evolution of the Short Story.
5. To help students understand the characteristics of the short story through the study of few popular short stories.
6. To teach students to appreciate English Fiction.
7. To instill the ability of recognizing the various elements of Fiction.

### **2. Learning Outcomes:** But the end of the course the student will be able:

1. To understand the various elements of the Novel and the Short Story.
2. To recognize the characteristics of the Novel and the Short Story.
3. To have the ability to analyze Short Stories and Novels critically.

### **3. Number of Lectures: 04 Lectures per week**

#### **4. Course Content:**

##### **Unit I: Background**

**(10 Lectures)**

1. Contribution Of Medieval Prose Romances to evolution of English Novel
2. Other Literary Forms That Contributed to the Novel (diaries and journals, biographies/autobiographies, letters, character sketch)
3. Reasons for Emergence and Growth of the Novel as a Distinct Literary Genre In the 18<sup>th</sup> Century
4. Characteristics of the contemporary novel.
5. Elements of the Novel.
6. Contribution of writers of Asian, African, Latin American origin to the Contemporary English Novel.
7. **Ancient Roots/origins of the short story** (Stories of the Old Testament, Parables Of the New Testament, Fables, Panchatantra Stories, Boccaccio's Decameron etc.)
8. Reasons for the emergence of the short story in the 19<sup>th</sup> century
9. Characteristics Of the short Story
10. Difference between Novella and Short Story.

##### **Unit II: Novel**

**(25 lectures)**

Lord of the Flies – William Golding

##### **Unit III: Short stories**

**(10 lectures)**

1. The Gift Of the Magi' by O Henry
2. 'The Cask Of Amontillado' by Edger Alan Poe
3. 'Darling' by Chekov
4. A Wrong Man in Workers Paradise by Rabindranath Tagore

5. The Tiger In the Tunnel by Ruskin Bond
6. The Doctor's word by R. K. Narayan
7. Vengeful Creditor by Chinua Achebe
8. Good Advice Is Rarer than Rubies by Salman Rushdie
9. The Monkey's Paw by W.W Jacobs

#### **Unit IV: Novella**

**(15 lectures)**

*Animal Farm*- George Orwell

(NOTE: Some short stories as well as background topics will be given for self study)

#### **5. References:**

##### **Primary References:**

1. Achebe, Chinua. *Girls At War*. Johannesburg, South Africa: Penguin Books, 2009. Print.
2. Cross, Wilbur. *The Development of the English Novel*. New York: Atlantic Publishers and Distributors, 2001. Print.
3. Desai, Anita. *Fasting, Feasting*. New York: Mariner Original, 1999. Print.
4. Golding William- *Lord of the Flies*. Penguin; Deluxe edition, 2017. Print.
5. Hunter, Adrian. *The Cambridge Introduction To The Short Story In English*. New Delhi: Cambridge University Press, 2007. Print
6. Hoppenstand, Gary , W.W. Jacobs. *The Monkey's Paw and Other Tales of Mystery and the Macabre*. Chicago Review Press; Revised ed. Edition. 2005. Print.
7. Kohli. Suresh (ed). *Modern Indian Short Stories: An Anthology*. New Delhi: Arnold Heinemann Publishers, 1974. Print.
8. Orwell, George. *Animal Farm*. Penguin India; Fourth edition, 2011. Print.

### **Secondary References:**

1. Abrams M. H. *A Glossary of Literary Terms*. Bangalore. Prism Books. 1999.
2. Daiches, David. *A Critical History Of English Literature Vol 1. 2<sup>nd</sup> ed.* New Delhi: Allied Publishers Pvt. Ltd., 2004. Print.
3. Reid, Ian. *The Short Story*. New York: Barnes and Nobel, 1977. Print

## **F.Y.B.A – SEMESTER II – CORE PAPER**

**Paper Title:** An Introduction to Linguistics and Stylistics

**Paper Code:** ENG-II.C-4

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To acquaint the students with the basic concepts in linguistics.
2. To introduce the students to various sub disciplines of linguistics.
3. To know the connection between linguistics and stylistics.
4. To understand the concept of style in literature.
5. To provide hands on experience in analysing texts, fiction and poetry.

### **2. Learning Outcome:**

1. The Students should be able to identify and classify English sounds.
2. Produce utterances with correct stress and rhythm.
3. Ability to distinguish between different registers of English, international varieties of English.
4. Ability to analyse stylistic features of prose and poetry.
5. Ability to analyse English syntax

**3. Number of Lectures:            04 Lectures per week**

### **4. Course Content:**

#### **Unit 1 - Nature of Language**

**(05 lectures)**

1. Language and communication
2. Origin of language
3. Characteristics of human language
4. Language varieties: standard and non-standard language, dialect, register, slang, pidgin, Creole; International varieties of English
5. Language change

**Unit 2 - English Phonetics and Phonology** (10 Lectures)

1. The Speech mechanism
2. Phonemes of English: Description and Classification
3. Syllable : Structure and Types
4. Word Stress, Degrees of Stress, Stress Shift, Grammatical Stress
5. Sentence Stress: Use of Weak and Strong Forms,
6. Intonation Patterns/Uses of Tones

**Unit 3- English Morphology** (10 Lectures)

1. Morphemes: Free and bound morphemes; Morphs and allomorphs
2. Word Formation in English: Simple, complex, compound, and compound-complex words; affixes, stems, roots; inflectional vs. derivational morphology
3. The process of word formation: Backformation, reduplication, blends, clippings, acronyms
4. Meaning change: Generalization, specialization, change in connotations

**Unit 4- Syntax and Grammar** (10 Lectures)

1. Different approaches to syntax
2. Types of grammar
3. Parts of speech, Basic sentence structures, Types of sentences, clauses, phrases

**Unit 5– Semantics** (10 Lectures)

1. Words as signs, transparent and opaque words
2. Conceptual vs. associative meaning
3. Lexical relations: synonymy, antonymy, hyponymy, homophony, homonymy, polysemy

**Unit 6- Applied Linguistics** (15 Lectures)

1. Linguistic approach to literature: Difference between ordinary language and language of literature  
Use of linguistics in the study of literature (stylistics): Figurative language; linguistic deviations; Phonological patterns of rhyme metre, alliteration, assonance, clustering of vowel and consonant sounds



2. Linguistics and language teaching: First language acquisition; Second language learning, barriers in learning second language, Methods of teaching second language: Grammar-translation method, Direct method, audio-lingual method, the communicative approach

## **5. Reference Books:**

### **Primary References:**

1. Akmajian, Demers, Farmer, Harnish. Linguistics. *An Introduction to Language and Communication*. PHI Learning Private Limited, New Delhi, 2009.
2. Leech Geoffrey. *Linguistic Guide to Poetry*. Routledge London, 1969.
3. Jones Daniel. *An Outline of English Phonetics*. Cambridge Uni. Press, 1972.
4. Lyons John. *Language and Linguistics an Introduction*. Cambridge University Press, 2003.
5. Quirk Randolph, Greenbaum Sidney. *A university Grammar of English*. Pearson Education Ltd. 2012.
6. Wallwork J F. *Language and Linguistics: An Introduction to the study of Language*. Heinemann Educational Books London, 1969.
7. Yule George. *The Study of Language: An Introduction*. Cambridge University Press, 1985.

### **Secondary References:**

1. Aarts, Bas and April McMahon. *The Handbook of English Linguistics*. Malden: Blackwell Publishing, 2006.
2. Broderick, John P. *Modern English Linguistics - A Structural and Transformational Grammar*. Thomas Y. Crowell Company, 1975.
3. Copley, Paul, ed. *Semiotics and Linguistics*. London: Routledge, 2001.

4. Dixon, R. M. W. *A Semantic Approach to English Grammar*. 2nd. Oxford University Press, 2005.
5. Hyland, Ken, ed. *English for Academic Purposes - An advanced resource book*. New York: Routledge, 2006.
6. Kretzschmar Jr, William A. *The Linguistic of Speech*. New York: Cambridge University Press, 2009.
7. Meyer, Charles. *Introducing English Linguistics*. Edinburgh: Cambridge University Press, 2009.
8. Radden, Gunter and Rene Dirven. *Cognitive English Grammar*. John Benjamins Publishing Company, 2007.
9. Trask, R. L. *Language & Linguistics - The Key Concepts*. Ed. Peter Stockwell. New York: Routledge, 2007.
10. Trousdale, Graeme and Nikolas Gisborne. *Constructional Approaches to English Grammar*. Berlin: Mouton de Gruyter, 2008.

## **F.Y.B.A./F.Y.B.Sc. – SEMESTER II – OPTIONAL ENGLISH PAPER II**

**Paper Title:** Effective Use of English

**Paper Code:**

**Marks:** 100

**Credits:** 4

### **1) Course Objectives:**

1. To help students proficiency in oral communication in English.
2. To increase students' confidence in using English for routine interactions with people.
3. To help students understand the importance of developing good Listening Skills.
4. To introduce and expose learners to different genres of literature.
5. To develop the skill of critical appreciation among learners.
6. To encourage creative use of language to express both literary and non- literary ideas.

### **2) Learning outcomes :**

Upon completion of the course the student should be able:

1. To be confident about their ability to use English proficiently.
2. To understand importance of developing good listening skills.
3. To enhance students' communication skills through building better word power.
4. To have the ability to use the English language in creative Writing as well as Social Letters and Feature Articles.
5. To demonstrate competence in the technicalities of clear, concise writing through the use of accurate grammar, punctuation, spellings and writing style.

### **3) Number of Lectures:            04 Lectures per week**

#### 4) Course Content:

**Unit I – Speaking & Listening& Reading Skills** **25 lectures**

**Unit 1.1 – Individual Presentation Skills** **10 lectures**

Students will be expected to use concepts taught in Optional 1 Course in its application.

#### **Applied:**

Students will be given topics to present before the class. Emphasis will be given to the reading and recitation areas. They can use a host of methods to do so -

Short Stories, Poems

Audio-Video presentations (Digital Story Telling format)

Informal Speeches – Toasts, Farewell Speech, Thank you & Congratulatory Speech

**Unit 1.2 – Pair Based & Group Based Spoken Activities** **15 lectures**

1. Social Debates can be used as group based activity
2. Pair based activities will focus on social settings

**Unit II - Writing Skills** **30 lectures**

#### A) Social Letters

- |                       |                            |
|-----------------------|----------------------------|
| 1) Invitation & reply | 3) Congratulations & Reply |
| 2) Condolence & Reply | 4) Thank you & Reply       |

B) Descriptive Writing – (Open to the Teacher to explore this writing in various areas Fiction and Non-Fiction and creative expression of personal writing)

C) Personal Writing - Diary Writing/Journal Entries/Blogs/podcasts

- D) Social Speeches – Toasts – Weddings, Anniversaries; Farewell, Roasts
- E) Writing for Print Media – Feature Writing, Letters to the Editor, Copy for advertisements
- F) Writing for Comics – Dialogue and narration

**Unit III – Grammar**

**05 lectures**

- 1. Basic Errors in English Language
- 2. Spotting Errors and correcting them
- 3. Revising and Editing

**5) Reference Books:**

**Primary References:**

- 1. Anker, Susan. *Real Essays with Readings – Writing Projects for College, Work, and Everyday Life*. 3<sup>rd</sup>. Boston: Bedford/St. Martin's, 2009.
- 2. Azar, Betty Schramper. *Basic English Grammar*. New York: Pearson Education, 1996.
- 3. Biber, Douglas, Susan Conrad and Geoffrey Leech. *Longman Student Grammar of Spoken and Written English*. Edinburgh: Pearson Education Limited, 2002.
- 4. Bullock, Richard. *The Norton Field Guide to Writing*. New York: W.W. Norton & Company, 2009.
- 5. Chakravarty, Auditi and Bonnie Boehme. *Grammar & Usage for Better Writing*. New York: Amsco School Publications, 2004.
- 6. Jain, A.K. and Dr.Pravin S.R. Bhatia. *Professional Communication Skills*. New Delhi: S.Chand& Company Ltd, 2000.
- 7. Marx, Christy. *Writing for Animation, Comics and Games*. Focal Press, 2006.
- 8. Mohan, Krishna and Singh, N. P. *Speaking English Effectively* Macmillan India Ltd.

9. Ruberg, Michelle and Yagoda, Ben. *Handbook of Magazine Article Writing*. 2<sup>nd</sup>. Cincinnati: Writer's Digest Books, 2009.
10. Sadanand, Kamelesh, and Susheela Punitha. *Spoken English: A Foundation Course-Part 1*. Hyderabad: Orient Blackswan Private Limited, 2009.
11. Sadanand, Kamelesh, and Susheela Punitha. *Spoken English: A Foundation Course-Part 2*. Hyderabad: Orient Blackswan Private Limited, 2009.
12. Stanek, William. *Effective Writing for Business, College and Life*. Reagent Press, 2005.

**Secondary References:**

- 1) Downing, Angela and Philip Locke. *English Grammar A University Course*. London and New York: Routledge, 2006.
- 2) Dutwin, Phyllis. *English Grammar Demystified*. McGraw Hill, 2010.
- 3) Hewings, Martin. *Advanced Grammar in Use*. 2nd. Great Britain: Cambridge University Press, 2005.
- 4) Kroeger, Paul. *Analyzing Grammar An Introduction*. Edinburgh: Cambridge University Press, 2005.
- 5) Naylor, Helen and Raymond Murphy. *Grammar in Use Supplementary Exercises*. Edinburgh: Cambridge University Press, 2001.
- 6) Nelson, Gerald. *English An Essential Grammar*. London: Routledge, 2001.
- 7) Penston, Tony. *A Concise Grammar for English Language Teachers*. Wicklow: TP Publications, 2005.
- 8) Quirk, Randolph, et al. *A Comprehensive Grammar of the English Language*. New York: Longman, 1985.

- 9) Rollason, Jane. *50 Mixed- Ability Grammar Lessons*. Scholastic, n.d.
- 10) Rozakis, Laurie Ph. D. *English Grammar for the Utterly Confused*. New York: McGraw - Hill, 2003.
- 11) Thomson, A.J. and A.V. Martinet. *A Practical English Grammar*. 3rd. Edinburgh: Oxford University Press, n.d.
- 12) Vorobej, Mark. *The Theory of Argument*. Edinburgh: Cambridge University Press, 2006.
- 13) Willis, Dave. *Grammar and Lexis in English Language Teaching*. Edinburgh: Cambridge University Press, 2003.
- 14) Wilkie, Helen. *Writing, Speaking, Listening*. Oxford: How to Books Ltd, 2001.

**S.Y. B.A. – SEMESTER III – CORE PAPER**

**Paper Title:** Contemporary Indian English Literature

**Paper Code:** Eng-III.C-5

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

- a. To introduce the students to different genres of contemporary Indian writing in English.
- b. To acquaint the students with the narrative of India' struggle for independence.
- c. To familiarize the students with various themes and cultural contexts of Contemporary Indian English Writing.

**2. Learning Objectives:**

By the end of this course students:

- a. Will be acquainted with literature of Contemporary Indian English Literature.
- b. Will be aware of the different genres employed by Contemporary Indian English Writers.
- c. Will sharpen their critical reading skill.
- d. Will be familiar with the various themes and narrative techniques of the Contemporary Indian English writers.

**3. Number of Lectures:** 04 per week.



#### 4. Course Content:

Total Number of Lectures: 60

#### Unit I - Poetry:

Number of Lectures: 15

1. Keki Daruwala a) Boat-ride Along The Ganga  
b) Draupadi

Secondary Reading - Hawk

2. Adil Jussawala – a) On First Approaching Santacruz Airport, Bombay  
b) Bars

3. Nissim Ezekiel – a) Goodbye Party for Miss Pushpa T.S.  
b) Background casually  
c) Poet, Lover, Birdwatcher

4. Arun Kolatkar – a) The Bus  
b) An Old Woman  
c) Ajamil and the Tigers

5. Jayanta Mahapatra – a) Hunger  
b) Indian Summer

6. A.K. Ramanujan – a) Love Poem for a Wife  
b) Looking for a cousin on a swing  
c) A River

7. Kamala Das - a) Introduction  
b) My grandmother's House  
c) Summer in Calcutta

#### Unit II- Drama

Number of Lectures: 18

1. Mahesh Dattani- Final Solutions
2. Girish Karnad- Yayati

#### Unit III- Prose

Number of Lectures: 12

##### a) Short Stories

- a) R. K. Narayan's -A Horse and Two Goats
- b) Ruskin Bond's -The Blue Umbrella
- c) Khushwant Singh's - Portrait of a Lady
- d) Vilas Sarang – (one short story to be selected from either *Fair Tree of the Void* or *The Women In Cages: Collected Stories.*)

##### b) Novel

Number of Lectures: 15

Khushwant Singh- Train to Pakistan

## 5. Reference Books:

### Primary References:

1. David Davidar. *A Clutch of Indian Masterpieces*. New Delhi: Aleph Book Company, 2014.
2. Girish Karnad. *Yayati*. New Delhi: Oxford University Press, 2007.
3. Singh Khushwant. *Train to Pakistan*. Penguin, 2016.
4. Vilas Sarang. *Fair Tree of the Void*. Penguin Books Ltd.

### Secondary References:

1. Iyengar, K. R. S. *Indian Writing in English*. New Delhi: Sterling Publishers Pvt. Ltd., fourth edition, 1984.
2. Joshi, Dr. Rakesh. *Girish Karnad's Plays*. Jaipur: Mark Publishers, 2011.
3. Khair Tabish. *Babu Fictions: Alienation in Contemporary Indian English Novels*. UP: Oxford UP, 2001.
4. King, Bruce. *Modern Indian Poetry in English*. USA: Oxford University Press, 2005.
5. Mehrotra Arvind Krishna. *Twelve Modern Indian Poets*. New Delhi: Oxford India Paperback, 1993.
6. Naik, M. K, S. K. Desai and G. S. Amur. *Critical Essays on Indian Writing in English*. New Delhi: MacMillan, 1968.
7. Paranjape, Makarand R. *Indian poetry in English*. New Delhi: Macmillan, 1993.
8. Parthasarathy, R.(ed.).*Ten Twentieth - Century Indian Poets* (New Poetry in India). New Delhi: Oxford University Press, 1976.
9. Shama, Ram. *Recent Indian English Literature*. Delhi: Manglam Publications, 2012.
10. Vilas Sarang. *The Women In Cages: Collected Stories*. Penguin India, 2006.
11. Warma, Monica. *Modern Indian Poetry in English*. New Delhi: Oxford University Press, 2010.

## **S.Y.B.A. – SEMESTER III – ELECTIVE PAPER**

**Paper Title:** Goan Literature and Culture

**Paper Code:** ENG-III.E-1

**Marks:** 100

**Credits:** 4

### **1. Course Objectives**

1. To introduce students to different genres of literary works of Goan Literature in English and translated works by Goan writers.
2. To acquaint students with Goan ethos and culture through the exploration of selected texts of Goan literature.
3. To examine selected texts of Goan Literature and folk lore to establish Goan identity.

### **2. Learning Objectives:**

By the end of this course students:

1. Will be sensitized to Goan ethos and culture.
2. Will be aware of the historical, psychological, religious and political realities of the times.
3. Will be familiar with diverse literary and cultural trends that helped form Goan Literature.
4. Will be enriched and knowledgeable about their cultural heritage.
5. Will be able to think clearly and critically.
6. Will sharpen critical reading and writing skills.

### **3. Number of Lectures: 04 Lectures per week**

**4. Course Content:**

**Total Number of lectures:60**

**Unit 1:** Background (Socio- Political and cultural)

**Number of Lectures: 08**

1) Historical

- a) Colonialism
- b) Post colonialism

2) Art and Artists of Goa (Folklore, Folkdance and Cartoonists)

- a) Tiatr (difference between Khell and Tiatr, Origin and development)
- b) Folklore (teacher can select any four folklores)
- c) Folk dances and Songs (any four forms to be selected.)
- d) Cartoonists of Goa (Alexzy and Mario Miranda)

**Unit 2:** Short stories-

**Number of Lectures: 13**

I. Lambert Mascarenhas - The Little Fellow

- Blood and Lily

II. Victor Rangel-Riberio- Lonely Aging Chinese -American New York Neighbour

Lady

-Loving Ayesha

III. Ben Antao - The Guardian Angel

- The Curse

IV. Damodar Mauzo- The Vignahatra

-A Writer's Tale

V. Laxmanrao Sardessai- The Hour's End

The Africa Boat

VI. Pundalik Naik- The Turtle

**Unit 3:** Novels

**Number of Lectures: 24**

Victor Rangel-Riberio- Tivolem

Pundalik Naik- The Upheaval (translated from Konkani)

**Unit 4:** Poetry:

**Number of Lectures:15**

1. Joseph Furtado- The Secret,

- Brahmin Girls

- The Neglected wife

2. R.V.Pandit - His Immortal Land
  - I'm a Gaudo
  
3. Eunice De Souza: - One Man's Poetry
  - Autobiographical
  - He Speaks
  - Advice to women
  
4. B. B. Borkar - Ebony Black
  - Towards the horizon
  - Cemetery
  
5. Robert De Souza- The Village Baker.
  
6. Manohar Shetty - Jigsaw
  - One morning
  - Bearings

**Reference Books:**

**Primary References:**

- 1) Antao, Ben. *Mad House and other nine stories*. Margao: Cinnamon Teal Publishing, 2012.
- 2) Mascarenhas, Lambert. *In the Womb of Saudade -Stories of Goan Life*. New Delhi: Rupa Publishing House, 1994.
- 3) Mauzo, Damodar. *Theresa's Man and other Stories from Goa*. Trans Xavier Cota. New Delhi: Rupa Publications, 2014.
- 4) Naik, Pundalik . *The Upheaval*. Trans Vidya Pai. New Delhi: Oxford University Press, 2012.
- 5) Rangel-Riberio, Victor. *Loving Ayesha and Other Stories*. New Delhi: HarperCollins Publishers, 2003.
- 6) Shetty Manohar, ed. *Ferry Crossing*. New Delhi: Penguin Books, 1998.
- 7) Victor Rangel-Riebriro. *Tivolem*. UK : Milkweed Editions, 2001.

**Secondary References:**

- 1) Couto, Maria Aurora. *Goa- A Daughter's Story*. New Delhi: Penguin Books, 2004.
- 2) Fernandes, Andre Rafael. *When the Curtains Rise*. Saligao: Tiatr Academy of Goa & Goa 1556, 2010.

- 3) Gomes, Cynthia James. "Tiatr : An unlimited Engagement," *Reflected in Water*.  
Jerry Pinto, ed. New Delhi: Penguin Books, 2006.
- 4) Gomes, Olvinho J.F, (retold). *Konkani Folktales*. New Delhi: National Book Trust,2008
- 5) Mauzo, Damodar. *Teresa's Man and other stories from Goa*. Trans Xavier Cota. Delhi:  
Rupa Publications, 2014.
- 6) Menezes, Juliao. *Goa's Freedom Struggle*. Velim: Mrs. Alzira da Almeida Charitable  
Trust, 2011.
- 7) Nazareth Peter, ed. *Pivoting on the Point of Return: Modern Goan Literature*. Saligao:  
Goa 1556 & Broadway Book Centre, 2010.
- 8) Pinto Jerry, ed. *Reflected in Water*. New Delhi: Penguin Books, 2006.

**S.Y.B.A. – SEMESTER III – ELECTIVE PAPER**

**Paper Title:** American Literature of the Twentieth Century

**Paper Code:** ENG-III.E-2

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

- A. To study the American Experience as captured in the seminal works of masters of American Literature of the twentieth century.
- B. To expose the students through prose and poetry and drama to the various main trends, ideas and forces that shaped the writing of those times.
- C. To acquaint students with the following literary movements in America – Realism, Modernism and Harlem Renaissance.

**2. Learning Outcomes:**

By the end of the course the students:

- A. Will learn to appreciate American culture and literature
- B. Will be sensitized to the American literature and culture during the twentieth century.
- C. Will be aware of the experimental nature of American literature like meta fiction, magical realism and confessional literature.
- D. Will be knowledgeable about the various socio-political issues that took place in America during the period.
- E. Will develop critical thinking and improve communication capabilities.

**3. Number of Lectures: 04 Lectures per week**

#### **4. Course Content Total**

**Number of Lectures: 60**

#### **Unit I: Novel**

**Number of Lectures: 15**

Novel - Alice Walker's The Colour Purple.

#### **Unit II: Drama**

**Number of Lectures: 15**

Drama - Arthur Miller's Death of a Salesman.

#### **Unit III: Poetry**

**Number of Lectures: 15**

1. Robert Frost - Mending Wall

- Stopping by the Woods

- The Road not taken

2. Theodore Roethke - My Papa's Waltz

- The Waking

3. Wallace Stevens- The Emperor of Ice Cream

4. John Crowe Ransom- Bells for John Whiteside's Daughter

5. Allen Ginsberg- America

- Ode to Failure

6. Robert Lowell- To Speak of Woe that is Marriage

7. Sylvia Path - Crossing the water

- Lady Lazarus

8. Langston Hughes- Dreams

- I Too

#### **Unit IV: Background**

**Number of Lectures: 15**

(Some topics could be assigned for self study and presentations in class)

1. The American Dream

2. The Great Depression



3. Social Realism and the American Novel

4. Beat Poets

5. Confessional Poets

## 6. Reference Books: Primary

### References:

1. Miller, Arthur. *Death of a Salesman*. Penguin UK, 2011.
2. Poulin. A. Jr & Michael Waters, ed. *Contemporary American Poetry*. 8th Edition. Houghton Mifflin Company, 2006.
3. Thomas. C.T. *Twentieth Century Verse- American Anthology*. Delhi: Macmillan India Ltd, 1999.
4. Walker, Alice. *The Colour Purple*. US: Mariner, 2006.

### Secondary References:

1. Brown, John Russell, ed. *American Theatre*. London, Edward Arnold, 1967.
2. Cullum, E. Linda, ed. *Contemporary American Ethnic Poets: Lives, works, sources*. Greenwood Publication group Inc, 2004.
3. Daniel Hoffman (ed.) Harward. *Guide to Contemporary American Writing*. New Delhi: Oxford University Press, 1979.
4. Gould, Jean. *Modern American Playwrights*. Bombay: Popular Prakashan, 1969.
5. Horto Rod, ed. *Background of American Literary Thought*. New Jersey: Prentice Hall, 1974.
6. Matthiessen F. O. *American Renaissance*. New York: Oxford University Press, 1941.
7. Pearce, Roy H. *The continuity of American Poetry*. Princeton University Press, 1979.
8. Shaw, R.B, ed. *American Poetry since 1960: Some Critical Perspectives*. 1974.

## **S.Y. B.A. – SEMESTER III – ELECTIVE PAPER**

**Paper Title:** Writing for the Media - I

**Paper Code:** ENG-III.E-3

**Marks :**100

**Credits :**4

### **1. Course Objectives**

1. To give students an overview of Media in today's world.
2. To promote interest in skilled Writing and to emphasize the importance of accurate use of English language in the field
3. To develop critical and analytical language skills to be applied in the field of Mass Media.
4. To train students to be self sufficient professionals capable of undertaking independent work and applying theoretical knowledge to real-life situations.
5. To prepare the foundation for careers in Media as an option for students.

### **2. Learning outcomes**

Upon completion of the course the student should be able:

1. To comprehend the importance of good writing in the field of Mass Media - from print to Digital Media
2. To understand theoretical perspectives behind mass media and the jargon associated with the field.
3. To Master writing skills required for various media - from journalism in print and broadcast media to advertising and creative commercial media

4. To demonstrate competence in the technicalities of clear, concise writing through the use of accurate grammar, punctuation, spellings and writing style.

### 3. Total number of lectures:

60 (1 hour Lectures) considering a term/semester runs over 15 weeks  
PER WEEK 4 HOURS

### 4. Topics to be covered

**Note:** To ensure the competency of students in the field after graduation, emphasis should be given to the written aspect of the course, while ensuring that the students understand various aspects of each field along with key-terms, and the differences in the written aspect.

## UNIT I – EDITING

**10 LECTURES**

Concepts & Applied: Copy editing process – Guiding principles of editing  
Grammar – Punctuation – Subbing – Proof-reading (Proof-reading notations)  
– [The AP style book can be a great guide here.]

**Note:** *The Editing component is to be taught simultaneously along with the applied component of the paper. The teaching should be graded - Beginning with the basic knowledge of grammar and its application up to a level where the student is competent enough to not only edit their own written works but also others'. Instructors should establish structures and proofreading processes through initial lectures. Subsequently, application ought to be in-situ. This unit should be taught over the rest of the components as well, ensuring an increase in the level of efficiency of the student.*

## UNIT 2 - PRINT MEDIA : NEWSPAPERS

**20**

### LECTURES

Introduction : The Media and the Message - Message depends on Medium  
Introduction to Print Media: Audience for the News  
Story Ideation as basis of commercial Radio, T.V. and Cinematic production  
Difference in writing styles between Print, Electronic and Digital Media

## **Newspaper Writing:**

*Concepts:* **News Reporting-** (datelines/Credit-line/Bylines/Nut-graph/Headlines)

**News Writing** – Appropriate angle for a news story – Structuring news (Lead/Climax form - Inverted Pyramid Form; Chronological form) – Qualities of effective leads –Using significant details – Effective revision Basic principles of AP Style (Associated Press Style Book) for Writing – Use of the Style Book – Style as a Manner of Writing – Clarity in Writing – Readability – Five ‘W’s and ‘H’ of Writing.

**Other Writing-** Features/Articles - Editorials – Letters to the Editor – Book and Film reviews – Interviews– Oped Pieces

**Basic Layout and Composition** - Balanced/Unbalanced/Circus Layout -

Column setups- photograph additions - final look

*Applied:* Reporting - Climax form - Inverted Pyramid Form; Chronological form Editorials- Letters to the Editor -Book and Film Reviews - Headlines - Oped Pieces - Layout & Composition

**Note:** *Applied Component will contain lectures devoted to writing, editing and review of articles. Instructor should maintain deadlines and expose to the students the roles they may aspire to in real life situations. These applied lectures may cover 45% if not more of the allotted lecture hours.*

### UNIT 3 - PRINT MEDIA : MAGAZINES

15 LECTURES

#### Writing for Magazines:

*Concepts:* Demographics (Target Audience); Types of Magazines and How writing differs in them; Differences/Similarities in writing Between Newspaper writing and Magazine writing; Editorials; Layout and Composition **Article writing** – Structuring for greatest effect – Preparation and organization of article – Specific angle – specific audience.

Feature writing – structure – organization – feature angles – simplicity in Style.

*Applied:* Feature and Article Writing- Creation of a Magazine - Layout/Composition - Photographs to enhance written word

**Note:** *Applied Component will contain lectures devoted to writing, editing and review of articles. Instructor should maintain deadlines and expose to the students the roles they may aspire to in real life situations. These applied lectures may cover 45% if not more of the allotted lecture hours.*

### UNIT 4 – DIGITAL MEDIA - Internet and New Media

15 LECTURES

*Concepts:* Kinds of Digital Media & New Media  
E-book/E-magazine – E-journal – E-newspaper – Internet – World Wide  
Web Mobile Media - Video Games

*Concepts:* Writing for Digital Media: An Interactive Media

Web Writing - Technical Writing – Blogging.- Introduction to Profile Writing – Broadcast News Analysis – Caption Writing – Copy Writing/Content Writing – Story Structure and Planning - Inverted Pyramid - Headline, Blurb, Lead - Digital Correspondence – Digital Editing

*Applied:* Web Writing - Technical Writing – Blogging; Caption Writing; Content Writing

**Note:** *Applied Component will contain lectures devoted to writing, editing and review of articles. Instructor should maintain deadlines and expose to the students the roles they may aspire to in real life situations. These applied lectures may cover 45% if not more of the allotted lecture hours.*

## **5. List of Books/CDs/Websites for reference**

### **Primary References:**

1. *An Introduction to Digital Media* Tony Feldman (Blueprint Series) 1996
2. *Basic News Writing* Melvin Menchar William. C.Brown Co., 1983
3. *E-Writing* Dianna Booter Macmillan, 2008
4. *Handbook of Magazine Article Writing*, Michelle Ruberg, Writer's Digest, 2009
5. *News Writing & Reporting* James A Neal & Suzane S Brown Surjeeth Publications, 2003
6. *Mass Communication Theory* Denis Mcquail Vistaar Publications, 2007
7. *The Associated Press Style Book and Libel Manual* Norm The A.P, 1994
8. *Writing and Reporting News: A Coaching Method* Carole Rich Wadsworth/ Thomson Learning, 2003
9. *Writing for the Mass Media* (Sixth edition). James Glen Stovall Pearson Education, 2006

### **Secondary Reading:**

1. *Digital Media: An Introduction* Richard L Lewis Prentice Hall
2. *Digital Media Tools* Dr.Chapman Nigel (Paperback - 26 Oct 2007)
3. *The Art of Editing the News* Robert.C McGiffort Chilton Book Co., 1978
4. *Media and Society in the Digital Age* Kevin Kawamoto Pearson Education, 2002
5. *Media in the Digital Age* J.V Pavlik (Paperback - 1 May 2008)
6. *News reporting and Editing* K.M Srivastava Sterling Publications
7. *The News Writer's Handbook: an Introduction to Journalism* M.L Stein, , Paterno, Susan.F
8. Surjeeth Publications, 2003
9. *Writing and Producing News* Eric Gormly Surjeet Publications, 2005
10. *Understanding Journalism* Lynette Sheridan Burns Vistaar Publications, 2004

## **S.Y. B.A. – SEMESTER IV – ELECTIVE PAPER**

**Paper Title:** Writing for the Media II

**Paper Code:** ENG- .E-

**Marks :**100

**Credits :**4

### **1. Course Objectives**

1. To give students an overview of Media in today's world.
2. To promote interest in skilled Writing and to emphasize the importance of accurate use of English language in the field
3. To develop critical and analytical language skills to be applied in the field of Mass Media.
4. To train students to be self sufficient professionals capable of undertaking independent work and applying theoretical knowledge to real-life situations.
5. To prepare the foundation for careers in Media as an option for students.

### **2. Learning outcomes**

Upon completion of the course the student should be able:

1. To comprehend the importance of good writing in the field of Mass Media - from print to Digital Media
2. To understand theoretical perspectives behind mass media and the jargon associated with the field.
3. To Master writing skills required for various media - from journalism in print and broadcast media to advertising and creative commercial media
4. To demonstrate competence in the technicalities of clear, concise writing through the use of accurate grammar, punctuation, spellings and writing style.

### 3. Total number of lectures:

60 (1 hour Lectures) considering a term/semester runs over 15 weeks  
PER WEEK 4 HOURS

### 4. Topics to be covered

**Note:** To ensure the competency of students in the field after graduation, emphasis should be given to the written aspect of the course, while ensuring that the students understand various aspects of each field along with key-terms, and the differences in the written aspect.

## UNIT I - ELECTRONIC MEDIA : RADIO

15 LECTURES

Introduction : The Media and the Message - Message depends on Medium

Introduction to Print Media: Audience for the News

Story Ideation as basis of commercial Radio, T.V. and Cinematic production

Difference in writing styles between Print, Electronic and Digital Media

### RADIO

*Concepts:* Radio as a Mass Medium – Radio Skills – Broadcast Writing –

Broadcast Terms – Scripting for Radio – Story Structure – Lead,

Body, Ending – Writing Radio News and Features - Programmes

for Radio (Features, News, Interviews, Skits, Music

Programmes, etc.)

*Applied:* Planning a Newscast – Radio Jockeying - Scripting for the Radio - Recording

## UNIT II - ELECTRONIC MEDIA : TELEVISION

15 LECTURES

*Concepts:* Television as a Mass Medium – Television Skills – Scripting for TV -

Programmes for TV (Features, News, Interviews, Music Programmes,

etc.)

*Applied* – Scripting for a show; Anchoring; Interviewing;



### **UNIT III - ELECTRONIC MEDIA : FILM/CINEMA**

**15 LECTURES**

*Concepts:* Fundamentals of Film Story Writing (The Three Act Story Structure),

Scripting, Screenplay and Production, Documentary Film.

Writing for the screen – Writing effective film reviews

*Applied*– The Three Act Story Structure, Writing Short Screenplays, Film Reviews.

### **UNIT 4 – ADVERTISING**

**15 LECTURES**

*Concepts:* Advertisements in Different Media (Print; TV; Radio; Digital) – An

Overview Promotional Literature: Copywriting for Leaflets,

Pamphlets, Brochures, Classifieds – Text, Captions, Logo – Story-board.

T.V. Advertisements - Story Idea to story board to screenplay to shoot.

writing for advertising –

*Applied:* copywriting for Print Advertisements; The 3 shot ad movie; PSA's; Parody ads

### **5. List of Books/CDs/Websites for reference**

#### **Primary References:**

1. *Advertising* Ahuja & Chhabra Sujeeth Publications, 1989
2. *An Introduction to Digital Media* Tony Feldman (Blueprint Series) 1996
3. *Basic News Writing* Melvin Menchar William. C.Brown Co., 1983
4. *Broadcast News Writing, Reporting & Production* Ted White Macmillan
5. *Mass Communication Theory* Denis Mcquail Vistaar Publications, 2007
6. *The Associated Press Style Book and Libel Manual* Norm The A.P, 1994
7. *The Screenwriter's Workbook* Syd Field Dell Publishing, 1984
8. *Writing for Television, Radio and New Media (Seventh Ed.)*. Hilliard, Robert - Wadsworth 2006
9. *Writing for the Mass Media* (Sixth edition). James Glen Stovall Pearson Education, 2006

## **Secondary Reading:**

1. *A Crash Course in Screenwriting* David Griffith Scottish Screen, 2004
2. *Digital Media: An Introduction* Richard L Lewis Prentice Hall, 2002
3. *Digital Media Tools* Dr.Chapman Nigel (Paperback - 26 Oct 2007)
4. *Media and Society in the Digital Age* Kevin Kawamoto Pearson Education, 2002
5. *Media in the Digital Age* J.V Pavlik (Paperback - 1 May 2008)
6. *The TV Writer's Workbook : A Creative Approach to Television* Ellen Sandler Delta, 2007
7. *Writing and Producing News* Eric Gormly Surjeet Publications, 2005

## **S.Y.B.A. – SEMESTER III – ELECTIVE PAPER**

**Paper Title:** New Literatures in English

**Paper Code:** ENG-III.E-4

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To introduce students to the marginalized voices in society through their literatures.
2. To help students understand the contribution of the marginalized to mainstream literature.
3. To establish the voices of the marginalized through their representative texts, authors and movements.
4. To inculcate an atmosphere of cultural acceptance through the texts
5. To introduce students to the marginalization of the female gender through their works in literature

### **2. Learning Outcomes:** But the end of the course the student will be able:

1. To understand the concept of the marginalized segments in society.
2. To recognize writers, forms, and movements associated with the marginalized.
3. To have the ability to analyze works of literatures critically, keeping in mind the segmented.

### **3. Number of Lectures: 04 Lectures per week**

#### 4. Course Content:

**Total number of lectures: 60**

##### **Unit 1: Contextual Study:**

**[8 lectures]**

**Note:** The following areas will be covered along with their representative texts

1. American Civil War and its consequences
2. The Harlem Renaissance - the rise and fall of the Black cultural movement with reference to the Black Panthers
3. Feminism - the waves and the main proponents of Feminism
4. Introduction to post-colonial themes

##### **Unit 2: Play:**

**[20 lectures]**

1. *The Lion and the Jewel* by Wole Soyinka
2. *Pantomime* by Derek Walcott

##### **Unit 3: Poetry**

**[18 lectures]**

1. Langston Hughes - The Weary Blues, The Negro Speaks of Rivers  
Secondary poems - Black Panther, Dinner Guest: Me
2. Countee Cullen- Heritage, Karengé ya Marengé, A Brown Girl Dead,  
Incident Secondary Poems - Yet do I Marvel, Mood
3. Paul Lawrence Dunbar - The Plantation Child's Lullaby, The  
wraith Secondary Poems - We Wear the Mask
4. Edward Braithwaite –Bread  
Secondary poems - Prelude
5. Claude McKay America, Tormented  
Secondary poems -If we must die, The Barrier
6. Imamu Amiri Baraka- Incident, In memory of Radio, Notes for a  
Speech Secondary Poems - At the National Black Assembly
7. Hilarie Lindsay –Barren Harvest, Monuments of Men
8. Maya Angelou- Caged bird, Women Work  
Secondary poems - Phenomenal Woman, Still I Rise

9. AD Hope – Australia, the Death of a Bird
10. Derek Walcott – A Far Cry from Africa, Ruins of a great House
11. Judith Wright – Nigger’s Leap
12. Louise Bennet – Colonization in Reverse
13. David Dabydeen – Coolie Mother, Coolie Son, Slave Song

#### **Unit 4: Short Stories**

**[14 lectures]**

1. *Miguel Street* by V.S. Naipaul  
Bogart, His Chosen Calling, The Thing Without a Name, Man-Man, George and the Pink House, B. Wordsworth
2. *The Tomorrow-Tamer* by Margaret Laurence-  
The Tomorrow-Tamer, The Merchant of Heaven
3. *Lives of Girls and Women* by Alice Munro  
The Flats-Land, Lives of Girls and Women

#### **5. References:**

##### **Primary References:**

1. Bajaj, Nirmal. *Search for Identity in Black Poetry*. Atlantic Publications
2. Chavan, Sunanda. *The Fair Voice-A Study of Women Poets in English*. Sterling.
3. Kulkarni, Harihar. *Black Feminist Fiction*. Creative Books
4. Loomba, Ania. *Colonialism/Postcolonialism -The New Critical Idiom*. Routledge.
5. Naipaul V.S. *Miguel Street*. New York Vintage International Edition, 1984.
6. Pushpa, M. *The plays of Wole Soyinka*. Prestige.
7. Rehman, Anisur. *New literatures in English*. Creative.
8. Sumana, K. *The Novels of Toni Morrison- A study in Race, Gender & Class*. New Delhi: Prestige Books
9. V.S. Naipaul. *Miguel Street*. New York: Vintage International Edition, 1984.

### **Secondary References:**

1. Bhelande, Anjali; Pandurang, Mala (ed). *Articulating Gender*. Delhi: Pencraft International
2. Kearns, Francis. *Black Identity*. N.Y.: Holt, Rinehart & Winston.
3. Ray, Mohit; Kundu, Rama, Kundu. *Studies in Women Writers in English*. Atlantic.
4. Wright, Derek. *Wole Soyinka revisited*. N.Y. Twayne Pubs.

**S.Y.B.A. – SEMESTER IV – CORE PAPER**

**Paper Title:** Literary Criticism

**Paper Code:** ENG-IV.C-6

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To enable the students understand nature of literary criticism.
2. To acquaint them with the terminology of literary criticism.
3. To provide them the knowledge of the important schools of literary criticism with the help of representative texts.
4. To help the students grasp methods and techniques of interpreting literature.
5. To be able to apply literary theory to text.

**2. Learning outcomes:**

Upon completion of the course the student will be able to:

1. To understand the nature and functions of literary criticism.
2. To read the writings of literary scholars and critics with understanding and judicious appreciation.
3. To recognize and define major critical schools.
4. To generate and articulate personal responses to literary and critical texts.
5. To explain the premises and assumptions underlying such personal responses.

**3. Number of Lectures:            04 Lectures per week**

#### 4. Course Content:

##### Unit 1: Introduction to literary Criticism

Number of Lectures: 05

- a) What is literature?
- b) Difference between Literary Theory and Literary Criticism.
- c) Functions of literary Criticism
- d) Types of literary Criticism.
- e) A brief survey of major critical schools

##### Unit 2: Classical Criticism

Number of Lectures: 14

- a) Features of Classical Criticism
- b) Plato on Imitation and Art
- c) Aristotle's *Poetics*
- d) Longinus' *On the Sublime*

##### Unit 3: Neo classical Criticism

Number of Lectures: 13

- a) Features of Neo Classical Criticism
- b) Dryden's *Essay of Dramatick Poesie*
- c) Pope's *Essay on Criticism*
- d) Dr. Samuel Johnson's *Preface to Shakespeare*

##### Unit 4: Romantic Criticism

Number of Lectures: 14

- a) Features of Romantic Criticism
- b) William Wordsworth's *Preface to Lyrical Ballads*.
- c) Coleridge's *Biographia Literaria*—His concept of fancy and imagination, language of poetry.
- d) P. B. Shelley's *A Defence of Poetry*—Poetry as an essential part of the fabric of society.

##### Unit 5: New Criticism

Number of Lectures: 14

- a) Features of New Criticism
- b) T. S. Eliot *Tradition and the Individual Talent*
- c) I. A. Richards *Four Kinds of Meaning*
- d) F. R. Leavis *Literary Criticism and Philosophy/ Revaluation*—Keats

#### 5. Reference Books:

##### Primary References:

1. Aristotle. *The Poetics of Aristotle*. Emereo Publishing, Australia, 2012.
2. Aivanhov, Omraam Mikhael. *T. S. Eliot: Tradition and the Individual Talent*. Prakash Book Depot Bareilly, U.P., 2012.



3. Arnold, Thomas. *Dryden: An Essay of Dramatic Poesy*. Atlantic Publisher, New Delhi, 2006.
4. Daiches, David. *Critical Approaches to Literature*. Orient Longman, Mumbai, 1967.
5. Giles, Herbert Allen. *Longinus on the Sublime*. Kessinger Publishing, U.S., 2010.
6. Habib M. A. R. *A History of Literary Criticism and Theory*. Blackwell Publishing, U.S.A., 2008.
7. Leavis F.R. *Revaluation: Tradition and Development in English Poetry*. Ivan R. Dee Publisher, Chicago, 1998
8. Nandwani Aditya. S.T. *Coleridge-Biographia Literaria*. Anmol Publications Pvt. Ltd., New Delhi, 2009
9. Narasimhaiah C. D (ed). *Indian response to American literature*. UEFI, New Delhi, 1967.
10. Plato. *The Republic*. Rupa Publications, India, 2013
11. Ransom J. C. - *The New Criticism Essay*. New Directions, New York, 1941.
12. Richards I. A. *Four Kinds of Meaning*. Transaction Publishers, 2004.
13. Samuel Johnson. *Preface to Shakespeare*. Hardpress Publishing, U.S.A., 2010
14. Scott James R.A. *The Making of Literature*. Nabu Press, South Carolina, 2011.
15. Warren Robert Penn. *A Poem of Pure Imagination: An Experiment in Reading*. Renal & Hitchcock, New York, 1946.
16. Wellek Rene. *A History of Modern Criticism*. Yale University Press, U.S., 1986

### **Secondary References:**

1. Brooks Cleanth. *The Well Wrought Urn*. Mariner Books, 1956.
2. Butcher S.H. *Aristotle's Theory of Poetry and Fine Art*. Dover P, USA, 1951.
3. Lodge David, Nigel Wood. *Modern Criticism and Theory*. Pearson Publishing, UP India, 2007.
4. Richards I. A. *Practical Criticism*. London, 1929.
5. Shawcross, John(ed). *Shelley's Literary and Philosophical Criticism*. Oxford, U.K. 1909.
6. Wimsat W. K. and Cleanth Brooks. *Literary Criticism: A Short History*. Routledge Kegan Paul, London, 1957.

**S.Y.B.A. – SEMESTER IV – ELECTIVE PAPER**

**Paper Title:** The Literature of the Indian Diaspora

**Paper Code:** ENG–IV.E-5

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To introduce to the students the types of Diaspora theories and writings
2. To enable students to read and appreciate Diaspora themes, identity and culture
3. To teach students to appreciate cross-cultural and multicultural studies
4. To understand multiple consciousness in Diaspora writings.

**2. Learning Outcomes:**

Upon completion of the course the student should be able:

1. Understand Diaspora
2. Understand Indian Diaspora through Arts and literature
3. Identify and analyze Diaspora themes through short stories and poems

**3. Number of Lectures:            04 Lectures per week**

4. Total lectures: 60

**Unit I: Background**

**(07 lectures)**

1. Nature and themes of Diasporic writings
  - a) Exile literature
  - b) Displacement and the Diasporic identity
  - c) Culture and hybridity
2. Gender and Diaspora politics
3. Major Diaspora writers of India

**Unit II: Poetry**

**(15 lectures)**

I. Sujata Bhatt

1. The Voices
2. The Dream
3. Search for my tongue

II. Meena Alexander

1. On Indian Road
2. Birthplace with Buried Stones

III. Chitra Banerjee Divakaruni

1. Indigo
2. Tiger Mask Ritual

IV. Saleem Peeradina

1. Exhibit C
2. To whom it may concern
3. Song of the makeover

V. Ratin Bhattacharjee

1. The Indian Diaspora

**Unit III: Novel**

**(15 lectures)**

1. A River Sutra by Geeta Mehta

Bye Bye blackbird by Anita Dessai (**Non –evaluative Secondary text**)

**Unit IV: Short stories****(15 Lectures)**

1. A Temporary Matter
2. When Mr. Pirzada Came To Dine
3. Interpreter Of Maladies
4. The Third And Final Continent
5. A Real Durwan

**Unit V: Essays****(08 lectures)**

1. Salman Rushdie
  - a) Imaginary Homelands
  - b) New empire within Britain

**Unit VI: Films (Non Evaluative)**

1. Anita and Me (film) by Meera Syal. Directed by Metin Hüseyin and Produced by Paul Raphael (UK) 2002
2. Namesake (film) by Jhumpa Lahiri. Produced and Directed by Meera Nair (India) 2007

**5. References:****Primary References:**

1. Bhatt Sujatha. *Collected Poems*. Carcanet Press Limited, 2013.
2. Bhatt Sujatha. *Point No Point: Selected Poems*. Carcanet Press Limited, 1997.
3. Dessai Anita. *Bye Bye Black Bird*. Orient Paperbacks, New Delhi, 2005.
4. Lahiri Jhumpa. *Interpreter of Maladies*. Harper Collins Publishers, 2008.
5. Mehta Gita. *A River Sutra*. Penguin, 2000.
6. Peeradina Saleem. *Contemporary Indian English Poetry*. Macmillan, Chennai, 2010.
7. Rushdie Salman. *Imaginary Homelands: Essays and Criticism* RHUK, 2004.

**Secondary References:**

1. Agarwal Beena. *Women Writers and Indian Diaspora*. Authorspress, 2011.
2. Agarwal Malti. *English Literature: Voices of Indian Diaspora*. Atlantic Publisher, 2009.
3. Bande Usha and Jasbir Jain (series ed). *Gita Mehta- Writing Home/Creating Homeland*. New Delhi: Rawat Publication, 2008.

4. Chakrabarti A. S. A. P. T Kavita. *Contextualizing Nationalism, Transnationalism and Indian Diaspora*. Creative Publisher, 2010.
5. Das Nigamananda. *Jhumpa Lahiri: Critical Perspectives*. Pencraft International, 2008.
6. Deb Kushal. *Mapping Multiculturalism (1<sup>st</sup> Edition)*. Rawat Publications , 2002.
7. Gupta K. Surendra. *Specifications of Indian Diaspora Study of Emerging Sandwich Cultures*. Atlantic Publisher, 2012.
8. Jain Jasbir. *Dislocations and Multiculturalisms: (1st Edition)*. Rawat Publications, 2004.
9. Jain Jasbir. *Writers of the Indian Diaspora*. Rawat Publications, 1998.
10. Kadekar Narayan Laxmi and Sahoo Kumar Ajaya .*Global Indian Diaspora: History, Culture and Identity*. Rawat Publications, 2012.
11. Knott Kim. *Diasporas: Concepts, Intersections, Identities*. Rawat Publications, 2011.
12. Tiffin Griffiths Ashcroft Menin. *The Empire Writes Back*. Taylor & Francis Ltd, 2002.

## **S.Y.B.A. – SEMESTER IV – ELECTIVE PAPER**

**Paper Title:** Creative Writing

**Paper Code:** ENG-IV.E-6

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To explore creative writing genres (Poetry, Drama, Fiction) through practical writing classes
2. To build on the foundation of basic knowledge and interest of students in creative writing
3. To develop ones' own style of writing through reading, discussion and experimenting in writing culminating in a student's work portfolio
4. To encourage students' to get their works published using traditional means and modern media
5. To write with the aid of the senses

### **2. Learning Outcomes:** By the end of the course the student will:

1. Have a sample of their own creative output (individual/group)
2. Demonstrate an understanding of concepts related to the creative writing genres
3. Be confident to put forward their ideas/opinions through creative writing genres
4. Develop ability to critique and edit their own work as well as others'
5. Have the ability to use technology in their creative endeavour

### **3. Number of Lectures:** 04 Lectures per week

#### 4. Course Content:

**Note:** This course will focus on the creative *writing* process. Thus, emphasis will be given to the written aspect of the course. Theoretical concepts, learnings, and innovations in the forms and fields will be imparted through praxis. Students will maintain a journal and submit a final portfolio of their creative output. The journal should mandatorily contain *all* the drafts of their works. The editing aspect of the writing process (revision, editing and proofreading) is to be taught concurrently with the units, while focusing on the particular needs of the forms.

##### Unit I: *Poetry*

20 lectures

*Concepts:* Metre and rhyme; Meaning and being of language- power of reference/pop culture/allusions; form (and subverting form); free verse; syllabics; shaping a sequence and collection; figures of speech and its use

Spoken Word -writing, speaking, and performing; Reading techniques – charm, set, space, cold open, silence, blending music

Use of technology in performance, exposing your work to others; *transaesthetics*

*Applied:* Students will apply some strategies of contemporary poetry in the writing of several poems and the analysis of published poetry. They will demonstrate, through the writing and performing of several poems, an understanding of some of the aesthetic aspects of contemporary poetry, such as manipulation of stanzas and line lengths, figures of speech, symbolism, setting, tone, and imagery. They will identify the aesthetic aspects of poetry in published poems and poems written by classmates.

*Portfolio:* Rhyming poems (with various rhyme scheme and forms), free verse, Slam poetry, Spoken word

**Note:** Instructor may use a selection of poetry (established poets) to illustrate the range and variety of poetry. Focus should be on cultivating the student's poetry writing skills.

##### Unit II: *Drama*

20 lectures

*Concepts:* Structures of a stage plays (physical/written); Acts/scenes; Scripting a stage play; Original v/s adapted; story/dialogue/description; Contrast creating conflict; characters and idiom; overwriting; individual voice

Exposition - Using monologues; subtext; dramatic irony; status

Staging - Action; Sets; stage directions and visual narrative; Using offstage effectively; Dramatic action; Staging scenes

Radio Drama: creating pictures with sound; constraints of the medium; Radio drama script; Adaptation; using voices

*Applied:* Students will apply strategies of storytelling in the medium of a play and the analysis of published drama. They will demonstrate, through the writing of a play (one act/two act/three act) an understanding of some of the aesthetic aspects of drama, such as scripting action for the stage, use of dialogue and creating powerful characters through use of monologues and dramatic irony. They will have the ability identify these aspects of drama in published plays and work written by classmates.

*Portfolio:* One act play, three act play, Radio play

**Note:** Instructor may use a selection of drama (established playwrights) to illustrate the range and variety of drama. Focus should be on cultivating the student's writing skills.

### **Unit III: Fiction**

**20 lectures**

*Concepts:* Short Fiction – Short Stories, Flash Fiction, Novella, and Novel

Form/Structure; Plot/Scenes; Character; point of view/narrative voice; conflict/crises; Setting/time

Micro-tales/Nano-tales – analysis of social media and innovative storytelling techniques

Novella/Novel: literary novel v/s genre novels exploring storylines, multiple/parallel plots; reality /s imagination; research and its importance; structuring your chapters vis-à-vis your novel

Creative Non – Fiction –Devices; Basic structure; Speaking with the reader – Your spoken voice; Passion involvement; Writing about yourself – You as a story; Memoir and memory; Writing about people and the world; finding a topic; fieldwork and interviews; literature of hope

*Applied:* Students will apply strategies of storytelling in the writing of atleast one short story/flash fiction; novella/novel (or works of creative non-fiction, or graphic novels) and the analysis of published fiction. They will demonstrate, through the writing of an original work, an understanding of some of the following elements of storytelling: plot, characterization, setting, point of view, symbolism, and style. They will identify the narrative techniques and elements of storytelling used in published works of fiction and stories written by classmates.



*Portfolio:* Short-story, Flash Fiction, Novel/Novella (Structuring/idea conception and writing of at least 3 chapters)

**Note:** Instructor may use a selection of fiction (established writers) to illustrate the range and variety of fiction. Focus should be on cultivating the student's writing skills.

**N.B:** the number of lectures for each unit includes time for continuous assessment, portfolio building (with instructor feedback and review) as well as writing classes.

**Additional note:** As a supplementary skill, the students should be taught how to prepare and submit a piece of work for publication. They should display the ability of using a word-processor, and desk-top publishing software to format their manuscript so as to be print ready and ready for submission to an editor, or publisher. They should also be taught, if not given, opportunities for publication. These can be achieved using the students' works, collected in a portfolio, to assess their growth and competency. (Desk-top publishing software such as Adobe Indesign/Publisher/Illustrator)

Instructors should use peer editing and group workshop method within the classroom as a method of giving and receiving constructive criticisms. This will also open opportunities for students to perform and read out their work, thereby taking care of the spoken word aspect of creative writing, as and when it may apply.

## 5. References:

### Primary References:

1. Cheney, Theodore A. Rees. *Writing Creative Nonfiction - Fiction Techniques for Crafting Great Nonfiction*. California: Ten Speed Press, 1987. ebook.
2. Burroway, Janet. *Writing Fiction: A Guide to Narrative Craft*. New York: Longman Publishers, 2000.
3. Earnshaw, Steven. *The Handbook of Creative Writing*. Edinburgh University Press, Edinburgh. 2007.
4. Greenwell, Bill and Linda Anderson. *A Creative Writing Handbook - Developing Dramatic Technique, Individual Style and Voice*. Ed. Derek Neale. London: A & C Publishers Ltd., 2009.
5. Miller, Brenda and Suzanne Paola. *Tell it Slant - Writing and Shaping Creative Nonfiction*. Mcgraw-Hill, 2005.
6. Mills, Paul. *The Routledge Creative Writing Coursebook*. Routledge, 2006. ebook.
7. Morley, David. *The Cambridge Introduction to Creative Writing*. Cambridge: Cambridge University Press, 2007.
8. Smith, Marc Kelly and Joe Kraynak. *Take the Mic - The Art of Performance Poetry, Slam and the Spoken Word*. Illinois: Sourcebooks MediaFusion, 2009. ebook.
9. Strunk, William and E. B. White. *The Elements of Style*. New York: The Penguin Press, 2005.

### Secondary References:

1. Boden, Margaret. *The Creative Mind - Myths and Mechanisms*. 2nd. New York: Routledge, 2004.
2. Bolton, Gille. *Write Yourself - Creative Writing and Personal Development*. London: Jessica Kingsley Publishers, 2011.
3. Hamand, Maggie. *Creative Writing For Dummies*. West Sussex: John Wiley & Sons, Ltd, 2009.
4. Harper, Graeme. *On Creative Writing*. London: Short Run Press, 2010.

5. Kaufman, Scott Barry and James Kaufman, *The Psychology of Creative Writing*, New York: Cambridge University Press, 2009.
6. May, Steve. *Doing Creative Writing*. Oxon: Routledge, 2007.
7. Smith, Marc Kelly and Joe Kraynak. *Stage a Poetry Slam*. Illinois: Sourcebooks Media Fusion, 2009.

## **S.Y.B.A. – SEMESTER IV – ELECTIVE PAPER**

**Paper Title:** Visual Literature

**Paper Code:** ENG-IV.E-7

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To introduce students to visual literature – in the form of graphic novels, comics and digital comics
2. To understand core concepts in the field of visual literature.
3. To understand how to read graphic novels, comics, and other forms of visual literature.
4. To establish the contribution of visual literature to literature on the whole.

### **2. Learning Outcomes:** By the end of the course the student will be able:

1. To understand visual literature - core concepts, how to read, and critically analyze it as well as establish it as no longer a para-literary form
2. To recognize writers, forms, and ages associated with graphic novels, comics and other forms of visual literature.
3. To have the ability to analyze works of visual literatures critically.

### **3. Number of Lectures: 04 Lectures per week**

#### 4. Course Content:

##### Unit 1: The Comics Genre – History, Formats to Key terms: [12 lectures]

- History of comics (from paper to digital), Graphic novels and other visual literature
- The major comics-creating nations and introduction to comics traditions
  - America - Titles from DC Comics, Marvel, Vertigo, Dark Horse and others
  - Europe - *Tintin*; *Asterix*, French and British Comics
  - Japan (Manga) - *Akira*
  - Indian Comics tradition - *Tinkle*, *Amar Chitra Katha*, *Jataka & Panchatantra tales*
- The single panel comic to syndication
  - R.K. Laxman's collection
  - *Calvin & Hobbes* - William Patterson
- Adapted Comics - *The League of Extraordinary Gentlemen* - Alan Moore
- Advent of Digital Comics/web comics -
  - Gavin Aung Than - [www.zenpencils.com](http://www.zenpencils.com)
  - Rob Denbleyker - [www.explosm.net](http://www.explosm.net)
- Key terms - Sequential Art, panel, gutter, tier, splash, spread, speech balloon, caption, sound effects, narration, formats, canon

[**Please Note:** Noted graphic novelists and comics creators will be introduced to students as they cover the history of the genre.]

##### Unit 2: The Modern Classic [16 lectures]

1. *The Complete Maus* by Art Spiegelman

**Recommended Secondary Reading** - *Persepolis* by Marjane Satrapi

##### Unit 3: A Realistic look at the 'Superhero' [16 lectures]

1. *Watchmen* by Alan Moore
2. *V for Vendetta* by Alan Moore

**Recommended Secondary Reading** - *Batman Year One* - Frank Miller  
*The Dark Knight Returns* - Frank Miller  
*Superman: Man of Steel* - John Byrne

## Unit 4: Alternative Comics/Graphic Novels

[16 lectures]

1. *Fun Home* by Alison Bechdel
2. *A Contract with God* by Will Eisner

### Recommended Secondary Reading -*Underwater Welder* by Jeff Lemire

**N.B:** The number of lectures for each unit includes time for continuous assessment.

Secondary Reading will not be evaluated in the Semester End Exam, but may be used for Continuous assessment if it is used as an extension of the scope of the course.

It is recommended for the students to read the suggested secondary readings in order to fully comprehend the material to be discussed in class.

## 5. References:

### Primary References:

1. Bechdel, Alison. *Fun Home: A Family Tragicomic*. Boston: Houghton Mifflin, 2006.
2. Chaney, Michael A., ed. *Graphic Subjects: Critical Essays on Autobiography and Graphic Novels*. Wisconsin: University of Wisconsin Press, 2011.
3. Eisner, Will. *A Contract with God and Other Tenement Stories*. New York: DC Comics, 1996.
4. —. *Comics & Sequential Art*. Florida: PoorHouse Press, 1985.
5. Heer, Jeet and Kent Worcester. *Arguing Comics: Literary Masters on a Popular Medium*. Jackson: University Press of Mississippi, 2004.
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18. Satrapi, Marjane. *Persopolis*. London: Vintage Books, 2008.
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5. Hatfield, Charles. *Alternative Comics: An Emerging Literature*. Jackson: University Press of Mississippi, 2005.
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9. MacWilliams, Mark W., ed. *Japanese Visual Culture-Explorations in the World of Manga and Anime*. New York: East Gate, 2008.
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11. —. *Zen Pencils-Volume Two - Dream the Impossible Dream*. Missouri: Andrew Mcmeel Publishing, 2015.
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## **S.Y. B.A – SEMESTER IV – ELECTIVE PAPER**

**Paper Title:** Representation of Gender and Sexuality in Literature

**Paper Code:** ENG-IV.E-8

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To acquaint the students with English literature that explores the dimensions of gender, its social constructs etc.
2. To unfold the concept of sexuality is through its various aspects.
3. To discover the notions of gender and sexuality and their interplay.
4. To enable the students to appreciate the various constructs of gender and sexuality.
5. To help students understand the fluid natures of gender and sexuality.
6. To reveal gender and sexuality as is prevalent with reference to society, psychology, morality etc.
7. To foster an appreciation for literature pertaining to interplay of gender and sexuality.

### **2. Learning Outcomes:**

Upon completion of the course the student should be able to:

1. Appreciate the fluid nature of gender and sexuality.
2. Recognize the literal/ symbolic meanings depicted in literature related to gender and sexuality.
3. Decipher the interplay between gender and sexuality as seen through depictions, imagery etc.
4. Recognize various themes seen in literature pertaining to gender and sexuality.

### **3. Number of Lectures: 04 Lectures per week**

#### **4. Course Content:**

**60 lectures**

#### **UNIT 1: BACKGROUND TOPICS**

**Number of Lectures: 10**

- o Feminist Movement:
  - Nature of Feminism
  - History of Feminism
  - Feminism Waves
  - Gynocriticism
  - Lesbian Feminism
  
- o Queer theory:
  - Nature and history of Queer
  - Theory Identity Politics
  - Gender Performativity

#### **UNIT 2: PROSE**

**Number of Lectures: 20**

##### **A. Essay:**

Kate Millett: Theory of Sexual Politics

##### **B. Novels:**

Raj Rao: The Boyfriend

##### **C. Short Stories:**

Katherine Mansfield: The Daughter of the Late Colonel.

Mahasweta Devi: Draupadi

#### **UNIT 3: PLAY**

**Number of Lectures: 20**

1. Gieve Patel: Mr. Behram
2. Mahesh Dattani: On a Muggy Night in Mumbai.

#### **UNIT 4: POEMS**

**Number of Lectures: 10**

1. Sappho:
  - o Come here to me from Crete
  - o To Aphrodite
  - o He is more than a hero
  
2. Suniti Namjoshi:
  - o I Give her the Rose
  - o Well then let slip the masks

3. Maya Angelou
  - o Phenomenal Woman
  - o Still I Rise
4. Kamala Das
  - o The Looking Glass
  - o The Old Playhouse
5. Sylvia Plath
  - o Spinster

## 5. Reference Books:

### Primary References:

1. Dattani, Mahesh. *Mahesh Dattani: Collected Plays*. New Delhi: Penguin, 2000.
2. Gilbert, Sandra & Gubar Susan. *The Madwoman in the Attic*. UK: Yale University Press, 1984.
3. Jain, Jasbir (ed). *Women in Patriarchy: Cross – Cultural Readings*. New Delhi: Rawat Publications, 2005.
4. Millett, Kate. *Sexual Politics*. University of Illinois Press, 2000.
5. Rao, Raj. *Boyfriend*. Penguin India, 2003.
6. Ruth Vanita & Kidwai Saleem. *Same Sex Love in India: Readings from Literature and History*. New Delhi: Macmillan, 2000.
7. Sedgwick Eve Kosofsky. *Epistemology of the Closet*. University of California, 1990.
8. Tendulkar, Vijay. *Mitrachi Goshta: A Friend's Story: A Play in Three Acts*. Oxford University Press, 2000.

### Secondary References:

1. Brabon, Benjamin & Genz Stephanie. *Postfeminism*. Edinburgh University Press, 2009.
2. Bristow, Joseph. *Sexuality*. Routledge, 2013.
3. Butler, Judith. *Gender Trouble*. Routledge, 2012.

4. Shahni, Parmesh. *Gay Bombay: Globalization, Love and (be)longing in Contemporary India*. Sage Publications India Pvt. Ltd, 2008.
5. Sharma, Prabhat. *The Plays of Vijay Tendulker: Critical Explorations*. Sarup & Sons, 2008.
6. Wake, Paul & Malpas Simon. *The Routledge Companion to Critical Theory*. Routledge, 2008.

## **T.Y.B.A. – SEMESTER V – CORE PAPER**

**Paper Title:** Nineteenth Century English Literature

**Paper Code:** ENG-V.C-7

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To acquaint the students with English literature of the nineteenth century.
2. To reveal the impact of socio-economic aspects of the nineteenth century on literature written during the period.
3. To acquaint the students with the prevalent literary genres as well as stylistic feature of literature written during the nineteenth century.
4. To encourage independent critical reading of the literary texts written during the nineteenth century.

### **2. Learning Outcomes:**

Upon the completion of the course the students should be able:

1. Appreciate the socio-economic facets of the nineteenth century and its impact on literature written during the time.
2. Understand essential features of Romanticism and Victorianism.
3. Independently read and evaluate the literary texts written during the time.

### **3. Number of Lectures: 04 Lectures per week**

**Total number of lectures: 60**

#### 4. Course Content:

##### Unit I: Background:

No. of lectures: 05

1. Romanticism
2. French Revolution and Romanticism
3. Features of Victorian literature
4. Georgian Poetry
5. Industrial Revolution; Darwinism

##### Unit II: Poetry:

No. of lectures: 25

1. Wordsworth :
  - 1) We are Seven
  - 2) Tables Turned
  - 3) Lines Written in Early Spring
  - 4) To a Skylark
  - 5) Simone Lee : The Old Huntsman
2. S.T. Coleridge :
  - 1) Kubla Khan
  - 2) A Broken Friendship
3. John Keats:
  - 1) Ode to Autumn
  - 2) When I have Fears that I may cease to be.
  - 3) Ode to Nightingale
4. P.B. Shelley:
  - 1) To a Skylark
  - 2) Ozymandias
  - 3) The Cloud
5. A. L. Tennyson:
  - 1) Break, Break, Break
  - 2) In memoriam-(Prologue, Epilogue)
6. Robert Browning:
  - 1) The Bishop orders his Tomb at saint Praxed's Church
7. Matthew Arnold:
  - 1) Dover Beach
  - 2) Longing
  - 3) To Marguerite

##### UNIT III

##### DRAMA

No. of lectures: 10

*Pygmalion* by George Bernard Shaw

## UNIT IV

### Novels

No. of lectures: 20

Charlotte Bronte - Jane Eyre

### 5. References:

#### Primary References:

1. Charlotte Bronte. *Jane Eyre*. Harper Press, 2010.
2. Green David. *The Winged Word*. Macmillan, Madras, 1974.
3. Shaw George Bernard. *Pymalion*. Penguin Edition, 2009.

#### Secondary References:

1. Churchill R.C. *English Literature of the Nineteenth Century*. University Tutorial Press; First Edition, 1956.
2. Daiches David. *A Critical History of English Literature, Volume 4: The Romantics to the Present Day*. Martin Secker & Warburg Ltd, 1968.
3. Ford Boris (ed.). *Pelican Guide to English Literature (Vol. 5, 6)*. Penguin Books, London, 1957.
4. Gridley E. Roy. *Browning*. Routledge & Kegan Paul, London, 1972.
5. Latham Jacqueline (ed.). *Critics on Matthew Arnold*. George Allen and Unwin Ltd. , U.K., 1973.
6. O'Neill Judith (ed.). *Critics On Keats*. George Allen & Unwin Ltd., U.K. 1967.
7. Sen S. Wordsworth William. *Preface to the Lyrical Ballads: A Critical Evaluation*. Unique Publishers (I) Pvt. Ltd, 2014.

## **T.Y.B.A. – SEMESTER V – ELECTIVE PAPER**

**Paper Title:** Shakespeare Today

**Paper Code:** ENG-V.E-9

**Marks:** 100

**Credits:** 4

### **1. Course Objectives**

1. To acquaint the students with the various forms of literature which are based on the works of William Shakespeare.
2. To foster an interest in the students in exploring the various literary works produced by Shakespeare.
3. To establish a link between the era of Shakespeare and the contemporary times.

### **2. Learning Outcomes:**

1. The students should be able to identify the various themes presented in the works of Shakespeare.
2. The students should be able to appreciate the genius of Shakespeare and its relevance in today's era.
3. The students should be able to understand the various genres that Shakespeare's plays have been adapted into.

### **3. Number of Lectures: 04 Lectures per week**

### **4. Course Content:**

#### **UNIT I: Background**

**5 Lectures**

1. Relevance of Shakespeare in the modern era.
2. The three genres of Shakespearean drama: Comedy, Tragedy and History.
3. The influence of Shakespeare on English Literature.
4. The impact of Shakespeare's plays on modern culture.



**UNIT II: Literature Based on Shakespeare's Plays**

**30 Lectures**

1. Prospero's daughter by Elizabeth Nunez (10 Lectures)
2. I, Iago by Nicole Galland (10 Lectures)
3. Hamlet (Manga Shakespeare) (10 Lectures)

**UNIT III: Visual Media Based on Shakespeare's Plays**

**20 Lectures**

Movies:

1. Hamlet (1996) by Kenneth Branagh
2. Maqbool (2003) by Vishal Bharadwaj
3. Omkara (2006) by Vishal Bharadwaj
4. Haider (2014) by Vishal Bharadwaj ( Self Study)
5. Twelfth Night (Series - Arkangel Complete Shakespeare )
6. Shakespeare's animated play : Gnomeo & Juliet Kelly Asbury

**UNIT IV: Review of Shakespearean Plays by Modern Schools of Criticism 5 Lectures**

1. Psychoanalytical interpretation of Shakespeare's works.
2. Post- colonial interpretation of Shakespeare's works.
3. Feminist interpretation of Shakespeare.
4. Marxist interpretation of Shakespeare's works.

**Note: *Hamlet* will be taught as a model text, which includes the original as well as the adaptations across mediums.**

**References:**

**Primary References:**

1. Amanda Root, Jonathan Firth. Twelfth Night. Series – (Arkangel Complete Shakespeare). Bbc Audiobooks America. 2005
2. Burt, Richard. *Shakespeare After Mass Media*. Palgrave Publications, New York, 2012.
3. *BBC Television Shakespeare*. Romeo and Juliet. BBC 2. U.K., 3 Dec. 1978. Television.
4. Cartelli, Thomas. *Repositioning Shakespeare*. Routledge, 2009.

5. Duffield P, Appignanesi R. *Manga Shakespeare: The Tempest*. Self Made Hero Publication, London, 2007.
6. Galland, Nicole. *I, Iago: A Novel*. William Morrow & Company, New York, 2012.
7. Garber, Majorie. *Shakespeare and Modern Culture*. Random House Inc, New York, 2008.
8. *Haider*. Dir. Vishal Bharadwaj. Perf. Shahid Kapoor, Tabu, Shraddha Kapoor, Kay Kay Menon, Irrfan Khan. UTV Motion Pictures, 2014. Film.
9. *Hamlet*. Dir. Kenneth Branagh. Columbia Pictures, 1996. Film.
10. Kelly Asbury dir. *Gnomeo & Juliet*. January 2011.
11. Lenz, Carolyn. *The Woman's Part: Feminist Criticism of Shakespeare*. University of Illinois Press, Chicago, 1984.
12. Lupton, Julia. *After Oedipus: Shakespeare in Psychoanalysis*. Cornell University Press, 1993.
13. *Maqbool*. Dir. Vishal Bharadwaj. Perf. Irrfan Khan, Tabu, Pankaj Kapoor, Om Puri, Naseeruddin Shah. Kaleidoscope Entertainment Pvt. Ltd., 2003. Film.
14. Nagarajan, S & Viswanathan. R, ed. *Shakespeare in India*. S. OUP India Publishers, 1987.
15. Nunez, Elizabeth. *Prospero's Daughter*. Random House Publishing Group, New York, 2006.
16. *Omkara*. Dir. Vishal Bharadwaj. Perf. Ajay Devgan, Saif Ali Khan, Vivek Oberoi, Kareena Kapoor. Eros Entertainment, Big Screen Entertainment, Shemaroo Entertainment, 2006. Film.
17. Siegel, Paul. *Shakespeare's English and Roman History Plays: A Marxist Approach*. Associated University Presses, 1964.

### **Secondary References:**

1. Barker, Granville and Harisson G.B. *Companion to Shakespearean Study*, Cambridge University, 1946.

3. Goddard. *The Meaning of Shakespeare*. University of Chicago Press, Chicago, 1960.
4. Halliday, F.E. *Shakespeare in His Age*, Gerald Duckworth & Co. Ltd, 1965.
5. Iyengar, Srinivasa. *Shakespeare: His World and His Art*, Sterling Publishers, 1984.
6. Kastan, David. *Shakespeare After Theory*. Routledge, New York, 1999.
7. Kott, J. *Shakespeare Our Contemporary*. W. W. Norton & Company, New York, 1974.
8. Rothwell, Kenneth S. *A History of Shakespeare on Screen: A Century of Film and Television*, Cambridge: Cambridge University Press, 2004.
9. Shakespeare, William. *Hamlet*. UBS Publishers' Distributors Pvt. Ltd, New Delhi, 2009.
10. Shakespeare, William. *Macbeth*. UBS Publishers' Distributors Pvt. Ltd, New Delhi, 2009.
11. Shakespeare, William. *Othello*. UBS Publishers' Distributors Pvt. Ltd, New Delhi, 2009.
12. Trivedi, P. and Bartholomeusz Dennis. *Shakespeare's India*. University of Delaware Press, 2005.

## **T.Y.B.A. – SEMESTER V – ELECTIVE PAPER**

**Paper Title:** Ancient Indian Classics in Translation

**Paper Code:** ENG-V.E-10

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To acquaint the students with Indian culture of the past.
2. To introduce the students to great ancient Indian classics.
3. To acquaint the students with Indian poetics.

### **2. Learning Outcomes:**

Upon the completion of the course the students should be able:

1. To perceive aesthetic and philosophical, social aspects of ancient Indian society.
2. To appreciate ancient Indian classics.
3. To comprehend Indian poetics.

### **3. Number of Lectures: 04 Lectures per week**

**Total number of lectures: 60**

### **4. Course Content:**

#### **1) The Mahabharat**

**15 lectures**

Extracts from the Mahabharat:

- a) Droupadi – Svayamvara Parva – Volume I (Pages 437-458)
- b) Vaivahka Parva Volume I (Pages 458-473)
- c) Dyuta Parva Volume II (Pages 185 to 247)
- d) Kichaka – Vadha Parva – Volume 4 (Pages 29 to 54)
- e) Amba – Upakhyana Parva – Volume 5 (Pages 1 to 60)

## 2) The Ramayana

15 lectures

Book I – Canto – XXXVI - L  
– LXVI - LXVIII  
– LXXVII

Book II – Canto – I,  
– VII - XIX,  
– XXVI - XXVII  
– XXXVII - XLIII  
– LI - LXIV

Book III – Canto – IX - XX  
– XXXI -LVII

Book VI – Canto – XXXI - XXXIV  
– C - CXXV

(Note: Book III & VI - Self Study)

## 3) Poems from Sanskrit in translation

15 lectures

Verse nos. 1-15; 18-21 ; 24; 26; 30; 32; 39; 40-45; 47; 51-53; 61; 63; 65; 67 ; 69-71 ; 73;74; 86;87; 97-101; 103; 104; 110; 111; 114 -116; 118; 119; 122; 123; 125; 131;135; 136; 138-140.

### Indian Poetics / Indian Literary Criticism

- a) Bharata – Ntaya – Manjiri (1975) by G. K. Bhatt: On Natya and Rasa: Aesthetics of Dramatic experience.
- b) Bhatrihari – Vakyapadiya .  
Text: From Vakyapadiya by K. Raghavan Pillai.
- c) Dandin from the Kavyadarsa. Translated by Vavilla Venkateswara Sastrulu.  
Dandin’s Marga Theory.
- d) Anandvardhana’s from Dhuanyaloka ( sphota theory).
- e) Kuntaka – Vakrokti.
- f) Abhinava Gupta’s concept of Shantarasa. Rasa - dvani theory.

#### 4) Philosophical Writings

15 lectures

- a) Bhagavat Gita – Chapter II-The Karmayoga
- b) Isha Upanishad as translated by Sri. Aurobindo

#### 5. Reference Books:

##### Primary References:

1. Brough John. *Poems from the Sanskrit*. Pelican Books, England, 1968.
2. Debroy Bibek (trans.). *The Mahabharata*. Pelican Books, New Delhi, 2012.(Vol. I, II, IV, V)
3. Devy G.N. (Ed.). *Indian Literary Criticism: Theory and Interpretation*. Orient Longman, New Delhi, 2002.
4. Griffeth Ralph( trans.). *The Ramayan of Valmiki*. Low Price Publications, Delhi, 2003.
5. Ryden W. Arthur(trans.). *Kalidas' Shakuntala* . In Parentheses Publication Sanskrit.
6. Sri. Aurobindo (trans.). *Isha Upanishad*. Sri. Aurobindo Ashram, Pondicherry, 2003.

##### Secondary References:

1. Banker Ashok K. *Ramayana* . Little, Brown Book Group, 2005.
2. Pattanaik Devdutt. *My Gita*. Rupa Publications, New Delhi, 2015.
3. R.K. Narayan. *God, Demons and others*. University of Chicago Press, 1993.
4. Sinha M.P. , Agnihotri Meeraj. *Critical Theories- Indian and Western*. Atlantic Publications, New Delhi, 2013.
5. Smith John (Abridged Trans.) *The Mahabharata*. Penguin Book, India, 2009.
6. Swami Chinmayanada. *The Holy Geeta*. Central Chissmaya Mission Trust, Mumbai, 1996.
7. Swami Parthasarthy. *Bhagvad Gita*. Vedanta World, 2 ed. , 2011.
8. Valmiki, Sattar Arshia. *The Ramayana*. Penguin Random House India, 2016.
9. Zakaria Rafiq. *Discovery of God*. Popular Prakashan Publisher.

## **T.Y.B.A. – SEMESTER V – ELECTIVE PAPER**

**Paper Title:** Film Studies

**Paper Code:** ENG-V.E-11

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To introduce students to the allied field of Film Studies, its history, literature, and theory.
2. To inculcate in students an educated response to films.
3. To allow students a space to explore film Studies practically and creatively through appropriate form and structure.

### **2. Learning Outcomes:** But the end of the course the student will be able:

1. To understand the literature of Films through relevant exemplars.
2. To recognize Directors, artists, genres, and movements in Films.
3. To have the ability to identify, critically analyze films.
4. To write, direct and shoot their own short film, informed by Film theory and literature.

### **3. Number of Lectures: 04 Lectures per week**

#### 4. Course Content:

Total number of lectures: 60

##### Unit 1: History of Film

(10 lectures)

**Silent Period (1895 – 1929):** Movements – German Expressionism, Soviet Montage, French Avant-garde; Lumiere Brothers, Georges Melies, Edwin Porter, D.W. Griffith, Thomas Ince, Mack Sennet, Charlie Chaplin, Buster Keaton, Oscar Miceaux, Carl Theodor Dreyer, Robert Flaherty, Cecil DeMille

**Classical Period (1930 – 1945):** Movements: French poetic realism; Frank Capra, Josef Von Sternberg, Howard Hawks, John Ford, Maya Deren

**Postwar Period (1946 – 1959):** Movements: Italian neorealism, Japanese art Cinema; Orson Welles, Douglas Sirk, Nicholas Ray, Ingmar Bergman, Satyajit Ray

**Transitional Period (1960 – 1979):** Movements- French New Wave, Feminist Film, Direct Cinema, Structural film, Third World Cinema ; John Cassavetes Arthur Penn, Sam Peckinpah, Francis Ford Coppola, Robert Altman, Stan Brakhage, Ousmane Sembene, Luis Bunuel, Woody Allen, Stanley Kubrick, George Lucas, Martin Scorsese

**Contemporary Period (1980 - ):** Movements – American Independent cinema, East Asian Cinema, Iranian Cinema, New British cinema, Personal documentary; Steven Spielberg, Oliver Stone, Lars von Trier, David Cronerberg, Ridley Scott, Mira Nair

**Note: Students are to be briefly introduced the context of the periods through clips, montages, extracts. Focus should be on the movements, emphasis should be in understanding the movements.**

##### Unit 2: Literature of Film:

(15 lectures)

**Film Form:** Mise en Scene –Setting, Performance & Movement, Costume and Props; Cinematography –Shot types; Camera Lenses; Camera Angles; Camera Movements, Lighting& Colour

Sound & Editing – Effects, Music, Perspective Sound, dialogue Overlaps/ Sound Bridges; Optical Effects, Continuity, Spatiotemporal effects

Narrative: Story & Plot, Narrative development, Narration, Narrative meaning; Time



**Note: Instructor, in conjunction with their class, should select movies, TV series, Documentaries etc to understand the Literature of Films. Each aspect and concept needs to be underlined with actual extracts, and clips of visuals.**

**Unit 3: Film Genres & Theory:**

**(15 lectures)**

Genre Theory; Genre as Film Language; Genres- Gangster, Western, Horror, Science Fiction, Musical, Romantic Comedy, Fantasy, Parody, Animation, Found Footage, Realism, Blaxploitation

Bollywood vs Hollywood – a comparison

Adaptations, Sequels and current forms of Film Trends – Studio Blockbusters, Shared Universe.

**Film Theory:** Medium Specific, Realism, Auteur Theory, Semiotics & Structuralism, Ideology theory, Feminist film Theory, Cultural Studies, Cognitive Theory

**Note: Instructor, in conjunction with their class, should select movies, TV series, Documentaries etc to discuss the various genres and Theory. Each Theory needs to be underlined with actual extracts, and clips of visuals. Adapted texts can also be taken.**

**Unit 4: Practical Application of Learning**

**(20 lectures)**

Reader-Response to Unseen Films: Reviews, comparisons, and break-downs of movies/TV/documentaries in written forms and structures.

Creation of movies using concepts learnt in Units 1, 2, and 3.

Application of Film Form – Message & Values, Mise en Scene, Cinematography, Sound & Editing, Narrative, Genre and Film theory

Story, Storyboard, Screenplay

**Note: Instructor should create a learning environment where concepts can be applied. Movies, TV series, Documentaries should be viewed and analyzed. Students should also create their own short films informed with the concepts learnt in the previous units.**

## 5. References:

### Primary References:

1. Andrew, Dudley. *concepts in FILM THEORY*. Oxford: Oxford University Press, 1984.
2. Aufderheide, Patricia. *Documentary Film A Very Short Introduction*. Oxford: Oxford University Press, 2007.
3. Benyahia, Sarah, Freddie Gaffeny and John White. *AS Film Studies The Essential Introduction*. New York: Routledge, 2006.
4. Butler, Andrew. *The Pocket Essentials Film Studies*. Berks: [www.pocketessentials.com](http://www.pocketessentials.com), 2005.
5. Dancyger, Ken. *The Technique of Film & Video Editing Fifth Edition*. Oxford: Focal Press, 2011.
6. Nelmes, Jill, ed. *Introductin to Film Studies, 05th Edition*. London: Routledge, 1996.
7. Pearson, Roberta and Philip Simpson, *Critical Dictionary of Film and Television Theory*. New York: Routledge, 2001.
8. Stadler, Jane and Kelly McWilliam. *Screen Media Anlaysiaing Film and Television*. NSW: Allen & Unwin, 2009.
9. Stam, Robert. *Film Theory An Introduction*. Massachusetts: Blackwell Publishing, 2000.
10. Thompson, Kristin and David Bordwell. *Film History An Introduction Second Edition*. New York: McGraw Hill, 2003.
11. Villarejo, Amy. *Film Studies The Basics*. New York: Routledge, 2007.
12. Welsh, James and Peter Lev, *The Literature/Film Reader*. Plymouth: The Scrcrow Press, 2007.

## Secondary References:

1. Fabe, Marilyn. *Closely Watched Films An Introduction to the Art of Narrative Film Technique*. New York: University of California Press, 2004.
2. Grant, Barry Keith, ed. *Film Genre reader III*. Austin: University of Texas Press, 1986.
3. Guynn, William, ed. *The Routledge Companion to Film History*. New York: Routledge, 2011.
4. Hart, John. *The Art of the Storyboard A Filmmaker's Introduction*. Oxford: Elsevier, 2008.
5. Monaco, James. *How to Read a Film The World of Movies, Media, and Multimedia*. New York: Oxford University Press, 200.
6. Jess-Cooke, Carolyn and Constantine Verevis, *Second Takes Critical Approaches to the Film Sequel*. New York: State University of New York Press, 2010.
7. Roberts, Graham. *Key Film Texts*. New York: Oxford University Press, 2002.

## **T.Y.B.A. – SEMESTER V – ELECTIVE PAPER**

**Paper Title:** Women's Writing in India

**Paper Code:** ENG-V.E-12

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To offer students women's perspective of life and womanhood.
2. To acquaint the students with the distinct stylistic features of Indian women writers.
3. To evaluate the position of woman in the Indian patriarchal society and as reflected in literature written by women writers.

### **2. Learning Outcomes:**

1. To appreciate woman's point of view regarding life.
2. To understand the life of a woman in patriarchal society of India.
3. To understand distinct features of women's writing.

### **3. Number of Lectures: 04 Lectures per week**

**Total number of lectures: 60**

### **4. Course Content:**

#### **Unit I: Poetry**

**20 lectures**

1. Kamala Das: a) The Descendants  
b) The Doubt  
c) The Maggots  
d) The Store Age
2. Mamta Kalia :a) Positive Thinking  
b) After eight years of marriage  
c) Dubious Lovers  
d) Sunday Song  
e) Anonymous

3. Melanie Silgado : a) For Father on the Shelf  
b) The Earthworm's Story  
c) Birds Brokers  
d) Doris
4. Imtiaz Dharker: a) Puradah I  
b) Battle –line  
c) Minority
5. Hira Bansode : a) Slave  
b) O Great Man
6. Mina Gaybhiye : a) The Weeping Wound of Centuries  
b) Both are Useless
7. Anuradha Gaurav : a) Request
8. Jyoti Lanje : a) Mother  
b) The Nameless One

**Unit II: Drama**

**15 lectures**

- 1) Padmanabhan Manjula – Harvest
- 2) Usha Ganguli –Rudali

**Unit III: Short Fiction**

**10 lectures**

1. Deshpande Shashi - The Day of the Golden Deer
2. Desai Anita - Games at Twilight
3. Nimbkar Jai - Childless one
4. Dalal Nergis - The Connoisseur
5. Ismat Chughtai - The Quilt

**Unit IV: Non - Fiction**

**15 lectures**

1. Bedi Kiran: Its always Possible: Transforming one of the Largest Prisons in the World “ Women in Tihar”.
2. Shashi Despande's “Writing from the Margins”.

## 5. Reference Books: Primary

### References:

1. Bedi Kiran. *Its always Possible: Transforming One of the Largest Prisons in the World*. Sterling Publishers Pvt.Ltd ,India; 6th edition , 2005.
2. Chughtai, Ismat. *The Quilt and other stories*. Sheep. Meadow Press,U.S. 1994.
3. Deshpande, Shashi. *Writing From the Margin & Other Essays*. Penguin Books, 2003
4. Deshpande Shashi. *Collected Stories*. Penguin Books, London, 2003.
5. Dhar Sheila. *Here's Someone I'd Like you to Meet*. Oxford University Press, 1996.
6. Eunice De Souza. *Nine Indian Women Poets*. Oxford University Press, New Delhi, 1997.
7. Ganguli Usha. *Rudali*. Radhakrishan Prakashan, 1<sup>st</sup> edition, 2004.
8. Mehta Gita. *Karma cola*. Penguin, 2015.
9. Mulk Raj Anand and Zelliott Eleanor (Ed). *An Anthology of Dalit Literature*. Gyan Publishing House, New Delhi, 1992.
10. Padmanabhan Manjula. *Harvest*. Aurora Metro Publications, 2003.
11. Prasad Madhusudan. *Contemporary Indian English Stories*. Sterling P. 1988.

### Secondary References:

1. Amga H.L. *Indo - English Poetry*. Surabhi P. Jaipur, 2000.
2. Bande Usha. *Gita Mehta: Writing Home / Creating Homeland (Writers of the Indian Diaspora)* . Rawat Publications , India, 2008.
3. Bedi Kiran. *I Dare*. Hay House, India, 2009.
4. Naik M.K. , Narayan Shyamala. *Indian English Literature 1980-2000 : A Critical Survey*. Pencraft International, Delhi, 2016.
5. Pawar M.S. *New Women Novelists with New Horizons*. Shruti P. Jaipur, 2011.
6. Ray Mohit. *Indian Writing in English*. Atlantic Publishers, New Delhi, 2008.

## **SEMESTER V – INTERDISCIPLINARY PAPER**

**Paper Title:** Creative Writing for Beginners

**Paper Code:**

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To expose students to a variety of literary genres, authors and styles through reading, discussion and analysis.
2. To experiment with a variety of writing genres like short story, poetry, novella, drama etc.
3. To help students understand the process of revision, editing and proofreading.
4. To develop the skills to self-critique one's own writing through a process of giving and receiving criticism on one's own and others' writings.
5. To encourage students to publish their works in the college magazine, college newsletters, local newspapers etc.

### **2. Learning Objectives :**

By the end of the course

1. Students will demonstrate an understanding of literary conventions like plot, character, theme etc.
2. Students will develop a basic understanding of various prose fiction genres.
3. Students will learn to use current events as inspiration for Creative Writing.
4. Students will understand the importance of proof reading, editing and rewriting.
5. Students will become confident about their ability to voice their opinion, desires, world-view etc through writing.
6. Students will learn to critique the writings of their peers.
7. Students will improve their vocabulary and sentence structures.
8. Students will learn to think and write creatively.

**3. Number of Lectures:            04 Lectures per week**

#### **4. Course Content :**

- 1) How to Get Started? **5 lectures**
  - i) Journal Writing (Recording Personal Experiences).
  - ii) Free Writing.
  - iii) Clustering.
  - iv) Badly Written First Drafts as Helpful a Starting Point.
  
- 2) How to find Subject Matter? **5 lectures**
  - i) Be inspired by events in personal life.
  - ii) Draw inspiration from people one comes across.
  - iii) Be moved by injustice.
  - iv) Draw on current events in Politics, Society etc.
  - v) Look at genres of fiction one loves to read etc.
  
- 3) How to make a story interesting? **5 lectures**
  - i) Introduce conflict, complications, trouble, crisis, resolution.
  - ii) Create feeling of suspense.
  - iii) Appeal to emotions.
  - iv) Surprise reader with unexpected ending.
  
- 4) Difference between 'Story' and 'Plot.' **5 lectures**
  
- 5) Characterization. **5 lectures**
  - i) Memorable characters have 'Credibility', 'Purpose' and 'Complexity.'
  - ii) 'Indirect Method' or 'Telling' method of Character Presentation  
– Authorial Interpretation
  - iii) Direct Method or 'Showing Method' of Character Presentation.
    - Showing appearance
    - Showing action
    - Portraying speech
  - iv) Checklist for Creating Character.  
Age, gender, race, nationality, marital status, region, education, religion, profession, memories, dietary habits, ideology, likes, dislikes etc.
  
- 6) Importance of Atmosphere and Setting in Fiction **5 lectures**



- 7) Point of View/Narrative voice **5 lectures**
- i) Who speaks :
- First Person Narrative
  - Second Person narrative
  - Third Person Narrative
- ii) To whom :
- To The Reader?
  - To Another character in the Story?
- 8) The Concept of Authorial Distance or Psychic Distance. **5 lectures**
- 9) Difference between types of Prose Fiction [Novel, Short Story, Play]. **5 lectures**
- 10) The Importance of Proofreading, Editing, Rewriting. **5 lectures**
- 11) Poetry: Prosodic Features-Rhyme. Rhythm, Metre, Stanzaic Forms, Figurative Language, Symbolism, Special Linguistic Features etc. **10 lectures**

## **5. Reference Books:**

### **Primary References:**

1. Burroway, Janet. *Writing Fiction: A Guide To Narrative Craft*. New York: Longman Publishers, 2000.
2. Earnshaw, Steven. *The Handbook of Creative Writing*, 2007: Edinburgh University Press, Edinburgh.
3. Morley, David. *The Cambridge Introduction to Creative Writing*, New York: Cambridge University Press, 2007.
4. Strunk, William, and E.B.White. *The Elements of Style*. New York: Longman, 2000.

### **Secondary References:**

1. Boden, Margaret. *the creative mind - myths and mechanisms*. 2nd. New York: Routledge, 2004.
2. Bolton, Gille. *Write Yourself - Creative Writing and Personal Development*. London: Jessica Kingsley Publishers, 2011.
3. Hamand, Maggie. *Creative Writing For Dummies*. West Sussex: John Wiley & Sons, Ltd, 2009.
4. Harper, Graeme. *On Creative Writing*. London: Short Run Press, 2010.
5. Kaufman, Scott Barry and James Kaufman, *The Psychology of Creative Writing*. New York: Cambridge University Press, 2009.
6. May, Steve. *doing creative writing*. Oxon: Routledge, 2007.
7. Mills, Paul. *The Routledge Creative Writing Coursebook*. Routledge, 2006.
8. Neale, Derek. *A Creative Writing Handbook: Developing Dramatic Technique, Individual Style and Voice*. London: A & C Black Publishers Ltd., 2009.

### **Additional Online Reading:**

1. <http://io9.com/10-tips-and-tricks-for-creating-memorable-characters-1616544190>
2. <http://thewritepractice.com/resources/characterization/>
3. <http://ladylovelace.hubpages.com/hub/The-Difference-Between-Story-and-Plot>
4. <http://www.learningnerd.com/the-difference-between-plot-and-story/>
5. <http://literarydevices.net/point-of-view/>

## **T.Y.B.A.– SEMESTER VI-ELECTIVE PAPER**

**Paper Title:** Twentieth Century English Literature

**Paper Code:** ENG-VI.C-8

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To introduce the students to novel, play and poems drawn from the English-language literatures of the twentieth century.
2. To examine how authors have responded to historical and cultural change throughout the twentieth century.
3. To probe the growth of modernism, and the appearance of post-colonialism and postmodernism

### **2. Learning Objectives:** By the end of the course the students will be able:

- a) To appreciate representative literary works of the Twentieth century English Literature.
- b) Acquainted with different modern prose styles as well as colloquial rhythms of modern poetry.
- c) To have a better understanding of the impact of world wars and psychology on literature.

### **3. Number of Lectures:** 04 lectures per week

### **4. Course Content:**

**Total number of Lectures 60**

#### **Unit I: Poems**

**20 Lectures**

1. W. B. Yeats -a) The Second Coming  
b) The Wild Swans at Coole  
c) Sailing to Byzantium
2. T.S Eliot- a) Love Song of Alfred Prufrock  
b)The Journey of the Magi
3. W.H Auden's –a) Stop all the Clocks,  
b) Cut the Telephones
4. Wilfred Owen- a) Insensibility,  
b) Strange Meeting
5. Siegfried Sassoon- a) The Death Bed  
b) Lamentations

- 6. Rupert Brooke
  - a) The Dead
  - b) The Solider
  - c) Futility
- 7. Ezra Pound
  - a) At the Metro Station
  - b) The Garden
- 8. Carl Sandburg
  - a) Fog
  - b) Grass
- 9. Dylan Thomas-
  - a) Do not go gentle into the good night
  - b) Fern Hill
- 10. Stephen Spender-
  - a) An elementary school classroom in a slum
  - b) Fall of a city
- 11. Louis Macneice
  - a) Prayer before birth
  - b) Bagpipe Music

**Unit II: Novel**

**17 Lectures**

James Joyce- *A Portrait of the Artist as a Young Man*

**Unit III: Drama**

**16 Lectures**

Harold Pinter- *The Home Coming*

**Unit IV: Background**

**7 Lectures**

- a) Modernist Thematic Concerns
- b) Techniques and Style of Modernist writers
- c) Impact of psychology on literature & Stream of Consciousness technique
- d) Impact of the World wars on Literature of the 20<sup>th</sup> Century Literature
- e) Surrealism, Expressionism and Impressionism

**5. References:**

**Primary References:**

1. James Joyce. *A Portrait of the Artist as a Young Man*. Fingerprint Publishing, 2016.
2. Pinter Harold. *The Homecoming*. Avalon Travel Publishing, 1994.

**Secondary References:**

1. Abraham, M.H. *The Norton Anthology of English Literature*. W. W. Norton, Incorporated, 2003.
2. Bloom, Harold. *Dramatists and Dramas*. Chelsea House publishing, US, 2005.
3. Brown, Dennis, John Theodore. *The Modernist Self in Twentieth-Century English Literature: A Study in Self Fragmentation*. New York, Palgrave Macmillan, 1989.

4. Corcoran, Neil ed. *The Cambridge Companion to Twentieth-Century English Poetry*. Cambridge University Press, New York, 2007.
5. Friedman, Alan Warren. *Modernism and Literature: An Introduction and Reader*. Routledge, 2013.
6. Greenblatt, Stephen, et al., eds. *The Norton Anthology of English Literature*. Volume F: The Twentieth Century and After. New York, W. W. Norton , 2012
7. Marcus, Laura, Peter Nicholls ed. *The Cambridge History of Twentieth Century English Literature*. Cambridge University Press, UK, 2004.
8. Matz, J. *The Modern Novel: A Short Introduction*. Blackwell Publishing, US, 2004.
9. Meredith, James H. *Understanding the Literature of World War I: A Student Casebook to Issues ...* Green Wood Press, London, 2004.
10. Polleta, Gregory T. , ed. *Issues in Contemporary Criticism*. Boston: Little, Brown and Company, 1973.
11. Roberts, Neil. *A Companion to Twentieth-Century Poetry*. Blackwell publishing, UK, 2004.
12. Silverstein, Marc. *Harold Pinter and the Language of Cultural Power*. Associate University Press, London, 1993.
13. Stringer, Jenny. *The Oxford Companion to Twentieth Century English Literature*. Oxford University Press, New York, 1996.

## **T.Y.B.A. – SEMESTER VI – ELECTIVE PAPER**

**Paper Title:** English Language and Literature Teaching

**Paper Code:** ENG-VI.E-13

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To introduce students to the fundamentals of English Language and Literature Teaching.
2. To introduce students to methods and approaches to teaching English Language and Literature.
3. To prepare students for the field of teaching with practical approaches to ELLT.

### **2. Learning Outcomes:** But the end of the course the student will be able:

1. To understand fundamentals in ELLT.
2. To recognize concepts, methods, and approaches related to ELLT.
3. To have the ability to create modules and teach using methods, and approaches in ELLT.

### **3. Number of Lectures: 04 Lectures per week**

#### **4. Course Content:**

**Total number of lectures: 60**

#### **Unit 1: English Language Teaching**

**(15 lectures)**

**Introduction:** English in the world today, Brief History of English Language teaching

Principles of Language Teaching – Cognitive, Social, Linguistic

Fundamentals: Listening, Speaking, Reading, Writing, Pronunciation, Vocabulary

Curriculum Building

**Methods:** Grammar-Translation Method, Direct Method, Audio-Lingual Method, Silent Way, Desuggestopedia, Community Language Learning, Total Physical Response, Communicative Language teaching; Content based, Task-Based, and Participatory Approaches, Learning Strategy Training, Cooperative Learning and Multiple Intelligences

Issues in English Language teaching with focus on India

Discussion topics - *Literature as Autobiography* and *Fiction as Lies*.

New Paradigms & Current innovations in ELT

#### **Unit 2: Praxis of English Language Teaching:**

**(15 lectures)**

Preparation – Organization – Dissemination - Feedback

Use of teaching Methods using methods learnt in Unit 1 for crafting language teaching modules: Lecture Method, Demonstration Method, Problem Solving Method, Project Method, Vee – Mapping, Discussion Method, Play Method, Individualized Instruction Method, Discovery Method, Guided Discovery Method, Concept Mapping, Team Teaching

Use of ICT/Technology, Mixed-Media teaching

Innovations in teaching – Student-Centric, Flipped classrooms, POGIL, Constructivism

Student Innovation

### **Unit 3: English Literature Teaching**

**(15 lectures)**

Curriculum Building

**Approaches:** Language- based approach, Culture-based approach, Personal Growth approach (Reader-Response), Integrated Approach, Cultural-Response Method, Active Learning, Explanatory & Experiential Approach, Dramatic Method, Close reading, Reader-Response

Form & Genre: Poetry, Drama, Novel, Graphic-Novel, Non-Fiction, Creative Non-Fiction

### **Unit 4: Praxis of Teaching English Literature**

**(15 lectures)**

Preparation – Organization – Dissemination - Feedback

Use of teaching Methods using methods learnt in Unit 3 for crafting literature teaching modules: Lecture Method, Demonstration Method

Interactive Method Using: Problem Solving Method, Project Method, Vee – Mapping, Discussion Method, Play Method, Individualized Instruction Method, Discovery Method, Guided Discovery Method, Concept Mapping, Team Teaching

Use of ICT/Technology, Mixed-Media teaching

Innovations in teaching – Student-Centric, Flipped classrooms, POGIL, Constructivism

Student Innovation



## 5. References:

### Primary References:

1. Broughton, Geoffrey, et al. *Teaching English as a Foreign Language*. New York: Routledge, 1978.
2. Carter, Ronald and David Nunan, *The Cambridge Guide to Teaching English to Speakers of Other Languages*. Cambridge: Cambridge University Press, 2001.
3. Chambers, Ellie and Marshall Gregory. *Teaching & Learning English Literature*. London: Sage, 2006.
4. Davison, Jon and John Moss, *Issues in English Teaching*. London: Routledge, 2000.
5. Irvine, Colin C., ed. *Teaching the Novel across the Curriculum - A Handbook for Educators*. Westport: Greenwood Press, 2008.
6. Jeffcoate, Robert. *Starting English Teaching*. London and New York: Routledge, 1992.
7. Larsen-Freeman, Diane. *Teaching and Principles in Language Teaching*. New York: Oxford University Press, 2003.
8. Nunan, David. *Language Teaching Methodology - A textbook for teachers*. Prentice Hall, 1991.
9. Richards, Jack and Theodore Rodgers. *Approaches and Methods in Language Teaching*. Cambridge: Cambridge University Press, 1986.
10. Richards, Jack and Willy Renandya. *Methodology in Language Teaching*. New York: Cambridge University Press, 2002.
11. Wyse, Dominic, Richard Andrews and James Hoffman, *The Routledge International Handbook of English, Language and Literacy Teaching*. New York: Routledge, 2010.

## Secondary References:

1. Chambers, Ellie and Marshall Gregory. *Teaching and Learning English Literature*. London: Sage Publications, 2006.
2. Ken, Bain. *What the Best College Teachers Do*. Massachusetts: Harvard University Press, 2004.
3. Nunan, David. *Learner-Centred English Language Education*. Devon: Routledge, 2013.
4. —. *Research Methods in Language Learning*. New York: Cambridge University Press, 1992.
5. —. *Teaching English to Speakers of Other Languages*. New York: Routledge, 2015.
6. Richards, Jack and Richard Schmidt. *Dictionary of Language Teaching & Applied Linguistics*. Edinburgh: Pearson, 2010.
7. Thurston, Cheryl Miller. *Ideas That Really Work!* Colorado: Cottonwood Press, 1991.

## **T.Y.B.A. – SEMESTER VI – ELECTIVE PAPER**

**Paper Title:** Latin American Literature

**Paper Code:** ENG-VI.E-14

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To introduce students to the Latin American culture through their Literatures.
2. To help students understand the contribution of Latin American Writers to world literature.
3. To encourage students to discover the various themes, and movements associated with Latin American Literature.
4. To inculcate an atmosphere of cultural acceptance through the texts.

### **2. Learning Outcomes:** By the end of the course the student will be able:

1. To understand the large landscape of Latin American Literature.
2. To recognize writers, forms, and movements associated with Latin American Literature.
3. To have the ability to analyze works of literatures critically, keeping in mind the context of Latin America.

### **3. Number of Lectures: 04 Lectures per week**

#### 4. Course Content:

Total number of lectures: 60

##### Unit 1: Contextual Study: (10 lectures)

**Note:** The following areas should be covered along with their representative texts. If representative texts are not present, extracts of such may be used

1. Brief History of Latin America
2. Movements : Modernismo, indigenismo, Romanticism/Realism/Naturalism, Mulatto
3. Andrade, Oswaldo de. (Brazil) “*Anthropophagie Manifesto*” - Transculturalism
4. The Boom, Magical Realism, Post-boom writers/writings

##### Unit 2: Fiction: (25 lectures)

1. *100 Years of Solitude* – **Gabriel Garcia Marquez (Colombia)**
2. *The Psychiatrist* - **Machado de Assis (Brazil)**

##### Unit 3: Poetry (15 lectures)

1. *Sonnet XVIII, The Song of Despair, A song for Bolivar* - **Pablo Neruda (Chile)**
2. *Flame, speech*; Proem, extract from *Sunstone* (first 15 stanzas) - **Octavio Paz (Mexico)**
3. *The Psychology of Composition, The Hen’s Egg* – **Joao Cabral de Neto (Brazil)**
4. *The Other, Antigone* – **Gabriela Mistral (Chile)**

##### Unit 4: Short Stories (10 lectures)

1. Selected Stories from *The Cubs and other stories* – **Mario Vargas Llosa (Peru)**  
*The Cubs, The Challenge*
2. Selected Stories of **Julio Cortazar (Argentina)**  
*House taken Over, Bestiary*
3. Selected Stories of **Jorge Luis Borges (Argentina)**  
*The Library of Babel, Death and the Compass*

**Note: Secondary readings of the selected authors, poets, critics are open to students to explore and should be encouraged for use in internal assessments.**

## 5. References:

### Primary References:

1. Borges, Jorge Luis. *Aleph and other Stories*. Ed. Norman Thomas Di Giovanni. Trans. Norman Thomas Di Giovanni. New York: Bantam Books, 1970.
2. Cortazar, Julio. *Blow-Up and Other Stories*. Trans. Paul Blackburn. New York: Pantheon Books, 1967.
3. Llosa, Mario Vargas. *The Cubs and Other Stories*. Trans. Gregory Kolovakos and Ronald Christ. New York: Farrar, Straus and Cirouxc, 1979.
4. Loundo, Dilip, ed. *Tropical Rhymes, Topical Reasons*. Brazil: National Book Trust, 2001.
5. Marquez, Gabriel Garcia. *One Hundred Years of Solitude*. Trans. Gregory Rabassa. New York: Avon Books, 1971.
6. —. *One Hundred Years of Solitude*. Trans. Gregory Rabassa. New York: Avon Books, 1967.
7. Mistral, Gabriela. *Madwomen*. Trans. Randall Couch. Chicago: University of Chicago Press, 2008.
8. Neruda, Pablo. *Twenty Love Poems and a Song of Despair*. Trans. W. S. Merwin. London: Penguin Books, 1976.
9. Neto, Joao cxabral De Melo. *Selected Poetry 1937 - 1990*. Hanover: Wesleyan University Press, 1994.
10. Paz, Octavio. *Selected Poems*. Ed. Eliot Weinberger. New York: New Directions, 1984.
11. —. *Sunstone*. Trans. Raymond Soulard and Kassandra Kramer. Seattle: Burning Man Books, 1957.

### Secondary References:

1. Bloom, Harold. *Bloom's Critical Views - Gabriel Garcia Marquez*. New York: Chelsea House Publishers, 2007.

2. —. *Bloom's Major Short Story Writers - Julio Cortazar*. Ed. Harold Bloom. Philadelphia: Chelsea House Publishers, 2004.
3. Castro-Klaren, Sara, ed. *A Companion to Latin American Literature and Culture*. Oxford: Blackwell Publishing, 2008.
4. Kristal, Efrain, ed. *The Cambridge Companion to the Latin American Novel*. Cambridge: Cambridge University Press, 2006.
5. Reisman, Rosemary, ed. *Latin American Poets*. Massachusetts: Salem Press, 2012.
6. Swanson, Philip. *Latin American Fiction*. Oxford: Blackwell Publishing, 2005.
7. Wood, Michael. *Landmarks of World Literature -One Hundred Years of Solitude*. Cambridge: Cambridge University Press, 1990.

## **T.Y.B.A. – SEMESTER VI – ELECTIVE PAPER**

**Paper Title:** Contemporary Literary Theory

**Paper Code:** ENG-VI.E-15

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To introduce the students to the basic concepts of Contemporary Literary Theory.
2. To introduce the students to major schools of literary theory.
3. To develop the ability in the students to apply literary theory to analyze a work of literature.

### **2. Learning Outcomes:**

Upon the completion of the course the students should be able:

1. To understand the different schools of literary theory.
2. To comprehend the basic tenets of modern literary theory and the jargon associated with it.
3. To apply literary theory and critically appreciate a work of literature.

### **3. Number of Lectures: 04 Lectures per week**

**Total number of lectures: 60**

### **4. Course Content:**

#### **Unit I: Marxist view of Literature**

**12 lectures**

- a) Society and History : Marxist view
- b) Major Marxists schools
- c) Marxism and literature:
  - i) Literature and ideology
  - ii) Autonomy in Literature
- d) Marxist approach to Literature

#### **Unit II: Psychoanalysis**

**13 lectures**

1. Views of Freud on human mind
2. Freudian approach to literature
3. Views of Lacan
4. Lacanian Criticism
5. Impact of psychoanalysis of literature

**Unit III: Structuralism and Post-structuralism****15 lectures**

1. From New Criticism to Structuralism
2. Important Tenets of Structuralism
3. Contribution of Saussure
4. Contribution of Jonathan Culler, A J Greimas, Roman Jakobson, Roland Barthes
5. Structuralist Approach to Literature
6. Defining Deconstruction
7. Deconstructing Structuralism
8. From 'Work to Test'
9. Death of the author
10. Deconstruction an example
11. Deconstructing Deconstruction

**Unit IV: Voices of the Subaltern: Feminist, Queer & Post-Colonial Theories****20 lectures****Feminist Theories**

1. Features of Feminist Criticism
2. Development to Feminist thought
3. Major contributors to Feminist Criticism
  - a) Mary Wollstonecraft
  - b) Virginia Woolf
  - c) Simon De Beauvoir
  - d) Elaine Showalter
  - e) Helen Cixous, Julia Kristeva
4. Gynocriticism
5. Feminist Criticism and Language
6. Feminist approach to literature

**Lesbian/Gay criticism**

1. Lesbian and Gay theory
2. Lesbian feminism
3. Queer theory
4. Lesbian/Gay criticism-An example

**Postcolonial Theory**

1. Edward Said's Orientalism
2. Gayatri Spivak's views on subalternity
3. Homi K. Bhabha's concept of mimicry



#### 4. Reference Books:

##### Primary References:

1. Abrams M. H. *A Glossary of Literary Terms*. Prism Publishers, 1999.
2. Barry Peter. *Beginning Theory*. Manchester United Press, Manchester, 1995.
3. Bertens Hans. *Literary Theory: Title Basics*. Routledge, London, 2001.
4. Eagleton Terry. *Literary Theory: An Introduction*. Blackwell, London, 1983.
5. Hawthorn Jeremy. *A Glossary of Contemporary Literary Theory*. Edward Arnold, London, 1994.
6. Selden Raman. *A Reader's Guide To Contemporary Literary Theory*. Harvester, London, 1993.
7. Webster Roger. *Studying Literary Theory: An Introduction*. Arnold Publishers, London, 1990.

##### Secondary References:

1. Ashcoft Bill, Griffiths Gareth, Tiffin Helen (ed). *The Post-Colonial Reader*. Routledge, New York, 1995.
2. Ashcoft Bill, Griffiths Gareth, Tiffin Helen (ed). *The Empire Writes Back*. Routledge, New York, 2010.
3. Butler Judith. *Gender Trouble*. Routledge India, 2016.
4. Jameson Fedric. *The Political Unconscious*. Routledge, New York, 1983.
5. Hawkes Terence. *Structuralism and Semiotics*. Routledge, New York, 2009.
6. Woods Tim. *Beginning Post-modernism*. Manchester University Press, Manchester, 2009.
7. Sarup Madan. *An Introductory Guide to Post-structuralism and Postmodernism*. 2<sup>nd</sup> Edition. The University of Georgia Press, Georgia, 1993.
8. Sedgwick Kosofsky Eve. *Epistemology of the Closet*. University of California Press, 2<sup>nd</sup> revised edition, 2008.
9. Vanita Ruth, Kidwai Saleem (eds). *Same-Sex Love in India: A Literary History*. Penguin India, 2008.

## **T.Y.B.A – SEMESTER VI - ELECTIVE PAPER**

**Paper Title:** World Literature

**Paper Code:** ENG-VI.E-16

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

- a) To expose students to representative works of world literature to develop their sensitivity to cultural diversity.
- b) To promote intellectual growth by strengthening student's abilities to read analytically and critically.
- c) To promote an understanding of the works in their cultural/historical contexts.

### **2. Learning outcomes:** By the end of the course the student will be able to:

- a) Understand and have an insight into the diverse representative works of World Literature.
- b) Have the ability to analyze works of literatures critically, keeping in mind the cultural diversity.
- c) Will be familiar with the various themes and narrative techniques of World Literature.

### **3. Number of Lectures:** 04 lectures per week

### **4. Course Content:**

**Total number of lectures: 60**

#### **Unit I: Novel**

**15 Lectures**

Chinua Achebe: Things Fall Apart

#### **Unit II: Drama**

**15 Lectures**

J. M. Synge - Riders to the Sea

#### **Unit III: Poetry**

**15 Lectures**

1. M. Klein- Indian Reservation: Caughnawaga
2. P.K. Page -First Neighbours
3. Margaret Atwood- Journey to the Interior

4. David Rubadiri- A Negro Labourer In Liverpool
5. Arthur Nortje- Letter From Pretoria Central Prison
6. Wole Soyinka -Telephonic Conversation
  - a. Dedication
7. Kath Walker – a) A Song of Hope
  - b) Dawn is at Hand
8. Les Murrays -The Widower in the Country

#### **Unit IV: Short Stories**

**15 Lectures**

- 1) Alice Munro- Child's play
- 2) Anton Chekvo- The Bet
- 3) Edwidge Danicat- Children of the sea
- 4) Henry Lawson- The Drover's Wife

#### **5. References:**

##### **Primary References:**

1. Achebe, Chinua. *Things Fall Apart*. Penguin Books, New Delhi, 2001.
2. Chekhov Anton. *Masterpieces of World Fiction: Selected Stories*. Rupa Publications, New Delhi, 2014.
3. Henry, Lawson. *The Penguin Henry Lawson Short Stories*. Penguin Books, New Delhi, 1998.
4. Klein. A.M. *The Rocking Chair and other Poems*. Toronto, McGraw-Hill, Ryeson, 1948.
5. Munro, Alice. *Too Much Happiness*. Penguin, Canada, 2012.
6. Page, P. K. *The Glass Air: Selected Poems*. Oxford University Press, 1986.

##### **Secondary References:**

1. Bloom, Harold, ed. *Modern Critical Views Anton Chekhov*. Chelsea House, Philadelphia, 1999.
2. Bloom, Harold. *Alice Munro*. Bloom's Literary Criticism, New York, 2009.

3. Dash, J. Michael. *Edwidge Danticat: A Reader's Guide*. Charlottesville, University of Virginia, 2010. 26–38. Print.
4. Counihan, Clare. "Desiring Diaspora: 'Testing' The Boundaries Of National Identity In Edwidge Danticat's *Breath, Eyes, Memory*." *Small Axe: A Caribbean Journal Of Criticism* 37. (2012): 36–52.
5. Eekman, Thomas A., and Virginia L. Smith. *Critical Essays on Anton Chekhov*. ed. Robert Lecker. G.K. Hall and Co, Boston, 1989.
6. Fisher, J. & Silber, E. (eds). *Women in Literature: Reading through the Lens of Gender*. Connecticut, Greenwood Press, 2003.
7. Matlaw, Ralph E., and Freedman, comps. *Anton Chekhov's Short Stories*. W.W. Norton and Company, New York, 1979. Print.
8. Pollock, Zailig, Seymour Mayne, Usher Caplan ed. *Selected Poems: A.M. Klein*. University of Toronto Press, Toronto, 1997.
9. Thacker, Robert. *Reading Alice Munro, 1973-2013*. University of Calgary Press, 9 Feb 2016.
10. Sakineh, Hamidi Mehr. *Critical Discourse Analysis of Alice Munros Short Stories*. Lambert Academic Publishing, London, 2014.
11. Hooper, Brad. *The Fiction of Alice Munroe*. Green publishing group, London, 2008.
12. Hunter, Adrian. *The Cambridge Introduction to the Short Stories in English*. Cambridge University Press, Cambridge, 2007.
13. Fallon Erin, and R.C. Feddersen, James Kurtzleben, Maurice A. Lee, Susan Rochette-Crawley.ed. *A Reader's Companion to the Short Story in English*. Routledge, New York, 2001.
14. Bartels, Anke, Dirk Wiemann, ed. *Global Fragments: (dis)orientation in the New World Order*. Rodopi, Amsterdam, 2007.

## **SEMESTER VI– INTERDISCIPLINARY PAPER**

**Paper Title:** Introduction to Mass Media

**Paper Code:**

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To give students an overview of Mass Media in today's world.
2. To introduce them to the world of communication in Media, through the fields of Print Media, Radio, Television, Film, Digital Media/New Media.
3. To develop an understanding of Mass Media and related concepts through a practical hands-on approach.
4. To introduce students to the various equipment and software required in the field.
5. To create a foundation and a broad base knowledge for further studies and careers in Media as an option for students.

### **2. Learning outcomes :**

Upon completion of the course the student should be able:

1. To comprehend the field of Mass Media - from print to Digital Media.
2. To understand a few theoretical perspectives behind mass media and the jargon associated with the field.
3. To be comfortable around the various equipment and software required for various media
4. To demonstrate competence in the field of Mass Media – be it in the ideation or execution stage.

**3. Number of Lectures:            04 Lectures per week**

#### 4. Course Content:

**NOTE:** To ensure the competency of students in the field after graduation, emphasis should be given to the APPLIED aspect of the course, while ensuring that the students understand various concepts of each field along with key-terms.

##### **Unit I – Mass Communication & Media Studies**

**05 Lectures**

**Concepts:** Mass Communications; Other forms of Communications; Technologies and Communications; Mass Media and Contemporary Culture; Media Studies – Encoding messages; Audience responses; Agenda

##### **Unit II – Advertising**

**11 Lectures**

**Concepts:** Brief History; Target Audience; Buying Motives; Advertising Message; Advertising Ethics; Advertisements in Different Media (Print; TV; Radio; New Media); Future in Advertising; Careers

**Applied:** Radio ad; Print ads – Newspapers/magazines – Product/info-ads; copy/layout/design; TV ad; Advertisements in New Media; PSA's

##### **Unit III – Print Media – Newspapers & Magazines**

**12 Lectures**

**Concepts:** Brief history of Newspapers & Magazines; Types of Magazines & Newspapers; Layout/Design of Newspapers & Magazines; Reports – Different formats; Photography and Print

**Applied:** Creation of Magazine/Newspaper; Layout/composition

##### **Unit IV – Radio & Music**

**11 Lectures**

**Concepts:** Brief History of Radio & Music; Radio Today: Internet and Music; Types of Radio Formats; Types of Music Formats; Digital Radio & Music; Future of Radio & Music; Careers

**Applied:** Radio Shows; Radio Editing; Radio Plays; Music and Composing

## **Unit V – Television, Cinema & Video**

**11 Lectures**

**Concepts:** Brief History of Broadcast TV & Cable TV; Cinematic History; Cinema & TV industry today; Future of TV & Cinema; Types of TV formats/shows etc; Types of Cinema; Internet and the Age of Streaming; Careers

**Applied:** TV Shows; Documentaries; Basic Shots; Editing; 3 Act movie; Short movie

## **Unit VI - Internet& New Media**

**10 Lectures**

**Concepts:** Brief History of Internet & New Media; Internet in the new age; Internet and Disruption; Mobile Phones; Blogging; Video games; New Media Careers; Future of the internet

**Applied:** New Media – Blogging, Podcasting, Social Media

## 5. Reference Books:

### Primary References:

1. Campbell, Richard. Martin, Christopher. Fabos, Bettina. *Media & Culture – An Introduction to Mass Communication (8<sup>th</sup> Ed.)*. Bedford. 2012.
2. Dominick, Joseph. *The Dynamics of Mass Communications (8<sup>th</sup> ed.)*. McGraw-Hill, 2005.
3. Paxson, Peyton. *Mass Communications and Media Studies – An Introduction*. Continuum, 2010.
4. Thompson, Ray. *Grammar of the Edit*. Burlington: Focal Press, 1993.

### Secondary References:

1. Mcquail, Denis. *Mass Communication Theory*. Vistaar Publications. 2007.
2. *The Associated Press Style Book and Libel Manual* Norm The A.P, 1994.
3. Hilliard, Robert. *Writing for Television, Radio and New Media (Seventh Ed.)*. Wadsworth. 2006.
4. Pavlik, J.V. *Media in the Digital Age*. 2008.
5. Perry, David K. *Theory and Research in Mass Communication*. Lawrence Erlbaum Associates, 2002.
6. Ruberg, Michelle. *Handbook of Magazine Article Writing*. Writer's Digest. 2009
7. Stadler, Jane and McWilliam, Kelly. *Screen Media – Analysing Film and Television*. Allen & Unwin. 2009.
8. White, Ted. *Broadcast News Writing, Reporting & Production*. Macmillan.



**Parvatibai Chowgule College of Arts and Science  
Autonomous**

**DEPARTMENT OF ENGLISH  
COURSE STRUCTURE  
THREE YEAR B.A. DEGREE COURSE IN ENGLISH**

SEMESTER	CORE COMPULSORY		CORE ELECTIVE			
I	<b>ENG-I.C-1</b>  Understanding Poetry & Drama	<b>ENG-I.C-2</b>  History of English Literature from Fifth Century to the Eighteenth Century	----	----	----	----
II	<b>ENG-II.C-3</b>  Understanding Fiction	<b>ENG-II.C-4</b>  An Introduction to Linguistics & Stylistics	----	----	----	----
III	<b>ENG-III.C-5</b>  Contemporary Indian English Literature	----	<b>ENG-E-12</b>  Women's Writing in India	<b>ENG-E-2</b>  American Literature of the Twentieth Century	<b>ENG-E-3</b>  Writing for the Media	<b>ENG-E-4</b>  New Literatures in English
IV	<b>ENG-IV.C-6</b>  Literary Criticism	----	<b>ENG-E-5</b>  The Literature of the Indian Diaspora	<b>ENG-E-6</b>  Creative Writing	<b>ENG-E-7</b>  Visual Literature	<b>ENG-E-16</b>  World Literature
V	<b>ENG-V.C-7</b>  Nineteenth Century English Literature	-----	<b>ENG-E-9</b>  Shakespeare Today	<b>ENG-E-10</b>  Ancient Indian Classics in Translation	<b>ENG-E-11</b>  Film Studies	<b>ENG-E-1</b>  Goan Literature and Culture
VI	<b>ENG-VI.C-8</b>  Twentieth Century English Literature	-----	<b>ENG-E-13</b>  English Language and Literature Teaching	<b>ENG-E-14</b>  Latin American Literature	<b>ENG-E-15</b>  Contemporary Literary Theory	<b>ENG-E-8</b>  Representation of Gender & Sexuality in Literature

<b>SEMESTER</b>	<b>OPTIONAL</b>
I	Effective English Communication (Arts Stream)
II	Effective English Communication (Science Stream)
III	-----
IV	-----
V	-----
VI	-----

<b>SEMESTER</b>	<b>INTERDISCIPLINARY</b>
Even Semester	<b>ENG-E-6</b> Creative Writing
Odd Semester	<b>ENG-E-11</b> Film Studies

**PARVATIBAI CHOWGULE COLLEGE OF ARTS AND SCIENCE  
AUTONOMOUS**

**DEPARTMENT OF ENGLISH  
REVISED SYLLABI OF SEMESTER I, II, III, IV, V & VI  
2018-2019**

**F.Y.B.A. – SEMESTER I – CORE COURSE**

**Course Title:** Understanding Poetry & Drama

**Course Code:** ENG-I.C-1

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To acquaint students with major poetic forms and trends in English Poetry.
2. To enable students to read and appreciate poems.
3. To improve the literary and critical competence of the students.
4. To teach students to appreciate English Drama.
5. To instill the appreciation of Drama and the universality of its reach.
6. To train students to identify basic elements in a Drama.

**2. Learning Outcomes:**

Upon completion of the course the student should be able:

1. Recognize and define major poetic forms such as lyric poetry, narrative poetry.
2. Know and identify rhyme, rhythm and meter.
3. Understand and appreciate the literal and symbolic/inner meaning (connotative and denotative meaning) of a poem.
4. Identify and analyze special stylistic features of poetry such as imagery, tone, atmosphere, special linguistic and stylistic features, imagery.
5. Recognize and appreciate various elements of a drama: Plot, Character, Dialogue, Setting, Theme, and Act-Scene Division.
6. Understand and be knowledgeable about the evolution of two major forms of Drama – Tragedy and Comedy.

**3. Number of hours:                    04 hours per week**

**5. Course Content:**

**Total Number of hours: 60**

**Unit I: Background to Poetry & Drama**

**12 hours**

1. Poetry as a Literary form
2. Nature and types of lyric poetry
3. Evolution of lyric as a literary form
4. Nature and forms of narrative poetry
5. Evolution of the English Drama
6. Nature of Tragedy & Comedy in Drama

**Unit II: Lyric Poetry: Songs, Sonnets, Odes, Elegies and Dramatic Monologues**

**12 hours**

1. Edmund Spenser            a) Whilst in Prime
2. William Shakespeare    a) Marriage of True Minds
3. John Donne                a) Batter my Heart
4. Robert Herrick            a) To Daffodils
5. William Blake             a) Lamb  
    b) Tyger
6. William Wordsworth      a) The Daffodils
7. Percy Bysshe Shelley     a) Mutability
9. John Keats                 a) Ode on a Grecian Urn
10. Robert Browning        a) My Last Duchess

**Unit III: Narrative Poetry: Ballads, Mock Epic**

**12 hours**

1. The Rime of the Ancient Mariner (Section 1) - Samuel Taylor Coleridge
2. Rape of the Lock (Canto I) - Alexander Pope

**Unit IV: Drama: Tragedy & Comedy**

**24 hours**

1. An Enemy of the People - Henrik Ibsen
2. The Admirable Crichton - James Matthew Barrie

## 5. Reference Books :

### Primary References:

1. Barrie. J. M. *The Admirable Crichton*.
2. Ibsen, Henrik. *An Enemy of the People*.

### Secondary References:

1. Abrams, M. H. *A Glossary of Literary Terms*. 11<sup>th</sup> Cengage Learning, 2014.
2. Bowra C.M. *Heroic Poetry*. Macmillan, 1966.
3. Ed. Bloom Harold. *William Shakespeare's Sonnets*. Viva Books, 2007.
4. Ed. Bottrall Margaret. *William Blake: Songs & Innocence & Experiences*. Macmillan, 1970.
5. Bradley. A.C. *Oxford Lectures on Poetry*. Atlantic, 2009.
6. Broadbent J.B. *Poetic Love*. Chatto & Windus London, 1964.
7. Chandra NDR, Sebastian A.J. *Literary Terms in English Poetry*. Authors Press, Delhi, 2001.
8. Cuddon J A. *The Penguin Dictionary of Literary Terms and Literary Theory*. Penguin Books, 1999.
9. Dobson, Michael and Wells, Stanley. *The Oxford Companion to Shakespeare*. Oxford, 2001.
10. Gardner Stanley. *Blake*. P. Evans Brothers Ltd, 1968.
11. Jump, John D.(Ed.) *Critical Idiom Series*. Law Book Co of Australasia, 1974.
12. Gridley Roy E. *Browning*. Routledge & Kegan Paul, 1972.
13. Ed. Grose Kenneth H. *Keats*. Evans Brother Ltd, 1969.
14. Hudson, W. H. *An Introduction to the Study of Literature*. B.I. Publications, 1972.
15. Klarer Mario. *An Introduction to Literary Studies*. Routledge, 2004.

16. Lever J.W. *The Elizabethan Love Sonnets*. Methuen & Co. Ltd, 1966.
17. Ed. O'Neill Judith. *Critics on Keats*. George Allen & Unwin Ltd, 1967.
18. O'Neill Judith. *Critics of Pope*. George Allen & Unwin Ltd., London, 1968.
19. Prasad, B. *Background to the Study of English Literature for Indian Students*. Trinity Press, 2014.
20. Read Herbert. *Wordsworth*. Faber & Faber Ltd, 1957.
21. Sarker Sunil Kumar. *Shakespeare's Sonnets*. Atlantic Publisher, 2006.
22. Rees, R. J. *Introduction to English Literature*. New Delhi: Macmillan India, 1973.
23. Smith Hallett. *Elizabethan Poetry*. Ann Arbor Paperbacks, 1968.
24. Ed. Ward Sir W. & Walter A.R. *The Cambridge History of English Literature*. Cambridge University Press, 1914.
25. Westland Peter. *Literary Appreciation*. The English University Press Ltd, 1964.

## **F.Y.B.A – SEMESTER I – CORE COURSE**

**Course Title:** History of English Literature from Fifth Century to the Eighteenth Century

**Course Code:** ENG-I.C-2

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To provide a comprehensive overview of major periods in the History of English literature.
2. To introduce to the students the historical and cultural contexts in which English Literature has developed through the ages.
3. To provide a view of major writers and their works in different ages.
4. To explore the complex relationship between literature and its context through discussion of particular literary trends, texts and issues within each period.

### **2. Learning Outcomes:**

1. Identify and perceive the complex relationship between literature and society.
2. Enable the learner to explain how and why particular types of literature emerged from particular set of historical circumstances.
3. Critically appreciate representative literary works written in different ages.
4. Inculcate ability to read independently literary texts of the Renaissance to the 18<sup>th</sup> Century

### **3. Number of hours: 04 hours per week**

#### 4. Course Content:

Total Number of hours: 60

##### Unit I: Anglo Saxon Age

12 hours

1. The dark ages and the Norman conquest^
2. Development of English Language (Old English and Middle English)^
3. The age of Chaucer/From Chaucer to Renaissance (1350- 1516)^
4. Age of unrest and transition, Religious movements, ^
5. New learning of classical antiquity Petrarch, Giovanni Boccaccio ^
6. Anglo Saxon Literature- Beowulf ^\*
7. Works of Major prose writers- John Wyclif, Sir John Mandeville ^\*
8. Works of Major Poets- Geoffrey Chaucer, William Langland, John Gower ^\*

##### Unit II: The English Renaissance/ The age of Shakespeare (1578-1625)

18 hours

1. Renaissance and Reformation
2. Development of drama from Miracle and Morality Plays#
3. War of the Roses, Anglican Clergy, Elizabethan age and Geographical discoveries
4. Interludes to University Wits^
5. Shakespeare# and Humanism
6. Poetry- Songs and sonnets of the 16th century, Bacon's Essays
7. Prose- Translations (Wyclif, Tyndale, Coverdale, Authorized Version of 1611),  
Historical and biographical works, Literary Criticism, Religious writings, Humanistic writings, Elizabethan satirical writings (Nash, Lodge, etc.)#

##### Unit III: The Seventeenth Century

18 hours

1. Political Background:  
England under James I (Jacobean Period) and Charles I (Cavaliers)^  
Commonwealth, the triumph of Puritanism^  
Restoration: Charles II^
2. Literary Movements:  
The age of John Milton and John Dryden(1625- 1700)^
3. Religious Movement: Puritanism^  
Prose- Sir Thomas Browne, ^(#)  
The Puritan writers^(#)  
Restoration prose: (Hobbes, Newton)^(#)  
Diarist of the Age: Samuel Pepy, John Evelyn,^(#)  
Moral Essays(Cowley, Temple)^, John Bunyan,^ George Fox,Thomas Ellwood,\*  
Establishment of Royal Society and the development of modern prose Poetry – The Cavalier Poets^\*(#)



The Metaphysical Poet: John Donne^(#), John Milton, Dryden \*(#)  
Restoration Drama: William Congreve^(#), John Vanburgh, George Farquhar, William  
Wycherley, George Etherege \*(#)  
Literary Criticism: Dryden ^(#)

#### **Unit IV: The Eighteenth Century**

**12 hours**

1. Political Background:

Reign of Queen Anne ^

2. Literary Movements:

The Age of Alexander Pope and Dr. Samuel Johnson (1700-1789)^

Periodical Essays ^

The Age of Prose and Reason^

Satires of the age^

The rise of the novel Sentimental Comedy^

3. Society:

The Coffee House Culture^(#)

Periodical Essays: Thomas Addison\*(#) and Dr. Samuel Johnson^(#)

Satires of the age – Johnathan Swift^(#)

Neoclassicism Augustan Reflective poetry - Alexander Pope^(#), Lady Anne Finch of  
Winchelsea\*(#)

Precursors of Romantic Poetry: Thomas Collins^(#), Thomas Gray\*(#) and Oliver  
Goldsmith\*(#) Robert Burns\*(#) and William Cowper \*(#)

**NOTE:** There shall be further changes made to the syllabus wherein certain topics shall be assigned for self-study.

**Key:** \* -Self-study, ^ -Discussed in class by the Instructor, # -shall be given as Assignments and Presentations

#### **5. Reference Books:**

##### **Primary References:**

1. Daiches David. *A Critical History of English Literature*. Allied Publishers Ltd. New Delhi, 1999.
2. Ford Boris Ed. *The Pelican Guide to English Literature*. Penguin Books UK, 1964.

3. Hudson William. *An Outline History of English Literature*. B I Publications, Bombay, 1972.
4. Poplawski Paul ed. *English Literature in Context*. New Delhi: Cambridge University Press, 2008.

**Secondary References:**

1. Compton-Rickett Arthur. *A History of English Literature*. Universal Book Stall, Delhi, 1969.
2. Evans I for. *A Short History of English Literature*. The English Language Book Society & Penguin Books, 1970.
3. Legouis Emile, and Cazamian Louis, Vergnas Raymond. *A History of English Literature*. London: J.M. Dent and Sons LTD, 1964.

**F.Y.B.A. / F.Y.B.Sc. – SEMESTER I/II – OPTIONAL ENGLISH**

**Course Title:** Effective English Communication

**Course Code:** FC-ENG-I

**Marks:** 100

**Credits:** 4

**Duration:** 60 hours

**1. Course Objectives:**

1. To help students develop proficiency in oral communication in English.
2. To help students understand the importance of developing good listening skills.
3. To help students become proficient in listening , writing and speaking skills

**2. Learning Outcomes:**

Upon completion of the course the student should be able:

1. Speak fluently, confidently and use correct English.
2. Efficiently draft letters– formal & informal letters, representations, notices, agendas and minutes of meetings.
3. Communicate effectively through written communication.

**3. Number of hours:                      04 hours per week**

#### 4. Course Content:

**Total Number of hours: 60**

##### **Unit I: Fun with Grammar**

**15 hours**

Students need to have a basic proficiency in Grammar to complete this course.

Pre-requisite to the course: Knowledge of Basic Grammar – Articles, Adjectives, adverbs, Conjunctions, Sentence Structures – SVO etc

The above can be revised briefly. Grammar component will be taught incidentally and in conjunction with Unit II.

1. Parts of Speech
2. Reported Speech
3. Punctuation
4. Phrases and Clauses
5. Active and Passive
6. Basic Errors in English Language
7. Spotting Errors and correcting them
8. Revising and Editing

Note: The teacher concern can make use of the following, to teach Grammar.

1. Reading a picture
2. Quiz
3. Word play
4. Dialogues

##### **Unit II: Spoken English**

**15 hours**

##### **1. Individual Presentation Skills**

**5 hours**

Students are to be taught public speaking using Presentation skills through application based teaching; public speaking is to be taught and application of these skills in formal and informal settings.

a) Concepts:

- i. Importance of Body Language and Eye Contact in Spoken Communication
- ii. Ways to Overcome Fear of Speaking
- iii. Pace, Tone and Intonation

iv. Listening as an Essential Part of Communication. How to be a an Effective Listener

b) Applied:

Students will be given topics to present before the class. They can use a host of methods to do so

1. Presentation with material - Formal
2. Oral presentation
3. Formal/Informal Speeches – Welcome, Introduction to a dignitary, Raising a toast, Farewell Speech, celebratory speeches

2. Pair Based Activities 5 hours

- a) Telephone Etiquette
- b) Speaking and Listening Classroom Practice Exercises in Pairs and Groups.

3. Group Based Activities 5 hours

Minutes of the meeting can be used as a group based activity.

Group Discussions of Formal and Informal nature.

### **Unit III: Written English**

**15 hours**

1. Letters

a) Formal Letters

- i. Job Application Letters
- ii. Enquiry Letters
- iii. Orders and Complaints letters
- iv. RTI
- v. Representations
- vi. Writing a resume

b) Social Letters

- i. Invitation &Reply
- ii. Condolence & Reply
- iii. Congratulations & Reply
- iv. Thank you & Reply

## Unit IV: Digital Story Telling (DST)

15 hours

Descriptive Writing – (Open to the Teacher to explore this writing in various areas Fiction and Non-Fiction and creative expression of personal writing)

### 5. Reference Books:

#### Primary References:

1. Azar, Betty Schramper. *Basic English Grammar*. New York: Pearson Education, 1996.
2. Biber, Douglas, Susan Conrad and Geoffrey Leech. *Longman Student Grammar of Spoken and Written English*. Edinburgh: Pearson Education Limited, 2002.
3. Bullock, Richard. *The Norton Field Guide to Writing*. New York: W.W. Norton & Company, 2009.
4. Jain, A.K. and Dr. Pravin S.R. Bhatia. *Professional Communication Skills*. New Delhi: S.Chand& Company Ltd, 2000.
5. Mohan, Krishna and Singh, N. P. *Speaking English Effectively* Macmillan India Ltd.
6. Sadanand, Kamelesh and Susheela Punitha. *Spoken English: A Foundation Course- Part I*.Hyderabad: Orient Blackswan Private Limited, 2009.
7. Stanek, William. *Effective Writing for Business, College and Life*. Reagent Press, 2005.

#### Secondary References:

1. Bullock, Richard. *The Norton Field Guide to Writing*. New York: W.W. Norton & Company, 2009.
2. Chakravarty, Auditi and Bonnie Boehme. *Grammar & Usage for Better Writing*. New York: Amsco School Publications, 2004.
3. Downing, Angela and Philip Locke. *English Grammar A University Course*. London and New York: Routledge, 2006.

4. Hewings, Martin. *Advanced Grammar in Use*. 2nd. Great Britain: Cambridge University Press, 2005.
8. Naylor, Helen and Raymond Murphy. *Grammar in Use Supplementary Exercises*. Edinburgh: Cambridge University Press, 2001.

## **F.Y.B.A. – SEMESTER II – CORE COURSE**

**Course Title:** Understanding Fiction

**Course Code:** ENG-II.C-3

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To help students understand the evolution of the Novel and Short Story as distinct Literary Forms.
2. To help students understand the contribution of various other literary forms like Medieval Romances, Character Sketch etc. to the evolution of the novel.
3. To help students understand how the socio-economic conditions prevalent in the 18<sup>th</sup> century contributed to the rise of the Novel, and how the conditions prevalent in the 19<sup>th</sup> century contributed to the rise of the Short Story.
4. To help students understand the contribution of various other literary forms like Parables, Fables etc. to the evolution of the Short Story.
5. To help students understand the characteristics of the short story through the study of few popular short stories.
6. To teach students to appreciate English Fiction.
7. To instill the ability of recognizing the various elements of Fiction.

### **2. Learning Outcomes:** By the end of the course the student will be able:

1. Recognize and define elements of Short Stories, Novella and Novel such as Plot, Character, Setting, Theme.
2. Understand the structural difference between a short story and a novel.
3. Critically analyze short stories and novels.
4. Understand the inception of the short story, novella and novel.

### **3. Number of hours: 04 hours per week**



**4. Course Content:**

**Total Number of hours: 60**

**Unit I: Background**

**10 hours**

1. Contribution Of Medieval Prose Romances to evolution of English Novel
2. Other Literary Forms That Contributed to the Novel (diaries and journals, biographies/autobiographies, letters, character sketch)
3. Reasons for Emergence and Growth of the Novel as a Distinct Literary Genre In the 18<sup>th</sup> Century
4. Characteristics of the contemporary novel
5. Elements of the Novel
6. Contribution of writers of Asian, African, Latin American origin to the Contemporary English Novel.
7. **Ancient Roots/origins of the short story** (Stories of the Old Testament, Parables Of the New Testament, Fables, Panchatantra Stories, Boccaccio's Decameron etc.)
8. Reasons for the emergence of the short story in the 19<sup>th</sup> century
9. Characteristics Of the short Story
10. Difference between Novella and Short Story.

**Unit II: Novel**

**25 hours**

1. Lord of the Flies - William Golding

**Unit III: Short stories**

**10 hours**

1. The Gift Of the Magi - O Henry
2. The Cask Of Amontillado - Edger Alan Poe
3. Darling - Chekov
4. A Wrong Man in Worker's Paradise - Rabindranath Tagore
5. The Tiger In the Tunnel - Ruskin Bond
6. The Doctor's word - Rasipuram Krishnaswami Iyer Narayanaswami
7. Vengeful Creditor - Chinua Achebe
8. Good Advice Is Rarer then Rubies - Salman Rushdie
9. The Monkey's Paw - William Wymark Jacobs

#### Unit IV: Novella

15 hours

1. Animal Farm - George Orwell

(NOTE: Some short stories as well as background topics will be given for self study)

#### 5. Reference Books:

##### Primary References:

1. Achebe, Chinua. *Girls At War*. Johannesburg, South Africa: Penguin Books, 2009. Print.
2. Cross, Wilbur. *The Development of the English Novel*. New York: Atlantic Publishers and Distributors, 2001. Print.
3. Desai, Anita. *Fasting, Feasting*. New York: Mariner Original, 1999. Print.
4. Golding William- *Lord of the Flies*. Penguin; Deluxe edition, 2017. Print.
5. Hunter, Adrian. *The Cambridge Introduction To The Short Story In English*. New Delhi: Cambridge University Press, 2007. Print
6. Hoppenstand, Gary , W.W. Jacobs. *The Monkey's Paw and Other Tales of Mystery and the Macabre*. Chicago Review Press; Revised ed. Edition. 2005. Print.
7. Kohli. Suresh (ed). *Modern Indian Short Stories: An Anthology*. New Delhi: Arnold Heinemann Publishers, 1974. Print.
8. Orwell, George. *Animal Farm*. Penguin India; Fourth edition, 2011. Print.

##### Secondary References:

1. Abrams M. H. *A Glossary of Literary Terms*. Bangalore. Prism Books. 1999.
2. Daiches, David. *A Critical History Of English Literature Vol 1. 2<sup>nd</sup> ed*. New Delhi: Allied Publishers Pvt. Ltd., 2004. Print.
3. Reid, Ian. *The Short Story*. New York: Barnes and Nobel, 1977. Print

## **F.Y.B.A. – SEMESTER II – CORE COURSE**

**Course Title:** An Introduction to Linguistics and Stylistics

**Course Code:** ENG-II.C-4

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To acquaint the students with the basic concepts in linguistics.
2. To introduce the students to various sub disciplines of linguistics.
3. To know the connection between linguistics and stylistics.
4. To understand the concept of style in literature.
5. To provide hands on experience in analysing texts, fiction and poetry.

### **2. Learning Outcomes:** By the end of the course the student will be able to:

1. Identify and classify English sounds.
2. Produce utterances with correct stress and rhythm.
3. Distinguish between different international varieties of English registers of English.
4. Analyse stylistic features of literary language.
5. Ability of analyse English syntax.
6. Select and use appropriate register of English language.
7. Ability to write grammatically correct English.

### **3. Number of hours: 04 hours per week**

### **4. Course Content:**

**Total Number of hours: 60**

#### **Unit I: Nature of Language**

**05 hours**

1. Language and communication
2. Origin of language
3. Characteristics of human language
4. Language varieties: standard and non-standard language, dialect, register, slang, pidgin, Creole; International varieties of English
5. Language change

**Unit II: English Phonetics and Phonology****10 hours**

1. The Speech mechanism
2. Phonemes of English: Description and Classification
3. Syllable : Structure and Types
4. Word Stress, Degrees of Stress, Stress Shift, Grammatical Stress
5. Sentence Stress: Use of Weak and Strong Forms,
6. Intonation Patterns/Uses of Tones

**Unit III: English Morphology****10 hours**

1. Morphemes: Free and bound morphemes; Morphs and allomorphs
2. Word Formation in English: Simple, complex, compound, and compound-complex words; affixes, stems, roots; inflectional vs. derivational morphology
3. The process of word formation: Backformation, reduplication, blends, clippings, acronyms
4. Meaning change: Generalization, specialization, change in connotations

**Unit IV: Syntax and Grammar****10 hours**

1. Different approaches to syntax
2. Parts of speech, Basic sentence structures, Types of sentences, clauses, phrases

**Unit V: Semantics****10 hours**

1. Words as signs, transparent and opaque words
2. Conceptual vs. associative meaning
3. Lexical relations: synonymy, antonymy, hyponymy, homophony, homonymy, polysemy

**Unit VI: Applied Linguistics****15 hours**

1. Linguistic approach to literature: Difference between ordinary language and language of literature  
Use of linguistics in the study of literature (stylistics): Figurative language; linguistic deviations; Phonological patterns of rhyme metre, alliteration, assonance, clustering of vowel and consonant sounds

2. Linguistics and language teaching: First language acquisition; Second language

learning, barriers in learning second language, Methods of teaching second language: Grammar-translation method, Direct method, audio-lingual method, the communicative approach

## 5. Reference Books:

### Primary References:

1. Akmajian, Demers, Farmer, Harnish. Linguistics. *An Introduction to Language and Communication*. PHI Learning Private Limited, New Delhi, 2009.
2. Leech Geoffrey. *Linguistic Guide to Poetry*. Routledge London, 1969.
3. Jones Daniel. *An Outline of English Phonetics*. Cambridge Uni. Press, 1972.
4. Lyons John. *Language and Linguistics an Introduction*. Cambridge University Press, 2003.
5. Quirk Randolph, Greenbaum Sidney. *A university Grammar of English*. Pearson Education Ltd. 2012.
6. Wallwork J F. *Language and Linguistics: An Introduction to the study of Language*. Heinemann Educational Books London, 1969.
7. Yule George. *The Study of Language: An Introduction*. Cambridge University Press, 1985.

### Secondary References:

1. Aarts, Bas and April McMahon. *The Handbook of English Linguistics*. Malden: Blackwell Publishing, 2006.
2. Broderick, John P. *Modern English Linguistics - A Structural and Transformational Grammar*. Thomas Y. Crowell Company, 1975.

3. Copley, Paul, ed. *Semiotics and Linguistics*. London: Routledge, 2001.
4. Dixon, R. M. W. *A Semantic Approach to English Grammar*. 2nd. Oxford University Press, 2005.
5. Hyland, Ken, ed. *English for Academic Purposes - An advanced resource book*. New York: Routledge, 2006.
6. Kretzschmar Jr, William A. *The Linguistic of Speech*. New York: Cambridge University Press, 2009.
7. Meyer, Charles. *Introducing English Linguistics*. Edinburgh: Cambridge University Press, 2009.
8. Radden, Gunter and Rene Dirven. *Cognitive English Grammar*. John Benjamins Publishing Company, 2007.
9. Trask, R. L. *Language & Linguistics - The Key Concepts*. Ed. Peter Stockwell. New York: Routledge, 2007.
10. Trousdale, Graeme and Nikolas Gisborne. *Constructional Approaches to English Grammar*. Berlin: Mouton de Gruyter, 2008.

**S.Y. B.A. – SEMESTER III – CORE COURSE**

**Course Title:** Contemporary Indian English Literature

**Course Code:** Eng-III.C-5

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To introduce the students to different genres of contemporary Indian writing in English.
2. To acquaint the students with the narrative of India' struggle for independence.
3. To familiarize the students with various themes and cultural contexts of Contemporary Indian English Writing.

**2. Learning Objectives:**

By the end of this course students:

1. Students with literature of Contemporary Indian English Literature.
2. Create awareness of the different genres employed by Contemporary Indian English Writers.
3. Elevate critical reading skill.
4. Familiarize students with the various themes and narrative techniques of the Contemporary Indian English writers.

**3. Number of hours:** 04 Hours per week.

#### 4. Course Content:

Total Number of hours: 60

#### Unit I: Poetry

15 hours

1. Keki Daruwala a) Boat-ride Along The Ganga  
b) Draupadi

Secondary Reading - Hawk

2. Adil Jussawala a) On First Approaching Santacruz Airport, Bombay  
b) Bars

3. Nissim Ezekiel a) Goodbye Party for Miss Pushpa T.S.  
b) Background casually

4. Arun Kolatkar a) The Bus  
b) An Old Woman  
c) Ajamil and the Tigers

5. Jayanta Mahapatra a) Hunger

6. Attipate Krishnaswami Ramanujan a) Love Poem for a Wife  
b) A River

7. Kamala Das a) Introduction  
b) My grandmother's House  
c) Summer in Calcutta

#### Unit II: Drama

18 hours

1. Final Solutions - Mahesh Dattani
2. Yayati - Girish Karnad

#### Unit III: Prose

12 hours

1. Short Stories

- a) A Horse and Two Goats - Rasipuram Krishnaswami Iyer Narayanaswami
- b) The Blue Umbrella - Ruskin Bond
- c) Portrait of a Lady - Khushwant Singh
- d) Vilas Sarang – (one short story to be selected from either *Fair Tree of the Void* or *The Women In Cages: Collected Stories.*)

2. Novel

15 hours

- a) Train to Pakistan- Khushwant Singh



## 5. Reference Books:

### Primary References:

1. David Davidar. *A Clutch of Indian Masterpieces*. New Delhi: Aleph Book Company, 2014.
2. Girish Karnad. *Yayati*. New Delhi: Oxford University Press, 2007.
3. Singh Khushwant. *Train to Pakistan*. Penguin, 2016.
4. Vilas Sarang. *Fair Tree of the Void*. Penguin Books Ltd.

### Secondary References:

1. Iyengar, K. R. S. *Indian Writing in English*. New Delhi: Sterling Publishers Pvt. Ltd., fourth edition, 1984.
2. Joshi, Dr. Rakesh. *Girish Karnad's Plays*. Jaipur: Mark Publishers, 2011.
3. Khair Tabish. *Babu Fictions: Alienation in Contemporary Indian English Novels*. UP: Oxford UP, 2001.
4. King, Bruce. *Modern Indian Poetry in English*. USA: Oxford University Press, 2005.
5. Mehrotra Arvind Krishna. *Twelve Modern Indian Poets*. New Delhi: Oxford India Paperback, 1993.
6. Naik, M. K, S. K. Desai and G. S. Amur. *Critical Essays on Indian Writing in English*. New Delhi: MacMillan, 1968.
7. Paranjape, Makarand R. *Indian poetry in English*. New Delhi: Macmillan, 1993.
8. Parthasarathy, R.(ed.). *Ten Twentieth - Century Indian Poets (New Poetry in India)*. New Delhi: Oxford University Press, 1976.
9. Shama, Ram. *Recent Indian English Literature*. Delhi: Manglam Publications, 2012.
10. Vilas Sarang. *The Women In Cages: Collected Stories*. Penguin India, 2006.
11. Warma, Monica. *Modern Indian Poetry in English*. New Delhi: Oxford University Press, 2010.

**Course Title:** Women's Writing in India

**Course Code:** ENG-E-12

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To offer students women's perspective of life and womanhood.
2. To acquaint the students with the distinct stylistic features of Indian women writers.
3. To evaluate the position of woman in the Indian patriarchal society and as reflected in literature written by women writers.

**2. Learning Outcomes:**

1. Appreciate a woman's point of view regarding life.
2. Understand the life of a woman in patriarchal communities of India.
3. Identify distinct features of women's writing in India.
4. Critically analyze significant women's texts written by Indian women.

**3. Number of hours: 04 hours per week**

**4. Course Content: Total number of hours: 60**

**Unit I: Poetry**

**20 hours**

1. Kamala Das a) The Descendants  
b) The Maggots
2. Mamta Kalia a) Positive Thinking  
b) After eight years of marriage

3. Melanie Silgado a) For Father on the Shelf  
b) Doris
4. Imtiaz Dharker a) Puradah I  
b) Minority
5. Hira Bansode a) Slave  
b) O Great Man
6. Mina Gaybhiye a) The Weeping Wound of Centuries  
b) Both are Useless
7. Anuradha Gaurav a) Request
8. Jyoti Lanje a) Mother  
b) The Nameless One

**Unit II: Drama**

**15 hours**

1. Rudali - Usha Ganguli

**Unit III: Short Fiction**

**10 hours**

1. The Day of the Golden Deer - Deshpande Shashi
2. Childless one - Nimbkar Jai
3. The Quilt - Ismat Chughtai

**Unit IV: Non - Fiction**

**15 hours**

1. It's always Possible: Transforming one of the Largest Prisons in the World  
"Women in Tihar"- Bedi Kiran.
2. Writing from the Margins -Shashi Deshpande

## 5. Reference Books:

### Primary References:

1. Bedi Kiran. *It's always Possible: Transforming One of the Largest Prisons in the World*. Sterling Publishers Pvt.Ltd ,India; 6th edition , 2005.
2. Chughtai, Ismat. *The Quilt and other stories*. Sheep. Meadow Press,U.S. 1994.
3. Deshpande, Shashi. *Writing From the Margin & Other Essays*. Penguin Books, 2003
4. Deshpande Shashi. *Collected Stories*. Penguin Books, London, 2003.
5. Dhar Sheila. *Here's Someone I'd Like you to Meet*. Oxford University Press, 1996.
6. Eunice De Souza. *Nine Indian Women Poets*. Oxford University Press, New Delhi, 1997.
7. Ganguli Usha. *Rudali*. Radhakrishan Prakashan, 1<sup>st</sup> edition, 2004.
8. Mehta Gita. *Karma cola*. Penguin, 2015.
9. Mulk Raj Anand and Zelliott Eleanor (Ed). *An Anthology of Dalit Literature*. Gyan Publishing House, New Delhi, 1992.
10. Prasad Madhusudan. *Contemporary Indian English Stories*. Sterling P. 1988.

### Secondary References:

1. Amga H.L. *Indo - English Poetry*. Surabhi P. Jaipur, 2000.
2. Bande Usha. *Gita Mehta: Writing Home / Creating Homeland (Writers of the Indian Diaspora)* . Rawat Publications , India, 2008.
3. Bedi Kiran. *I Dare*. Hay House, India, 2009.
4. Naik M.K. , Narayan Shyamala. *Indian English Literature 1980-2000 : A Critical Survey*. Pencraft International, Delhi, 2016.
5. Pawar M.S. *New Women Novelists with New Horizons*. Shruti P. Jaipur, 2011.
6. Ray Mohit. *Indian Writing in English*. Atlantic Publishers, New Delhi, 2008.

**Course Title:** American Literature of the Twentieth Century

**Course Code:** ENG-E-2

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To study the American Experience as captured in the seminal works of masters of American Literature of the twentieth century.
2. To expose the students through prose and poetry and drama to the various main trends, ideas and forces that shaped the writing of those times.
3. To acquaint students with the following literary movements in America – Realism, Modernism and Harlem Renaissance.

**2. Learning Outcomes:**

By the end of the course the students:

1. Appreciate American culture and literature of the Twentieth Century.
2. Will be sensitized to American culture and literature during the Twentieth Century.
3. Identify socio-political issues that took place in America during the Twentieth Century.
4. Critically analyze the American literary texts of the Twentieth Century.

**3. Number of hours: 04 hours per week**

#### **4. Course Content**

**Total Number of hours: 60**

##### **Unit I: Novel**

**15 hours**

1. The Colour Purple - Alice Walker

##### **Unit II: Drama**

**15 hours**

1. Death of a Salesman -Arthur Miller

##### **Unit III: Poetry**

**15 hours**

1. Robert Frost
  - a) Mending Wall
  - b) Stopping by the Woods
  - c) The Road not taken
2. Theodore Roethke
  - a) My Papa's Waltz
  - b) The Waking
3. Wallace Stevens
  - a) The Emperor of Ice Cream
4. John Crowe Ransom
  - a) Bells for John Whiteside's Daughter
5. Allen Ginsberg
  - a) America
  - b) Ode to Failure
6. Robert Lowell
  - a) To Speak of Woe that is Marriage
7. Sylvia Path
  - a) Crossing the water
  - b) Lady Lazarus
8. Langston Hughes
  - a) Dreams
  - b) I Too

## Unit IV: Background

15 hours

(Some topics could be assigned for self study and presentations in class)

1. The American Dream
2. The Great Depression
3. Social Realism and the American Novel
4. Beat Poets
5. Confessional Poets

### 5. Reference Books:

#### Primary References:

1. Miller, Arthur. *Death of a Salesman*. Penguin UK, 2011.
2. Poulin. A. Jr & Michael Waters, ed. *Contemporary American Poetry*. 8th Edition. Houghton Mifflin Company, 2006.
3. Thomas. C.T. *Twentieth Century Verse- American Anthology*. Delhi: Macmillan India Ltd, 1999.
4. Walker, Alice. *The Colour Purple*. US: Mariner, 2006.

#### Secondary References:

1. Brown, John Russell, ed. *American Theatre*. London, Edward Arnold, 1967.
2. Cullum, E. Linda, ed. *Contemporary American Ethnic Poets: Lives, works, sources*. Greenwood Publication group Inc, 2004.
3. Daniel Hoffman (ed.) Harward. *Guide to Contemporary American Writing*. New Delhi: Oxford University Press, 1979.
4. Gould, Jean. *Modern American Playwrights*. Bombay: Popular Prakashan, 1969.
5. Horto Rod, ed. *Background of American Literary Thought*. New Jersey: Prentice Hall, 1974.
6. Matthiessen F. O. *American Renaissance*. New York: Oxford University Press, 1941.

7. Pearce, Roy H. *The continuity of American Poetry*. Princeton University Press, 1979.

8. Shaw, R.B, ed. *American Poetry since 1960: Some Critical Perspectives*. 1974.



**Course Title:** Writing for the Media

**Course Code:** ENG-III.E-3

**Marks :**100

**Credits :**4

### **Course Objectives**

1. To give students an overview of Media in today's world.
2. To promote interest in skilled Writing and to emphasize the importance of accurate use of English language in the field
3. To develop critical and analytical language skills to be applied in the field of Mass Media.
4. To train students to be self sufficient professionals capable of undertaking independent work and applying theoretical knowledge to real-life situations.
5. To prepare the foundation for careers in Media as an option for students.

### **Learning Outcomes**

Upon completion of the course the student should be able:

1. Comprehend the importance of good writing in the field of Mass Media - from print to Digital Media
2. Understand theoretical perspectives behind mass media and the jargon associated with the field.
3. Master writing skills required for various media - from journalism in print and broadcast media to advertising and creative commercial media.
4. Demonstrate competence in the technicalities of clear, concise writing through the use of accurate grammar, punctuation, spellings and writing style.

### 3. Total number of hours:

60 (1 hour Lectures) considering a term/semester runs over 15

weeks PER WEEK 4 HOURS

### 4. Topics to be covered

**Note:** To ensure the competency of students in the field after graduation, emphasis should be given to the written aspect of the course, while ensuring that the students understand various aspects of each field along with key-terms, and the differences in the written aspect.

#### **Unit I – PRINT MEDIA : Newspapers and Magazines Theory (12 lectures)**

Introduction : The Media and the Message - Message depends on Medium Introduction

to Print Media: Audience for the News

Story Ideation as basis of commercial Radio, T.V. and Cinematic production

Difference in writing styles between Print, Electronic and Digital Media

#### **Newspaper Writing:**

*Concepts:* **News Reporting-** (datelines/Credit-line/Bylines/Nut-graph/Headlines) **News Writing** – Appropriate angle for a news story – Structuring news (Lead/Climax form - Inverted Pyramid Form; Chronological form) – Qualities of effective leads –Using significant details – Effective revision Basic principles of AP Style (Associated Press Style Book) for Writing – Use of the Style Book – Style as a Manner of Writing – Clarity in Writing – Readability – Five ‘W’s and ‘H’ of Writing.

**Other Writing-** Features/Articles - Editorials – Letters to the Editor – Book and Film reviews – Interviews– Oped Pieces

**Basic Layout and Composition** - Balanced/Unbalanced/Circus Layout - column setups- photograph additions - final look

*Applied:* Reporting - Climax form - Inverted Pyramid Form; Chronological form Editorials- Letters to the Editor -Book and Film Reviews - Headlines - Oped Pieces - Layout & Composition

## **Writing for Magazines:**

*Concepts:* Demographics (Target Audience); Types of Magazines and How writing differs in them; Differences/Similarities in writing Between Newspaper writing and Magazine writing; Editorials; Layout and Composition **Article writing** – Structuring for greatest effect – Preparation and organization of article – Specific angle – specific audience.

Feature writing – structure – organisation – feature angles – simplicity in Style. *Applied:* Feature and Article Writing- Creation of a Magazine - Layout/Composition - Photographs to enhance written word

## **Editing:**

Concepts & Applied: Copy editing process – Guiding principles of editing Grammar – Punctuation – Subbing – Proof-reading (Proof-reading notations) – [The AP style book can be a great guide here.]

**Note:** *The Editing component is to be taught simultaneously along with the applied component of the paper. The teaching should be graded - Beginning with the basic knowledge of grammar and its application up to a level where the student is competent enough to not only edit their own written works but also others'. This part of component 1 should be taught over the rest of the components as well, ensuring an increase in the level of efficiency of the student.*

## **Unit 2 - ELECTRONIC MEDIA : Radio, T.V. and Cinema RADIO (18 lectures)**

*Concepts:* Radio as a Mass Medium – Radio Skills – Broadcast Writing – Broadcast Terms – Scripting for Radio – Story Structure – Lead, Body, Ending – Writing Radio News and Features - Programmes for Radio (Features, News, Interviews, Skits, Music Programmes, etc.)

*Applied:* Planning a Newscast – Radio Jockeying - Scripting for the Radio - Recording

## **TELEVISION**

*Concepts:* Television as a Mass Medium – Television Skills – Scripting for TV -  
Programmes for TV (Features, News, Interviews, Music Programmes, etc.)

*Applied* – Scripting for a show; Anchoring; Interviewing;

## **FILM**

*Concepts:* Fundamentals of Film Story Writing (The Three Act Story Structure), Scripting,  
Screenplay and Production, Documentary Film.

Writing for the screen – Writing effective film reviews

*Applied*– The Three Act Story Structure, Writing Short Screenplays, Film Reviews.

## **UNIT 3 – DIGITAL MEDIA - Internet and New Media**

**(18 lectures)**

*Concepts:* Kinds of Digital Media & New Media

E-book/E-magazine – E-journal – E-newspaper – Internet – World Wide  
Web Mobile Media - Video Games

*Concepts:* Writing for Digital Media: An Interactive Media

Web Writing - Technical Writing – Blogging.- Introduction to  
Profile Writing – Broadcast News Analysis – Caption Writing –  
Copy Writing/Content Writing – Story Structure and Planning -  
Inverted Pyramid - Headline, Blurb, Lead - Digital Correspondence  
– Digital Editing

*Applied:* Web Writing - Technical Writing – Blogging; Caption Writing; Content Writing

## **UNIT 4 – ADVERTISING**

**(12 lectures)**

*Concepts:* Advertisements in Different Media (Print; TV; Radio; Digital) – An  
Overview Promotional Literature: Copywriting for Leaflets, Pamphlets,  
Brochures, Classifieds – Text, Captions, Logo – Story-board.

T.V. Advertisements - Story Idea to story board to screenplay to  
shoot. writing for advertising –

*Applied:* copywriting for Print Advertisements; The 3 shot ad movie; PSA's; Parody ads

## 5. List of Books/CDs/Websites for reference

1. *Writing for Television, Radio and New Media (Seventh Ed.)*. Hilliard, Robert - Wadsworth 2006
2. *Writing for the Mass Media* (Sixth edition). James Glen Stovall Pearson Education, 2006
3. *Basic News Writing* Melvin Menchar William. C.Brown Co., 1983
4. *Writing and Reporting News: A Coaching Method* Carole Rich Wadsworth/ Thomson Learning, 2003
5. *News Writing & Reporting* James A Neal & Suzane S Brown Surjeeth Publications, 2003
6. *Broadcast News Writing, Reporting & Production* Ted White Macmillan
7. *An Introduction to Digital Media* Tony Feldman (Blueprint Series) 1996
8. *Advertising* Ahuja & Chhabra Sujeeth Publications, 1989
9. *The Screenwriter's Workbook* Syd Field Dell Publishing, 1984
10. *E-Writing* Dianna Boother Macmillan, 2008
11. *Mass Communication Theory* Denis Mcquail Vistaar Publications, 2007
12. *The Associated Press Style Book and Libel Manual* Norm The A.P, 1994
13. *Handbook of Magazine Article Writing*, Michelle Ruberg, Writer's Digest, 2009

### Secondary Reading:

1. *Writing and Producing News* Eric Gormly Surjeet Publications, 2005
2. *A Crash Course in Screenwriting* David Griffith Scottish Screen, 2004
3. *Digital Media: An Introduction* Richard L Lewis Prentice Hall
4. *The Art of Editing the News* Robert.C McGiffort Chilton Book Co., 1978
5. *Digital Media Tools* Dr.Chapman Nigel (Paperback - 26 Oct 2007)
6. *News reporting and Editing* K.M Srivastava Sterling Publications
7. *The News Writer's Handbook: an Introduction to Journalism* M.L Stein, , Paterno, Susan.F Surjeeth Publications, 2003
8. *The TV Writer's Workbook : A Creative Approach to Television* Ellen Sandler Delta, 2007
9. *Understanding Journalism* Lynette Sheridan Burns Vistaar Publications, 2004
10. *Media and Society in the Digital Age* Kevin Kawamoto Pearson Education, 2002  
*Media in the Digital Age* J.V Pavlik (Paperback - 1 May 2008)

**Course Title:** New Literatures in English

**Course Code:** ENG-E-4

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To introduce students to the marginalized voices in society through their literatures.
2. To help students understand the contribution of the marginalized to mainstream literature.
3. To establish the voices of the marginalized through their representative texts, authors and movements.
4. To inculcate an atmosphere of cultural acceptance through the texts
5. To introduce students to the marginalization of the female gender through their works in literature

**2. Learning Outcomes:** But the end of the course the student will be able:

1. Understand the concept of the marginalized segments in society.
2. Recognize writers, forms, and movements associated with the marginalized.
3. Analyze works of literatures critically, keeping in mind the segmented.
4. Write reflective and research essays to present their responses to New Literatures in English.

**3. Number of hours: 04 hours per week**



5. Claude McKay
  - a) America,
  - b) Tormented

Secondary poems

  - a) If we must die
  - b) The Barrier
  
6. Imamu Amiri Baraka
  - a) Incident
  - b) In memory of Radio
  - c) Notes for a Speech

Secondary Poems

  - a) At the National Black Assembly
  
7. Hilarie Lindsay
  - a) Barren Harvest
  - b) Monuments of Men
  
8. Maya Angelou
  - a) Caged bird
  - b) Women Work

Secondary poems

  - a) Phenomenal Woman
  - b) Still I Rise
  
9. Alec Derwent Hope
  - a) Australia
  - b) The Death of a Bird
  
10. Derek Walcott
  - a) A Far Cry from Africa
  - b) Ruins of a great House
  
11. Judith Wright
  - a) Nigger's Leap
  
12. Louise Bennet
  - a) Colonization in Reverse
  
13. David Dabydeen
  - a) Coolie Mother
  - b) Coolie Son
  - c) Slave Song



## Unit IV: Short Stories

14 hours

1. *Miguel Street* - V.S. Naipaul
  - a) Bogart
  - b) His Chosen Calling
  - c) The Thing Without a Name
  - d) Man-Man
  - e) George and the Pink House
  - f) B. Wordsworth
2. *The Tomorrow-Tamer* - Margaret Laurence
  - a) The Tomorrow-Tamer
  - b) The Merchant of Heaven
3. *Lives of Girls and Women* - Alice Munro
  - a) The Flats-Land
  - b) Lives of Girls and Women

### 5. Reference Books:

#### Primary References:

1. Bajaj, Nirmal. *Search for Identity in Black Poetry*. Atlantic Publications
2. Chavan, Sunanda. *The Fair Voice-A Study of Women Poets in English*. Sterling.
3. Kulkarni, Harihar. *Black Feminist Fiction*. Creative Books
4. Loomba, Ania. *Colonialism/Postcolonialism -The New Critical Idiom*. Routledge.
5. Naipaul V.S. *Miguel Street*. New York Vintage International Edition, 1984.
6. Pushpa, M. *The plays of Wole Soyinka*. Prestige.
7. Rehman, Anisur. *New literatures in English*. Creative.
8. Sumana, K. *The Novels of Toni Morrison- A study in Race, Gender & Class*. New Delhi: Prestige Books
9. V.S. Naipaul. *Miguel Street*. New York: Vintage International Edition, 1984.

#### Secondary References:

1. Bhelande, Anjali; Pandurang, Mala (ed). *Articulating Gender*. Delhi: Pencraft International
2. Kearns, Francis. *Black Identity*. N.Y.: Holt, Rinehart & Winston.

3. Ray, Mohit; Kundu, Rama, Kundu. *Studies in Women Writers in English*. Atlantic.
4. Wright, Derek. *Wole Soyinka revisited*. N.Y. Twayne Pubs.

**S.Y.B.A. – SEMESTER IV – CORE COURSE**

**Course Title:** Literary Criticism

**Course Code:** ENG-IV.C-6

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To enable the students understand nature of literary criticism.
2. To acquaint them with the terminology of literary criticism.
3. To provide them the knowledge of the important schools of literary criticism with the help of representative texts.
4. To help the students grasp methods and techniques of interpreting literature.
5. To be able to apply literary theory to text.

**2.Learning outcomes:** By the end of the course the student will be able to:

1. Understand the nature and functions of literary criticism.
2. Read the writings of literary scholars and critics with understanding and judicious appreciation.
3. Recognize and define major critical schools.
4. Generate and articulate personal responses to literary and critical texts.
5. Explain the premises and assumptions underlying such personal responses.

**3. Number of hours:                      04 hours per week**

**4. Course Content:**

**Total Number of hours: 60**

**Unit I: Introduction to literary Criticism**

**05 hours**

1. What is literature?
2. Difference between Literary Theory and Literary Criticism.
3. Functions of literary Criticism
4. Types of literary Criticism.
5. A brief survey of major critical schools

**Unit II: Classical Criticism**

**14 hours**

1. Features of Classical Criticism
2. Plato on Imitation and Art
3. Aristotle's *Poetics*
4. Longinus' *On the Sublime*

**Unit III: Neo-Classical Criticism**

**13 hours**

1. Features of Neo-Classical Criticism
2. John Dryden- *Essay of Dramatick Poesie*
3. Alexander Pope - *Essay on Criticism*
4. Dr. Samuel Johnson- *Preface to Shakespeare*

**Unit IV: Romantic Criticism**

**14 hours**

1. Features of Romantic Criticism
2. William Wordsworth- *Preface to Lyrical Ballads*.
3. Samuel Taylor Coleridge - *Biographia Literaria* –His concept of fancy and imagination, language of poetry.

**Unit V: New Criticism**

**14 hours**

1. Features of New Criticism
2. Thomas Stearns Eliot - *Tradition and the Individual Talent*
3. Ivor Armstrong Richards - *Four Kinds of Meaning*

**5. Reference Books:**

**Primary References:**

1. Aristotle. *The Poetics of Aristotle*. Emereo Publishing, Australia, 2012.
2. Aivanhov, Omraam Mikhael. *T. S. Eliot: Tradition and the Individual Talent*. Prakash Book Deport Bareilly, U.P., 2012.

3. Arnold, Thomas. *Dryden: An Essay of Dramatic Poesy*. Atlantic Publisher, New Delhi, 2006.
4. Daiches, David. *Critical Approaches to Literature*. Orient Longman, Mumbai, 1967.
5. Giles, Herbert Allen. *Longinus on the Sublime*. Kessinger Publishing, U.S., 2010.
6. Habib M. A. R. *A History of Literary Criticism and Theory*. Blackwell Publishing, U.S.A., 2008.
7. Leavis F.R. *Revaluation: Tradition and Development in English Poetry*. Ivan R. Dee Publisher, Chicago, 1998
8. Nandwani Aditya. S.T. *Coleridge-Biographia Literaria*. Anmol Publications Pvt. Ltd., New Delhi, 2009
9. Narasimhaiah C. D (ed). *Indian response to American literature*. UEFI, New Delhi, 1967.
10. Plato. *The Republic*. Rupa Publications, India, 2013
11. Ransom J. C. - *The New Criticism Essay*. New Directions, New York, 1941.
12. Richards I. A. *Four Kinds of Meaning*. Transaction Publishers, 2004.
13. Samuel Johnson. *Preface to Shakespeare*. Hardpress Publishing, U.S.A., 2010
14. Scott James R.A. *The Making of Literature*. Nabu Press, South Carolina, 2011.
15. Warren Robert Penn. *A Poem of Pure Imagination: An Experiment in Reading*. Renal & Hitchcock, New York, 1946.
16. Wellek Rene. *A History of Modern Criticism*. Yale University Press, U.S., 1986

### **Secondary References:**

1. Brooks Cleanth. *The Well Wrought Urn*. Mariner Books, 1956.
2. Butcher S.H. *Aristotle's Theory of Poetry and Fine Art*. Dover P, USA, 1951.
3. Lodge David, Nigel Wood. *Modern Criticism and Theory*. Pearson Publishing, UP India, 2007.
4. Richards I. A. *Practical Criticism*. London, 1929.
5. Shawcross, John(ed). *Shelley's Literary and Philosophical Criticism*. Oxford, U.K. 1909.
6. Wimsat W. K. and Cleanth Brooks. *Literary Criticism: A Short History*. Routledge Kegan Paul, London, 1957.

**Course Title:** The Literature of the Indian Diaspora

**Course Code:** ENG-E-5

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To introduce to the students the types of Diaspora theories and writings
2. To enable students to read and appreciate Diaspora themes, identity and culture
3. To teach students to appreciate cross-cultural and multicultural studies
4. To understand multiple consciousness in Diaspora writings.

**2. Learning Outcomes:** By the end of the course the student will be able to:

1. Understand Diaspora
2. Understand Indian Diaspora through Arts and literature
3. Identify and analyze Diaspora themes through short stories and poems

**3. Number of Hours:**                      **04 Hours per week**

**4. Course Content:**

**Total Number of hours: 60**

**Unit I: Background**

**07 hours**

1. Nature and themes of Diasporic writings
  - a) Exile literature
  - b) Displacement and the Diasporic identity
  - c) Culture and hybridity
2. Gender and Diaspora politics
3. Major Diaspora writers of India

**Unit II: Poetry**

**15 hours**

1. Sujata Bhatt
  - a) The Voices
  - b) The Dream
  - c) Search for my tongue
2. Meena Alexander
  - a) On Indian Road
  - b) Birthplace with Buried Stones
3. Chitra Banerjee Divakaruni
  - a) Indigo
  - b) Tiger Mask Ritual
4. Saleem Peeradina
  - a) To whom it may concern
  - b) Song of the makeover
5. Ratin Bhattacharjee
  - a) The Indian Diaspora

**Unit III: Novel**

**15 hours**

1. A River Sutra - Geeta Mehta  
Bye Bye blackbird - Anita Dessai (**Non –evaluative Secondary text**)

**Unit IV: Short stories****15 hours**

1. A Temporary Matter
2. When Mr. Pirzada Came To Dine
3. Interpreter Of Maladies
4. The Third And Final Continent
5. A Real Durwan

**Unit V: Essays****08 hours**

1. Salman Rushdie
  - a) Imaginary Homelands
  - b) New empire within Britain

**Unit VI: Films (Non Evaluative)**

1. Anita and Me (film) - Meera Syal. Directed by Metin Hüseyin and Produced by Paul Raphael (UK) 2002
2. Namesake (film) - Jhumpa Lahiri. Produced and Directed by Meera Nair (India) 2007

**5. Reference Books:****Primary References:**

1. Bhatt Sujatha. *Collected Poems*. Carcanet Press Limited, 2013.
2. Bhatt Sujatha. *Point No Point: Selected Poems*. Carcanet Press Limited, 1997.
3. Dessai Anita. *Bye Bye Black Bird*. Orient Paperbacks, New Delhi, 2005.
4. Lahiri Jhumpa. *Interpreter of Maladies*. Harper Collins Publishers, 2008.
5. Mehta Gita. *A River Sutra*. Penguin, 2000.
6. Peeradina Saleem. *Contemporary Indian English Poetry*. Macmillan, Chennai, 2010.
7. Rushdie Salman. *Imaginary Homelands: Essays and Criticism* RHUK, 2004.

**Secondary References:**

1. Agarwal Beena. *Women Writers and Indian Diaspora*. Authors press, 2011.
2. Agarwal Malti. *English Literature: Voices of Indian Diaspora*. Atlantic Publisher, 2009.
3. Bande Usha and Jasbir Jain (series ed). *Gita Mehta- Writing Home/Creating Homeland*. New Delhi: Rawat Publication, 2008.



4. Chakrabarti A. S. A. P. T Kavita. *Contextualizing Nationalism, Transnationalism and Indian Diaspora*. Creative Publisher, 2010.
5. Das Nigamananda. *Jhumpa Lahiri: Critical Perspectives*. Pencraft International, 2008.
6. Deb Kushal. *Mapping Multiculturalism (1<sup>st</sup> Edition)*. Rawat Publications , 2002.
7. Gupta K. Surendra. *Specifications of Indian Diaspora Study of Emerging Sandwich Cultures*. Atlantic Publisher, 2012.
8. Jain Jasbir. *Dislocations and Multiculturalisms: (1st Edition)*. Rawat Publications, 2004.
9. Jain Jasbir. *Writers of the Indian Diaspora*. Rawat Publications, 1998.
10. Kadekar Narayan Laxmi and Sahoo Kumar Ajaya .*Global Indian Diaspora: History, Culture and Identity*. Rawat Publications, 2012.
11. Knott Kim. *Diasporas: Concepts, Intersections, Identities*. Rawat Publications, 2011.
12. Tiffin Griffiths Ashcroft Menin. *The Empire Writes Back*. Taylor & Francis Ltd, 2002.

**Course Title:** Creative Writing

**Course Code:** ENG-E-6

**Marks:** 100

**Credits:** 4

**5. Course Objectives:**

1. To explore creative writing genres (Poetry, Drama, Fiction) through practical writing classes
2. To build on the foundation of basic knowledge and interest of students in creative writing
3. To develop ones' own style of writing through reading, discussion and experimenting in writing culminating in a student's work portfolio
4. To encourage students' to get their works published using traditional means and modern media
5. To write with the aid of the senses

**6. Learning Outcomes:** By the end of the course the student will:

1. Demonstrate an understanding of concepts related to the creative writing genres.
2. Present their ideas/opinions through creative writing genres.
3. Create a sample of their own creative output(individual/group)
4. Develop ability to critique and edit their own work as well as others'
5. Use ICT and Digital technology in their creative endeavour.

**7. Number of Hours:** 04 hours per week

#### 4. Course Content:

**Total Number of hours: 60**

**Note:** This course will focus on the creative *writing* process. Thus, emphasis will be given to the written aspect of the course. Theoretical concepts, learnings, and innovations in the forms and fields will be imparted through praxis. Students will maintain a journal and submit a final portfolio of their creative output. The journal should mandatorily contain *all* the drafts of their works. The editing aspect of the writing process (revision, editing and proofreading) is to be taught concurrently with the units, while focusing on the particular needs of the forms.

#### **Unit I: Poetry**

**20 hours**

*Concepts:* Metre and rhyme; Meaning and being of language- power of reference/pop culture/allusions; form (and subverting form); free verse; syllabics; shaping a sequence and collection; figures of speech and its use

Spoken Word -writing, speaking, and performing; Reading techniques – charm, set, space, cold open, silence, blending music

Use of technology in performance, exposing your work to others; *transaesthetics*

*Applied:* Students will apply some strategies of contemporary poetry in the writing of several poems and the analysis of published poetry. They will demonstrate, through the writing and performing of several poems, an understanding of some of the aesthetic aspects of contemporary poetry, such as manipulation of stanzas and line lengths, figures of speech, symbolism, setting, tone, and imagery. They will identify the aesthetic aspects of poetry in published poems and poems written by classmates.

*Portfolio:* Rhyming poems (with various rhyme scheme and forms), free verse, Slam poetry, Spoken word

**Note:** Instructor may use a selection of poetry (established poets) to illustrate the range and variety of poetry. Focus should be on cultivating the student's poetry writing skills.

#### **Unit II: Drama**

**20 hours**

*Concepts:* Structures of a stage plays (physical/written); Acts/scenes; Scripting a stage play; Original v/s adapted; story/dialogue/description; Contrast creating conflict; characters and idiom; overwriting; individual voice

Exposition - Using monologues; subtext; dramatic irony; status

Staging - Action; Sets; stage directions and visual narrative; Using offstage effectively; Dramatic action; Staging scenes

Radio Drama: creating pictures with sound; constraints of the medium; Radio drama script; Adaptation; using voices

*Applied:* Students will apply strategies of storytelling in the medium of a play and the analysis of published drama. They will demonstrate, through the writing of a play (one act/two act/three act) an understanding of some of the aesthetic aspects of drama, such as scripting action for the stage, use of dialogue and creating powerful characters through use of monologues and dramatic irony. They will have the ability identify these aspects of drama in published plays and work written by classmates.

*Portfolio:* One act play, three act play, Radio play

**Note:** Instructor may use a selection of drama (established playwrights) to illustrate the range and variety of drama. Focus should be on cultivating the student's writing skills.

### **Unit III: Fiction**

**20 hours**

*Concepts:* Short Fiction – Short Stories, Flash Fiction, Novella, and Novel

Form/Structure; Plot/Scenes; Character; point of view/narrative voice; conflict/crises; Setting/time

Micro-tales/Nano-tales – analysis of social media and innovative storytelling techniques

Novella/Novel: literary novel v/s genre novels exploring storylines, multiple/parallel plots; reality /s imagination; research and its importance; structuring your chapters vis-à-vis your novel

Creative Non – Fiction –Devices; Basic structure; Speaking with the reader – Your spoken voice; Passion involvement; Writing about yourself – You as a story; Memoir and memory; Writing about people and the world; finding a topic; fieldwork and interviews; literature of hope

*Applied:* Students will apply strategies of storytelling in the writing of atleast one short story/flash fiction; novella/novel (or works of creative non-fiction, or graphic novels) and the analysis of published fiction. They will demonstrate, through the writing of an original work, an understanding of some of the following elements of storytelling: plot, characterization, setting, point of view, symbolism, and style. They will identify the narrative techniques and elements of storytelling used in published works of fiction and stories written by classmates.

*Portfolio:* Short-story, Flash Fiction, Novel/Novella (Structuring/idea conception and writing of at least 3 chapters)

**Note:** Instructor may use a selection of fiction (established writers) to illustrate the range and variety of fiction. Focus should be on cultivating the student's writing skills.

**N.B:** the number of lectures for each unit includes time for continuous assessment, portfolio building (with instructor feedback and review) as well as writing classes.

**Additional note:** As a supplementary skill, the students should be taught how to prepare and submit a piece of work for publication. They should display the ability of using a word-processor, and desk-top publishing software to format their manuscript so as to be print ready and ready for submission to an editor, or publisher. They should also be taught, if not given, opportunities for publication. These can be achieved using the students' works, collected in a portfolio, to assess their growth and competency. (Desk-top publishing software such as Adobe Indesign/Publisher/Illustrator)

Instructors should use peer editing and group workshop method within the classroom as a method of giving and receiving constructive criticisms. This will also open opportunities for students to perform and read out their work, thereby taking care of the spoken word aspect of creative writing, as and when it may apply.

## **Reference Books:**

### **Primary References:**

1. Cheney, Theodore A. Rees. *Writing Creative Nonfiction - Fiction Techniques for Crafting Great Nonfiction*. California: Ten Speed Press, 1987. ebook.
2. Burroway, Janet. *Writing Fiction: A Guide to Narrative Craft*. New York: Longman Publishers, 2000.
3. Earnshaw, Steven. *The Handbook of Creative Writing*. Edinburgh University Press, Edinburgh. 2007.
4. Greenwell, Bill and Linda Anderson. *A Creative Writing Handbook - Developing Dramatic Technique, Individual Style and Voice*. Ed. Derek Neale. London: A & C Publishers Ltd., 2009.
5. Miller, Brenda and Suzanne Paola. *Tell it Slant - Writing and Shaping Creative Nonfiction*. Mcgraw-Hill, 2005.
6. Mills, Paul. *The Routledge Creative Writing Coursebook*. Routledge, 2006. ebook.

7. Morley, David. *The Cambridge Introduction to Creative Writing*. Cambridge: Cambridge University Press, 2007.
8. Smith, Marc Kelly and Joe Kraynak. *Take the Mic - The Art of Performance Poetry, Slam and the Spoken Word*. Illinois: Sourcebooks Media Fusion, 2009. ebook.
9. Strunk, William and E. B. White. *The Elements of Style*. New York: The Penguin Press, 2005.

**Secondary References:**

1. Boden, Margaret. *The Creative Mind - Myths and Mechanisms*. 2nd. New York: Routledge, 2004.
2. Bolton, Gille. *Write Yourself - Creative Writing and Personal Development*. London: Jessica Kingsley Publishers, 2011.
3. Hamand, Maggie. *Creative Writing For Dummies*. West Sussex: John Wiley & Sons, Ltd, 2009.
4. Harper, Graeme. *On Creative Writing*. London: Short Run Press, 2010.
14. Kaufman, Scott Barry and James Kaufman. *The Psychology of Creative Writing*. New York: Cambridge University Press, 2009.
15. May, Steve. *Doing Creative Writing*. Oxon: Routledge, 2007.
16. Smith, Marc Kelly and Joe Kraynak. *Stage a Poetry Slam*. Illinois: Sourcebooks Media Fusion, 2009.

**Course Title:** Visual Literature

**Course Code:** ENG-E-7

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To introduce students to visual literature – in the form of graphic novels, comics and digital comics
2. To understand core concepts in the field of visual literature.
3. To understand how to read graphic novels, comics, and other forms of visual literature.
4. To establish the contribution of visual literature to literature on the whole.

**2. Learning Outcomes:** By the end of the course the student will be able:

1. Understand core concepts in Visual Literature: how to read, and establish it as a literary form.
2. Recognize writers, forms, and ages associated with graphic novels, comics and other forms of visual literature.
3. Analyze works of visual literatures critically.
4. Write reflective and research essays to present their responses to Visual Literature.

**Number of Hours: 04 hours per week**

**4. Course Content:**

**Total Number of hours: 60**

**Unit I: The Comics Genre – History, Formats to Key terms:**

**12 hours**

1. History of comics (from paper to digital), Graphic novels and other visual literature
2. The major comics-creating nations and introduction to comics traditions
  - a) America - Titles from DC Comics, Marvel, Vertigo, Dark Horse and others
  - b) Europe - *Tintin; Asterix*, French and British Comics
  - c) Japan (Manga) - *Akira*
  - d) Indian Comics tradition - *Tinkle, Amar Chitra Katha, Jataka & Panchatantra tales*
3. The single panel comic to syndication
  - a) R.K. Laxman's collection
  - b) *Calvin & Hobbes* - William Patterson
4. Adapted Comics - *The League of Extraordinary Gentlemen* - Alan Moore
5. Advent of Digital Comics/web comics -
  - a) Gavin Aung Than - [www.zenpencils.com](http://www.zenpencils.com)
  - b) Rob Denbleyker - [www.explosm.net](http://www.explosm.net)
6. Key terms - Sequential Art, panel, gutter, tier, splash, spread, speech balloon, caption, sound effects, narration, formats, canon

[**Please Note:** Noted graphic novelists and comics creators will be introduced to students as they cover the history of the genre.]

**Unit II: The Modern Classic**

**16 hours**

1. The Complete Maus - Art Spiegelman

**Recommended Secondary Reading** -Persepolis - Marjane Satrapi

**Unit III: A Realistic look at the 'Superhero'**

**16 hours**

1. Watchmen - Alan Moore
2. V for Vendetta - Alan Moore

**Recommended Secondary Reading**

- a) Batman Year One - Frank Miller
- b) The Dark Knight Returns- Frank Miller
- c) Superman: Man of Steel - John Byrne



## Unit IV: Alternative Comics/Graphic Novels

16 hours

1. Fun Home - Alison Bechdel
2. A Contract with God - Will Eisner

### Recommended Secondary Reading -Underwater Welder - Jeff Lemire

**N.B:** The number of lectures for each unit includes time for continuous assessment.

Secondary Reading will not be evaluated in the Semester End Exam, but may be used for Continuous assessment if it is used as an extension of the scope of the course.

It is recommended for the students to read the suggested secondary readings in order to fully comprehend the material to be discussed in class.

## 5. Reference Books:

### Primary References:

1. Bechdel, Alison. *Fun Home: A Family Tragicomic*. Boston: Houghton Mifflin, 2006.
2. Chaney, Michael A., ed. *Graphic Subjects: Critical Essays on Autobiography and Graphic Novels*. Wisconsin: University of Wisconsin Press, 2011.
3. Eisner, Will. *A Contract with God and Other Tenement Stories*. New York: DC Comics, 1996.
4. —. *Comics & Sequential Art*. Florida: PoorHouse Press, 1985.
5. Heer, Jeet and Kent Worcester. *Arguing Comics: Literary Masters on a Popular Medium*. Jackson: University Press of Mississippi, 2004.
6. Liddo, Annalisa di. *Alan Moore: Comics as Performance, Fiction as Scalpel*. Mississippi: University Press of Mississippi, 2009.
7. McCloud, Scott. *Making Comics- Story Telling Secrets of Comics, Manga and Graphic Novels*. New York: Harper Collins, 2006.

8. —. *Understanding Comics: The Invisible Art*. New York: HarperCollins, 1993.
9. McLaughlin, Jef, ed. *Comics as Philosophy*. Jackson: University Press of Mississippi, 2005.
10. Miller, Frank. *Batman: Year One*. New York: DC Comics, 2005.
11. Mills, Anthony R. *American Theology, Superhero Comics, and Cinema: The Marvel of Stan Lee and the Revolution of a Genre*. New York: Routledge, 2014.
12. Moore, Alan (w) and David (a) Lloyd. *V for Vendetta*. DC Comics, 2008.
13. Moore, Alan. *The League of Extraordinary Gentlemen*. La Jolla: CA: America's Best Comics, 2000.
14. Moore, Alan and Dave Gibbons. *Watchmen*. New York: Warner Books, 1987.
15. Morris, Tom and Matt Morris. *Superheroes and Philosophy: Truth, Justice and the Socratic Way*. Illinois: Open Court, 2005.
16. Peterson, Robert S. *Comics, and Manga, Graphic Novels: A History of Graphic Narratives*. California: Praeger, 2011.
17. Robb, Brian J. *Superheroes: From Superman to the Avengers, The Evolution of Comic Book Legends*. London: Robinson, 2014.
18. Satrapi, Marjane. *Persopolis*. London: Vintage Books, 2008.
19. Spiegelman, Art. *MetaMaus*. New York: Pantheon Books, 2011.
20. —. *The Complete Maus*. USA: Pantheon Books, 1996.
21. White, Mark D. *Watchmen and Philosophy: A Rorschach Test*. New Jersey: John Wiley & Sons, Inc, 2009.

### **Secondary References:**

1. Berninger, Mark, John Ecke and Gideon Haberkon. *Comics as a Nexus of Cultures: Essays on the Interplay of Media, Disciplines and International Perspectives*. London: McFarland & Company, Inc. Publishers, 2010.

2. Dalton, Russell. *Marvelous Myths: Marvel Superheroes and Everyday Faith*. Missouri: Chalice Press, 2011.
3. Daniels, Les. *DC Comics: A Celebration of the World's Favorite Comic Book Heroes*. New York: Bulfinch Press, 1995.
4. Hahn, Joel. "A Librarian's Guide to DC Comics." *Serials Review* (1998): 64-78.
5. Hatfield, Charles. *Alternative Comics: An Emerging Literature*. Jackson: University Press of Mississippi, 2005.
6. Lavin, Michael. "A Librarian's Guide to Dark Horse Comics." *Serials Review* (1998): 76-93.
7. —. "A Librarian's Guide to Marvel Comics." *Serials Review* (1998): 41-63.
8. Lopes, Paul. *Demanding Respect: The Evolution of the American Comic Book*. Philadelphia: Temple University Press, 2009.
9. MacWilliams, Mark W., ed. *Japanese Visual Culture-Explorations in the World of Manga and Anime*. New York: East Gate, 2008.
10. Than, Gavin Aung. *Zen Pencils: Cartoon Quotes from Inspirational Folks*. Missouri: Andrew McMeel Publishing, 2014.
11. —. *Zen Pencils-Volume Two - Dream the Impossible Dream*. Missouri: Andrew Mcmeel Publishing, 2015.
12. Weiner, Robert G. *Marvel: Graphic Novels and Related Publications- An Annotated Guide-Comics, Prose Novels, Children's books, Articles, Criticism and Reference Works, 1965 -2005*. London: McFarland & Company, Inc., Publishers, 2008.

**Course Title:** World Literature

**Course Code:** ENG-E-16

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To expose students to representative works of world literature to develop their sensitivity to cultural diversity.
2. To promote intellectual growth by strengthening student's abilities to read analytically and critically.
3. To promote an understanding of the works in their cultural/historical contexts.

**2. Learning outcomes:** By the end of the course the student will be able to:

1. Understand and have an insight into the diverse representative works in World Literature.
2. Analyze literature critically, keeping in mind the cultural diversity.
3. Identify the various themes and narrative techniques of World Literature.
4. Critically analyze significant texts from the World Literature canon.
5. Appreciate canonical works of World Literature

**3. Number of hours:** 04 hours per week

**4. Course Content:**

**Total number of hours: 60**

**Unit I: Novel**

**15 hours**

1. Things Fall Apart - Chinua Achebe

**Unit II: Drama**

**15 hours**

1. Riders to the Sea- John Millington Synge

**Unit III: Poetry**

**15 hours**

1. Abraham Moses Klein a) Indian Reservation: Caughnawaga
2. Margaret Atwood a) Journey to the Interior

4. David Rubadiri a) A Negro Labourer In Liverpool
5. Arthur Nortje a) Letter From Pretoria Central Prison
6. Wole Soyinka a) Telephonic Conversation
7. Kath Walker a) A Song of Hope  
b) Dawn is at Hand
8. Les Murrays a) The Widower in the Country

**Unit IV: Short Stories**

**15 hours**

1. Child's play - Alice Munro
2. The Bet -Anton Chekvo
3. The Drover's Wife - Henry Lawson

**5. Reference Books:**

**Primary References:**

1. Achebe, Chinua. *Things Fall Apart*. Penguin Books, New Delhi, 2001.
2. Chekhov Anton. *Masterpieces of World Fiction: Selected Stories*. Rupa Publications, New Delhi, 2014.
3. Henry, Lawson. *The Penguin Henry Lawson Short Stories*. Penguin Books, New Delhi, 1998.
4. Klein. A.M. *The Rocking Chair and other Poems*. Toronto, McGraw-Hill, Ryerson, 1948.
5. Munro, Alice. *Too Much Happiness*. Penguin, Canada, 2012.
6. Page, P. K. *The Glass Air: Selected Poems*. Oxford University Press, 1986.

**Secondary References:**

1. Bloom, Harold, ed. *Modern Critical Views Anton Chekhov*. Chelsea House, Philadelphia, 1999.
2. Bloom, Harold. *Alice Munro*. Bloom's Literary Criticism, New York, 2009.

3. Eekman, Thomas A., and Virginia L. Smith. *Critical Essays on Anton Chekhov*. ed. Robert Lecker. G.K. Hall and Co, Boston, 1989.
4. Fisher, J. & Silber, E. (eds). *Women in Literature: Reading through the Lens of Gender*. Connecticut, Greenwood Press, 2003.
5. Matlaw, Ralph E., and Freedman, comps. *Anton Chekhov's Short Stories*. W.W. Norton and Company, New York, 1979. Print.
6. Pollock, Zailig, Seymour Mayne, Usher Caplan ed. *Selected Poems: A.M. Klein*. University of Toronto Press, Toronto, 1997.
7. Thacker, Robert. *Reading Alice Munro, 1973-2013*. University of Calgary Press, 9 Feb 2016.
8. Sakineh, Hamidi Mehr. *Critical Discourse Analysis of Alice Munros Short Stories*. Lambert Academic Publishing, London, 2014.
9. Hooper, Brad. *The Fiction of Alice Munroe*. Green publishing group, London, 2008.
10. Hunter, Adrian. *The Cambridge Introduction to the Short Stories in English*. Cambridge University Press, Cambridge, 2007.
11. Fallon Erin, and R.C. Feddersen, James Kurtzleben, Maurice A. Lee, Susan Rochette-Crawley.ed. *A Reader's Companion to the Short Story in English*. Routledge, New York, 2001.
12. Bartels, Anke, Dirk Wiemann, ed. *Global Fragments: (dis)orientation in the New World Order*. Rodopi, Amsterdam, 2007.

## **T.Y.B.A. – SEMESTER V – CORE COURSE**

**Course Title:** Nineteenth Century English Literature

**Course Code:** ENG-V.C-7

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To acquaint the students with English literature of the nineteenth century.
2. To reveal the impact of socio-economic aspects of the nineteenth century on literature written during the period.
3. To acquaint the students with the prevalent literary genres as well as stylistic feature of literature written during the nineteenth century.
4. To encourage independent critical reading of the literary texts written during the nineteenth century.

### **2. Learning Outcomes:**

Upon the completion of the course the students should be able:

1. Appreciate the socio-economic facets of nineteenth century and its impact on literature written during the time.
2. Analyze the socio-economic impact on literature written during the time.
3. Understand and identify the essential features of Romanticism and Victorianism
4. Critically evaluate the literary texts written during the Nineteenth Century.

### **3. Number of Hours: 04 Hours per week**

**4. Course Content:**

**Total Number of hours: 60**

**Unit I: Background:**

**05 hours**

1. Romanticism
2. French Revolution and Romanticism
3. Features of Victorian literature
4. Georgian Poetry
5. Industrial Revolution; Darwinism

**Unit II: Poetry**

**25 hours**

1. William Wordsworth
  - a) We are Seven
  - b) Tables Turned
  - c) Lines Written in Early Spring
  - d) To a Skylark
  - e) Simone Lee: The Old Huntsman
2. Samuel Taylor Coleridge a) Kubla Khan
3. John Keats
  - a) Ode to Autumn
  - b) When I have Fears that I may cease to be
  - c) Ode to Nightingale
4. Percy Bysshe Shelley
  - a) To a Skylark
  - b) Ozymandias
5. Alfred Lord Tennyson
  - a) Break, Break, Break
  - b) In memoriam-(Prologue, Epilogue)
6. Robert Browning a) The Bishop orders his Tomb at saint Praxed's Church
7. Matthew Arnold
  - a) Dover Beach
  - b) To Marguerite

**UNIT III: Drama**

**10 hours**

1. Pygmalion - George Bernard Shaw



## UNIT IV: Novels

20 hours

1. Jane Eyre - Charlotte Bronte

### 5. Reference Books:

#### Primary References:

1. Charlotte Bronte. *Jane Eyre*. Harper Press, 2010.
2. Green David. *The Winged Word*. Macmillan, Madras, 1974.
3. Shaw George Bernard. *Pymalion*. Penguin Edition, 2009.

#### Secondary References:

1. Churchill R.C. *English Literature of the Nineteenth Century*. University Tutorial Press; First Edition, 1956.
2. Daiches David. *A Critical History of English Literature, Volume 4: The Romantics to the Present Day*. Martin Secker & Warburg Ltd, 1968.
3. Ford Boris (ed.). *Pelican Guide to English Literature (Vol. 5, 6)*. Penguin Books, London, 1957.
4. Gridley E. Roy. *Browning*. Routledge & Kegan Paul, London, 1972.
5. Latham Jacqueline (ed.). *Critics on Matthew Arnold*. George Allen and Unwin Ltd. , U.K., 1973.
6. O'Neill Judith (ed.). *Critics On Keats*. George Allen & Unwin Ltd., U.K. 1967.
7. Sen S. Wordsworth William. *Preface to the Lyrical Ballads: A Critical Evaluation*. Unique Publishers (I) Pvt. Ltd, 2014.

**Course Title:** Shakespeare Today

**Course Code:** ENG-E-9

**Marks:** 100

**Credits:** 4

### **1. Course Objectives**

1. To acquaint the students with the various forms of literature which are based on the works of William Shakespeare.
2. To foster an interest in the students in exploring the various literary works produced by Shakespeare.
3. To establish a link between the era of Shakespeare and the contemporary times.

### **2. Learning Outcomes:**

1. Understand the various themes presented in the works of Shakespeare.
2. Appreciate Shakespeare's works and its relevance in today's era.
3. Identify the various genres that Shakespeare's plays have been adapted into.
4. Compare and contrast Shakespeare's plays and the adapted versions.

### **3. Number of hours: 04 hours per week**

### **4. Course Content:**

**Total Number of hours: 60**

#### **UNIT I: Background**

**5 hours**

1. Relevance of Shakespeare in the modern era.
2. The three genres of Shakespearean drama: Comedy, Tragedy and History.
3. The influence of Shakespeare on English Literature.
4. The impact of Shakespeare's plays on modern culture.

**UNIT II: Literature Based on Shakespeare's Plays****30 hours**

1. Prospero's daughter - Elizabeth Nunez (10 hours)
2. I, Iago - Nicole Galland (10 hours)
3. Hamlet (Manga Shakespeare) (10 hours)

**UNIT III: Visual Media Based on Shakespeare's Plays****20 hours**

Movies:

1. Hamlet (1996) - Kenneth Branagh
2. Maqbool (2003) - Vishal Bharadwaj
3. Omkara (2006) - Vishal Bharadwaj
4. Haider (2014) - Vishal Bharadwaj ( Self Study)
5. Twelfth Night (Series - Arkangel Complete Shakespeare )
6. Gnomeo & Juliet - Kelly Asbury (Shakespeare's animated play)

**UNIT IV: Review of Shakespearean Plays by Modern Schools of Criticism 5 hours**

1. Psychoanalytical interpretation of Shakespeare's works.
2. Post- colonial interpretation of Shakespeare's works.
3. Feminist interpretation of Shakespeare.
4. Marxist interpretation of Shakespeare's works.

**Note: *Hamlet* will be taught as a model text, which includes the original as well as the adaptations across mediums.**

**5. References Books:****Primary References:**

1. Amanda Root, Jonathan Firth. Twelfth Night. Series – (Arkangel Complete Shakespeare). Bbc Audiobooks America. 2005
2. Burt, Richard. *Shakespeare After Mass Media*. Palgrave Publications, New York, 2012.
3. *BBC Television Shakespeare*. Romeo and Juliet. BBC 2. U.K., 3 Dec. 1978. Television.
4. Cartelli, Thomas. *Repositioning Shakespeare*. Routledge, 2009.

5. Duffield P, Appignanesi R. *Manga Shakespeare: The Tempest*. Self Made Hero Publication, London, 2007.
6. Galland, Nicole. *I, Iago: A Novel*. William Morrow & Company, New York, 2012.
7. Garber, Majorie. *Shakespeare and Modern Culture*. Random House Inc, New York, 2008.
8. *Haider*. Dir. Vishal Bharadwaj. Perf. Shahid Kapoor, Tabu, Shraddha Kapoor, Kay Kay Menon, Irrfan Khan. UTV Motion Pictures, 2014. Film.
9. *Hamlet*. Dir. Kenneth Branagh. Columbia Pictures, 1996. Film.
10. Kelly Asbury dir. *Gnomeo & Juliet*. January 2011.
11. Lenz, Carolyn. *The Woman's Part: Feminist Criticism of Shakespeare*. University of Illinois Press, Chicago, 1984.
12. Lupton, Julia. *After Oedipus: Shakespeare in Psychoanalysis*. Cornell University Press, 1993.
13. *Maqbool*. Dir. Vishal Bharadwaj. Perf. Irrfan Khan, Tabu, Pankaj Kapoor, Om Puri, Naseeruddin Shah. Kaleidoscope Entertainment Pvt. Ltd., 2003. Film.
14. Nagarajan, S & Viswanathan. R, ed. *Shakespeare in India*. S. OUP India Publishers, 1987.
15. Nunez, Elizabeth. *Prospero's Daughter*. Random House Publishing Group, New York, 2006.
16. *Omkaara*. Dir. Vishal Bharadwaj. Perf. Ajay Devgan, Saif Ali Khan, Vivek Oberoi, Kareena Kapoor. Eros Entertainment, Big Screen Entertainment, Shemaroo Entertainment, 2006. Film.
17. Siegel, Paul. *Shakespeare's English and Roman History Plays: A Marxist Approach*. Associated University Presses, 1964.

### **Secondary References:**

1. Barker, Granville and Harisson G.B. *Companion to Shakespearean Study*, Cambridge University, 1946.
2. Goddard. *The Meaning of Shakespeare*. University of Chicago Press, Chicago, 1960.
3. Halliday, F.E. *Shakespeare in His Age*, Gerald Duckworth & Co. Ltd, 1965.
4. Iyengar, Srinivasa. *Shakespeare: His World and His Art*, Sterling Publishers, 1984.
5. Kastan, David. *Shakespeare After Theory*. Routledge, New York, 1999.

6. Kott, J. *Shakespeare Our Contemporary*. W. W. Norton & Company, New York, 1974.
7. Rothwell, Kenneth S. *A History of Shakespeare on Screen: A Century of Film and Television*, Cambridge: Cambridge University Press, 2004.
8. Shakespeare, William. *Hamlet*. UBS Publishers' Distributors Pvt. Ltd, New Delhi, 2009.
9. Shakespeare, William. *Macbeth*. UBS Publishers' Distributors Pvt. Ltd, New Delhi, 2009.
10. Shakespeare, William. *Othello*. UBS Publishers' Distributors Pvt. Ltd, New Delhi, 2009.
11. Trivedi, P. and Bartholomeusz Dennis. *Shakespeare's India*. University of Delaware Press, 2005.

**Course Title:** Ancient Indian Classics in Translation

**Course Code:** ENG-E-10

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To acquaint the students with Indian culture of the past.
2. To introduce the students to great ancient Indian classics.
3. To acquaint the students with Indian poetics.

**2. Learning Outcomes:** By the end of the course the student will be able to:

1. Perceive aesthetic and philosophical, social aspects of ancient Indian society and their reflection in literature.
2. Analyze and appreciate various literary features in ancient Indian classics
3. Comprehend Indian poetics.
4. Make a comparative study of Indian poetics and Western

**3. Number of Hours: 04 Hours per week**

**4. Course Content:**

**Total Number of hours: 60**

**Unit I: The Mahabharat**

**15 hours**

1.Extracts from the Mahabharat:

- a) Droupadi – Svayamvara Parva – Volume I (Pages 437-458)
- b) Vaivahka Parva Volume I (Pages 458-473)
- c) Dyuta Parva Volume II (Pages 185 to 247)
- d) Amba – Upakhyaana Parva – Volume 5 (Pages 1 to 60)

## Unit II: The Ramayana

15 hours

1. Book I – Canto
  - a) XXXVI - L
  - b) LXVI - LXVIII
  - c) LXXVII
2. Book II – Canto
  - a) I
  - b) VII - XIX
  - c) XXVI - XXVII
  - d) XXXVII - XLIII
  - e) LI - LXIV
3. Book III – Canto
  - a) IX - XX
  - b) XXXI -LVII

(Note: Book III - Self Study)

## Unit III: Poems from Sanskrit in translation

15 hours

1. **Verse nos.** 1-15; 18-21 ; 24; 26; 30; 32; 39; 40-45; 47; 51-53; 61; 63; 65; 67 ; 69-71 ; 73;74; 86;87; 97-101; 103; 104; 110; 111; 114 -116; 118; 119; 122; 123; 125; 131;135; 136; 138-140.
2. **Indian Poetics / Indian Literary Criticism**
  - a) Bharata – Ntaya – Manjiri (1975) - G. K. Bhatt: On Natya and Rasa: Aesthetics of Dramatic experience.
  - b) Bhatrihari -Vakyapadiya .  
Text: From Vakyapadiya - K. Raghavan Pillai.
  - c) Dandin from the Kavyadarsa. Translated - Vavilla Venkateswara Sastrulu.  
Dandin's Marga Theory.
  - d) Anandvardhana's from Dhuanyaloka ( sphota theory).
  - e) Kuntaka -Vakrokti.
  - f) Abhinava Gupta's concept of Shantarasa. Rasa - dvani theory.

## Unit IV: Philosophical Writings

15 hours

1. Bhagavat Gita – Chapter II -The Karmayoga
2. Isha Upanishad (trans.) - Sri. Aurobindo

### 5. Reference Books:

#### Primary References:

1. Brough John. *Poems from the Sanskrit*. Pelican Books, England, 1968.
2. Debroy Bibek (trans.). *The Mahabharata*. Pelican Books, New Delhi, 2012.(Vol. I, II, IV, V)
3. Devy G.N. (Ed.). *Indian Literary Criticism: Theory and Interpretation*. Orient Longman, New Delhi, 2002.
4. Griffeth Ralph( trans.). *The Ramayan of Valmiki*. Low Price Publications, Delhi, 2003.
5. Ryden W. Arthur(trans.). *Kalidas' Shakuntala* . In Parentheses Publication Sanskrit.
6. Sri. Aurobindo (trans.). *Isha Upanishad*. Sri. Aurobindo Ashram, Pondicherry, 2003.

#### Secondary References:

1. Banker Ashok K. *Ramayana* . Little, Brown Book Group, 2005.
2. Pattanaik Devdutt. *My Gita*. Rupa Publications, New Delhi, 2015.
3. R.K. Narayan. *God, Demons and others*. University of Chicago Press, 1993.
4. Sinha M.P. , Agnihotri Meeraj. *Critical Theories- Indian and Western*. Atlantic Publications, New Delhi, 2013.
5. Smith John (Abridged Trans.) *The Mahabharata*. Penguin Book, India, 2009.
6. Swami Chinmayanada. *The Holy Geeta*. Central Chissmaya Mission Trust, Mumbai, 1996.
7. Swami Parthasarthy. *Bhagvad Gita*. Vedanta World, 2 ed. , 2011.
8. Valmiki, Sattar Arshia. *The Ramayana*. Penguin Random House India, 2016.
9. Zakaria Rafiq. *Discovery of God*. Popular Prakashan Publisher.



**Course Title:** Film Studies

**Course Code:** ENG-E-11

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To introduce students to the allied field of Film Studies, its history, literature, and theory.
2. To inculcate in students an educated response to films.
3. To allow students a space to explore film Studies practically and creatively through appropriate form and structure.

**2. Learning Outcomes:** But the end of the course the student will be able:

1. Understand the literature of Films through relevant exemplars.
2. Recognize Directors, artists, genres, and movements in Films.
3. Identify genres in films, and critically analyze films.
4. Write, direct and shoot their own short film, informed by Film theory and Film literature.

**5. Number of hours: 04 hours per week**

#### 4. Course Content:

Total number of hours: 60

##### Unit I: History of Film

10 hours

1. **Silent Period (1895 – 1929):** Movements – German Expressionism, Soviet Montage, French Avant-garde; Lumiere Brothers, Georges Melies, Edwin Porter, D.W. Griffith, Thomas Ince, Mack Sennet, Charlie Chaplin, Buster Keaton, Oscar Miceaux, Carl Theodor Dreyer, Robert Flaherty, Cecil DeMille
2. **Classical Period (1930 – 1945):** Movements: French poetic realism; Frank Capra, Josef Von Sternberg, Howard Hawks, John Ford, Maya Deren
3. **Postwar Period (1946 – 1959):** Movements: Italian neorealism, Japanese art Cinema; Orson Welles, Douglas Sirk, Nicholas Ray, Ingmar Bergman, Satyajit Ray
4. **Transitional Period (1960 – 1979):** Movements- French New Wave, Feminist Film, Direct Cinema, Structural film, Third World Cinema ; John Cassavetes Arthur Penn, Sam Peckinpah, Francis Ford Coppola, Robert Altman, Stan Brakhage, Ousmane Sembene, Luis Bunuel, Woody Allen, Stanley Kubrick, George Lucas, Martin Scorsese
5. **Contemporary Period (1980 - present):** Movements – American Independent cinema, East Asian Cinema, Iranian Cinema, New British cinema, Personal documentary; Steven Spielberg, Oliver Stone, Lars von Trier, David Cronerberg, Ridley Scott, Mira Nair

**Note: Students are to be briefly introduced the context of the periods through clips, montages, extracts. Focus should be on the movements, emphasis should be in understanding the movements.**

##### Unit II: Literature of Film

15 hours

1. **Film Form:** Mise en Scene –Setting, Performance & Movement, Costume and Props; Cinematography –Shot types; Camera Lenses; Camera Angles; Camera Movements, Lighting & Colour
2. **Sound & Editing** – Effects, Music, Perspective Sound, dialogue Overlaps/ Sound Bridges; Optical Effects, Continuity, Spatiotemporal effects
3. **Narrative-** Story & Plot, Narrative development, Narration, Narrative meaning; Time

**Note: Instructor, in conjunction with their class, should select movies, TV series, Documentaries etc to understand the Literature of Films. Each aspect and concept needs to be underlined with actual extracts, and clips of visuals.**

**Unit III: Film Genres & Theory:**

**15 hours**

1. **Genre Theory:** Genre as Film Language; Genres- Gangster, Western, Horror, Science Fiction, Musical, Romantic Comedy, Fantasy, Parody, Animation, Found Footage, Realism, Blaxploitation  
Bollywood vs Hollywood – a comparison  
Adaptations, Sequels and current forms of Film Trends – Studio Blockbusters, Shared Universe.
2. **Film Theory:** Medium Specific, Realism, Auteur Theory, Semiotics & Structuralism, Ideology  
theory, Feminist film Theory, Cultural Studies, Cognitive Theory

**Note: Instructor, in conjunction with their class, should select movies, TV series, Documentaries etc to discuss the various genres and Theory. Each Theory needs to be underlined with actual extracts, and clips of visuals. Adapted texts can also be taken.**

**Unit IV: Practical Application of Learning**

**20 hours**

**1. Reader-Response**

Reader-Response to Unseen Films: Reviews, comparisons, and break-downs of movies/TV/documentaries in written forms and structures.

**2. Application of Film Form**

Message & Values, Mise en Scene, Cinematography, Sound & Editing, Narrative, Genre and Film theory

Story, Storyboard, Screenplay

Creation of movies using concepts learnt in Units 1, 2, and 3.

**Note: Instructor should create a learning environment where concepts can be applied. Movies, TV series, Documentaries should be viewed and analyzed. Students should also create their own short films informed with the concepts learnt in the previous units.**

## 5. Reference Books:

### Primary References:

1. Andrew, Dudley. *concepts in FILM THEORY*. Oxford: Oxford University Press, 1984.
2. Aufderheide, Patricia. *Documentary Film A Very Short Introduction*. Oxford: Oxford University Press, 2007.
3. Benyahia, Sarah, Freddie Gaffeny and John White. *AS Film Studies The Essential Introduction*. New York: Routledge, 2006.
4. Butler, Andrew. *The Pocket Essentials Film Studies*. Berks: [www.pocketessentials.com](http://www.pocketessentials.com), 2005.
5. Dancyger, Ken. *The Technique of Film & Video Editing Fifth Edition*. Oxford: Focal Press, 2011.
6. Nelmes, Jill, ed. *Introductin to Film Studies, 05th Edition*. London: Routledge, 1996.
7. Pearson, Roberta and Philip Simpson, *Critical Dictionary of Film and Television Theory*. New York: Routledge, 2001.
8. Stadler, Jane and Kelly McWilliam. *Screen Media Anlaysiaing Film and Television*. NSW: Allen & Unwin, 2009.
9. Stam, Robert. *Film Theory An Introduction*. Massachusetts: Blackwell Publishing, 2000.
10. Thompson, Kristin and David Bordwell. *Film History An Introduction Second Edition*. New York: McGraw Hill, 2003.
11. Villarejo, Amy. *Film Studies The Basics*. New York: Routledge, 2007.
12. Welsh, James and Peter Lev, *The Literature/Film Reader*. Plymouth: The Scrcrow Press, 2007.

## Secondary References:

1. Fabe, Marilyn. *Closely Watched Films An Introduction to the Art of Narrative Film Technique*. New York: University of California Press, 2004.
2. Grant, Barry Keith, ed. *Film Genre reader III*. Austin: University of Texas Press, 1986.
3. Guynn, William, ed. *The Routledge Companion to Film History*. New York: Routledge, 2011.
4. Hart, John. *The Art of the Storyboard A Filmmaker's Introduction*. Oxford: Elsevier, 2008.
5. Monaco, James. *How to Read a Film The World of Movies, Media, and Multimedia*. New York: Oxford University Press, 200.
6. Jess-Cooke, Carolyn and Constantine Verevis, *Second Takes Critical Approaches to the Film Sequel*. New York: State University of New York Press, 2010.
7. Roberts, Graham. *Key Film Texts*. New York: Oxford University Press, 2002.

**Course Title:** Goan Literature and Culture

**Course Code:** ENG-E-1

**Marks:** 100

**Credits:** 4

### **1. Course Objectives**

1. To introduce students to different genres of literary works of Goan Literature in English and translated works by Goan writers.
2. To acquaint students with Goan ethos and culture through the exploration of selected texts of Goan literature.
3. To examine selected texts of Goan Literature and folk lore to establish Goan identity.

### **2. Learning Objectives:**

By the end of this course students:

1. Sensitized to Goan ethos and culture.
2. Appreciate the historical, psychological, religious and political realities during the pre-colonial and post colonial period.
3. Identify diverse literary and cultural trends that helped form Goan Literature.
4. Knowledgeable and enriched about Goan cultural heritage.
5. Critically analyze the Goan literary texts.

### **3. Number of hours: 04 hours per week**

#### 4. Course Content

Total Number of hours:60

##### Unit I: Background (Socio- Political and cultural)

08 hours

###### 1. Historical

- a) Colonialism
- b) Post colonialism

###### 2. Art and Artists of Goa (Folklore, Folkdance and Cartoonists)

- a) Tiatr (difference between Khell and Tiatr, Origin and development)
- b) Folklore (teacher can select any four folklores)
- c) Folk dances and Songs (any four forms to be selected.)
- d) Cartoonists of Goa (Alexzy and Mario Miranda)

##### Unit II: Short stories

13 hours

###### 1. Lambert Mascarenhas a) The Little Fellow

- b) Blood and Lily

###### 2. Victor Rangel-Riberio a) Lonely Aging Chinese

- b) American New York Neighbour Lady
- c) Loving Ayesha

###### 3. Ben Antao a) The Guardian Angel

- b)The Curse

###### 4. Damodar Mauzo a) The Vignahatra

- b) A Writer's Tale

###### 5. Laxmanrao Sardessai a) The Hour's End

- b)The Africa Boat

###### 6. Pundalik Naik- The Turtle

##### Unit III: Novels

24 hours

###### 1. Tivolem

- Victor Rangel-Riberio

###### 2. The Upheaval (translated from Konkani) - Pundalik Naik

**Unit IV: Poetry****15 hours**

1. Joseph Furtado a) The Secret  
b) Brahmin Girls  
c) The Neglected wife
  
2. Raghunath Vishnu Pandit a) His Immortal Land  
b) I'm a Gaudo
  
3. Eunice De Souza: a) One Man's Poetry  
b) Autobiographical  
c) He Speaks  
d) Advice to women
  
4. Balakrishna Bhagwant Borkar a) Ebony Black  
b) Towards the horizon  
c) Cemetery
  
5. Robert De Souza a) The Village Baker
  
6. Manohar Shetty a) Jigsaw  
b) One morning

**5. Reference Books:****Primary References:**

- 1) Antao, Ben. *Mad House and other nine stories*. Margao: Cinnamon Teal Publishing, 2012.
- 2) Mascarenhas, Lambert. *In the Womb of Saudade -Stories of Goan Life*. New Delhi: Rupa Publishing House, 1994.
- 3) Mauzo, Damodar. *Theresa's Man and other Stories from Goa*. Trans Xavier Cota. New Delhi: Rupa Publications, 2014.
- 4) Naik, Pundalik . *The Upheaval*. Trans Vidya Pai. New Delhi: Oxford University Press, 2012.
- 5) Rangel-Riberio, Victor. *Loving Ayesha and Other Stories*. New Delhi: HarperCollins Publishers, 2003.
- 6) Shetty Manohar, ed. *Ferry Crossing*. New Delhi: Penguin Books, 1998.
- 7) Victor Rangel-Riebrio. *Tivolem*. UK : Milkweed Editions, 2001.



### **Secondary References:**

- 1) Couto, Maria Aurora. *Goa- A Daughter's Story*. New Delhi: Penguin Books, 2004.
- 2) Fernandes, Andre Rafael. *When the Curtains Rise*. Saligao: Tiatr Academy of Goa & Goa 1556, 2010.
- 3) Gomes, Cynthia James. "Tiatr : An unlimited Engagement," *Reflected in Water*. Jerry Pinto, ed. New Delhi: Penguin Books, 2006.
- 4) Gomes, Olvinho J.F, (retold). *Konkani Folktales*. New Delhi: National Book Trust, 2008
- 5) Mauzo, Damodar. *Teresa's Man and other stories from Goa*. Trans Xavier Cota. Delhi: Rupa Publications, 2014.
- 6) Menezes, Juliao. *Goa's Freedom Struggle*. Velim: Mrs. Alzira da Almeida Charitable Trust, 2011.
- 7) Nazareth Peter, ed. *Pivoting on the Point of Return: Modern Goan Literature*. Saligao: Goa 1556 & Broadway Book Centre, 2010.
- 8) Pinto Jerry, ed. *Reflected in Water*. New Delhi: Penguin Books, 2006.

## **T.Y.B.A.– SEMESTER VI- CORE COURSE**

**Course Title:** Twentieth Century English Literature

**Course Code:** ENG-VI.C-8

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To introduce the students to novel, play and poems drawn from the English-language literatures of the twentieth century.
2. To examine how authors have responded to historical and cultural change throughout the twentieth century.
3. To probe the growth of modernism, and the appearance of post-colonialism and postmodernism

### **2. Learning Objectives:** By the end of the course the students will be able:

1. Read and appreciate representative literary works of Twentieth Century English Literature.
2. Identify different modern prose styles as well as colloquial rhythms of modern poetry.
3. Critically evaluate the impact of World Wars and psychology on Literature.
4. Appreciate the socio-eco facets of the Twentieth Century.

### **3. Number of Hours:** 04 hours per week

### **4. Course Content:**

**Total number of Hours 60**

#### **Unit I: Poems**

**20 hours**

1. William Butler Yeats  
a) The Second Coming  
b) The Wild Swans at Coole  
c) Sailing to Byzantium
2. Thomas Stearns Eliot  
a) Love Song of Alfred Prufrock  
b) The Journey of the Magi
3. Wilfred Owen  
a) Insensibility  
b) Strange Meeting
5. Siegfried Sassoon  
a) The Death Bed  
b) Lamentations

6. Rupert Brooke    a) The Dead  
                               b) The Solider  
                               c) Futility
7. Ezra Pound        a) At the Metro Station  
                               b) The Garden
8. Carl Sandburg    a) Fog  
                               b) Grass
9. Dylan Thomas    a) Do not go gentle into the good night  
                               b) Fern Hill
10. Stephen Spender a) An elementary school classroom in a slum
11. Louis MacNeice a) Prayer before birth

**Unit II: Novel**

**17 Hours**

1. James Joyce- A Portrait of the Artist as a Young Man

**Unit III: Drama**

**16 Hours**

1. Harold Pinter- The Home Coming

**Unit IV: Background**

**07 Hours**

1. Modernist Thematic Concerns
2. Techniques and Style of Modernist writers
3. Impact of psychology on literature & Stream of Consciousness technique
4. Impact of the World wars on Literature of the 20<sup>th</sup> Century Literature
5. Surrealism, Expressionism and Impressionism

**5. Reference Books:**

**Primary References:**

1. James Joyce. *A Portrait of the Artist as a Young Man*. Fingerprint Publishing, 2016.
2. Pinter Harold. *The Homecoming*. Avalon Travel Publishing, 1994.

**Secondary References:**

1. Abraham, M.H. *The Norton Anthology of English Literature*. W. W. Norton, Incorporated, 2003.
2. Bloom, Harold. *Dramatists and Dramas*. Chelsea House publishing, US, 2005.
3. Brown, Dennis, John Theodore. *The Modernist Self in Twentieth-Century English Literature: A Study in Self Fragmentation*. New York, Palgrave Macmillan, 1989.

4. Corcoran, Neil ed. *The Cambridge Companion to Twentieth-Century English Poetry*. Cambridge University Press, New York, 2007.
5. Friedman, Alan Warren. *Modernism and Literature: An Introduction and Reader*. Routledge, 2013.
6. Greenblatt, Stephen, et al., eds. *The Norton Anthology of English Literature*. Volume F: The Twentieth Century and After. New York, W. W. Norton , 2012
7. Marcus, Laura, Peter Nicholls ed. *The Cambridge History of Twentieth Century English Literature*. Cambridge University Press, UK, 2004.
8. Matz, J. *The Modern Novel: A Short Introduction*. Blackwell Publishing, US, 2004.
9. Meredith, James H. *Understanding the Literature of World War I: A Student Casebook to Issues ...* Green Wood Press, London, 2004.
10. Polleta, Gregory T. , ed. *Issues in Contemporary Criticism*. Boston: Little, Brown and Company, 1973.
11. Roberts, Neil. *A Companion to Twentieth-Century Poetry*. Blackwell publishing, UK, 2004.
12. Silverstein, Marc. *Harold Pinter and the Language of Cultural Power*. Associate University Press, London, 1993.
13. Stringer, Jenny. *The Oxford Companion to Twentieth Century English Literature*. Oxford University Press, New York, 1996.

**Course Title:** English Language and Literature Teaching

**Course Code:** ENG-E-13

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To introduce students to the fundamentals of English Language and Literature Teaching.
2. To introduce students to methods and approaches to teaching English Language and Literature.
3. To prepare students for the field of teaching with practical approaches to ELLT.

**2. Learning Outcomes:** But the end of the course the student will be able:

1. Understand and recognize fundamental concepts, methods, and approaches related to ELLT.
2. Create basic modules using theories in ELLT
3. Teach using methods, and approaches in ELLT.
4. Write reflective, analytical and research action essays to present their responses to ELLT.

**3. Number of hours: 04 hours per week**

#### **4. Course Content:**

**Total number of hours: 60**

#### **Unit I: English Language Teaching**

**15 hours**

**Introduction:** English in the world today, Brief History of English Language teaching

Principles of Language Teaching – Cognitive, Social, Linguistic

Fundamentals: Listening, Speaking, Reading, Writing, Pronunciation, Vocabulary

Curriculum Building

**Methods:** Grammar-Translation Method, Direct Method, Audio-Lingual Method, Silent Way, Desuggestopedia, Community Language Learning, Total Physical Response, Communicative Language teaching; Content based, Task-Based, and Participatory Approaches, Learning Strategy Training, Cooperative Learning and Multiple Intelligences

Issues in English Language teaching with focus on India

Discussion topics - *Literature as Autobiography* and *Fiction as Lies*.

New Paradigms & Current innovations in ELT

#### **Unit II: Praxis of English Language Teaching:**

**15 hours**

Preparation – Organization – Dissemination - Feedback

Use of teaching Methods using methods learnt in Unit 1 for crafting language teaching modules: Lecture Method, Demonstration Method, Problem Solving Method, Project Method, Vee – Mapping, Discussion Method, Play Method, Individualized Instruction Method, Discovery Method, Guided Discovery Method, Concept Mapping, Team Teaching

Use of ICT/Technology, Mixed-Media teaching

Innovations in teaching – Student-Centric, Flipped classrooms, POGIL, Constructivism

Student Innovation

### **Unit III: English Literature Teaching**

**15 hours**

Curriculum Building

**Approaches:** Language- based approach, Culture-based approach, Personal Growth approach (Reader-Response), Integrated Approach, Cultural-Response Method, Active Learning, Explanatory & Experiential Approach, Dramatic Method, Close reading, Reader-Response

Form & Genre: Poetry, Drama, Novel, Graphic-Novel, Non-Fiction, Creative Non-Fiction

### **Unit IV: Praxis of Teaching English Literature**

**15 hours**

Preparation – Organization – Dissemination - Feedback

Use of teaching Methods using methods learnt in Unit 3 for crafting literature teaching modules: Lecture Method, Demonstration Method

Interactive Method Using: Problem Solving Method, Project Method, Vee – Mapping, Discussion Method, Play Method, Individualized Instruction Method, Discovery Method, Guided Discovery Method, Concept Mapping, Team Teaching

Use of ICT/Technology, Mixed-Media teaching

Innovations in teaching – Student-Centric, Flipped classrooms, POGIL, Constructivism

Student Innovation

## 5. Reference Books:

### Primary References:

1. Broughton, Geoffrey, et al. *Teaching English as a Foreign Language*. New York: Routledge, 1978.
2. Carter, Ronald and David Nunan, *The Cambridge Guide to Teaching English to Speakers of Other Languages*. Cambridge: Cambridge University Press, 2001.
3. Chambers, Ellie and Marshall Gregory. *Teaching & Learning English Literature*. London: Sage, 2006.
4. Davison, Jon and John Moss, *Issues in English Teaching*. London: Routledge, 2000.
5. Irvine, Colin C., ed. *Teaching the Novel across the Curriculum - A Handbook for Educators*. Westport: Greenwood Press, 2008.
6. Jeffcoate, Robert. *Starting English Teaching*. London and New York: Routledge, 1992.
7. Larsen-Freeman, Diane. *Teaching and Principles in Language Teaching*. New York: Oxford University Press, 2003.
8. Nunan, David. *Language Teaching Methodology - A textbook for teachers*. Prentice Hall, 1991.
9. Richards, Jack and Theodore Rodgers. *Approaches and Methods in Language Teaching*. Cambridge: Cambridge University Press, 1986.
10. Richards, Jack and Willy Renandya. *Methodology in Language Teaching*. New York: Cambridge University Press, 2002.
11. Wyse, Dominic, Richard Andrews and James Hoffman, *The Routledge International Handbook of English, Language and Literacy Teaching*. New York: Routledge, 2010.



## Secondary References:

1. Chambers, Ellie and Marshall Gregory. *Teaching and Learning English Literature*. London: Sage Publications, 2006.
2. Ken, Bain. *What the Best College Teachers Do*. Massachusetts: Harvard University Press, 2004.
3. Nunan, David. *Learner-Centred English Language Education*. Devon: Routledge, 2013.
4. —. *Research Methods in Language Learning*. New York: Cambridge University Press, 1992.
5. —. *Teaching English to Speakers of Other Languages*. New York: Routledge, 2015.
6. Richards, Jack and Richard Schmidt. *Dictionary of Language Teaching & Applied Linguistics*. Edinburgh: Pearson, 2010.
7. Thurston, Cheryl Miller. *Ideas That Really Work!* Colorado: Cottonwood Press, 1991.

**Course Title:** Latin American Literature

**Course Code:** ENG-E-14

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To introduce students to the Latin American culture through their Literatures.
2. To help students understand the contribution of Latin American Writers to world literature.
3. To encourage students to discover the various themes, and movements associated with Latin American Literature.
4. To inculcate an atmosphere of cultural acceptance through the texts.

**2. Learning Outcomes:** By the end of the course the student will be able:

1. Understand the large landscape of Latin American Literature.
2. Recognize writers, forms, and movements associated with Latin American Literature.
3. Write reflective and research essays to present their responses to Latin American Literature.
4. Analyze works of literatures critically, keeping in mind the context of Latin America.

**3. Number of Hours: 04 Hours per week**

#### 4. Course Content:

**Total number of hours: 60**

#### Unit I: Contextual Study:

**10 hours**

**Note:** The following areas should be covered along with their representative texts. If representative texts are not present, extracts of such may be used

1. Brief History of Latin America
2. Movements : Modernismo, indigenismo, Romanticism/Realism/Naturalism, Mulatto
3. Andrade, Oswaldo de. (Brazil) “*Anthropophagie Manifesto*” - Transculturalism
4. The Boom, Magical Realism, Post-boom writers/writings

#### Unit II: Fiction:

**25 hours**

1. *100 Years of Solitude* – **Gabriel Garcia Marquez (Colombia)**
2. *The Psychiatrist* - **Machado de Assis (Brazil)**

#### Unit III: Poetry

**15 hours**

1. *Sonnet XVIII, The Song of Despair, A song for Bolivar* - **Pablo Neruda (Chile)**
2. *Flame, speech*; Proem, extract from *Sunstone* (first 15 stanzas) - **Octavio Paz (Mexico)**
3. *The Psychology of Composition, The Hen’s Egg* – **Joao Cabral de Neto (Brazil)**
4. *The Other, Antigone* – **Gabriela Mistral (Chile)**

#### Unit IV: Short Stories

**10 hours**

1. Selected Stories from *The Cubs and other stories* – **Mario Vargas Llosa (Peru)**  
*The Cubs, The Challenge*
2. Selected Stories of **Julio Cortazar (Argentina)**  
*House taken Over, Bestiary*
3. Selected Stories of **Jorge Luis Borges (Argentina)**  
*The Library of Babel, Death and the Compass*

**Note: Secondary readings of the selected authors, poets, critics are open to students to explore and should be encouraged for use in internal assessments.**

## 5. Reference Books:

### Primary References:

1. Borges, Jorge Luis. *Aleph and other Stories*. Ed. Norman Thomas Di Giovanni. Trans. Norman Thomas Di Giovanni. New York: Bantam Books, 1970.
2. Cortazar, Julio. *Blow-Up and Other Stories*. Trans. Paul Blackburn. New York: Pantheon Books, 1967.
3. Llosa, Mario Vargas. *The Cubs and Other Stories*. Trans. Gregory Kolovakos and Ronald Christ. New York: Farrar, Straus and Cirouxc, 1979.
4. Loundo, Dilip, ed. *Tropical Rhymes, Topical Reasons*. Brazil: National Book Trust, 2001.
5. Marquez, Gabriel Garcia. *One Hundred Years of Solitude*. Trans. Gregory Rabassa. New York: Avon Books, 1971.
6. —. *One Hundred Years of Solitude*. Trans. Gregory Rabassa. New York: Avon Books, 1967.
7. Mistral, Gabriela. *Madwomen*. Trans. Randall Couch. Chicago: University of Chicago Press, 2008.
8. Neruda, Pablo. *Twenty Love Poems and a Song of Despair*. Trans. W. S. Merwin. London: Penguin Books, 1976.
9. Neto, Joao cxabral De Melo. *Selected Poetry 1937 - 1990*. Hanover: Wesleyan University Press, 1994.
10. Paz, Octavio. *Selected Poems*. Ed. Eliot Weinberger. New York: New Directions, 1984.
11. —. *Sunstone*. Trans. Raymond Soulard and Kassandra Kramer. Seattle: Burning Man Books, 1957.

### Secondary References:

1. Bloom, Harold. *Bloom's Critical Views - Gabriel Garcia Marquez*. New York: Chelsea House Publishers, 2007.

2. —. *Bloom's Major Short Story Writers - Julio Cortazar*. Ed. Harold Bloom. Philadelphia: Chelsea House Publishers, 2004.
3. Castro-Klaren, Sara, ed. *A Companion to Latin American Literature and Culture*. Oxford: Blackwell Publishing, 2008.
4. Kristal, Efrain, ed. *The Cambridge Companion to the Latin American Novel*. Cambridge: Cambridge University Press, 2006.
5. Reisman, Rosemary, ed. *Latin American Poets*. Massachusetts: Salem Press, 2012.
6. Swanson, Philip. *Latin American Fiction*. Oxford: Blackwell Publishing, 2005.
7. Wood, Michael. *Landmarks of World Literature -One Hundred Years of Solitude*. Cambridge: Cambridge University Press, 1990.

**Course Title:** Contemporary Literary Theory

**Course Code:** ENG-E-15

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To introduce the students to the basic concepts of Contemporary Literary Theory.
2. To introduce the students to major schools of literary theory.
3. To develop the ability in the students to apply literary theory to analyze a work of literature.

**2. Learning Outcomes:** By the end of the course the student will be able to:

1. Make a comparative study of the different schools of literary theory.
2. Comprehend the basic tenets of modern literary theory and the jargon associated with it.
3. Apply literary theory and critically appreciate works of literature.

**3. Number of Hours: 04 hours per week**

**4. Course Content:**

**Total number of hours: 60**

**Unit I: Marxist view of Literature**

**12 hours**

1. Society and History : Marxist view
2. Major Marxists schools
3. Marxism and literature:
  - a) Literature and ideology
  - b) Autonomy in Literature
4. Marxist approach to Literature

**Unit II: Psychoanalysis**

**13 hours**

1. Views of Freud on human mind
2. Freudian approach to literature
3. Views of Lacan
4. Lacanian Criticism
5. Impact of psychoanalysis of literature

**Unit III: Structuralism and Post-structuralism**

**15 hours**

1. From New Criticism to Structuralism

2. Important Tenets of Structuralism
3. Contribution of Saussure
4. Contribution of Jonathan Culler, A. J. Greimas, Roman Jakobson, Roland Barthes
5. Structuralist Approach to Literature
6. Defining Deconstruction
7. Deconstructing Structuralism
8. From 'Work to Text'
9. Death of the author
10. Deconstruction an example
11. Deconstructing Deconstruction

**Unit IV: Voices of the Subaltern: Feminist, Queer & Post-Colonial Theories**

**20 hours**

**1. Feminist Theories**

- a) Features of Feminist Criticism
- b) Development to Feminist thought
- c) Major contributors to Feminist Criticism
  - i. Mary Wollstonecraft
  - ii. Virginia Woolf
  - iii. Simon De Beauvoir
  - iv. Elaine Showalter
  - v. Helen Cixous, Julia Kristeva
- d) Gynocriticism
- e) Feminist Criticism and Language
- f) Feminist approach to literature

**2. Lesbian/Gay criticism**

- a) Lesbian and Gay theory
- b) Lesbian feminism
- c) Queer theory
- d) Lesbian/Gay criticism-An example

**3. Postcolonial Theory**

- a) Edward Said - Orientalism
- b) Gayatri Spivak- Views on subalternity
- c) Homi K. Bhabha - Concept of mimicry

#### 4. Reference Books:

##### Primary References:

1. Abrams M. H. *A Glossary of Literary Terms*. Prism Publishers, 1999.
2. Barry Peter. *Beginning Theory*. Manchester United Press, Manchester, 1995.
3. Bertens Hans. *Literary Theory: Title Basics*. Routledge, London, 2001.
4. Eagleton Terry. *Literary Theory: An Introduction*. Blackwell, London, 1983.
5. Hawthorn Jeremy. *A Glossary of Contemporary Literary Theory*. Edward Arnold, London, 1994.
6. Selden Raman. *A Reader's Guide To Contemporary Literary Theory*. Harvester, London, 1993.
7. Webster Roger. *Studying Literary Theory: An Introduction*. Arnold Publishers, London, 1990.

##### Secondary References:

1. Ashcoft Bill, Griffiths Gareth, Tiffin Helen (ed). *The Post-Colonial Reader*. Routledge, New York, 1995.
2. Ashcoft Bill, Griffiths Gareth, Tiffin Helen (ed). *The Empire Writes Back*. Routledge, New York, 2010.
3. Butler Judith. *Gender Trouble*. Routledge India, 2016.
4. Jameson Fedric. *The Political Unconscious*. Routledge, New York, 1983.
5. Hawkes Terence. *Structuralism and Semiotics*. Routledge, New York, 2009.
6. Woods Tim. *Beginning Post-modernism*. Manchester University Press, Manchester, 2009.
7. Sarup Madan. *An Introductory Guide to Post-structuralism and Postmodernism*. 2<sup>nd</sup> Edition. The University of Georgia Press, Georgia, 1993.
8. Sedgwick Kosofsky Eve. *Epistemology of the Closet*. University of California Press, 2<sup>nd</sup> revised edition, 2008.
9. Vanita Ruth, Kidwai Saleem (eds). *Same-Sex Love in India: A Literary History*. Penguin India, 2008.



### **Secondary References:**

1. Mcquail, Denis. *Mass Communication Theory*. Vistaar Publications. 2007.
2. *The Associated Press Style Book and Libel Manual* Norm The A.P, 1994.
3. Hilliard, Robert. *Writing for Television, Radio and New Media (Seventh Ed.)*. Wadsworth. 2006.
4. Pavlik, J.V. *Media in the Digital Age*. 2008.
5. Perry, David K. *Theory and Research in Mass Communication*. Lawrence Erlbaum Associates, 2002.
6. Ruberg, Michelle. *Handbook of Magazine Article Writing*. Writer's Digest. 2009
7. Stadler, Jane and McWilliam, Kelly. *Screen Media – Analysing Film and Television*. Allen & Unwin. 2009.
8. White, Ted. *Broadcast News Writing, Reporting & Production*. Macmillan.

**Course Title:** Representation of Gender and Sexuality in Literature

**Course Code:** ENG-E-8

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To open classroom discussions in an easily accessible manner to students learning to comprehend gender and sexuality in practical situations as well as in literature.
2. To aid an understanding of the distinction between the concepts of gender and sexuality, and explore to explore its ever expanding reach.
3. To discover the interplay of gender and sexuality.
4. To help students understand the fluid natures of gender and sexuality.
5. To understand and appreciate the different artistic expressions of gender and sexuality.

**2. Learning Outcomes:** By the end of the course the student will be able to::

1. Appreciate the fluid nature of gender and sexuality.
2. Recognize the literal/ symbolic meanings depicted in literature related to gender and sexuality.
3. Decipher the interplay between gender and sexuality as seen through depictions, imagery and so on.
4. Recognize various themes seen in literature pertaining to gender and sexuality.

**3. Number of hours: 04 hours per week**

#### 4. Course Content:

Total number of hours: 60

#### UNIT I: Introduction:

20 hours

(“Why,What, How)

1. Introducing Women, Gender, Sexuality Studies
  - a) Video: *Gender fluidity*: Gabrielle Burton at TEDxColumbus
2. Thinking about Gender, Sexuality and Culture
  - a) Video: *Straightlaced: How Gender’s Got Us All Tied Up* (YouTube)
  - b) Marilyn Boxer, Ch. 1: Feminist Advocacy, Scholarly Inquiry, and the Experience of Women. *When Women Ask the Questions*.
3. Key Concepts and Theoretical Frameworks (Difference, Experience, Performance, Intersectionality)
  - a) “Doing Gender” in Gendered Society Reader- Candace West & Don Zimmerman
  - b) Gender: Judith Butler (Chapter 2)Sara Salih
4. Contemporary Contestations – Intersex and Transgender Movements
  - a) The Five Sexes: Why males and females are not enough- Anne Fausto-Sterling
  - b) Video: *Changing Gender Dynamics in Current Structure of India*. Laxmi Narayan Tripathi. TEDxSIUHinjewadi
  - c) Ashwini Sukthankar. *Facing the Mirror: Lesbian Writing from India*. Penguin Books Australia. 1999.
5. Reproduction & Family Politics
  - a) De-constructing ‘choice’: The social imperative and women’s use of the birth control pill - Granzow, Kara

#### UNIT II: Prose

15 hours

1. Novel:
  - a) The Truth About Me: A Hijra Life Story- A. Revathi
2. Essays:
  - a) Selected reading on Masculism from Popular Masculine Cultures in India: Critical Essays - Rohit K. Dasgupta (ed.) (any two essays)

**UNIT III: Plays****10 hours**

1. Mr. Behram - Gieve Patel

**UNIT IV: Poems****15 hours**

1. Suniti Namjoshi
  - a) I Give her the Rose
  - b) Well then let slip the masks
2. Maya Angelou
  - a) Phenomenal Woman
3. Kamala Das
  - a) The Old Playhouse
4. Sylvia Plath
  - a) Spinster
5. Trace Peterson
  - a) After and Before After
6. Hoshang Merchant
  - a) Selected poems from *Flower to Flame*

**Note to Instructor:**

1. As the syllabus (Unit I) features a large part theoretical/ essays on Gender and Sexuality, it is recommended that the instructor ensure that a rapport between student and teacher, and student and student is developed prior to moving forward to Unit II, III and IV.
2. Comfort in openly discussing their views and listening patiently to the views of their peers is necessary.
3. Recommended method of examination:
  - a) CAs – Students may be allowed the option of either a) writing an original report/ essay, commenting on the text they are studying (Secondary Reading list open); b) writing an original report/ essay viewing a literary piece through the lens of the essay(s); or c) class presentations based on syllabus topics featuring their own stance(s) and backed up with justifying arguments.
  - b) Semester End Exam –This may be a research paper written under the guidance of the instructor.

**5. Reference Books:****Primary References:**

1. A. Revathi. *The Truth About Me: A Hijra Life Story*. Penguin, 2010.

2. Boxer, Marilyn. *When Women Ask the Questions*. Baltimore and London: The Johns Hopkins University Press.
3. Fausto-Sterling, Anne. "The Five Sexes: Why males and females are not enough." *The Sciences*, 33 (2), 1994. Pgs. 20-25.
4. Granzow, Kara. "De-constructing 'choice': The social imperative and women's use of the birth control pill". *Culture, Health & Sexuality*, 9(1), 2007. Pgs. 43–54.
5. Jain, Jasbir (ed). *Women in Patriarchy: Cross – Cultural Reading*. New Delhi: Rawat Publications, 2005.
6. Ruth Vanita & Kidwai Saleem. *Same Sex Love in India: Readings from Literature and History*. New Delhi: Macmillan, 2000.
7. Salih, Sara. Chapter 2: Gender: *Judith Butler*. London: Routledge, 2002.
8. Tendulkar, Vijay. *Mitrachi Goshta: A Friend's Story: A Play in Three Acts*. Oxford University Press, 2000.
9. Peterson, Trace. *After and Before After*. Online. [Link](#)
10. West, Candace and Don Zimmerman. "Doing Gender". *Gendered Society Reader*. eds. Michael Kimmel & Amy Aronson. Oxford, 2000. Pgs. 146- 163.
11. Merchant, Hoshang. *Flower to Flame*. Rupa & Co. ,1992.
12. Dasgupta, Rohit K. *Popular Masculine Cultures in India: Critical Essays*. Setu Prakashani, 2013.

### **Secondary References:**

1. Brabon, Benjamin & Genz Stephanie. *Postfeminism*. Edinburgh University Press, 2009.
2. Bristow, Joseph. *Sexuality*. Routledge, 2013.
3. Butler, Judith. *Gender Trouble*. Routledge, 2012.
4. Shahni, Parmesh. *Gay Bombay: Globalization, Love and (be)longing in Contemporary India*. Sage Publications India Pvt. Ltd, 2008.
5. Sharma, Prabhat. *The Plays of Vijay Tendulkar: Critical Explorations*. Sarup & Sons, 2008.
6. Wake, Paul & Malpas Simon. *The Routledge Companion to Critical Theory*. Routledge, 2008.

7. Merchant, Hoshang. *Forbidden Sex, Forbidden Texts: New India's Gay Poets*. India: Routledge, 2009.
8. Bose, Brinda (Ed.), Subhabrata Bhattacharyya (Ed.). *Phobic And The Erotic: The Politics Of Sexualities In Contemporary India*. Seagull Books, 2007.

**Suggested Readings:**

1. Gilbert, Sandra & Gubar Susan. *The Madwoman in the Attic*. UK: Yale University Press, 1984.
2. Millett, Kate. *Sexual Politics*. University of Illinois Press, 2000.
3. Mohanty, Chandra Talpade. "Feminist Encounters: Locating the Politics of Experience". *Destabilizing Theory: Contemporary Feminist Debates*. eds. Michele Barrett and Anne Phillips. Stanford: Stanford University Press, 1992.
4. Monette, Paul. *Borrowed Time: An AIDS Memoir*. Mariner Books; 1 edition (June 1, 1998)
5. Sedgwick Eve Kosofsky. *Epistemology of the Closet*. University of California, 1990.
6. Seth, Vikram. *The Humble Administrator's Garden*. India: Penguin, 2012.

**Videos:**

1. *Changing Gender Dynamics in Current Structure of India*. Laxmi Narayan Tripathi. TEDxSIUHinjewadi [Link](#)
2. *Gender fluidity*: Gabrielle Burton at TEDxColumbus [Link](#)
3. *Straightlaced: How Gender's Got Us All Tied Up* (YouTube) [Link](#).

**Suggested Films:**

1. Campillo, Robin. *120 BPM (Beats per Minute)*. 2017.
2. Epstein, Rob and Jeffrey Friedman. *Howl*. 2010.
3. Kechiche, Abdellatif. *Blue Is the Warmest Colour*. 2013.

**Parvatibai Chowgule College of Arts and Science  
Autonomous**

**DEPARTMENT OF ENGLISH  
COURSE STRUCTURE  
THREE YEAR B.A. DEGREE COURSE IN ENGLISH**

SEMESTER	CORE COMPULSORY	CORE ELECTIVE				OPTIONAL	SEC
I	<b>ENG-I.C-1</b> Understanding Poetry & Drama	----	----	----	----	<b>FC-ENG-I</b> Effective English Communication (Arts Stream)	----
	<b>ENG-I.C-2</b> History of English Literature from Fifth Century to the Eighteenth Century						
II	<b>ENG-II.C-3</b> Understanding Fiction	----	----	----	----	<b>FC-ENG-I</b> Effective English Communication (Science Stream)	----
	<b>ENG-II.C-4</b> An Introduction to Linguistics & Stylistics						
III	<b>ENG-III.C-5</b> Contemporary Indian English Literature	<b>ENG-E-1</b> Goan Literature and Culture	<b>ENG-E-2</b> American Literature of the Twentieth Century	<b>ENG-E-4</b> New Literatures in English	<b>ENG-E-12</b> Women's Writing in India <i>(common elective for SY/TY)</i>	----	<b>ENG-SEC-1</b> Writing for the Media I ✓
							<b>ENG-SEC-2</b> Creative Writing I ✓
IV	<b>ENG-IV.C-6</b> Literary Criticism	<b>ENG-E-5</b> The Literature of the Indian Diaspora	<b>ENG-E-7</b> Visual Literature <i>(offered as ID-even semester 2019-20)</i>	<b>ENG-E-8</b> Representation of Gender & Sexuality in Literature	<b>ENG-E-16</b> World Literature <i>(common elective for SY/TY)</i>	----	<b>ENG-SEC-3</b> Writing for the Media II ✓
							<b>ENG-SEC-4</b> Creative Writing II ✓
V	<b>ENG-V.C-7</b> Nineteenth Century English Literature	<b>ENG-E-9</b> Shakespeare Today	<b>ENG-E-10</b> Ancient Indian Classics in Translation	<b>ENG-E-11</b> Film Studies <i>(offered as ID-odd semester 2019-20)</i>	<b>ENG-E-12</b> Women's Writing in India <i>(common elective for SY/TY)</i> ✓	----	----
VI	<b>ENG-VI.C-8</b> Twentieth Century English Literature	<b>ENG-E-13</b> English Language and Literature Teaching	<b>ENG-E-14</b> Latin American Literature	<b>ENG-E-15</b> Contemporary Literary Theory	<b>ENG-E-16</b> World Literature <i>(common elective for SY/TY)</i>	----	----

<b>SEMESTER</b>	<b>OPTIONAL</b>
I	Effective English Communication (Arts Stream)
II	Effective English Communication (Science Stream)
III	-----
IV	-----
V	-----
VI	-----

<b>SEMESTER</b>	<b>INTERDISCIPLINARY</b>
Even Semester	<b>ENG-E-6</b> Creative Writing
Odd Semester	<b>ENG-E-11</b> Film Studies



**PARVATIBAI CHOWGULE COLLEGE OF ARTS AND SCIENCE  
AUTONOMOUS**

**DEPARTMENT OF ENGLISH  
REVISED SYLLABI OF SEMESTER I, II, III, IV, V & VI  
2018-2019**

**F.Y.B.A. – SEMESTER I – CORE COURSE**

**Course Title:** Understanding Poetry & Drama

**Course Code:** ENG-I.C-1

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To acquaint students with major poetic forms and trends in English Poetry.
2. To enable students to read and appreciate poems.
3. To improve the literary and critical competence of the students.
4. To teach students to appreciate English Drama.
5. To instill the appreciation of Drama and the universality of its reach.
6. To train students to identify basic elements in a Drama.

**2. Learning Outcomes:**

Upon completion of the course the student should be able:

1. Recognize and define major poetic forms such as lyric poetry, narrative poetry.
2. Know and identify rhyme, rhythm and meter.
3. Understand and appreciate the literal and symbolic/inner meaning (connotative and denotative meaning) of a poem.
4. Identify and analyze special stylistic features of poetry such as imagery, tone, atmosphere, special linguistic and stylistic features, imagery.
5. Recognize and appreciate various elements of a drama: Plot, Character, Dialogue, Setting, Theme, and Act-Scene Division.
6. Understand and be knowledgeable about the evolution of two major forms of Drama – Tragedy and Comedy.

**3. Number of hours:                      04 hours per week**

**5. Course Content:**

**Total Number of hours: 60**

**Unit I: Background to Poetry & Drama**

**12 hours**

1. Poetry as a Literary form
2. Nature and types of lyric poetry
3. Evolution of lyric as a literary form
4. Nature and forms of narrative poetry
5. Evolution of the English Drama
6. Nature of Tragedy & Comedy in Drama

**Unit II: Lyric Poetry: Songs, Sonnets, Odes, Elegies and Dramatic Monologues**

**12 hours**

1. Edmund Spenser            a) Whilst in Prime
2. William Shakespeare    a) Marriage of True Minds
3. John Donne                a) Batter my Heart
4. Robert Herrick            a) To Daffodils
5. William Blake            a) Lamb  
    b) Tyger
6. William Wordsworth    a) The Daffodils
7. Percy Bysshe Shelley    a) Mutability
9. John Keats                a) Ode on a Grecian Urn
10. Robert Browning        a) My Last Duchess

**Unit III: Narrative Poetry: Ballads, Mock Epic**

**12 hours**

1. The Rime of the Ancient Mariner (Section 1) - Samuel Taylor Coleridge
2. Rape of the Lock (Canto I) - Alexander Pope

**Unit IV: Drama: Tragedy & Comedy**

**24 hours**

1. An Enemy of the People - Henrik Ibsen
2. The Admirable Crichton - James Matthew Barrie

## 5. Reference Books :

### Primary References:

1. Barrie. J. M. *The Admirable Crichton*.
2. Ibsen, Henrik. *An Enemy of the People*.

### Secondary References:

1. Abrams, M. H. *A Glossary of Literary Terms*. 11<sup>th</sup> Cengage Learning, 2014.
2. Bowra C.M. *Heroic Poetry*. Macmillan, 1966.
3. Ed. Bloom Harold. *William Shakespeare's Sonnets*. Viva Books, 2007.
4. Ed. Bottrall Margaret. *William Blake: Songs & Innocence & Experiences*. Macmillan, 1970.
5. Bradley. A.C. *Oxford Lectures on Poetry*. Atlantic, 2009.
6. Broadbent J.B. *Poetic Love*. Chatto & Windus London, 1964.
7. Chandra NDR, Sebastian A.J. *Literary Terms in English Poetry*. Authors Press, Delhi, 2001.
8. Cuddon J A. *The Penguin Dictionary of Literary Terms and Literary Theory*. Penguin Books, 1999.
9. Dobson, Michael and Wells, Stanley. *The Oxford Companion to Shakespeare*. Oxford, 2001.
10. Gardner Stanley. *Blake*. P. Evans Brothers Ltd, 1968.
11. Jump, John D.(Ed.) *Critical Idiom Series*. Law Book Co of Australasia, 1974.
12. Gridley Roy E. *Browning*. Routledge & Kegan Paul, 1972.
13. Ed. Grose Kenneth H. *Keats*. Evans Brother Ltd, 1969.
14. Hudson, W. H. *An Introduction to the Study of Literature*. B.I. Publications, 1972.
15. Klarer Mario. *An Introduction to Literary Studies*. Routledge, 2004.

16. Lever J.W. *The Elizabethan Love Sonnets*. Methuen & Co. Ltd, 1966.
17. Ed. O'Neill Judith. *Critics on Keats*. George Allen & Unwin Ltd, 1967.
18. O'Neill Judith. *Critics of Pope*. George Allen & Unwin Ltd., London, 1968.
19. Prasad, B. *Background to the Study of English Literature for Indian Students*. Trinity Press, 2014.
20. Read Herbert. *Wordsworth*. Faber & Faber Ltd, 1957.
21. Sarker Sunil Kumar. *Shakespeare's Sonnets*. Atlantic Publisher, 2006.
22. Rees, R. J. *Introduction to English Literature*. New Delhi: Macmillan India, 1973.
23. Smith Hallett. *Elizabethan Poetry*. Ann Arbor Paperbacks, 1968.
24. Ed. Ward Sir W. & Walter A.R. *The Cambridge History of English Literature*. Cambridge University Press, 1914.
25. Westland Peter. *Literary Appreciation*. The English University Press Ltd, 1964.

## **F.Y.B.A – SEMESTER I – CORE COURSE**

**Course Title:** History of English Literature from Fifth Century to the Eighteenth Century

**Course Code:** ENG-I.C-2

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To provide a comprehensive overview of major periods in the History of English literature.
2. To introduce to the students the historical and cultural contexts in which English Literature has developed through the ages.
3. To provide a view of major writers and their works in different ages.
4. To explore the complex relationship between literature and its context through discussion of particular literary trends, texts and issues within each period.

### **2. Learning Outcomes:**

1. Identify and perceive the complex relationship between literature and society.
2. Enable the learner to explain how and why particular types of literature emerged from particular set of historical circumstances.
3. Critically appreciate representative literary works written in different ages.
4. Inculcate ability to read independently literary texts of the Renaissance to the 18<sup>th</sup> Century

### **3. Number of hours: 04 hours per week**

#### 4. Course Content:

Total Number of hours: 60

##### Unit I: Anglo Saxon Age

12 hours

1. The dark ages and the Norman conquest^
2. Development of English Language (Old English and Middle English)^
3. The age of Chaucer/From Chaucer to Renaissance (1350- 1516)^
4. Age of unrest and transition, Religious movements, ^
5. New learning of classical antiquity Petrarch, Giovanni Boccaccio ^
6. Anglo Saxon Literature- Beowulf ^\*
7. Works of Major prose writers- John Wyclif, Sir John Mandeville ^\*
8. Works of Major Poets- Geoffrey Chaucer, William Langland, John Gower ^\*

##### Unit II: The English Renaissance/ The age of Shakespeare (1578-1625)

18 hours

1. Renaissance and Reformation
2. Development of drama from Miracle and Morality Plays#
3. War of the Roses, Anglican Clergy, Elizabethan age and Geographical discoveries
4. Interludes to University Wits^
5. Shakespeare# and Humanism
6. Poetry- Songs and sonnets of the 16th century, Bacon's Essays
7. Prose- Translations (Wyclif, Tyndale, Coverdale, Authorized Version of 1611), Historical and biographical works, Literary Criticism, Religious writings, Humanistic writings, Elizabethan satirical writings (Nash, Lodge, etc.)#

##### Unit III: The Seventeenth Century

18 hours

1. Political Background:  
England under James I (Jacobean Period) and Charles I (Cavaliers)^  
Commonwealth, the triumph of Puritanism^  
Restoration: Charles II^
2. Literary Movements:  
The age of John Milton and John Dryden(1625- 1700)^
3. Religious Movement: Puritanism^  
Prose- Sir Thomas Browne, ^(#)  
The Puritan writers^(#)  
Restoration prose: (Hobbes, Newton)^(#)  
Diarist of the Age: Samuel Pepy, John Evelyn,^(#)  
Moral Essays(Cowley, Temple)^, John Bunyan,^ George Fox,Thomas Ellwood,\*  
Establishment of Royal Society and the development of modern prose Poetry – The Cavalier Poets^\*(#)

The Metaphysical Poet: John Donne^(#), John Milton, Dryden \*(#)  
Restoration Drama: William Congreve^(#), John Vanburgh, George Farquhar, William  
Wycherley, George Etherege \*(#)  
Literary Criticism: Dryden ^(#)

#### **Unit IV: The Eighteenth Century**

**12 hours**

1. Political Background:

Reign of Queen Anne ^

2. Literary Movements:

The Age of Alexander Pope and Dr. Samuel Johnson (1700-1789)^

Periodical Essays ^

The Age of Prose and Reason^

Satires of the age^

The rise of the novel Sentimental Comedy^

3. Society:

The Coffee House Culture^(#)

Periodical Essays: Thomas Addison\*(#) and Dr. Samuel Johnson^(#)

Satires of the age – Johnathan Swift^(#)

Neoclassicism Augustan Reflective poetry - Alexander Pope^(#), Lady Anne Finch of  
Winchelsea\*(#)

Precursors of Romantic Poetry: Thomas Collins^(#), Thomas Gray\*(#) and Oliver  
Goldsmith\*(#) Robert Burns\*(#) and William Cowper \*(#)

**NOTE:** There shall be further changes made to the syllabus wherein certain topics shall be assigned for self-study.

**Key:** \* -Self-study, ^ -Discussed in class by the Instructor, # -shall be given as Assignments and Presentations

#### **5. Reference Books:**

##### **Primary References:**

1. Daiches David. *A Critical History of English Literature*. Allied Publishers Ltd. New Delhi, 1999.
2. Ford Boris Ed. *The Pelican Guide to English Literature*. Penguin Books UK, 1964.

3. Hudson William. *An Outline History of English Literature*. B I Publications, Bombay, 1972.
4. Poplawski Paul ed. *English Literature in Context*. New Delhi: Cambridge University Press, 2008.

**Secondary References:**

1. Compton-Rickett Arthur. *A History of English Literature*. Universal Book Stall, Delhi, 1969.
2. Evans I for. *A Short History of English Literature*. The English Language Book Society & Penguin Books, 1970.
3. Legouis Emile, and Cazamian Louis, Vergnas Raymond. *A History of English Literature*. London: J.M. Dent and Sons LTD, 1964.



**F.Y.B.A. / F.Y.B.Sc. – SEMESTER I/II – OPTIONAL ENGLISH**

**Course Title:** Effective English Communication

**Course Code:** FC-ENG-I

**Marks:** 100

**Credits:** 4

**Duration:** 60 hours

**1. Course Objectives:**

1. To help students develop proficiency in oral communication in English.
2. To help students understand the importance of developing good listening skills.
3. To help students become proficient in listening , writing and speaking skills

**2. Learning Outcomes:**

Upon completion of the course the student should be able:

1. Speak fluently, confidently and use correct English.
2. Efficiently draft letters– formal & informal letters, representations, notices, agendas and minutes of meetings.
3. Communicate effectively through written communication.

**3. Number of hours:                      04 hours per week**

#### 4. Course Content:

**Total Number of hours: 60**

##### **Unit I: Fun with Grammar**

**15 hours**

Students need to have a basic proficiency in Grammar to complete this course.

Pre-requisite to the course: Knowledge of Basic Grammar – Articles, Adjectives, adverbs, Conjunctions, Sentence Structures – SVO etc

The above can be revised briefly. Grammar component will be taught incidentally and in conjunction with Unit II.

1. Parts of Speech
2. Reported Speech
3. Punctuation
4. Phrases and Clauses
5. Active and Passive
6. Basic Errors in English Language
7. Spotting Errors and correcting them
8. Revising and Editing

Note: The teacher concern can make use of the following, to teach Grammar.

1. Reading a picture
2. Quiz
3. Word play
4. Dialogues

##### **Unit II: Spoken English**

**15 hours**

##### **1. Individual Presentation Skills**

**5 hours**

Students are to be taught public speaking using Presentation skills through application based teaching; public speaking is to be taught and application of these skills in formal and informal settings.

a) Concepts:

- i. Importance of Body Language and Eye Contact in Spoken Communication
- ii. Ways to Overcome Fear of Speaking
- iii. Pace, Tone and Intonation

iv. Listening as an Essential Part of Communication. How to be a an Effective Listener

b) Applied:

Students will be given topics to present before the class. They can use a host of methods to do so

1. Presentation with material - Formal
2. Oral presentation
3. Formal/Informal Speeches – Welcome, Introduction to a dignitary, Raising a toast, Farewell Speech, celebratory speeches

2. Pair Based Activities 5 hours

- a) Telephone Etiquette
- b) Speaking and Listening Classroom Practice Exercises in Pairs and Groups.

3. Group Based Activities 5 hours

Minutes of the meeting can be used as a group based activity.

Group Discussions of Formal and Informal nature.

### **Unit III: Written English**

**15 hours**

1. Letters

a) Formal Letters

- i. Job Application Letters
- ii. Enquiry Letters
- iii. Orders and Complaints letters
- iv. RTI
- v. Representations
- vi. Writing a resume

b) Social Letters

- i. Invitation &Reply
- ii. Condolence & Reply
- iii. Congratulations & Reply
- iv. Thank you & Reply

## Unit IV: Digital Story Telling (DST)

15 hours

Descriptive Writing – (Open to the Teacher to explore this writing in various areas Fiction and Non-Fiction and creative expression of personal writing)

### 5. Reference Books:

#### Primary References:

1. Azar, Betty Schramper. *Basic English Grammar*. New York: Pearson Education, 1996.
2. Biber, Douglas, Susan Conrad and Geoffrey Leech. *Longman Student Grammar of Spoken and Written English*. Edinburgh: Pearson Education Limited, 2002.
3. Bullock, Richard. *The Norton Field Guide to Writing*. New York: W.W. Norton & Company, 2009.
4. Jain, A.K. and Dr. Pravin S.R. Bhatia. *Professional Communication Skills*. New Delhi: S.Chand& Company Ltd, 2000.
5. Mohan, Krishna and Singh, N. P. *Speaking English Effectively* Macmillan India Ltd.
6. Sadanand, Kamelesh and Susheela Punitha. *Spoken English: A Foundation Course-Part 1*.Hyderabad: Orient Blackswan Private Limited, 2009.
7. Stanek, William. *Effective Writing for Business, College and Life*. Reagent Press, 2005.

#### Secondary References:

1. Bullock, Richard. *The Norton Field Guide to Writing*. New York: W.W. Norton & Company, 2009.
2. Chakravarty, Auditi and Bonnie Boehme. *Grammar & Usage for Better Writing*. New York: Amsco School Publications, 2004.
3. Downing, Angela and Philip Locke. *English Grammar A University Course*. London and New York: Routledge, 2006.

4. Hewings, Martin. *Advanced Grammar in Use*. 2nd. Great Britain: Cambridge University Press, 2005.
8. Naylor, Helen and Raymond Murphy. *Grammar in Use Supplementary Exercises*. Edinburgh: Cambridge University Press, 2001.

## **F.Y.B.A. – SEMESTER II – CORE COURSE**

**Course Title:** Understanding Fiction

**Course Code:** ENG-II.C-3

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To help students understand the evolution of the Novel and Short Story as distinct Literary Forms.
2. To help students understand the contribution of various other literary forms like Medieval Romances, Character Sketch etc. to the evolution of the novel.
3. To help students understand how the socio-economic conditions prevalent in the 18<sup>th</sup> century contributed to the rise of the Novel, and how the conditions prevalent in the 19<sup>th</sup> century contributed to the rise of the Short Story.
4. To help students understand the contribution of various other literary forms like Parables, Fables etc. to the evolution of the Short Story.
5. To help students understand the characteristics of the short story through the study of few popular short stories.
6. To teach students to appreciate English Fiction.
7. To instill the ability of recognizing the various elements of Fiction.

### **2. Learning Outcomes:** By the end of the course the student will be able:

1. Recognize and define elements of Short Stories, Novella and Novel such as Plot, Character, Setting, Theme.
2. Understand the structural difference between a short story and a novel.
3. Critically analyze short stories and novels.
4. Understand the inception of the short story, novella and novel.

### **3. Number of hours: 04 hours per week**

**4. Course Content:**

**Total Number of hours: 60**

**Unit I: Background**

**10 hours**

1. Contribution Of Medieval Prose Romances to evolution of English Novel
2. Other Literary Forms That Contributed to the Novel (diaries and journals, biographies/autobiographies, letters, character sketch)
3. Reasons for Emergence and Growth of the Novel as a Distinct Literary Genre In the 18<sup>th</sup> Century
4. Characteristics of the contemporary novel
5. Elements of the Novel
6. Contribution of writers of Asian, African, Latin American origin to the Contemporary English Novel.
7. **Ancient Roots/origins of the short story** (Stories of the Old Testament, Parables Of the New Testament, Fables, Panchatantra Stories, Boccaccio's Decameron etc.)
8. Reasons for the emergence of the short story in the 19<sup>th</sup> century
9. Characteristics Of the short Story
10. Difference between Novella and Short Story.

**Unit II: Novel**

**25 hours**

1. Lord of the Flies - William Golding

**Unit III: Short stories**

**10 hours**

1. The Gift Of the Magi - O Henry
2. The Cask Of Amontillado - Edger Alan Poe
3. Darling - Chekov
4. A Wrong Man in Worker's Paradise - Rabindranath Tagore
5. The Tiger In the Tunnel - Ruskin Bond
6. The Doctor's word - Rasipuram Krishnaswami Iyer Narayanaswami
7. Vengeful Creditor - Chinua Achebe
8. Good Advice Is Rarer then Rubies - Salman Rushdie
9. The Monkey's Paw - William Wymark Jacobs

#### Unit IV: Novella

15 hours

1. Animal Farm - George Orwell

(NOTE: Some short stories as well as background topics will be given for self study)

#### 5. Reference Books:

##### Primary References:

1. Achebe, Chinua. *Girls At War*. Johannesburg, South Africa: Penguin Books, 2009. Print.
2. Cross, Wilbur. *The Development of the English Novel*. New York: Atlantic Publishers and Distributors, 2001. Print.
3. Desai, Anita. *Fasting, Feasting*. New York: Mariner Original, 1999. Print.
4. Golding William- *Lord of the Flies*. Penguin; Deluxe edition, 2017. Print.
5. Hunter, Adrian. *The Cambridge Introduction To The Short Story In English*. New Delhi: Cambridge University Press, 2007. Print
6. Hoppenstand, Gary , W.W. Jacobs. *The Monkey's Paw and Other Tales of Mystery and the Macabre*. Chicago Review Press; Revised ed. Edition. 2005. Print.
7. Kohli. Suresh (ed). *Modern Indian Short Stories: An Anthology*. New Delhi: Arnold Heinemann Publishers, 1974. Print.
8. Orwell, George. *Animal Farm*. Penguin India; Fourth edition, 2011. Print.

##### Secondary References:

1. Abrams M. H. *A Glossary of Literary Terms*. Bangalore. Prism Books. 1999.
2. Daiches, David. *A Critical History Of English Literature Vol 1. 2<sup>nd</sup> ed*. New Delhi: Allied Publishers Pvt. Ltd., 2004. Print.
3. Reid, Ian. *The Short Story*. New York: Barnes and Nobel, 1977. Print



## **F.Y.B.A. – SEMESTER II – CORE COURSE**

**Course Title:** An Introduction to Linguistics and Stylistics

**Course Code:** ENG-II.C-4

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To acquaint the students with the basic concepts in linguistics.
2. To introduce the students to various sub disciplines of linguistics.
3. To know the connection between linguistics and stylistics.
4. To understand the concept of style in literature.
5. To provide hands on experience in analysing texts, fiction and poetry.

### **2. Learning Outcomes:** By the end of the course the student will be able to:

1. Identify and classify English sounds.
2. Produce utterances with correct stress and rhythm.
3. Distinguish between different international varieties of English registers of English.
4. Analyse stylistic features of literary language.
5. Ability of analyse English syntax.
6. Select and use appropriate register of English language.
7. Ability to write grammatically correct English.

### **3. Number of hours: 04 hours per week**

### **4. Course Content:**

**Total Number of hours: 60**

#### **Unit I: Nature of Language**

**05 hours**

1. Language and communication
2. Origin of language
3. Characteristics of human language
4. Language varieties: standard and non-standard language, dialect, register, slang, pidgin, Creole; International varieties of English
5. Language change

**Unit II: English Phonetics and Phonology** **10 hours**

1. The Speech mechanism
2. Phonemes of English: Description and Classification
3. Syllable : Structure and Types
4. Word Stress, Degrees of Stress, Stress Shift, Grammatical Stress
5. Sentence Stress: Use of Weak and Strong Forms,
6. Intonation Patterns/Uses of Tones

**Unit III: English Morphology** **10 hours**

1. Morphemes: Free and bound morphemes; Morphs and allomorphs
2. Word Formation in English: Simple, complex, compound, and compound-complex words; affixes, stems, roots; inflectional vs. derivational morphology
3. The process of word formation: Backformation, reduplication, blends, clippings, acronyms
4. Meaning change: Generalization, specialization, change in connotations

**Unit IV: Syntax and Grammar** **10 hours**

1. Different approaches to syntax
2. Parts of speech, Basic sentence structures, Types of sentences, clauses, phrases

**Unit V: Semantics** **10 hours**

1. Words as signs, transparent and opaque words
2. Conceptual vs. associative meaning
3. Lexical relations: synonymy, antonymy, hyponymy, homophony, homonymy, polysemy

**Unit VI: Applied Linguistics** **15 hours**

1. Linguistic approach to literature: Difference between ordinary language and language of literature  
Use of linguistics in the study of literature (stylistics): Figurative language; linguistic deviations; Phonological patterns of rhyme metre, alliteration, assonance, clustering of vowel and consonant sounds

2. Linguistics and language teaching: First language acquisition; Second language

learning, barriers in learning second language, Methods of teaching second language: Grammar-translation method, Direct method, audio-lingual method, the communicative approach

## 5. Reference Books:

### Primary References:

1. Akmajian, Demers, Farmer, Harnish. Linguistics. *An Introduction to Language and Communication*. PHI Learning Private Limited, New Delhi, 2009.
2. Leech Geoffrey. *Linguistic Guide to Poetry*. Routledge London, 1969.
3. Jones Daniel. *An Outline of English Phonetics*. Cambridge Uni. Press, 1972.
4. Lyons John. *Language and Linguistics an Introduction*. Cambridge University Press, 2003.
5. Quirk Randolph, Greenbaum Sidney. *A university Grammar of English*. Pearson Education Ltd. 2012.
6. Wallwork J F. *Language and Linguistics: An Introduction to the study of Language*. Heinemann Educational Books London, 1969.
7. Yule George. *The Study of Language: An Introduction*. Cambridge University Press, 1985.

### Secondary References:

1. Aarts, Bas and April McMahon. *The Handbook of English Linguistics*. Malden: Blackwell Publishing, 2006.
2. Broderick, John P. *Modern English Linguistics - A Structural and Transformational Grammar*. Thomas Y. Crowell Company, 1975.

3. Copley, Paul, ed. *Semiotics and Linguistics*. London: Routledge, 2001.
4. Dixon, R. M. W. *A Semantic Approach to English Grammar*. 2nd. Oxford University Press, 2005.
5. Hyland, Ken, ed. *English for Academic Purposes - An advanced resource book*. New York: Routledge, 2006.
6. Kretzschmar Jr, William A. *The Linguistic of Speech*. New York: Cambridge University Press, 2009.
7. Meyer, Charles. *Introducing English Linguistics*. Edinburgh: Cambridge University Press, 2009.
8. Radden, Gunter and Rene Dirven. *Cognitive English Grammar*. John Benjamins Publishing Company, 2007.
9. Trask, R. L. *Language & Linguistics - The Key Concepts*. Ed. Peter Stockwell. New York: Routledge, 2007.
10. Trousdale, Graeme and Nikolas Gisborne. *Constructional Approaches to English Grammar*. Berlin: Mouton de Gruyter, 2008.

**S.Y. B.A. – SEMESTER III – CORE COURSE**

**Course Title:** Contemporary Indian English Literature

**Course Code:** Eng-III.C-5

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To introduce the students to different genres of contemporary Indian writing in English.
2. To acquaint the students with the narrative of India' struggle for independence.
3. To familiarize the students with various themes and cultural contexts of Contemporary Indian English Writing.

**2. Learning Objectives:**

By the end of this course students:

1. Students with literature of Contemporary Indian English Literature.
2. Create awareness of the different genres employed by Contemporary Indian English Writers.
3. Elevate critical reading skill.
4. Familiarize students with the various themes and narrative techniques of the Contemporary Indian English writers.

**3. Number of hours:** 04 Hours per week.

#### 4. Course Content:

Total Number of hours: 60

#### Unit I: Poetry

15 hours

1. Keki Daruwala a) Boat-ride Along The Ganga  
b) Draupadi

Secondary Reading - Hawk

2. Adil Jussawala a) On First Approaching Santacruz Airport, Bombay  
b) Bars

3. Nissim Ezekiel a) Goodbye Party for Miss Pushpa T.S.  
b) Background casually

4. Arun Kolatkar a) The Bus  
b) An Old Woman  
c) Ajamil and the Tigers

5. Jayanta Mahapatra a) Hunger

6. Attipate Krishnaswami Ramanujan a) Love Poem for a Wife  
b) A River

7. Kamala Das a) Introduction  
b) My grandmother's House  
c) Summer in Calcutta

#### Unit II: Drama

18 hours

1. Final Solutions - Mahesh Dattani
2. Yayati - Girish Karnad

#### Unit III: Prose

12 hours

1. Short Stories

- a) A Horse and Two Goats - Rasipuram Krishnaswami Iyer Narayanaswami
- b) The Blue Umbrella - Ruskin Bond
- c) Portrait of a Lady - Khushwant Singh
- d) Vilas Sarang – (one short story to be selected from either *Fair Tree of the Void* or *The Women In Cages: Collected Stories.*)

2. Novel

15 hours

- a) Train to Pakistan- Khushwant Singh

## 5. Reference Books:

### Primary References:

1. David Davidar. *A Clutch of Indian Masterpieces*. New Delhi: Aleph Book Company, 2014.
2. Girish Karnad. *Yayati*. New Delhi: Oxford University Press, 2007.
3. Singh Khushwant. *Train to Pakistan*. Penguin, 2016.
4. Vilas Sarang. *Fair Tree of the Void*. Penguin Books Ltd.

### Secondary References:

1. Iyengar, K. R. S. *Indian Writing in English*. New Delhi: Sterling Publishers Pvt. Ltd., fourth edition, 1984.
2. Joshi, Dr. Rakesh. *Girish Karnad's Plays*. Jaipur: Mark Publishers, 2011.
3. Khair Tabish. *Babu Fictions: Alienation in Contemporary Indian English Novels*. UP: Oxford UP, 2001.
4. King, Bruce. *Modern Indian Poetry in English*. USA: Oxford University Press, 2005.
5. Mehrotra Arvind Krishna. *Twelve Modern Indian Poets*. New Delhi: Oxford India Paperback, 1993.
6. Naik, M. K, S. K. Desai and G. S. Amur. *Critical Essays on Indian Writing in English*. New Delhi: MacMillan, 1968.
7. Paranjape, Makarand R. *Indian poetry in English*. New Delhi: Macmillan, 1993.
8. Parthasarathy, R.(ed.). *Ten Twentieth - Century Indian Poets (New Poetry in India)*. New Delhi: Oxford University Press, 1976.
9. Shama, Ram. *Recent Indian English Literature*. Delhi: Manglam Publications, 2012.
10. Vilas Sarang. *The Women In Cages: Collected Stories*. Penguin India, 2006.
11. Warma, Monica. *Modern Indian Poetry in English*. New Delhi: Oxford University Press, 2010.

**Course Title:** Women's Writing in India

**Course Code:** ENG-E-12

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To offer students women's perspective of life and womanhood.
2. To acquaint the students with the distinct stylistic features of Indian women writers.
3. To evaluate the position of woman in the Indian patriarchal society and as reflected in literature written by women writers.

**2. Learning Outcomes:**

1. Appreciate a woman's point of view regarding life.
2. Understand the life of a woman in patriarchal communities of India.
3. Identify distinct features of women's writing in India.
4. Critically analyze significant women's texts written by Indian women.

**3. Number of hours: 04 hours per week**

**4. Course Content: Total number of hours: 60**

**Unit I: Poetry**

**20 hours**

1. Kamala Das a) The Descendants  
b) The Maggots
2. Mamta Kalia a) Positive Thinking  
b) After eight years of marriage



3. Melanie Silgado a) For Father on the Shelf  
b) Doris
4. Imtiaz Dharker a) Puradah I  
b) Minority
5. Hira Bansode a) Slave  
b) O Great Man
6. Mina Gaybhiye a) The Weeping Wound of Centuries  
b) Both are Useless
7. Anuradha Gaurav a) Request
8. Jyoti Lanje a) Mother  
b) The Nameless One

**Unit II: Drama**

**15 hours**

1. Rudali - Usha Ganguli

**Unit III: Short Fiction**

**10 hours**

1. The Day of the Golden Deer - Deshpande Shashi
2. Childless one - Nimbkar Jai
3. The Quilt - Ismat Chughtai

**Unit IV: Non - Fiction**

**15 hours**

1. It's always Possible: Transforming one of the Largest Prisons in the World  
"Women in Tihar"- Bedi Kiran.
2. Writing from the Margins -Shashi Deshpande

## 5. Reference Books:

### Primary References:

1. Bedi Kiran. *It's always Possible: Transforming One of the Largest Prisons in the World*. Sterling Publishers Pvt.Ltd ,India; 6th edition , 2005.
2. Chughtai, Ismat. *The Quilt and other stories*. Sheep. Meadow Press,U.S. 1994.
3. Deshpande, Shashi. *Writing From the Margin & Other Essays*. Penguin Books, 2003
4. Deshpande Shashi. *Collected Stories*. Penguin Books, London, 2003.
5. Dhar Sheila. *Here's Someone I'd Like you to Meet*. Oxford University Press, 1996.
6. Eunice De Souza. *Nine Indian Women Poets*. Oxford University Press, New Delhi, 1997.
7. Ganguli Usha. *Rudali*. Radhakrishan Prakashan, 1<sup>st</sup> edition, 2004.
8. Mehta Gita. *Karma cola*. Penguin, 2015.
9. Mulk Raj Anand and Zelliott Eleanor (Ed). *An Anthology of Dalit Literature*. Gyan Publishing House, New Delhi, 1992.
10. Prasad Madhusudan. *Contemporary Indian English Stories*. Sterling P. 1988.

### Secondary References:

1. Amga H.L. *Indo - English Poetry*. Surabhi P. Jaipur, 2000.
2. Bande Usha. *Gita Mehta: Writing Home / Creating Homeland (Writers of the Indian Diaspora)* . Rawat Publications , India, 2008.
3. Bedi Kiran. *I Dare*. Hay House, India, 2009.
4. Naik M.K. , Narayan Shyamala. *Indian English Literature 1980-2000 : A Critical Survey*. Pencraft International, Delhi, 2016.
5. Pawar M.S. *New Women Novelists with New Horizons*. Shruti P. Jaipur, 2011.
6. Ray Mohit. *Indian Writing in English*. Atlantic Publishers, New Delhi, 2008.

**Course Title:** American Literature of the Twentieth Century

**Course Code:** ENG-E-2

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To study the American Experience as captured in the seminal works of masters of American Literature of the twentieth century.
2. To expose the students through prose and poetry and drama to the various main trends, ideas and forces that shaped the writing of those times.
3. To acquaint students with the following literary movements in America – Realism, Modernism and Harlem Renaissance.

**2. Learning Outcomes:**

By the end of the course the students:

1. Appreciate American culture and literature of the Twentieth Century.
2. Will be sensitized to American culture and literature during the Twentieth Century.
3. Identify socio-political issues that took place in America during the Twentieth Century.
4. Critically analyze the American literary texts of the Twentieth Century.

**3. Number of hours: 04 hours per week**

#### **4. Course Content**

**Total Number of hours: 60**

##### **Unit I: Novel**

**15 hours**

1. The Colour Purple - Alice Walker

##### **Unit II: Drama**

**15 hours**

1. Death of a Salesman -Arthur Miller

##### **Unit III: Poetry**

**15 hours**

1. Robert Frost
  - a) Mending Wall
  - b) Stopping by the Woods
  - c) The Road not taken
2. Theodore Roethke
  - a) My Papa's Waltz
  - b) The Waking
3. Wallace Stevens
  - a) The Emperor of Ice Cream
4. John Crowe Ransom
  - a) Bells for John Whiteside's Daughter
5. Allen Ginsberg
  - a) America
  - b) Ode to Failure
6. Robert Lowell
  - a) To Speak of Woe that is Marriage
7. Sylvia Path
  - a) Crossing the water
  - b) Lady Lazarus
8. Langston Hughes
  - a) Dreams
  - b) I Too

## Unit IV: Background

15 hours

(Some topics could be assigned for self study and presentations in class)

1. The American Dream
2. The Great Depression
3. Social Realism and the American Novel
4. Beat Poets
5. Confessional Poets

### 5. Reference Books:

#### Primary References:

1. Miller, Arthur. *Death of a Salesman*. Penguin UK, 2011.
2. Poulin. A. Jr & Michael Waters, ed. *Contemporary American Poetry*. 8th Edition. Houghton Mifflin Company, 2006.
3. Thomas. C.T. *Twentieth Century Verse- American Anthology*. Delhi: Macmillan India Ltd, 1999.
4. Walker, Alice. *The Colour Purple*. US: Mariner, 2006.

#### Secondary References:

1. Brown, John Russell, ed. *American Theatre*. London, Edward Arnold, 1967.
2. Cullum, E. Linda, ed. *Contemporary American Ethnic Poets: Lives, works, sources*. Greenwood Publication group Inc, 2004.
3. Daniel Hoffman (ed.) Harward. *Guide to Contemporary American Writing*. New Delhi: Oxford University Press, 1979.
4. Gould, Jean. *Modern American Playwrights*. Bombay: Popular Prakashan, 1969.
5. Horto Rod, ed. *Background of American Literary Thought*. New Jersey: Prentice Hall, 1974.
6. Matthiessen F. O. *American Renaissance*. New York: Oxford University Press, 1941.

7. Pearce, Roy H. *The continuity of American Poetry*. Princeton University Press, 1979.

8. Shaw, R.B, ed. *American Poetry since 1960: Some Critical Perspectives*. 1974.

**PARVATIBAI CHOWGULE COLLEGE OF ARTS AND SCIENCE**  
**AUTONOMOUS**  
**DEPARTMENT OF ENGLISH**  
**APPROVED UG SYLLABI OF SEMESTER III, IV & V**  
**2019-2020**

**Course Title:** Writing for the Media - I

**Course Code:** ENG-SEC-1

**Marks:** 50

**Credits:** 2

**1. Course Objectives:**

1. To give students an over view of Media into day's world.
2. To promote interest in skilled Writing and to emphasize the importance of accurate use of English language in the field
3. To develop critical and analytical languages skills to be applied in the field of Mass Media.
4. To train students to be self-sufficient professionals capable of undertaking independent work and applying theoretical knowledge to real- life situations.
5. To prepare the foundation for careers in Media as an option for students.

**2. Learning Outcomes:**

Upon completion of the course the student should be able:

1. To comprehend the importance of good writing in the field of Mass Media- from print to Digital Media
2. To understand theoretical perspectives behind mass media and the jargon associated with the field.
3. To Master writing skills required for various media-from journalism in print and broad cast media to advertising and creative commercial media
4. To demonstrate competence in the technicalities of clear, concise writing through the use of accurate grammar, punctuation, spellings and writing style.

### 3. Total number of lectures:

30 (1hour Lectures) considering a term/semester runs over 15 weeks PERWEEK 2 HOURS

### 4. Topics to be covered

**Note:** To ensure the competency of students in the field after graduation, emphasis should be given to the written aspect of the course , while ensuring that the students understand various aspects of each field along with key-terms, and the differences in the written aspect.

#### Unit I: PRINTMEDIA: Newspapers

10 hours

Introduction: The Media and the Message-Message depends on Medium Introduction to Print

Media: Audience for the News

Advertising in Print Media: Promotional Literature: Copywriting for Leaflets, Pamphlets ,Brochures, Classifieds– Text ,Captions

#### Newspaper Writing:

*Concepts:* **News Reporting**-(datelines/Credit-line/Bylines/Nut-graph/Headlines )**News**

**Writing**–Appropriate angle for a new sstory– Structuring news(Lead/Climax form- Inverted Pyramid Form; Chronological form)– Qualities of effective leads–Using significant details–Effective revision Basic principles of AP Style (Associated Press Style Book) for Writing–Use of the Style Book– Style as a Manner of Writing– Clarity in Writing– Readability–Five ‘W’ sand ‘H’ of Writing.

**Other Writing**- Features/Articles-Editorials– Letters to the Editor– Book and Film reviews– Interviews–Oped Pieces

**Basic Layout and Composition**-Balanced/Unbalanced/Circu Layout- column setups- photograph additions-final look

*Applied:* Reporting -Climaxform -Inverted Pyramid Form;Chronological form Editorials- Letters to the Editor -Book and Film Reviews- Headlines- Oped Pieces -Layout & Composition; copywriting for Print Advertisements



**Editing:**

Concepts & Applied: Copy editing process–Guiding principles of editing Grammar–Punctuation–Subbing–Proof-reading(Proof-reading notations)– [The A P style book can be a great guide here.]

**Note :***The Editing component Is to be taught simultaneously along with the applied component of the paper . The teaching should be graded- Beginning with the basic knowledge of grammar and its application up to a level where the student is competent enough to not only edit their own written works but also others'. This part of component 1 should be taught over the rest of the components as well, ensuring an increase in the level of efficiency of the student.*

**Unit II: ELECTRONIC MEDIA: Radio and TV****10 hours**

*Concepts:* Radio as a Mass Medium–Radio Skills–Broad cast Writing–Broadcast Terms–Scripting for Radio– Story Structure–Lead ,Body, Ending– Writing Radio News and Features-Programmes for Radio (Features, News, Interviews, Skits ,Music Programmes, etc.), Advertising in Radio

*Applied:* Planning a Newscast– Radio Jockeying- Scripting for the Radio–Recording, Radio Ads, Radio PSA

**TELEVISION**

*Concepts:* Television as a Mass Medium–Television Skills–Scripting for TV- Programmes for TV(Features ,News, Interviews, Music Programmes, etc.), TV Advertising - Story Idea to story board to screen play to shoot

*Applied–* Anchoring; Interviewing, TV PSA, Parody Ads, The 3 shot ad movie

**UNIT III: DIGITALMEDIA-Internet and New Media****10 hours**

*Concepts:* Kinds of Digital Media & New Media

E-book/E-magazine–E-journal–E-newspaper–Internet–World Wide Web Mobile Media-Video Games

*Concepts :* Writing for Digital Media: An Interactive Media

Web Writing––Blogging.-Introduction to Profile Writing–Broadcast News Analysis–Caption Writing–Headline, Blurb, Lead-Digital Correspondence–Digital Editing

*Applied:* Web Writing-Blogging; Caption writing

## **5. Reference Books/CDs/Websites**

### **Primary References:**

1. *Writing for Television, Radio and New Media (Seventh Ed.)*. Hilliard, Robert-Wadsworth 2006
2. *Writing for the Mass Media* (Sixth edition). James Glen Stovall Pearson Education, 2006
3. *Basic News Writing* Melvin Menchar William. C. Brown Co., 1983
4. *Writing and Reporting News: A Coaching Method* Carol e Rich Wadsworth/Thomson Learning, 2003
5. *News Writing & reporting* James A Neal & Suzane S Brown Surjeeth Publications, 2003
6. *Broadcast News Writing, Reporting & Production* Ted White Macmillan
7. *An Introduction to Digital Media* Tony Feldman (Blueprint Series) 1996
8. *Advertising* Ahuja & Chhabra Sujeeth Publications, 1989
9. *The Screenwriter's Workbook* Syd Field Dell Publishing, 1984
10. *E-Writing* Dianna Booher Macmillan, 2008
11. *Mass Communication Theory* Denis Mcquail Vistaar Publications, 2007
12. *The Associated Press Style Book and Libel Manual* norm The A.P, 1994
13. *Hand book of Magazine Article Writing*, Michelle Ruberg, Writer's Digest, 2009

### **Secondary Reading:**

1. *Writing and Producing News* Eric Gormly Surjeet Publications, 2005
2. *A Crash Course in Screenwriting* David Griffith Scottish Screen, 2004
3. *Digital Media: An Introduction* Richard L Lewis Prentice Hall
4. *The Art of Editing the News* Robert. C McGiffort Chilton Book Co., 1978
5. *Digital Media Tools* Dr. Chapman Nigel (Paperback-26 Oct 2007)
6. *News reporting and Editing* K.M Srivastava Sterling Publications
7. *The News Writer's Handbook: an Introduction to Journalism* M. L Stein, Paterno, Susan .F Surjeeth Publications, 2003
8. *The TV Writer's Workbook :A Creative Approach to Television* Ellen Sandler Delta, 2007
9. *Understanding Journalism* Lynette Sheridan Burns Vistaar Publications, 2004
10. *Media and Society in the Digital Age* Kevin Kawamoto Pearson Education, 2002
11. *Media in the Digital Age* J.V Pavlik (Paperback-1 May 2008)

**Course Title:** Creative Writing - I

**Course Code:** ENG-SEC-2

**Marks:** 50

**Credits:** 2

**1. Course Objectives:**

1. To explore creative writing genres (Poetry, Drama, Fiction) through practical writing classes
2. To build on the foundation of basic knowledge of students' interest in creative writing
3. To develop ones' own style of writing through reading, discussion and experimenting in writing
4. To encourage students' to get their works published using traditional means and modern media
5. To encourage students' to use modern media in their creative effort
6. To create a writing portfolio for each student

**2. Learning Outcomes:** By the end of the course the student will :

1. Have a sample of their own creative output (individual/group)
2. Demonstrate an understanding of concepts related to the creative writing genres
3. Be confident to put forward their ideas/opinions through creative writing genres
4. Have the knowledge to be constructively critical of their own work as well as others'
5. Have the ability to use technology/social media/internet to showcase their works

**3. Number of hours: 02 hours per week**

#### **4. Course Content:**

**Total number of hours: 60**

**Note:** This course will focus on the creative *writing* process. Thus, emphasis will be given to the written aspect of the course. Theoretical concepts, learnings, and innovations in the forms and fields will be imparted through praxis. Students will maintain a journal and submit a finale portfolio of their creative output. The editing aspect of the writing process (revision, editing and proof reading) is to be taught concurrently with the units, while focusing on the particular needs of the forms.

#### **Unit I: Poetry**

**10 hours**

*Concepts:* Metre and rhyme ;form(and subverting form);free verse; syllabics; figures of speech and its use

Reading techniques—charm set, space, cold open, silence, blending music

Use of technology in performance, exposing our work to others

*Applied:* Students will apply some strategies of contemporary poetry in the writing of several poems and the analysis of published poetry. They will demonstrate, through the writing and performing of several poems, an understanding of some of the aesthetic aspects of contemporary poetry, such as manipulation of stanzas and line lengths, figures of speech, symbolism, setting, tone, and imagery. They will identify the aesthetic aspects of poetry in published poems and poems written by classmates.

*Portfolio:* Rhyming poems (with various rhyme scheme and forms), free verse

#### **Unit II: Drama**

**10 hours**

*Concepts:* Structures of a stage plays (physical/written) ;Acts/scenes; Scripting a stage play; story/dialogue/description; Contrast creating conflict; characters and idiom; overwriting; individual voice

Exposition -Using monologues; subtext; dramatic irony; status

*Applied:* Students will apply strategies of story- telling in the medium of a play and the analysis of published drama. They will demonstrate, through the writing of a play an understanding of some of the aesthetic aspects of drama, such as scripting action for the stage, use of dialogue and creating powerful characters through use of monologues and dramatic irony. They will have the ability identify these aspects of drama in published plays and work written by classmates.

*Portfolio:* One act play

### Unit III: Fiction

10 hours

*Concepts:* Short Fiction– Flash Fiction, Short Fiction (not more than 1000 words)

Descriptive Writing in Plot/Scenes; Character; point of view/ narrative voice; conflict/crises; Setting/time

Micro-tales/Nano -tales–analysis of social media and innovative story- telling techniques

*Applied:* Students will apply strategies of story telling in the writing of atleast five short story/flash fiction; and the analysis of published fiction. They will demonstrate, through the writing of an original work, an understanding of some of the following elements of story-telling: plot, characterization, setting, point of view, symbolism, and style. They will identify the narrative techniques and elements of storytelling used in published works of fiction and stories written by classmates.

*Portfolio :*Short-story, Flash Fiction

**N.B:** the number of hours for each unit includes time for continuous assessment, portfolio building(with instructor feedback and review) as well as writing classes.

**Additional note:** As a supplementary skill, the students should be taught how to prepare and submit a piece of work for publication. They should display the ability of using a word-processor, and desk-top publishing software to format their manuscript so as to be print ready and ready for submission to an editor, or publisher. They should also be taught, if not given opportunities for publication. These can be achieved using a portfolio method of assessing the students work. (Desk-to publishing software such as Adobe In design/Publisher/Illustrator)

Instructors should use pre editing and group workshop method within the classroom as a method of giving and receiving constructive criticisms. This will also open opportunities for students to perform and read out their work, there by taking care of the spoken word aspect of creative writing, as and when it may apply.

### 5. Reference Books:

#### Primary References:

1. Burroway, Janet. *Writing Fiction: A Guide To Narrative Craft*. New York : Longman Publishers, 2000.
2. Cheney, Theodore A. Rees. *Writing Creative Nonfiction-Fiction Techniques for Crafting Great Nonfiction*. California: Ten Speed Press, 1987. ebook.

3. Earnshaw, Steven. *The Handbook of Creative Writing*. Edinburgh University Press, Edinburgh. 2007.
4. Greenwell, Bill and Linda Anderson. *A Creative Writing Handbook- Developing Dramatic Technique, Individual Style and Voice*. Ed . Derek Neale. London : A & C Publishers Ltd., 2009.
5. Miller, Brenda and Suzanne Paola. *Tell it Slant- Writing and Shaping Creative Nonfiction*. Mcgraw- Hill, 2005.
6. Mills, Paul. *The Routledge Creative Writing Coursebook*. Routledge, 2006. ebook.
7. Morley, David. *The Cambridge Introduction to Creative Writing*. Cambridge: Cambridge University Press, 2007.
8. Smith, Marc Kelly and Joe Kraynak. *Take the Mic- The Art of Performance Poetry, Slam and the Spoken Word*. Illinois: Source books Media Fusion, 2009. ebook.
9. Strunk, William and E.B. White. *The Elements of Style*. New York: The Penguin Press, 2005.

### **Secondary References:**

1. Boden, Margaret. *The creative mind - myths and mechanisms*. 2nd. New York: Routledge, 2004.
2. Bolton, Gille. *Write Yourself-Creative Writing and Personal Development*. London: Jessica Kingsley Publishers, 2011.
3. Hamand, Maggie. *Creative Writing For Dummies*. West Sussex: John Wiley & Sons, Ltd, 2009.
4. Harper, Graeme. *On Creative Writing*. London: Short Run Press, 2010.
5. Kaufman, Scott Barry and James Kaufman. *The Psychology of Creative Writing*. New York: Cambridge University Press, 2009.
6. May, Steve. *Doing creative writing*. Oxon: Routledge, 2007.
7. Smith, Marc Kelly and Joe Kraynak. *Stage a Poetry Slam*. Illinois: Sourcebooks Media Fusion, 2009, Publishers, 2008.

**Course Title:** Writing for the Media

**Course Code:** ENG-III.E-3

**Marks :**100

**Credits :**4

### **Course Objectives**

1. To give students an overview of Media in today's world.
2. To promote interest in skilled Writing and to emphasize the importance of accurate use of English language in the field
3. To develop critical and analytical language skills to be applied in the field of Mass Media.
4. To train students to be self sufficient professionals capable of undertaking independent work and applying theoretical knowledge to real-life situations.
5. To prepare the foundation for careers in Media as an option for students.

### **Learning Outcomes**

Upon completion of the course the student should be able:

1. Comprehend the importance of good writing in the field of Mass Media - from print to Digital Media
2. Understand theoretical perspectives behind mass media and the jargon associated with the field.
3. Master writing skills required for various media - from journalism in print and broadcast media to advertising and creative commercial media.
4. Demonstrate competence in the technicalities of clear, concise writing through the use of accurate grammar, punctuation, spellings and writing style.

### 3. Total number of hours:

60 (1 hour Lectures) considering a term/semester runs over 15 weeks PER WEEK 4 HOURS

### 4. Topics to be covered

**Note:** To ensure the competency of students in the field after graduation, emphasis should be given to the written aspect of the course, while ensuring that the students understand various aspects of each field along with key-terms, and the differences in the written aspect.

#### **Unit I – PRINT MEDIA : Newspapers and Magazines Theory (12 lectures)**

Introduction : The Media and the Message - Message depends on Medium Introduction to Print Media: Audience for the News

Story Ideation as basis of commercial Radio, T.V. and Cinematic production

Difference in writing styles between Print, Electronic and Digital Media

#### **Newspaper Writing:**

*Concepts:* **News Reporting-** (datelines/Credit-line/Bylines/Nut-graph/Headlines) **News Writing** – Appropriate angle for a news story – Structuring news (Lead/Climax form - Inverted Pyramid Form; Chronological form) – Qualities of effective leads –Using significant details – Effective revision Basic principles of AP Style (Associated Press Style Book) for Writing – Use of the Style Book – Style as a Manner of Writing – Clarity in Writing – Readability – Five ‘W’s and ‘H’ of Writing.

**Other Writing-** Features/Articles - Editorials – Letters to the Editor – Book and Film reviews – Interviews– Oped Pieces

**Basic Layout and Composition** - Balanced/Unbalanced/Circus Layout - column setups- photograph additions - final look

*Applied:* Reporting - Climax form - Inverted Pyramid Form; Chronological form Editorials- Letters to the Editor -Book and Film Reviews - Headlines - Oped Pieces - Layout & Composition



## **Writing for Magazines:**

*Concepts:* Demographics (Target Audience); Types of Magazines and How writing differs in them; Differences/Similarities in writing Between Newspaper writing and Magazine writing; Editorials; Layout and Composition **Article writing** – Structuring for greatest effect – Preparation and organization of article – Specific angle – specific audience.

Feature writing – structure – organisation – feature angles – simplicity in Style. *Applied:* Feature and Article Writing- Creation of a Magazine - Layout/Composition - Photographs to enhance written word

## **Editing:**

Concepts & Applied: Copy editing process – Guiding principles of editing Grammar – Punctuation – Subbing – Proof-reading (Proof-reading notations) – [The AP style book can be a great guide here.]

**Note:** *The Editing component is to be taught simultaneously along with the applied component of the paper. The teaching should be graded - Beginning with the basic knowledge of grammar and its application up to a level where the student is competent enough to not only edit their own written works but also others'. This part of component 1 should be taught over the rest of the components as well, ensuring an increase in the level of efficiency of the student.*

## **Unit 2 - ELECTRONIC MEDIA : Radio, T.V. and Cinema RADIO (18 lectures)**

*Concepts:* Radio as a Mass Medium – Radio Skills – Broadcast Writing – Broadcast Terms – Scripting for Radio – Story Structure – Lead, Body, Ending – Writing Radio News and Features - Programmes for Radio (Features, News, Interviews, Skits, Music Programmes, etc.)

*Applied:* Planning a Newscast – Radio Jockeying - Scripting for the Radio - Recording

## **TELEVISION**

*Concepts:* Television as a Mass Medium – Television Skills – Scripting for TV -  
Programmes for TV (Features, News, Interviews, Music Programmes, etc.)

*Applied* – Scripting for a show; Anchoring; Interviewing;

## **FILM**

*Concepts:* Fundamentals of Film Story Writing (The Three Act Story Structure), Scripting,  
Screenplay and Production, Documentary Film.

Writing for the screen – Writing effective film reviews

*Applied*– The Three Act Story Structure, Writing Short Screenplays, Film Reviews.

## **UNIT 3 – DIGITAL MEDIA - Internet and New Media**

**(18 lectures)**

*Concepts:* Kinds of Digital Media & New Media

E-book/E-magazine – E-journal – E-newspaper – Internet – World Wide  
Web Mobile Media - Video Games

*Concepts:* Writing for Digital Media: An Interactive Media

Web Writing - Technical Writing – Blogging.- Introduction to  
Profile Writing – Broadcast News Analysis – Caption Writing –  
Copy Writing/Content Writing – Story Structure and Planning -  
Inverted Pyramid - Headline, Blurb, Lead - Digital Correspondence  
– Digital Editing

*Applied:* Web Writing - Technical Writing – Blogging; Caption Writing; Content Writing

## **UNIT 4 – ADVERTISING**

**(12 lectures)**

*Concepts:* Advertisements in Different Media (Print; TV; Radio; Digital) – An  
Overview Promotional Literature: Copywriting for Leaflets, Pamphlets,  
Brochures, Classifieds – Text, Captions, Logo – Story-board.

T.V. Advertisements - Story Idea to story board to screenplay to  
shoot. writing for advertising –

*Applied:* copywriting for Print Advertisements; The 3 shot ad movie; PSA's; Parody ads

## 5. List of Books/CDs/Websites for reference

1. *Writing for Television, Radio and New Media (Seventh Ed.)*. Hilliard, Robert - Wadsworth 2006
2. *Writing for the Mass Media* (Sixth edition). James Glen Stovall Pearson Education, 2006
3. *Basic News Writing* Melvin Menchar William. C.Brown Co., 1983
4. *Writing and Reporting News: A Coaching Method* Carole Rich Wadsworth/ Thomson Learning, 2003
5. *News Writing & Reporting* James A Neal & Suzane S Brown Surjeeth Publications, 2003
6. *Broadcast News Writing, Reporting & Production* Ted White Macmillan
7. *An Introduction to Digital Media* Tony Feldman (Blueprint Series) 1996
8. *Advertising* Ahuja & Chhabra Sujeeth Publications, 1989
9. *The Screenwriter's Workbook* Syd Field Dell Publishing, 1984
10. *E-Writing* Dianna Boother Macmillan, 2008
11. *Mass Communication Theory* Denis Mcquail Vistaar Publications, 2007
12. *The Associated Press Style Book and Libel Manual* Norm The A.P, 1994
13. *Handbook of Magazine Article Writing*, Michelle Ruberg, Writer's Digest, 2009

### Secondary Reading:

1. *Writing and Producing News* Eric Gormly Surjeet Publications, 2005
2. *A Crash Course in Screenwriting* David Griffith Scottish Screen, 2004
3. *Digital Media: An Introduction* Richard L Lewis Prentice Hall
4. *The Art of Editing the News* Robert.C McGiffort Chilton Book Co., 1978
5. *Digital Media Tools* Dr.Chapman Nigel (Paperback - 26 Oct 2007)
6. *News reporting and Editing* K.M Srivastava Sterling Publications
7. *The News Writer's Handbook: an Introduction to Journalism* M.L Stein, , Paterno, Susan.F Surjeeth Publications, 2003
8. *The TV Writer's Workbook : A Creative Approach to Television* Ellen Sandler Delta, 2007
9. *Understanding Journalism* Lynette Sheridan Burns Vistaar Publications, 2004
10. *Media and Society in the Digital Age* Kevin Kawamoto Pearson Education, 2002  
*Media in the Digital Age* J.V Pavlik (Paperback - 1 May 2008)

**Course Title:** New Literatures in English

**Course Code:** ENG-E-4

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To introduce students to the marginalized voices in society through their literatures.
2. To help students understand the contribution of the marginalized to mainstream literature.
3. To establish the voices of the marginalized through their representative texts, authors and movements.
4. To inculcate an atmosphere of cultural acceptance through the texts
5. To introduce students to the marginalization of the female gender through their works in literature

**2. Learning Outcomes:** But the end of the course the student will be able:

1. Understand the concept of the marginalized segments in society.
2. Recognize writers, forms, and movements associated with the marginalized.
3. Analyze works of literatures critically, keeping in mind the segmented.
4. Write reflective and research essays to present their responses to New Literatures in English.

**3. Number of hours: 04 hours per week**

#### 4. Course Content:

**Total number of hours: 60**

#### Unit I: Contextual Study

**8 hours**

**Note:** The following areas will be covered along with their representative texts

1. American Civil War and its consequences
2. The Harlem Renaissance - the rise and fall of the Black cultural movement with reference to the Black Panthers
3. Feminism - the waves and the main proponents of Feminism
4. Introduction to post-colonial themes

#### Unit II: Play

**20 hours**

1. *The Lion and the Jewel* - Wole Soyinka
2. *Pantomime* - Derek Walcott

#### Unit III: Poetry

**18 hours**

1. Langston Hughes
  - a) The Weary Blues,
  - b) The Negro Speaks of Rivers

Secondary poems

  - a) Black Panther
  - b) Dinner Guest: Me
2. Countee Cullen
  - a) Heritage, Karengé ya Marengé
  - b) A Brown Girl Dead
  - c) Incident

Secondary Poems

  - a) Yet do I Marvel
  - b) Mood
3. Paul Lawrence Dunbar
  - a) The Plantation Child's Lullaby
  - b) The wraith

Secondary Poems

  - a) We Wear the Mask
4. Edward Braithwaite
  - a) Bread

Secondary poems

  - a) Prelude

5. Claude McKay
  - a) America,
  - b) Tormented

Secondary poems

  - a) If we must die
  - b) The Barrier
  
6. Imamu Amiri Baraka
  - a) Incident
  - b) In memory of Radio
  - c) Notes for a Speech

Secondary Poems

  - a) At the National Black Assembly
  
7. Hilarie Lindsay
  - a) Barren Harvest
  - b) Monuments of Men
  
8. Maya Angelou
  - a) Caged bird
  - b) Women Work

Secondary poems

  - a) Phenomenal Woman
  - b) Still I Rise
  
9. Alec Derwent Hope
  - a) Australia
  - b) The Death of a Bird
  
10. Derek Walcott
  - a) A Far Cry from Africa
  - b) Ruins of a great House
  
11. Judith Wright
  - a) Nigger's Leap
  
12. Louise Bennet
  - a) Colonization in Reverse
  
13. David Dabydeen
  - a) Coolie Mother
  - b) Coolie Son
  - c) Slave Song

## Unit IV: Short Stories

14 hours

1. *Miguel Street* - V.S. Naipaul
  - a) Bogart
  - b) His Chosen Calling
  - c) The Thing Without a Name
  - d) Man-Man
  - e) George and the Pink House
  - f) B. Wordsworth
2. *The Tomorrow-Tamer* - Margaret Laurence
  - a) The Tomorrow-Tamer
  - b) The Merchant of Heaven
3. *Lives of Girls and Women* - Alice Munro
  - a) The Flats-Land
  - b) Lives of Girls and Women

### 5. Reference Books:

#### Primary References:

1. Bajaj, Nirmal. *Search for Identity in Black Poetry*. Atlantic Publications
2. Chavan, Sunanda. *The Fair Voice-A Study of Women Poets in English*. Sterling.
3. Kulkarni, Harihar. *Black Feminist Fiction*. Creative Books
4. Loomba, Ania. *Colonialism/Postcolonialism -The New Critical Idiom*. Routledge.
5. Naipaul V.S. *Miguel Street*. New York Vintage International Edition, 1984.
6. Pushpa, M. *The plays of Wole Soyinka*. Prestige.
7. Rehman, Anisur. *New literatures in English*. Creative.
8. Sumana, K. *The Novels of Toni Morrison- A study in Race, Gender & Class*. New Delhi: Prestige Books
9. V.S. Naipaul. *Miguel Street*. New York: Vintage International Edition, 1984.

#### Secondary References:

1. Bhelande, Anjali; Pandurang, Mala (ed). *Articulating Gender*. Delhi: Pencraft International
2. Kearns, Francis. *Black Identity*. N.Y.: Holt, Rinehart & Winston.

3. Ray, Mohit; Kundu, Rama, Kundu. *Studies in Women Writers in English*. Atlantic.
4. Wright, Derek. *Wole Soyinka revisited*. N.Y. Twayne Pubs.



**S.Y.B.A. – SEMESTER IV – CORE COURSE**

**Course Title:** Literary Criticism

**Course Code:** ENG-IV.C-6

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To enable the students understand nature of literary criticism.
2. To acquaint them with the terminology of literary criticism.
3. To provide them the knowledge of the important schools of literary criticism with the help of representative texts.
4. To help the students grasp methods and techniques of interpreting literature.
5. To be able to apply literary theory to text.

**2. Learning outcomes:** By the end of the course the student will be able to:

1. Understand the nature and functions of literary criticism.
2. Read the writings of literary scholars and critics with understanding and judicious appreciation.
3. Recognize and define major critical schools.
4. Generate and articulate personal responses to literary and critical texts.
5. Explain the premises and assumptions underlying such personal responses.

**3. Number of hours:**                      **04 hours per week**

**4. Course Content:**

**Total Number of hours: 60**

**Unit I: Introduction to literary Criticism**

**05 hours**

1. What is literature?
2. Difference between Literary Theory and Literary Criticism.
3. Functions of literary Criticism
4. Types of literary Criticism.
5. A brief survey of major critical schools

**Unit II: Classical Criticism**

**14 hours**

1. Features of Classical Criticism
2. Plato on Imitation and Art
3. Aristotle's *Poetics*
4. Longinus' *On the Sublime*

**Unit III: Neo-Classical Criticism**

**13 hours**

1. Features of Neo-Classical Criticism
2. John Dryden- *Essay of Dramatick Poesie*
3. Alexander Pope - *Essay on Criticism*
4. Dr. Samuel Johnson- *Preface to Shakespeare*

**Unit IV: Romantic Criticism**

**14 hours**

1. Features of Romantic Criticism
2. William Wordsworth- *Preface to Lyrical Ballads*.
3. Samuel Taylor Coleridge - *Biographia Literaria* –His concept of fancy and imagination, language of poetry.

**Unit V: New Criticism**

**14 hours**

1. Features of New Criticism
2. Thomas Stearns Eliot - *Tradition and the Individual Talent*
3. Ivor Armstrong Richards - *Four Kinds of Meaning*

**5. Reference Books:**

**Primary References:**

1. Aristotle. *The Poetics of Aristotle*. Emereo Publishing, Australia, 2012.
2. Aivanhov, Omraam Mikhael. *T. S. Eliot: Tradition and the Individual Talent*. Prakash Book Deport Bareilly, U.P., 2012.

3. Arnold, Thomas. *Dryden: An Essay of Dramatic Poesy*. Atlantic Publisher, New Delhi, 2006.
4. Daiches, David. *Critical Approaches to Literature*. Orient Longman, Mumbai, 1967.
5. Giles, Herbert Allen. *Longinus on the Sublime*. Kessinger Publishing, U.S., 2010.
6. Habib M. A. R. *A History of Literary Criticism and Theory*. Blackwell Publishing, U.S.A., 2008.
7. Leavis F.R. *Revaluation: Tradition and Development in English Poetry*. Ivan R. Dee Publisher, Chicago, 1998
8. Nandwani Aditya. S.T. *Coleridge-Biographia Literaria*. Anmol Publications Pvt. Ltd., New Delhi, 2009
9. Narasimhaiah C. D (ed). *Indian response to American literature*. UEFI, New Delhi, 1967.
10. Plato. *The Republic*. Rupa Publications, India, 2013
11. Ransom J. C. - *The New Criticism Essay*. New Directions, New York, 1941.
12. Richards I. A. *Four Kinds of Meaning*. Transaction Publishers, 2004.
13. Samuel Johnson. *Preface to Shakespeare*. Hardpress Publishing, U.S.A., 2010
14. Scott James R.A. *The Making of Literature*. Nabu Press, South Carolina, 2011.
15. Warren Robert Penn. *A Poem of Pure Imagination: An Experiment in Reading*. Renal & Hitchcock, New York, 1946.
16. Wellek Rene. *A History of Modern Criticism*. Yale University Press, U.S., 1986

### **Secondary References:**

1. Brooks Cleanth. *The Well Wrought Urn*. Mariner Books, 1956.
2. Butcher S.H. *Aristotle's Theory of Poetry and Fine Art*. Dover P, USA, 1951.
3. Lodge David, Nigel Wood. *Modern Criticism and Theory*. Pearson Publishing, UP India, 2007.
4. Richards I. A. *Practical Criticism*. London, 1929.
5. Shawcross, John(ed). *Shelley's Literary and Philosophical Criticism*. Oxford, U.K. 1909.
6. Wimsat W. K. and Cleanth Brooks. *Literary Criticism: A Short History*. Routledge Kegan Paul, London, 1957.

**Course Title:** The Literature of the Indian Diaspora

**Course Code:** ENG-E-5

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To introduce to the students the types of Diaspora theories and writings
2. To enable students to read and appreciate Diaspora themes, identity and culture
3. To teach students to appreciate cross-cultural and multicultural studies
4. To understand multiple consciousness in Diaspora writings.

**2. Learning Outcomes:** By the end of the course the student will be able to:

1. Understand Diaspora
2. Understand Indian Diaspora through Arts and literature
3. Identify and analyze Diaspora themes through short stories and poems

**3. Number of Hours:**                      **04 Hours per week**

**4. Course Content:**

**Total Number of hours: 60**

**Unit I: Background**

**07 hours**

1. Nature and themes of Diasporic writings
  - a) Exile literature
  - b) Displacement and the Diasporic identity
  - c) Culture and hybridity
2. Gender and Diaspora politics
3. Major Diaspora writers of India

**Unit II: Poetry**

**15 hours**

1. Sujata Bhatt
  - a) The Voices
  - b) The Dream
  - c) Search for my tongue
2. Meena Alexander
  - a) On Indian Road
  - b) Birthplace with Buried Stones
3. Chitra Banerjee Divakaruni
  - a) Indigo
  - b) Tiger Mask Ritual
4. Saleem Peeradina
  - a) To whom it may concern
  - b) Song of the makeover
5. Ratin Bhattacharjee
  - a) The Indian Diaspora

**Unit III: Novel**

**15 hours**

1. A River Sutra - Geeta Mehta  
Bye Bye blackbird - Anita Dessai (**Non –evaluative Secondary text**)

**Unit IV: Short stories****15 hours**

1. A Temporary Matter
2. When Mr. Pirzada Came To Dine
3. Interpreter Of Maladies
4. The Third And Final Continent
5. A Real Durwan

**Unit V: Essays****08 hours**

1. Salman Rushdie
  - a) Imaginary Homelands
  - b) New empire within Britain

**Unit VI: Films (Non Evaluative)**

1. Anita and Me (film) - Meera Syal. Directed by Metin Hüseyin and Produced by Paul Raphael (UK) 2002
2. Namesake (film) - Jhumpa Lahiri. Produced and Directed by Meera Nair (India) 2007

**5. Reference Books:****Primary References:**

1. Bhatt Sujatha. *Collected Poems*. Carcanet Press Limited, 2013.
2. Bhatt Sujatha. *Point No Point: Selected Poems*. Carcanet Press Limited, 1997.
3. Dessai Anita. *Bye Bye Black Bird*. Orient Paperbacks, New Delhi, 2005.
4. Lahiri Jhumpa. *Interpreter of Maladies*. Harper Collins Publishers, 2008.
5. Mehta Gita. *A River Sutra*. Penguin, 2000.
6. Peeradina Saleem. *Contemporary Indian English Poetry*. Macmillan, Chennai, 2010.
7. Rushdie Salman. *Imaginary Homelands: Essays and Criticism* RHUK, 2004.

**Secondary References:**

1. Agarwal Beena. *Women Writers and Indian Diaspora*. Authors press, 2011.
2. Agarwal Malti. *English Literature: Voices of Indian Diaspora*. Atlantic Publisher, 2009.
3. Bande Usha and Jasbir Jain (series ed). *Gita Mehta- Writing Home/Creating Homeland*. New Delhi: Rawat Publication, 2008.

4. Chakrabarti A. S. A. P. T Kavita. *Contextualizing Nationalism, Transnationalism and Indian Diaspora*. Creative Publisher, 2010.
5. Das Nigamananda. *Jhumpa Lahiri: Critical Perspectives*. Pencraft International, 2008.
6. Deb Kushal. *Mapping Multiculturalism (1<sup>st</sup> Edition)*. Rawat Publications , 2002.
7. Gupta K. Surendra. *Specifications of Indian Diaspora Study of Emerging Sandwich Cultures*. Atlantic Publisher, 2012.
8. Jain Jasbir. *Dislocations and Multiculturalisms: (1st Edition)*. Rawat Publications, 2004.
9. Jain Jasbir. *Writers of the Indian Diaspora*. Rawat Publications, 1998.
10. Kadekar Narayan Laxmi and Sahoo Kumar Ajaya .*Global Indian Diaspora: History, Culture and Identity*. Rawat Publications, 2012.
11. Knott Kim. *Diasporas: Concepts, Intersections, Identities*. Rawat Publications, 2011.
12. Tiffin Griffiths Ashcroft Menin. *The Empire Writes Back*. Taylor & Francis Ltd, 2002.

**Course Title:** Writing for the Media - II

**Course Code:** ENG-SEC-3

**Marks:** 50

**Credits:** 2

**1. Course Objectives:**

1. To give students an overview of Media in today's world.
2. To promote interest in skilled Writing and to emphasize the importance of accurate use of English language in the field
3. To develop critical and analytical language skills to be applied in the field of Mass Media.
4. To train students to be self-sufficient professionals capable of undertaking independent work and applying theoretical knowledge to real- life situations.
5. To prepare the foundation for careers in Media as an option for students.

**2. Learning Outcomes:**

Up on completion of the course the student should be able:

1. To comprehend the importance of good writing in the field of Mass Media- from print to Digital Media
2. To understand theoretical perspectives behind mass media and the jargon associated with the field.
3. To Master writing skills required for various media- from journalism in print and broad cast media to advertising and creative commercial media
4. To demonstrate competence in the technicalities of clear, concise writing through the use of accurate grammar, punctuation, spellings and writing style.



### 3. Total number of hours:

30 (1hour lectures) considering a term/semester runs over 15 weeks PER WEEK  
2 HOURS

### 4. Topics to be covered

**Note:** To ensure the competency of students in the field after graduation, emphasis should be given to the written aspect of the course, while ensuring that the students understand various aspects of each field along with key-terms, and the differences in the written aspect.

#### Unit I: Print Media - Magazines

10 hours

Introduction: The Media and the Message-Message depends on Medium

Difference in writing styles between Newspaper and Magazines

#### Writing for Magazines:

*Concepts:* Demographics (Target Audience); Types of Magazines and How writing differs in them; Differences/Similarities in writing Between Newspaper writing and Magazine writing; Editorials; Layout and Composition **Article writing**– Structuring for greatest effect–Preparation and organization of article– Specific angle–specific audience.

Feature writing–structure– organization– feature angles–simplicity in Style.

*Applied:* Feature and Article Writing-Creation of a Magazine-Layout/Composition- Photographs to enhance written word, Product/information based advertisements

#### Editing:

Concepts & Applied: Copy editing process–Guiding principles of editing Grammar– Punctuation–Subbing–Proof-reading (Proof-reading notations)– [The A P stylebook can be a great guide here.]

**Note:** *The Editing component is to be taught simultaneously along with the applied component of the course. The teaching should be graded- Beginning with the basic knowledge of grammar and its application up to a level where the student is competent enough to not only edit their own written works butalsoothers'. This part of*

*component should be taught over the rest of the components as well, ensuring an increase in the level of efficiency of the student.*

## **Unit II: Electronic Media- Cinema**

**10 hours**

**Television:** *Concepts* :Television as a Mass Medium–Television Skills–Scripting for TV-Programs for TV  
*Applied*–Scripting for a show

**Film :** *Concepts:* Fundamentals of Film Story Writing (The Three Act Story Structure),Scripting, Screenplay and Production ,Documentary Film. Writing for the screen–Writing effective film reviews

*Applied*–The Three Act Story Structure , Writing Short Screen plays, Film Reviews.

## **Unit III: Digital Media-Internet and New Media**

**10 hours**

*Concepts:* Writing for Digital Media: An Interactive Media

Web Writing- Technical Writing–Blogging.-Introduction to Profile Writing–  
Broadcast News Analysis–Caption Writing–Copy Writing/Content Writing–  
Story Structure and Planning-Inverted Pyramid-Headline, Blurb, Lead-Digital  
Correspondence–Digital Editing

*Applied:* Technical Writing; Content Writing using blogs, Social media content generation

## **5. Reference Books/CDs/Websites:**

### **Primary References:**

1. *Writing for Television, Radio and New Media (Seventh Ed.)*. Hilliard, Robert- Wadsworth 2006
2. *Writing for the Mass Media* (Sixth edition). James Glen Stovall Pearson Education, 2006
3. *Basic News Writing* Melvin Menchar William. C. BrownCo.,1983
4. *Writing and Reporting News: A Coaching Method* Carole. Rich Wadsworth/Thomson Learning, 2003
5. *News Writing & Reporting* James A Neal & Suzane S Brown Surjeeth Publications,2003
6. *Broadcast News Writing, Reporting & Production* Ted White Macmillan

7. *An Introduction to Digital Media* Tony Feldman (Blueprint Series)1996
8. *Advertising* Ahuja & Chhabra Sujeeth Publications,1989
9. *The Screen writer's Workbook* Syd Field Dell Publishing,1984
10. *E-Writing* Dianna Booher Macmillan,2008
11. *Mass Communication Theory* Denis Mcquail Vistaar Publications, 2007
12. *The Associated Press Style Book and Libel Manuel* Norm The A.P,1994
13. *Handbook of Magazine Article Writing*, Michelle Ruberg, Writer's Digest,2009

**Secondary References:**

1. *Writing and Producing News* Eric Gormly Surjeet Publications,2005
2. *A Crash Course in Screen writing* David Griffith Scottish Screen, 2004
3. *Digital Media: An Introduction* Richard L Lewis Prentice Hall
4. *The Art of Editing the News* Robert C Mc Giffort Chilton Book Co.,1978
5. *Digital Media Tools* Dr. Chapman Nigel (Paperback-26Oct2007)
6. *News reporting and Editing* K. M Srivastava Sterling Publications
7. *The News Writer's Handbook: an Introduction to Journalism* M. L Stein, ,Paterno, Susan. F Surjeeth Publications, 2003
8. *The T V Writer's Workbook: A Creative Approach to Television* Ellen Sandler Delta, 2007
9. *Understanding Journalism* Lynette Sheridan Burns Vistaar Publications,2004
10. *Media and Society in the Digital Age* Kevin Kawamoto Pearson Education,2002
11. *Media in the Digital Age* J. V Pavlik (Paperback-1May2008)

**Course Title:** Creative Writing - II

**Course Code:** ENG-SEC-4

**Marks:** 50

**Credits:** 2

### **1. Course Objectives:**

1. To explore creative writing genres (Poetry, Drama ,Fiction) through practical writing classes
2. To build on the foundation of basic knowledge of students' interest in creative writing
3. To develop ones' own style of writing through reading, discussion and experimenting in writing
4. To encourage students' to get their works published using traditional means and modern media
5. To encourage students' to use modern media in their creative effort
6. To create a writing portfolio for each student

### **2. Learning Outcomes:** By the end of the course the student will :

1. Have a sample of their own creative output (individual/group)
2. Demonstrate an understanding of concepts related to the creative writing genres
3. Be confident to put forward their ideas/opinions through creative writing genres
4. Have the knowledge to be constructively critical of their own work as well as others'
5. Have the ability to use technology/social media/internet to showcase their works

### **3. Number of hours: 02 hours per week**

#### 4. Course Content:

**Total number of hours: 60**

**Note:** This course will focus on the creative *writing* process. Thus, emphasis will be given to the written aspect of the course. Theoretical concepts, learning and innovations in the forms and fields will be imparted through praxis. Students will maintain a journal and submit a finale portfolio of their creative output. The editing aspect of the writing process (revision, editing and proof reading) is to be taught concurrently with the units, while focusing on the particular needs of the forms.

#### **Unit I: Poetry**

**10 hours**

*Concepts:* Meaning and being of language- power of reference/pop culture/allusions; form (and subverting form); syllabics; shaping a sequence and collection;

Spoken Word-writing, speaking, and performing ; Reading techniques—charm, set, space, cold open, silence, blending music

Use of technology in performance, exposing your work to others

*Applied:* Students will apply some strategies of contemporary poetry in the writing of several poems and the analysis of published poetry. They will demonstrate ,through the writing and performing of several poems, an understanding of some of the aesthetic aspects of contemporary poetry, such as manipulation of stanzas and line lengths, figures of speech, symbolism, setting, tone, and imagery. They will identify the aesthetic aspects of poetry in published poems and poems written by classmates.

*Portfolio:* Rhyming poems, free verse, Slam poetry, Spoken word

#### **Unit II: Drama**

**10 hours**

*Concepts:* Scripting a stage play; Original v/s adapted; story/dialogue/description; Contrast creating conflict; characters and idiom; overwriting; individual voice

Exposition -Using monologues; subtext; dramatic irony; status

Staging-Action; Sets; stage directions and visual narrative; Using off stage effectively; Dramatic action; Staging scenes

Radio Drama: creating pictures with sound; constraints of the medium; Radio drama script; Adaptation; using voices

*Applied:* Students will apply strategies of story-telling in the medium of a play and the analysis of published drama. They will demonstrate, through the writing of a play (three act) an understanding of some of the aesthetic aspects of drama, such as scripting action for the stage, use of dialogue and creating powerful characters through use of monologues and dramatic irony. They will have the ability identify these aspects of drama in published plays and work written by classmates.

*Portfolio:* three act play, Radio play

### **Unit III: Fiction**

**10 hours**

*Concepts:* Short Fiction– Short Stories, Novella, and Novel (only introduction to Novella/novel form)

Form/Structure; Plot/Scenes; Character; point of view/narrative voice; conflict/crises; Setting/time

Novella/Novel: literary novel v/s genre novels exploring story lines, multiple/parallel plots; reality v/s imagination; research and its importance; structuring your chapters vis-à-vis your novel

Creative Non-Fiction–Devices; Basic structure; Speaking with the reader–Your spoken voice; Passion involvement; Writing about yourself– You as a story; Memoir and memory; Writing about people and the world; finding atopic; field work and interviews; literature of hope

*Applied:* Students will apply strategies of storytelling in the writing of at least one short story/flash fiction; novella/novel (or works of creative non-fiction, or graphic novels) and the analysis of published fiction. They will demonstrate, through the writing of an original work, an understanding of some of the following elements of story-telling: plot, characterization, setting, point of view, symbolism, and style. They will identify the narrative techniques and elements of storytelling used in published works of fiction and stories written by classmates.

*Portfolio:* Short-story, Creative Non-fiction Novel/Novella (Structuring/idea conception and writing of at least 3 chapters)

**N.B :** the number of hours for each unit includes time for continuous assessment, portfolio building (with instructor feedback and review) as well as writing classes.

**Additional note:** As a supplementary skill, the students should be taught how to prepare and submit a piece of work for publication. They should display the ability of using a word-processor, and desk-top publishing of word to format the manuscripts to be print ready and ready for submission to an editor, or publisher. They should also be taught, if not given, opportunities for publication. These can be achieved using a portfolio method of assessing the students work. (Desk-top publishing of software such as Adobe In design/Publisher/Illustrator)

Instructors should use peer editing and group workshop method within the classroom as a method of giving and receiving constructive criticisms. This will also open opportunities for students to perform and read out their work, thereby taking care of the spoken word aspect of creative writing, as and when it may apply.

## **5. Reference Books:**

### **Primary References:**

1. Burroway, Janet. *Writing Fiction: A Guide To Narrative Craft*. New York: Longman Publishers, 2000.
2. Cheney, Theodore A. Rees. *Writing Creative Nonfiction-Fiction Techniques for Crafting Great Nonfiction*. California: Ten Speed Press, 1987. e book.
3. Earnshaw, Steven. *The Handbook of Creative Writing*. Edinburgh University Press, Edinburgh. 2007.
4. Greenwell, Bill and Linda Anderson. *A Creative Writing Handbook-Developing Dramatic Technique, Individual style and Voice*. Ed. Derek Neale. London: A&C Publishers Ltd., 2009.
5. Miller, Brenda and Suzanne Paola. *Tell it Slant-Writing and Shaping Creative Nonfiction*. McGraw-Hill, 2005.
6. Mills, Paul. *The Routledge Creative Writing Course book*. Routledge, 2006. ebook.
7. Morley, David. *The Cambridge Introduction to Creative Writing*. Cambridge: Cambridge University Press, 2007.
8. Smith, Marc Kelly and Joe Kraynak. *Take the Mic-The Art of Performance Poetry, Slam and the Spoken Word*. Illinois: Source books Media Fusion, 2009. e book.
9. Strunk, William and E.B. White. *The Elements of Style*. New York: The Penguin Press, 2005.

### Secondary References:

1. Boden, Margaret. *the creative mind - myths and mechanisms*. 2nd. New York: Routledge, 2004.
2. Bolton, Gille. *Write Yourself- Creative Writing and Personal Development* .London: Jessica Kingsley Publishers, 2011.
3. Hamand, Maggie. *Creative Writing For Dummies*. West Sussex: John Wiley & Sons, Ltd, 2009.
4. Harper, Graeme. *On Creative Writing*. London: Short Run Press, 2010.
5. Kaufman, Scott Barry and James Kaufman, *The Psychology of Creative Writing*. New York: Cambridge University Press, 2009.
6. May, Steve. *Doing creative writing*. Oxon: Routledge, 2007.
7. Smith, Marc Kelly and Joe Kraynak. *Stage a Poetry Slam Illinois: Sourcebooks Media Fusion*, 2009



**Course Title:** Creative Writing

**Course Code:** ENG-E-6

**Marks:** 100

**Credits:** 4

**5. Course Objectives:**

1. To explore creative writing genres (Poetry, Drama, Fiction) through practical writing classes
2. To build on the foundation of basic knowledge and interest of students in creative writing
3. To develop ones' own style of writing through reading, discussion and experimenting in writing culminating in a student's work portfolio
4. To encourage students' to get their works published using traditional means and modern media
5. To write with the aid of the senses

**6. Learning Outcomes:** By the end of the course the student will:

1. Demonstrate an understanding of concepts related to the creative writing genres.
2. Present their ideas/opinions through creative writing genres.
3. Create a sample of their own creative output(individual/group)
4. Develop ability to critique and edit their own work as well as others'
5. Use ICT and Digital technology in their creative endeavour.

**7. Number of Hours:** 04 hours per week

#### 4. Course Content:

**Total Number of hours: 60**

**Note:** This course will focus on the creative *writing* process. Thus, emphasis will be given to the written aspect of the course. Theoretical concepts, learnings, and innovations in the forms and fields will be imparted through praxis. Students will maintain a journal and submit a final portfolio of their creative output. The journal should mandatorily contain *all* the drafts of their works. The editing aspect of the writing process (revision, editing and proofreading) is to be taught concurrently with the units, while focusing on the particular needs of the forms.

#### **Unit I: Poetry**

**20 hours**

*Concepts:* Metre and rhyme; Meaning and being of language- power of reference/pop culture/allusions; form (and subverting form); free verse; syllabics; shaping a sequence and collection; figures of speech and its use

Spoken Word -writing, speaking, and performing; Reading techniques – charm, set, space, cold open, silence, blending music

Use of technology in performance, exposing your work to others; *transaesthetics*

*Applied:* Students will apply some strategies of contemporary poetry in the writing of several poems and the analysis of published poetry. They will demonstrate, through the writing and performing of several poems, an understanding of some of the aesthetic aspects of contemporary poetry, such as manipulation of stanzas and line lengths, figures of speech, symbolism, setting, tone, and imagery. They will identify the aesthetic aspects of poetry in published poems and poems written by classmates.

*Portfolio:* Rhyming poems (with various rhyme scheme and forms), free verse, Slam poetry, Spoken word

**Note:** Instructor may use a selection of poetry (established poets) to illustrate the range and variety of poetry. Focus should be on cultivating the student's poetry writing skills.

#### **Unit II: Drama**

**20 hours**

*Concepts:* Structures of a stage plays (physical/written); Acts/scenes; Scripting a stage play; Original v/s adapted; story/dialogue/description; Contrast creating conflict; characters and idiom; overwriting; individual voice

Exposition - Using monologues; subtext; dramatic irony; status

Staging - Action; Sets; stage directions and visual narrative; Using offstage effectively; Dramatic action; Staging scenes

Radio Drama: creating pictures with sound; constraints of the medium; Radio drama script; Adaptation; using voices

*Applied:* Students will apply strategies of storytelling in the medium of a play and the analysis of published drama. They will demonstrate, through the writing of a play (one act/two act/three act) an understanding of some of the aesthetic aspects of drama, such as scripting action for the stage, use of dialogue and creating powerful characters through use of monologues and dramatic irony. They will have the ability identify these aspects of drama in published plays and work written by classmates.

*Portfolio:* One act play, three act play, Radio play

**Note:** Instructor may use a selection of drama (established playwrights) to illustrate the range and variety of drama. Focus should be on cultivating the student's writing skills.

### **Unit III: Fiction**

**20 hours**

*Concepts:* Short Fiction – Short Stories, Flash Fiction, Novella, and Novel

Form/Structure; Plot/Scenes; Character; point of view/narrative voice; conflict/crises; Setting/time

Micro-tales/Nano-tales – analysis of social media and innovative storytelling techniques

Novella/Novel: literary novel v/s genre novels exploring storylines, multiple/parallel plots; reality /s imagination; research and its importance; structuring your chapters vis-à-vis your novel

Creative Non – Fiction –Devices; Basic structure; Speaking with the reader – Your spoken voice; Passion involvement; Writing about yourself – You as a story; Memoir and memory; Writing about people and the world; finding a topic; fieldwork and interviews; literature of hope

*Applied:* Students will apply strategies of storytelling in the writing of atleast one short story/flash fiction; novella/novel (or works of creative non-fiction, or graphic novels) and the analysis of published fiction. They will demonstrate, through the writing of an original work, an understanding of some of the following elements of storytelling: plot, characterization, setting, point of view, symbolism, and style. They will identify the narrative techniques and elements of storytelling used in published works of fiction and stories written by classmates.

*Portfolio:* Short-story, Flash Fiction, Novel/Novella (Structuring/idea conception and writing of at least 3 chapters)

**Note:** Instructor may use a selection of fiction (established writers) to illustrate the range and variety of fiction. Focus should be on cultivating the student's writing skills.

**N.B:** the number of lectures for each unit includes time for continuous assessment, portfolio building (with instructor feedback and review) as well as writing classes.

**Additional note:** As a supplementary skill, the students should be taught how to prepare and submit a piece of work for publication. They should display the ability of using a word-processor, and desk-top publishing software to format their manuscript so as to be print ready and ready for submission to an editor, or publisher. They should also be taught, if not given, opportunities for publication. These can be achieved using the students' works, collected in a portfolio, to assess their growth and competency. (Desk-top publishing software such as Adobe Indesign/Publisher/Illustrator)

Instructors should use peer editing and group workshop method within the classroom as a method of giving and receiving constructive criticisms. This will also open opportunities for students to perform and read out their work, thereby taking care of the spoken word aspect of creative writing, as and when it may apply.

## **Reference Books:**

### **Primary References:**

1. Cheney, Theodore A. Rees. *Writing Creative Nonfiction - Fiction Techniques for Crafting Great Nonfiction*. California: Ten Speed Press, 1987. ebook.
2. Burroway, Janet. *Writing Fiction: A Guide to Narrative Craft*. New York: Longman Publishers, 2000.
3. Earnshaw, Steven. *The Handbook of Creative Writing*. Edinburgh University Press, Edinburgh. 2007.
4. Greenwell, Bill and Linda Anderson. *A Creative Writing Handbook - Developing Dramatic Technique, Individual Style and Voice*. Ed. Derek Neale. London: A & C Publishers Ltd., 2009.
5. Miller, Brenda and Suzanne Paola. *Tell it Slant - Writing and Shaping Creative Nonfiction*. Mcgraw-Hill, 2005.
6. Mills, Paul. *The Routledge Creative Writing Coursebook*. Routledge, 2006. ebook.

7. Morley, David. *The Cambridge Introduction to Creative Writing*. Cambridge: Cambridge University Press, 2007.
8. Smith, Marc Kelly and Joe Kraynak. *Take the Mic - The Art of Performance Poetry, Slam and the Spoken Word*. Illinois: Sourcebooks Media Fusion, 2009. ebook.
9. Strunk, William and E. B. White. *The Elements of Style*. New York: The Penguin Press, 2005.

**Secondary References:**

1. Boden, Margaret. *The Creative Mind - Myths and Mechanisms*. 2nd. New York: Routledge, 2004.
2. Bolton, Gille. *Write Yourself - Creative Writing and Personal Development*. London: Jessica Kingsley Publishers, 2011.
3. Hamand, Maggie. *Creative Writing For Dummies*. West Sussex: John Wiley & Sons, Ltd, 2009.
4. Harper, Graeme. *On Creative Writing*. London: Short Run Press, 2010.
14. Kaufman, Scott Barry and James Kaufman. *The Psychology of Creative Writing*. New York: Cambridge University Press, 2009.
15. May, Steve. *Doing Creative Writing*. Oxon: Routledge, 2007.
16. Smith, Marc Kelly and Joe Kraynak. *Stage a Poetry Slam*. Illinois: Sourcebooks Media Fusion, 2009.

**Course Title:** Visual Literature

**Course Code:** ENG-E-7

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To introduce students to visual literature – in the form of graphic novels, comics and digital comics
2. To understand core concepts in the field of visual literature.
3. To understand how to read graphic novels, comics, and other forms of visual literature.
4. To establish the contribution of visual literature to literature on the whole.

**2. Learning Outcomes:** By the end of the course the student will be able:

1. Understand core concepts in Visual Literature: how to read, and establish it as a literary form.
2. Recognize writers, forms, and ages associated with graphic novels, comics and other forms of visual literature.
3. Analyze works of visual literatures critically.
4. Write reflective and research essays to present their responses to Visual Literature.

**Number of Hours: 04 hours per week**

**4. Course Content:**

**Total Number of hours: 60**

**Unit I: The Comics Genre – History, Formats to Key terms:**

**12 hours**

1. History of comics (from paper to digital), Graphic novels and other visual literature
2. The major comics-creating nations and introduction to comics traditions
  - a) America - Titles from DC Comics, Marvel, Vertigo, Dark Horse and others
  - b) Europe - *Tintin; Asterix*, French and British Comics
  - c) Japan (Manga) - *Akira*
  - d) Indian Comics tradition - *Tinkle, Amar Chitra Katha, Jataka & Panchatantra tales*
3. The single panel comic to syndication
  - a) R.K. Laxman's collection
  - b) *Calvin & Hobbes* - William Patterson
4. Adapted Comics - *The League of Extraordinary Gentlemen* - Alan Moore
5. Advent of Digital Comics/web comics -
  - a) Gavin Aung Than - [www.zenpencils.com](http://www.zenpencils.com)
  - b) Rob Denbleyker - [www.explosm.net](http://www.explosm.net)
6. Key terms - Sequential Art, panel, gutter, tier, splash, spread, speech balloon, caption, sound effects, narration, formats, canon

[**Please Note:** Noted graphic novelists and comics creators will be introduced to students as they cover the history of the genre.]

**Unit II: The Modern Classic**

**16 hours**

1. The Complete Maus - Art Spiegelman

**Recommended Secondary Reading** -*Persepolis* - Marjane Satrapi

**Unit III: A Realistic look at the 'Superhero'**

**16 hours**

1. Watchmen - Alan Moore
2. V for Vendetta - Alan Moore

**Recommended Secondary Reading**

- a) Batman Year One - Frank Miller
- b) The Dark Knight Returns- Frank Miller
- c) Superman: Man of Steel - John Byrne

## Unit IV: Alternative Comics/Graphic Novels

16 hours

1. Fun Home - Alison Bechdel
2. A Contract with God - Will Eisner

### Recommended Secondary Reading -Underwater Welder - Jeff Lemire

**N.B:** The number of lectures for each unit includes time for continuous assessment.

Secondary Reading will not be evaluated in the Semester End Exam, but may be used for Continuous assessment if it is used as an extension of the scope of the course.

It is recommended for the students to read the suggested secondary readings in order to fully comprehend the material to be discussed in class.

## 5. Reference Books:

### Primary References:

1. Bechdel, Alison. *Fun Home: A Family Tragicomic*. Boston: Houghton Mifflin, 2006.
2. Chaney, Michael A., ed. *Graphic Subjects: Critical Essays on Autobiography and Graphic Novels*. Wisconsin: University of Wisconsin Press, 2011.
3. Eisner, Will. *A Contract with God and Other Tenement Stories*. New York: DC Comics, 1996.
4. —. *Comics & Sequential Art*. Florida: PoorHouse Press, 1985.
5. Heer, Jeet and Kent Worcester. *Arguing Comics: Literary Masters on a Popular Medium*. Jackson: University Press of Mississippi, 2004.
6. Liddo, Annalisa di. *Alan Moore: Comics as Performance, Fiction as Scalpel*. Mississippi: University Press of Mississippi, 2009.
7. McCloud, Scott. *Making Comics- Story Telling Secrets of Comics, Manga and Graphic Novels*. New York: Harper Collins, 2006.



8. —. *Understanding Comics: The Invisible Art*. New York: HarperCollins, 1993.
9. McLaughlin, Jef, ed. *Comics as Philosophy*. Jackson: University Press of Mississippi, 2005.
10. Miller, Frank. *Batman: Year One*. New York: DC Comics, 2005.
11. Mills, Anthony R. *American Theology, Superhero Comics, and Cinema: The Marvel of Stan Lee and the Revolution of a Genre*. New York: Routledge, 2014.
12. Moore, Alan (w) and David (a) Lloyd. *V for Vendetta*. DC Comics, 2008.
13. Moore, Alan. *The League of Extraordinary Gentlemen*. La Jolla: CA: America's Best Comics, 2000.
14. Moore, Alan and Dave Gibbons. *Watchmen*. New York: Warner Books, 1987.
15. Morris, Tom and Matt Morris. *Superheroes and Philosophy: Truth, Justice and the Socratic Way*. Illinois: Open Court, 2005.
16. Peterson, Robert S. *Comics, and Manga, Graphic Novels: A History of Graphic Narratives*. California: Praeger, 2011.
17. Robb, Brian J. *Superheroes: From Superman to the Avengers, The Evolution of Comic Book Legends*. London: Robinson, 2014.
18. Satrapi, Marjane. *Persopolis*. London: Vintage Books, 2008.
19. Spiegelman, Art. *MetaMaus*. New York: Pantheon Books, 2011.
20. —. *The Complete Maus*. USA: Pantheon Books, 1996.
21. White, Mark D. *Watchmen and Philosophy: A Rorschach Test*. New Jersey: John Wiley & Sons, Inc, 2009.

### **Secondary References:**

1. Berninger, Mark, John Ecke and Gideon Haberkon. *Comics as a Nexus of Cultures: Essays on the Interplay of Media, Disciplines and International Perspectives*. London: McFarland & Company, Inc. Publishers, 2010.

2. Dalton, Russell. *Marvelous Myths: Marvel Superheroes and Everyday Faith*. Missouri: Chalice Press, 2011.
3. Daniels, Les. *DC Comics: A Celebration of the World's Favorite Comic Book Heroes*. New York: Bulfinch Press, 1995.
4. Hahn, Joel. "A Librarian's Guide to DC Comics." *Serials Review* (1998): 64-78.
5. Hatfield, Charles. *Alternative Comics: An Emerging Literature*. Jackson: University Press of Mississippi, 2005.
6. Lavin, Michael. "A Librarian's Guide to Dark Horse Comics." *Serials Review* (1998): 76-93.
7. —. "A Librarian's Guide to Marvel Comics." *Serials Review* (1998): 41-63.
8. Lopes, Paul. *Demanding Respect: The Evolution of the American Comic Book*. Philadelphia: Temple University Press, 2009.
9. MacWilliams, Mark W., ed. *Japanese Visual Culture-Explorations in the World of Manga and Anime*. New York: East Gate, 2008.
10. Than, Gavin Aung. *Zen Pencils: Cartoon Quotes from Inspirational Folks*. Missouri: Andrew McMeel Publishing, 2014.
11. —. *Zen Pencils-Volume Two - Dream the Impossible Dream*. Missouri: Andrew Mcmeel Publishing, 2015.
12. Weiner, Robert G. *Marvel: Graphic Novels and Related Publications- An Annotated Guide-Comics, Prose Novels, Children's books, Articles, Criticism and Reference Works, 1965 -2005*. London: McFarland & Company, Inc., Publishers, 2008.

**Course Title:** World Literature

**Course Code:** ENG-E-16

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To expose students to representative works of world literature to develop their sensitivity to cultural diversity.
2. To promote intellectual growth by strengthening student's abilities to read analytically and critically.
3. To promote an understanding of the works in their cultural/historical contexts.

**2. Learning outcomes:** By the end of the course the student will be able to:

1. Understand and have an insight into the diverse representative works in World Literature.
2. Analyze literature critically, keeping in mind the cultural diversity.
3. Identify the various themes and narrative techniques of World Literature.
4. Critically analyze significant texts from the World Literature canon.
5. Appreciate canonical works of World Literature

**3. Number of hours:** 04 hours per week

**4. Course Content:**

**Total number of hours: 60**

**Unit I: Novel**

**15 hours**

1. Things Fall Apart - Chinua Achebe

**Unit II: Drama**

**15 hours**

1. Riders to the Sea- John Millington Synge

**Unit III: Poetry**

**15 hours**

1. Abraham Moses Klein a) Indian Reservation: Caughnawaga
2. Margaret Atwood a) Journey to the Interior

4. David Rubadiri a) A Negro Labourer In Liverpool
5. Arthur Nortje a) Letter From Pretoria Central Prison
6. Wole Soyinka a) Telephonic Conversation
7. Kath Walker a) A Song of Hope  
b) Dawn is at Hand
8. Les Murrays a) The Widower in the Country

**Unit IV: Short Stories**

**15 hours**

1. Child's play - Alice Munro
2. The Bet -Anton Chekvo
3. The Drover's Wife - Henry Lawson

**5. Reference Books:**

**Primary References:**

1. Achebe, Chinua. *Things Fall Apart*. Penguin Books, New Delhi, 2001.
2. Chekhov Anton. *Masterpieces of World Fiction: Selected Stories*. Rupa Publications, New Delhi, 2014.
3. Henry, Lawson. *The Penguin Henry Lawson Short Stories*. Penguin Books, New Delhi, 1998.
4. Klein. A.M. *The Rocking Chair and other Poems*. Toronto, McGraw-Hill, Ryerson, 1948.
5. Munro, Alice. *Too Much Happiness*. Penguin, Canada, 2012.
6. Page, P. K. *The Glass Air: Selected Poems*. Oxford University Press, 1986.

**Secondary References:**

1. Bloom, Harold, ed. *Modern Critical Views Anton Chekhov*. Chelsea House, Philadelphia, 1999.
2. Bloom, Harold. *Alice Munro*. Bloom's Literary Criticism, New York, 2009.

3. Eekman, Thomas A., and Virginia L. Smith. *Critical Essays on Anton Chekhov*. ed. Robert Lecker. G.K. Hall and Co, Boston, 1989.
4. Fisher, J. & Silber, E. (eds). *Women in Literature: Reading through the Lens of Gender*. Connecticut, Greenwood Press, 2003.
5. Matlaw, Ralph E., and Freedman, comps. *Anton Chekhov's Short Stories*. W.W. Norton and Company, New York, 1979. Print.
6. Pollock, Zailig, Seymour Mayne, Usher Caplan ed. *Selected Poems: A.M. Klein*. University of Toronto Press, Toronto, 1997.
7. Thacker, Robert. *Reading Alice Munro, 1973-2013*. University of Calgary Press, 9 Feb 2016.
8. Sakineh, Hamidi Mehr. *Critical Discourse Analysis of Alice Munros Short Stories*. Lambert Academic Publishing, London, 2014.
9. Hooper, Brad. *The Fiction of Alice Munroe*. Green publishing group, London, 2008.
10. Hunter, Adrian. *The Cambridge Introduction to the Short Stories in English*. Cambridge University Press, Cambridge, 2007.
11. Fallon Erin, and R.C. Feddersen, James Kurtzleben, Maurice A. Lee, Susan Rochette-Crawley.ed. *A Reader's Companion to the Short Story in English*. Routledge, New York, 2001.
12. Bartels, Anke, Dirk Wiemann, ed. *Global Fragments: (dis)orientation in the New World Order*. Rodopi, Amsterdam, 2007.

## **T.Y.B.A. – SEMESTER V – CORE COURSE**

**Course Title:** Nineteenth Century English Literature

**Course Code:** ENG-V.C-7

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To acquaint the students with English literature of the nineteenth century.
2. To reveal the impact of socio-economic aspects of the nineteenth century on literature written during the period.
3. To acquaint the students with the prevalent literary genres as well as stylistic feature of literature written during the nineteenth century.
4. To encourage independent critical reading of the literary texts written during the nineteenth century.

### **2. Learning Outcomes:**

Upon the completion of the course the students should be able:

1. Appreciate the socio-economic facets of nineteenth century and its impact on literature written during the time.
2. Analyze the socio-economic impact on literature written during the time.
3. Understand and identify the essential features of Romanticism and Victorianism
4. Critically evaluate the literary texts written during the Nineteenth Century.

### **3. Number of Hours: 04 Hours per week**

**4. Course Content:**

**Total Number of hours: 60**

**Unit I: Background:**

**05 hours**

1. Romanticism
2. French Revolution and Romanticism
3. Features of Victorian literature
4. Georgian Poetry
5. Industrial Revolution; Darwinism

**Unit II: Poetry**

**25 hours**

1. William Wordsworth
  - a) We are Seven
  - b) Tables Turned
  - c) Lines Written in Early Spring
  - d) To a Skylark
  - e) Simone Lee: The Old Huntsman
2. Samuel Taylor Coleridge
  - a) Kubla Khan
3. John Keats
  - a) Ode to Autumn
  - b) When I have Fears that I may cease to be
  - c) Ode to Nightingale
4. Percy Bysshe Shelley
  - a) To a Skylark
  - b) Ozymandias
5. Alfred Lord Tennyson
  - a) Break, Break, Break
  - b) In memoriam-(Prologue, Epilogue)
6. Robert Browning
  - a) The Bishop orders his Tomb at saint Praxed's Church
7. Matthew Arnold
  - a) Dover Beach
  - b) To Marguerite

**UNIT III: Drama**

**10 hours**

1. Pygmalion - George Bernard Shaw

## UNIT IV: Novels

20 hours

1. Jane Eyre - Charlotte Bronte

### 5. Reference Books:

#### Primary References:

1. Charlotte Bronte. *Jane Eyre*. Harper Press, 2010.
2. Green David. *The Winged Word*. Macmillan, Madras, 1974.
3. Shaw George Bernard. *Pymalion*. Penguin Edition, 2009.

#### Secondary References:

1. Churchill R.C. *English Literature of the Nineteenth Century*. University Tutorial Press; First Edition, 1956.
2. Daiches David. *A Critical History of English Literature, Volume 4: The Romantics to the Present Day*. Martin Secker & Warburg Ltd, 1968.
3. Ford Boris (ed.). *Pelican Guide to English Literature (Vol. 5, 6)*. Penguin Books, London, 1957.
4. Gridley E. Roy. *Browning*. Routledge & Kegan Paul, London, 1972.
5. Latham Jacqueline (ed.). *Critics on Matthew Arnold*. George Allen and Unwin Ltd. , U.K., 1973.
6. O'Neill Judith (ed.). *Critics On Keats*. George Allen & Unwin Ltd., U.K. 1967.
7. Sen S. Wordsworth William. *Preface to the Lyrical Ballads: A Critical Evaluation*. Unique Publishers (I) Pvt. Ltd, 2014.



**Course Title:** Shakespeare Today

**Course Code:** ENG-E-9

**Marks:** 100

**Credits:** 4

### **1. Course Objectives**

1. To acquaint the students with the various forms of literature which are based on the works of William Shakespeare.
2. To foster an interest in the students in exploring the various literary works produced by Shakespeare.
3. To establish a link between the era of Shakespeare and the contemporary times.

### **2. Learning Outcomes:**

1. Understand the various themes presented in the works of Shakespeare.
2. Appreciate Shakespeare's works and its relevance in today's era.
3. Identify the various genres that Shakespeare's plays have been adapted into.
4. Compare and contrast Shakespeare's plays and the adapted versions.

### **3. Number of hours: 04 hours per week**

### **4. Course Content:**

**Total Number of hours: 60**

#### **UNIT I: Background**

**5 hours**

1. Relevance of Shakespeare in the modern era.
2. The three genres of Shakespearean drama: Comedy, Tragedy and History.
3. The influence of Shakespeare on English Literature.
4. The impact of Shakespeare's plays on modern culture.

**UNIT II: Literature Based on Shakespeare's Plays****30 hours**

1. Prospero's daughter - Elizabeth Nunez (10 hours)
2. I, Iago - Nicole Galland (10 hours)
3. Hamlet (Manga Shakespeare) (10 hours)

**UNIT III: Visual Media Based on Shakespeare's Plays****20 hours**

Movies:

1. Hamlet (1996) - Kenneth Branagh
2. Maqbool (2003) - Vishal Bharadwaj
3. Omkara (2006) - Vishal Bharadwaj
4. Haider (2014) - Vishal Bharadwaj ( Self Study)
5. Twelfth Night (Series - Arkangel Complete Shakespeare )
6. Gnomeo & Juliet - Kelly Asbury (Shakespeare's animated play)

**UNIT IV: Review of Shakespearean Plays by Modern Schools of Criticism 5 hours**

1. Psychoanalytical interpretation of Shakespeare's works.
2. Post- colonial interpretation of Shakespeare's works.
3. Feminist interpretation of Shakespeare.
4. Marxist interpretation of Shakespeare's works.

**Note: *Hamlet* will be taught as a model text, which includes the original as well as the adaptations across mediums.**

**5. References Books:****Primary References:**

1. Amanda Root, Jonathan Firth. Twelfth Night. Series – (Arkangel Complete Shakespeare). Bbc Audiobooks America. 2005
2. Burt, Richard. *Shakespeare After Mass Media*. Palgrave Publications, New York, 2012.
3. *BBC Television Shakespeare*. Romeo and Juliet. BBC 2. U.K., 3 Dec. 1978. Television.
4. Cartelli, Thomas. *Repositioning Shakespeare*. Routledge, 2009.

5. Duffield P, Appignanesi R. *Manga Shakespeare: The Tempest*. Self Made Hero Publication, London, 2007.
6. Galland, Nicole. *I, Iago: A Novel*. William Morrow & Company, New York, 2012.
7. Garber, Majorie. *Shakespeare and Modern Culture*. Random House Inc, New York, 2008.
8. *Haider*. Dir. Vishal Bharadwaj. Perf. Shahid Kapoor, Tabu, Shraddha Kapoor, Kay Kay Menon, Irrfan Khan. UTV Motion Pictures, 2014. Film.
9. *Hamlet*. Dir. Kenneth Branagh. Columbia Pictures, 1996. Film.
10. Kelly Asbury dir. *Gnomeo & Juliet*. January 2011.
11. Lenz, Carolyn. *The Woman's Part: Feminist Criticism of Shakespeare*. University of Illinois Press, Chicago, 1984.
12. Lupton, Julia. *After Oedipus: Shakespeare in Psychoanalysis*. Cornell University Press, 1993.
13. *Maqbool*. Dir. Vishal Bharadwaj. Perf. Irrfan Khan, Tabu, Pankaj Kapoor, Om Puri, Naseeruddin Shah. Kaleidoscope Entertainment Pvt. Ltd., 2003. Film.
14. Nagarajan, S & Viswanathan. R, ed. *Shakespeare in India*. S. OUP India Publishers, 1987.
15. Nunez, Elizabeth. *Prospero's Daughter*. Random House Publishing Group, New York, 2006.
16. *Omkaara*. Dir. Vishal Bharadwaj. Perf. Ajay Devgan, Saif Ali Khan, Vivek Oberoi, Kareena Kapoor. Eros Entertainment, Big Screen Entertainment, Shemaroo Entertainment, 2006. Film.
17. Siegel, Paul. *Shakespeare's English and Roman History Plays: A Marxist Approach*. Associated University Presses, 1964.

### **Secondary References:**

1. Barker, Granville and Harisson G.B. *Companion to Shakespearean Study*, Cambridge University, 1946.
2. Goddard. *The Meaning of Shakespeare*. University of Chicago Press, Chicago, 1960.
3. Halliday, F.E. *Shakespeare in His Age*, Gerald Duckworth & Co. Ltd, 1965.
4. Iyengar, Srinivasa. *Shakespeare: His World and His Art*, Sterling Publishers, 1984.
5. Kastan, David. *Shakespeare After Theory*. Routledge, New York, 1999.

6. Kott, J. *Shakespeare Our Contemporary*. W. W. Norton & Company, New York, 1974.
7. Rothwell, Kenneth S. *A History of Shakespeare on Screen: A Century of Film and Television*, Cambridge: Cambridge University Press, 2004.
8. Shakespeare, William. *Hamlet*. UBS Publishers' Distributors Pvt. Ltd, New Delhi, 2009.
9. Shakespeare, William. *Macbeth*. UBS Publishers' Distributors Pvt. Ltd, New Delhi, 2009.
10. Shakespeare, William. *Othello*. UBS Publishers' Distributors Pvt. Ltd, New Delhi, 2009.
11. Trivedi, P. and Bartholomeusz Dennis. *Shakespeare's India*. University of Delaware Press, 2005.

**Course Title:** Ancient Indian Classics in Translation

**Course Code:** ENG-E-10

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To acquaint the students with Indian culture of the past.
2. To introduce the students to great ancient Indian classics.
3. To acquaint the students with Indian poetics.

**2. Learning Outcomes:** By the end of the course the student will be able to:

1. Perceive aesthetic and philosophical, social aspects of ancient Indian society and their reflection in literature.
2. Analyze and appreciate various literary features in ancient Indian classics
3. Comprehend Indian poetics.
4. Make a comparative study of Indian poetics and Western

**3. Number of Hours: 04 Hours per week**

**4. Course Content:**

**Total Number of hours: 60**

**Unit I: The Mahabharat**

**15 hours**

1.Extracts from the Mahabharat:

- a) Droupadi – Svayamvara Parva – Volume I (Pages 437-458)
- b) Vaivahka Parva Volume I (Pages 458-473)
- c) Dyuta Parva Volume II (Pages 185 to 247)
- d) Amba – Upakhyaana Parva – Volume 5 (Pages 1 to 60)

## Unit II: The Ramayana

15 hours

1. Book I – Canto
  - a) XXXVI - L
  - b) LXVI - LXVIII
  - c) LXXVII
2. Book II – Canto
  - a) I
  - b) VII - XIX
  - c) XXVI - XXVII
  - d) XXXVII - XLIII
  - e) LI - LXIV
3. Book III – Canto
  - a) IX - XX
  - b) XXXI -LVII

(Note: Book III - Self Study)

## Unit III: Poems from Sanskrit in translation

15 hours

1. **Verse nos.** 1-15; 18-21 ; 24; 26; 30; 32; 39; 40-45; 47; 51-53; 61; 63; 65; 67 ; 69-71 ; 73;74; 86;87; 97-101; 103; 104; 110; 111; 114 -116; 118; 119; 122; 123; 125; 131;135; 136; 138-140.
2. **Indian Poetics / Indian Literary Criticism**
  - a) Bharata – Ntaya – Manjiri (1975) - G. K. Bhatt: On Natya and Rasa: Aesthetics of Dramatic experience.
  - b) Bhatrhari -Vakyapadiya .  
Text: From Vakyapadiya - K. Raghavan Pillai.
  - c) Dandin from the Kavyadarsa. Translated - Vavilla Venkateswara Sastrulu.  
Dandin's Marga Theory.
  - d) Anandvardhana's from Dhuanyaloka ( sphota theory).
  - e) Kuntaka -Vakrokti.
  - f) Abhinava Gupta's concept of Shantarasa. Rasa - dvani theory.

## Unit IV: Philosophical Writings

15 hours

1. Bhagavat Gita – Chapter II -The Karmayoga
2. Isha Upanishad (trans.) - Sri. Aurobindo

### 5. Reference Books:

#### Primary References:

1. Brough John. *Poems from the Sanskrit*. Pelican Books, England, 1968.
2. Debroy Bibek (trans.). *The Mahabharata*. Pelican Books, New Delhi, 2012.(Vol. I, II, IV, V)
3. Devy G.N. (Ed.). *Indian Literary Criticism: Theory and Interpretation*. Orient Longman, New Delhi, 2002.
4. Griffeth Ralph( trans.). *The Ramayan of Valmiki*. Low Price Publications, Delhi, 2003.
5. Ryden W. Arthur(trans.). *Kalidas' Shakuntala* . In Parentheses Publication Sanskrit.
6. Sri. Aurobindo (trans.). *Isha Upanishad*. Sri. Aurobindo Ashram, Pondicherry, 2003.

#### Secondary References:

1. Banker Ashok K. *Ramayana* . Little, Brown Book Group, 2005.
2. Pattanaik Devdutt. *My Gita*. Rupa Publications, New Delhi, 2015.
3. R.K. Narayan. *God, Demons and others*. University of Chicago Press, 1993.
4. Sinha M.P. , Agnihotri Meeraj. *Critical Theories- Indian and Western*. Atlantic Publications, New Delhi, 2013.
5. Smith John (Abridged Trans.) *The Mahabharata*. Penguin Book, India, 2009.
6. Swami Chinmayanada. *The Holy Geeta*. Central Chissmaya Mission Trust, Mumbai, 1996.
7. Swami Parthasarthy. *Bhagvad Gita*. Vedanta World, 2 ed. , 2011.
8. Valmiki, Sattar Arshia. *The Ramayana*. Penguin Random House India, 2016.
9. Zakaria Rafiq. *Discovery of God*. Popular Prakashan Publisher.

**Course Title:** Film Studies

**Course Code:** ENG-E-11

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To introduce students to the allied field of Film Studies, its history, literature, and theory.
2. To inculcate in students an educated response to films.
3. To allow students a space to explore film Studies practically and creatively through appropriate form and structure.

**2. Learning Outcomes:** But the end of the course the student will be able:

1. Understand the literature of Films through relevant exemplars.
2. Recognize Directors, artists, genres, and movements in Films.
3. Identify genres in films, and critically analyze films.
4. Write, direct and shoot their own short film, informed by Film theory and Film literature.

**5. Number of hours: 04 hours per week**



#### 4. Course Content:

Total number of hours: 60

##### Unit I: History of Film

10 hours

1. **Silent Period (1895 – 1929):** Movements – German Expressionism, Soviet Montage, French Avant-garde; Lumiere Brothers, Georges Melies, Edwin Porter, D.W. Griffith, Thomas Ince, Mack Sennet, Charlie Chaplin, Buster Keaton, Oscar Miceaux, Carl Theodor Dreyer, Robert Flaherty, Cecil DeMille
2. **Classical Period (1930 – 1945):** Movements: French poetic realism; Frank Capra, Josef Von Sternberg, Howard Hawks, John Ford, Maya Deren
3. **Postwar Period (1946 – 1959):** Movements: Italian neorealism, Japanese art Cinema; Orson Welles, Douglas Sirk, Nicholas Ray, Ingmar Bergman, Satyajit Ray
4. **Transitional Period (1960 – 1979):** Movements- French New Wave, Feminist Film, Direct Cinema, Structural film, Third World Cinema ; John Cassavetes Arthur Penn, Sam Peckinpah, Francis Ford Coppola, Robert Altman, Stan Brakhage, Ousmane Sembene, Luis Bunuel, Woody Allen, Stanley Kubrick, George Lucas, Martin Scorsese
5. **Contemporary Period (1980 - present):** Movements – American Independent cinema, East Asian Cinema, Iranian Cinema, New British cinema, Personal documentary; Steven Spielberg, Oliver Stone, Lars von Trier, David Cronerberg, Ridley Scott, Mira Nair

**Note: Students are to be briefly introduced the context of the periods through clips, montages, extracts. Focus should be on the movements, emphasis should be in understanding the movements.**

##### Unit II: Literature of Film

15 hours

1. **Film Form:** Mise en Scene –Setting, Performance & Movement, Costume and Props; Cinematography –Shot types; Camera Lenses; Camera Angles; Camera Movements, Lighting & Colour
2. **Sound & Editing** – Effects, Music, Perspective Sound, dialogue Overlaps/ Sound Bridges; Optical Effects, Continuity, Spatiotemporal effects
3. **Narrative-** Story & Plot, Narrative development, Narration, Narrative meaning; Time

**Note: Instructor, in conjunction with their class, should select movies, TV series, Documentaries etc to understand the Literature of Films. Each aspect and concept needs to be underlined with actual extracts, and clips of visuals.**

**Unit III: Film Genres & Theory:**

**15 hours**

1. **Genre Theory:** Genre as Film Language; Genres- Gangster, Western, Horror, Science Fiction, Musical, Romantic Comedy, Fantasy, Parody, Animation, Found Footage, Realism, Blaxploitation  
Bollywood vs Hollywood – a comparison  
Adaptations, Sequels and current forms of Film Trends – Studio Blockbusters, Shared Universe.
2. **Film Theory:** Medium Specific, Realism, Auteur Theory, Semiotics & Structuralism, Ideology  
theory, Feminist film Theory, Cultural Studies, Cognitive Theory

**Note: Instructor, in conjunction with their class, should select movies, TV series, Documentaries etc to discuss the various genres and Theory. Each Theory needs to be underlined with actual extracts, and clips of visuals. Adapted texts can also be taken.**

**Unit IV: Practical Application of Learning**

**20 hours**

**1. Reader-Response**

Reader-Response to Unseen Films: Reviews, comparisons, and break-downs of movies/TV/documentaries in written forms and structures.

**2. Application of Film Form**

Message & Values, Mise en Scene, Cinematography, Sound & Editing, Narrative, Genre and Film theory

Story, Storyboard, Screenplay

Creation of movies using concepts learnt in Units 1, 2, and 3.

**Note: Instructor should create a learning environment where concepts can be applied. Movies, TV series, Documentaries should be viewed and analyzed. Students should also create their own short films informed with the concepts learnt in the previous units.**

## 5. Reference Books:

### Primary References:

1. Andrew, Dudley. *concepts in FILM THEORY*. Oxford: Oxford University Press, 1984.
2. Aufderheide, Patricia. *Documentary Film A Very Short Introduction*. Oxford: Oxford University Press, 2007.
3. Benyahia, Sarah, Freddie Gaffeny and John White. *AS Film Studies The Essential Introduction*. New York: Routledge, 2006.
4. Butler, Andrew. *The Pocket Essentials Film Studies*. Berks: [www.pocketessentials.com](http://www.pocketessentials.com), 2005.
5. Dancyger, Ken. *The Technique of Film & Video Editing Fifth Edition*. Oxford: Focal Press, 2011.
6. Nelmes, Jill, ed. *Introductin to Film Studies, 05th Edition*. London: Routledge, 1996.
7. Pearson, Roberta and Philip Simpson, *Critical Dictionary of Film and Television Theory*. New York: Routledge, 2001.
8. Stadler, Jane and Kelly McWilliam. *Screen Media Anlaysiaing Film and Television*. NSW: Allen & Unwin, 2009.
9. Stam, Robert. *Film Theory An Introduction*. Massachusetts: Blackwell Publishing, 2000.
10. Thompson, Kristin and David Bordwell. *Film History An Introduction Second Edition*. New York: McGraw Hill, 2003.
11. Villarejo, Amy. *Film Studies The Basics*. New York: Routledge, 2007.
12. Welsh, James and Peter Lev, *The Literature/Film Reader*. Plymouth: The Scrcrow Press, 2007.

## Secondary References:

1. Fabe, Marilyn. *Closely Watched Films An Introduction to the Art of Narrative Film Technique*. New York: University of California Press, 2004.
2. Grant, Barry Keith, ed. *Film Genre reader III*. Austin: University of Texas Press, 1986.
3. Guynn, William, ed. *The Routledge Companion to Film History*. New York: Routledge, 2011.
4. Hart, John. *The Art of the Storyboard A Filmmaker's Introduction*. Oxford: Elsevier, 2008.
5. Monaco, James. *How to Read a Film The World of Movies, Media, and Multimedia*. New York: Oxford University Press, 200.
6. Jess-Cooke, Carolyn and Constantine Verevis, *Second Takes Critical Approaches to the Film Sequel*. New York: State University of New York Press, 2010.
7. Roberts, Graham. *Key Film Texts*. New York: Oxford University Press, 2002.

**Course Title:** Goan Literature and Culture

**Course Code:** ENG-E-1

**Marks:** 100

**Credits:** 4

### **1. Course Objectives**

1. To introduce students to different genres of literary works of Goan Literature in English and translated works by Goan writers.
2. To acquaint students with Goan ethos and culture through the exploration of selected texts of Goan literature.
3. To examine selected texts of Goan Literature and folk lore to establish Goan identity.

### **2. Learning Objectives:**

By the end of this course students:

1. Sensitized to Goan ethos and culture.
2. Appreciate the historical, psychological, religious and political realities during the pre-colonial and post colonial period.
3. Identify diverse literary and cultural trends that helped form Goan Literature.
4. Knowledgeable and enriched about Goan cultural heritage.
5. Critically analyze the Goan literary texts.

### **3. Number of hours: 04 hours per week**

#### 4. Course Content

Total Number of hours:60

##### Unit I: Background (Socio- Political and cultural)

08 hours

##### 1. Historical

- a) Colonialism
- b) Post colonialism

##### 2. Art and Artists of Goa (Folklore, Folkdance and Cartoonists)

- a) Tiatr (difference between Khell and Tiatr, Origin and development)
- b) Folklore (teacher can select any four folklores)
- c) Folk dances and Songs (any four forms to be selected.)
- d) Cartoonists of Goa (Alexzy and Mario Miranda)

##### Unit II: Short stories

13 hours

##### 1. Lambert Mascarenhas a) The Little Fellow

- b) Blood and Lily

##### 2. Victor Rangel-Riberio a) Lonely Aging Chinese

- b) American New York Neighbour Lady
- c) Loving Ayesha

##### 3. Ben Antao a) The Guardian Angel

- b)The Curse

##### 4. Damodar Mauzo a) The Vignahatra

- b) A Writer's Tale

##### 5. Laxmanrao Sardessai a) The Hour's End

- b)The Africa Boat

##### 6. Pundalik Naik- The Turtle

##### Unit III: Novels

24 hours

##### 1. Tivolem

- Victor Rangel-Riberio

##### 2. The Upheaval (translated from Konkani) - Pundalik Naik

**Unit IV: Poetry****15 hours**

1. Joseph Furtado a) The Secret  
b) Brahmin Girls  
c) The Neglected wife
  
2. Raghunath Vishnu Pandit a) His Immortal Land  
b) I'm a Gaudo
  
3. Eunice De Souza: a) One Man's Poetry  
b) Autobiographical  
c) He Speaks  
d) Advice to women
  
4. Balakrishna Bhagwant Borkar a) Ebony Black  
b) Towards the horizon  
c) Cemetery
  
5. Robert De Souza a) The Village Baker
  
6. Manohar Shetty a) Jigsaw  
b) One morning

**5. Reference Books:****Primary References:**

- 1) Antao, Ben. *Mad House and other nine stories*. Margao: Cinnamon Teal Publishing, 2012.
- 2) Mascarenhas, Lambert. *In the Womb of Saudade -Stories of Goan Life*. New Delhi: Rupa Publishing House, 1994.
- 3) Mauzo, Damodar. *Theresa's Man and other Stories from Goa*. Trans Xavier Cota. New Delhi: Rupa Publications, 2014.
- 4) Naik, Pundalik . *The Upheaval*. Trans Vidya Pai. New Delhi: Oxford University Press, 2012.
- 5) Rangel-Riberio, Victor. *Loving Ayesha and Other Stories*. New Delhi: HarperCollins Publishers, 2003.
- 6) Shetty Manohar, ed. *Ferry Crossing*. New Delhi: Penguin Books, 1998.
- 7) Victor Rangel-Riebrio. *Tivolem*. UK : Milkweed Editions, 2001.

### **Secondary References:**

- 1) Couto, Maria Aurora. *Goa- A Daughter's Story*. New Delhi: Penguin Books, 2004.
- 2) Fernandes, Andre Rafael. *When the Curtains Rise*. Saligao: Tiatr Academy of Goa & Goa 1556, 2010.
- 3) Gomes, Cynthia James. "Tiatr : An unlimited Engagement," *Reflected in Water*. Jerry Pinto, ed. New Delhi: Penguin Books, 2006.
- 4) Gomes, Olvinho J.F, (retold). *Konkani Folktales*. New Delhi: National Book Trust, 2008
- 5) Mauzo, Damodar. *Teresa's Man and other stories from Goa*. Trans Xavier Cota. Delhi: Rupa Publications, 2014.
- 6) Menezes, Juliao. *Goa's Freedom Struggle*. Velim: Mrs. Alzira da Almeida Charitable Trust, 2011.
- 7) Nazareth Peter, ed. *Pivoting on the Point of Return: Modern Goan Literature*. Saligao: Goa 1556 & Broadway Book Centre, 2010.
- 8) Pinto Jerry, ed. *Reflected in Water*. New Delhi: Penguin Books, 2006.



## **T.Y.B.A.– SEMESTER VI- CORE COURSE**

**Course Title:** Twentieth Century English Literature

**Course Code:** ENG-VI.C-8

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To introduce the students to novel, play and poems drawn from the English-language literatures of the twentieth century.
2. To examine how authors have responded to historical and cultural change throughout the twentieth century.
3. To probe the growth of modernism, and the appearance of post-colonialism and postmodernism

### **2. Learning Objectives:** By the end of the course the students will be able:

1. Read and appreciate representative literary works of Twentieth Century English Literature.
2. Identify different modern prose styles as well as colloquial rhythms of modern poetry.
3. Critically evaluate the impact of World Wars and psychology on Literature.
4. Appreciate the socio-eco facets of the Twentieth Century.

### **3. Number of Hours:** 04 hours per week

### **4. Course Content:**

**Total number of Hours 60**

#### **Unit I: Poems**

**20 hours**

1. William Butler Yeats  
a) The Second Coming  
b) The Wild Swans at Coole  
c) Sailing to Byzantium
2. Thomas Stearns Eliot  
a) Love Song of Alfred Prufrock  
b) The Journey of the Magi
3. Wilfred Owen  
a) Insensibility  
b) Strange Meeting
5. Siegfried Sassoon  
a) The Death Bed  
b) Lamentations

6. Rupert Brooke    a) The Dead  
                               b) The Solider  
                               c) Futility
7. Ezra Pound        a) At the Metro Station  
                               b) The Garden
8. Carl Sandburg    a) Fog  
                               b) Grass
9. Dylan Thomas    a) Do not go gentle into the good night  
                               b) Fern Hill
10. Stephen Spender a) An elementary school classroom in a slum
11. Louis MacNeice a) Prayer before birth

**Unit II: Novel**

**17 Hours**

1. James Joyce- A Portrait of the Artist as a Young Man

**Unit III: Drama**

**16 Hours**

1. Harold Pinter- The Home Coming

**Unit IV: Background**

**07 Hours**

1. Modernist Thematic Concerns
2. Techniques and Style of Modernist writers
3. Impact of psychology on literature & Stream of Consciousness technique
4. Impact of the World wars on Literature of the 20<sup>th</sup> Century Literature
5. Surrealism, Expressionism and Impressionism

**5. Reference Books:**

**Primary References:**

1. James Joyce. *A Portrait of the Artist as a Young Man*. Fingerprint Publishing, 2016.
2. Pinter Harold. *The Homecoming*. Avalon Travel Publishing, 1994.

**Secondary References:**

1. Abraham, M.H. *The Norton Anthology of English Literature*. W. W. Norton, Incorporated, 2003.
2. Bloom, Harold. *Dramatists and Dramas*. Chelsea House publishing, US, 2005.
3. Brown, Dennis, John Theodore. *The Modernist Self in Twentieth-Century English Literature: A Study in Self Fragmentation*. New York, Palgrave Macmillan, 1989.

4. Corcoran, Neil ed. *The Cambridge Companion to Twentieth-Century English Poetry*. Cambridge University Press, New York, 2007.
5. Friedman, Alan Warren. *Modernism and Literature: An Introduction and Reader*. Routledge, 2013.
6. Greenblatt, Stephen, et al., eds. *The Norton Anthology of English Literature*. Volume F: The Twentieth Century and After. New York, W. W. Norton , 2012
7. Marcus, Laura, Peter Nicholls ed. *The Cambridge History of Twentieth Century English Literature*. Cambridge University Press, UK, 2004.
8. Matz, J. *The Modern Novel: A Short Introduction*. Blackwell Publishing, US, 2004.
9. Meredith, James H. *Understanding the Literature of World War I: A Student Casebook to Issues ...* Green Wood Press, London, 2004.
10. Polleta, Gregory T. , ed. *Issues in Contemporary Criticism*. Boston: Little, Brown and Company, 1973.
11. Roberts, Neil. *A Companion to Twentieth-Century Poetry*. Blackwell publishing, UK, 2004.
12. Silverstein, Marc. *Harold Pinter and the Language of Cultural Power*. Associate University Press, London, 1993.
13. Stringer, Jenny. *The Oxford Companion to Twentieth Century English Literature*. Oxford University Press, New York, 1996.

**Course Title:** English Language and Literature Teaching

**Course Code:** ENG-E-13

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To introduce students to the fundamentals of English Language and Literature Teaching.
2. To introduce students to methods and approaches to teaching English Language and Literature.
3. To prepare students for the field of teaching with practical approaches to ELLT.

**2. Learning Outcomes:** But the end of the course the student will be able:

1. Understand and recognize fundamental concepts, methods, and approaches related to ELLT.
2. Create basic modules using theories in ELLT
3. Teach using methods, and approaches in ELLT.
4. Write reflective, analytical and research action essays to present their responses to ELLT.

**3. Number of hours: 04 hours per week**

#### **4. Course Content:**

**Total number of hours: 60**

#### **Unit I: English Language Teaching**

**15 hours**

**Introduction:** English in the world today, Brief History of English Language teaching

Principles of Language Teaching – Cognitive, Social, Linguistic

Fundamentals: Listening, Speaking, Reading, Writing, Pronunciation, Vocabulary

Curriculum Building

**Methods:** Grammar-Translation Method, Direct Method, Audio-Lingual Method, Silent Way, Desuggestopedia, Community Language Learning, Total Physical Response, Communicative Language teaching; Content based, Task-Based, and Participatory Approaches, Learning Strategy Training, Cooperative Learning and Multiple Intelligences

Issues in English Language teaching with focus on India

Discussion topics - *Literature as Autobiography* and *Fiction as Lies*.

New Paradigms & Current innovations in ELT

#### **Unit II: Praxis of English Language Teaching:**

**15 hours**

Preparation – Organization – Dissemination - Feedback

Use of teaching Methods using methods learnt in Unit 1 for crafting language teaching modules: Lecture Method, Demonstration Method, Problem Solving Method, Project Method, Vee – Mapping, Discussion Method, Play Method, Individualized Instruction Method, Discovery Method, Guided Discovery Method, Concept Mapping, Team Teaching

Use of ICT/Technology, Mixed-Media teaching

Innovations in teaching – Student-Centric, Flipped classrooms, POGIL, Constructivism

Student Innovation

### **Unit III: English Literature Teaching**

**15 hours**

Curriculum Building

**Approaches:** Language- based approach, Culture-based approach, Personal Growth approach (Reader-Response), Integrated Approach, Cultural-Response Method, Active Learning, Explanatory & Experiential Approach, Dramatic Method, Close reading, Reader-Response

Form & Genre: Poetry, Drama, Novel, Graphic-Novel, Non-Fiction, Creative Non-Fiction

### **Unit IV: Praxis of Teaching English Literature**

**15 hours**

Preparation – Organization – Dissemination - Feedback

Use of teaching Methods using methods learnt in Unit 3 for crafting literature teaching modules: Lecture Method, Demonstration Method

Interactive Method Using: Problem Solving Method, Project Method, Vee – Mapping, Discussion Method, Play Method, Individualized Instruction Method, Discovery Method, Guided Discovery Method, Concept Mapping, Team Teaching

Use of ICT/Technology, Mixed-Media teaching

Innovations in teaching – Student-Centric, Flipped classrooms, POGIL, Constructivism

Student Innovation

## 5. Reference Books:

### Primary References:

1. Broughton, Geoffrey, et al. *Teaching English as a Foreign Language*. New York: Routledge, 1978.
2. Carter, Ronald and David Nunan, *The Cambridge Guide to Teaching English to Speakers of Other Languages*. Cambridge: Cambridge University Press, 2001.
3. Chambers, Ellie and Marshall Gregory. *Teaching & Learning English Literature*. London: Sage, 2006.
4. Davison, Jon and John Moss, *Issues in English Teaching*. London: Routledge, 2000.
5. Irvine, Colin C., ed. *Teaching the Novel across the Curriculum - A Handbook for Educators*. Westport: Greenwood Press, 2008.
6. Jeffcoate, Robert. *Starting English Teaching*. London and New York: Routledge, 1992.
7. Larsen-Freeman, Diane. *Teaching and Principles in Language Teaching*. New York: Oxford University Press, 2003.
8. Nunan, David. *Language Teaching Methodology - A textbook for teachers*. Prentice Hall, 1991.
9. Richards, Jack and Theodore Rodgers. *Approaches and Methods in Language Teaching*. Cambridge: Cambridge University Press, 1986.
10. Richards, Jack and Willy Renandya. *Methodology in Language Teaching*. New York: Cambridge University Press, 2002.
11. Wyse, Dominic, Richard Andrews and James Hoffman, *The Routledge International Handbook of English, Language and Literacy Teaching*. New York: Routledge, 2010.

## Secondary References:

1. Chambers, Ellie and Marshall Gregory. *Teaching and Learning English Literature*. London: Sage Publications, 2006.
2. Ken, Bain. *What the Best College Teachers Do*. Massachusetts: Harvard University Press, 2004.
3. Nunan, David. *Learner-Centred English Language Education*. Devon: Routledge, 2013.
4. —. *Research Methods in Language Learning*. New York: Cambridge University Press, 1992.
5. —. *Teaching English to Speakers of Other Languages*. New York: Routledge, 2015.
6. Richards, Jack and Richard Schmidt. *Dictionary of Language Teaching & Applied Linguistics*. Edinburgh: Pearson, 2010.
7. Thurston, Cheryl Miller. *Ideas That Really Work!* Colorado: Cottonwood Press, 1991.



**Course Title:** Latin American Literature

**Course Code:** ENG-E-14

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To introduce students to the Latin American culture through their Literatures.
2. To help students understand the contribution of Latin American Writers to world literature.
3. To encourage students to discover the various themes, and movements associated with Latin American Literature.
4. To inculcate an atmosphere of cultural acceptance through the texts.

**2. Learning Outcomes:** By the end of the course the student will be able:

1. Understand the large landscape of Latin American Literature.
2. Recognize writers, forms, and movements associated with Latin American Literature.
3. Write reflective and research essays to present their responses to Latin American Literature.
4. Analyze works of literatures critically, keeping in mind the context of Latin America.

**3. Number of Hours: 04 Hours per week**

#### 4. Course Content:

**Total number of hours: 60**

#### Unit I: Contextual Study:

**10 hours**

**Note:** The following areas should be covered along with their representative texts. If representative texts are not present, extracts of such may be used

1. Brief History of Latin America
2. Movements : Modernismo, indigenismo, Romanticism/Realism/Naturalism, Mulatto
3. Andrade, Oswaldo de. (Brazil) “*Anthropophagie Manifesto*” - Transculturalism
4. The Boom, Magical Realism, Post-boom writers/writings

#### Unit II: Fiction:

**25 hours**

1. *100 Years of Solitude* – **Gabriel Garcia Marquez (Colombia)**
2. *The Psychiatrist* - **Machado de Assis (Brazil)**

#### Unit III: Poetry

**15 hours**

1. *Sonnet XVIII, The Song of Despair, A song for Bolivar* - **Pablo Neruda (Chile)**
2. *Flame, speech*; Proem, extract from *Sunstone* (first 15 stanzas) - **Octavio Paz (Mexico)**
3. *The Psychology of Composition, The Hen’s Egg* – **Joao Cabral de Neto (Brazil)**
4. *The Other, Antigone* – **Gabriela Mistral (Chile)**

#### Unit IV: Short Stories

**10 hours**

1. Selected Stories from *The Cubs and other stories* – **Mario Vargas Llosa (Peru)**  
*The Cubs, The Challenge*
2. Selected Stories of **Julio Cortazar (Argentina)**  
*House taken Over, Bestiary*
3. Selected Stories of **Jorge Luis Borges (Argentina)**  
*The Library of Babel, Death and the Compass*

**Note: Secondary readings of the selected authors, poets, critics are open to students to explore and should be encouraged for use in internal assessments.**

## 5. Reference Books:

### Primary References:

1. Borges, Jorge Luis. *Aleph and other Stories*. Ed. Norman Thomas Di Giovanni. Trans. Norman Thomas Di Giovanni. New York: Bantam Books, 1970.
2. Cortazar, Julio. *Blow-Up and Other Stories*. Trans. Paul Blackburn. New York: Pantheon Books, 1967.
3. Llosa, Mario Vargas. *The Cubs and Other Stories*. Trans. Gregory Kolovakos and Ronald Christ. New York: Farrar, Straus and Cirouxc, 1979.
4. Loundo, Dilip, ed. *Tropical Rhymes, Topical Reasons*. Brazil: National Book Trust, 2001.
5. Marquez, Gabriel Garcia. *One Hundred Years of Solitude*. Trans. Gregory Rabassa. New York: Avon Books, 1971.
6. —. *One Hundred Years of Solitude*. Trans. Gregory Rabassa. New York: Avon Books, 1967.
7. Mistral, Gabriela. *Madwomen*. Trans. Randall Couch. Chicago: University of Chicago Press, 2008.
8. Neruda, Pablo. *Twenty Love Poems and a Song of Despair*. Trans. W. S. Merwin. London: Penguin Books, 1976.
9. Neto, Joao cxabral De Melo. *Selected Poetry 1937 - 1990*. Hanover: Wesleyan University Press, 1994.
10. Paz, Octavio. *Selected Poems*. Ed. Eliot Weinberger. New York: New Directions, 1984.
11. —. *Sunstone*. Trans. Raymond Soulard and Kassandra Kramer. Seattle: Burning Man Books, 1957.

### Secondary References:

1. Bloom, Harold. *Bloom's Critical Views - Gabriel Garcia Marquez*. New York: Chelsea House Publishers, 2007.

2. —. *Bloom's Major Short Story Writers - Julio Cortazar*. Ed. Harold Bloom. Philadelphia: Chelsea House Publishers, 2004.
3. Castro-Klaren, Sara, ed. *A Companion to Latin American Literature and Culture*. Oxford: Blackwell Publishing, 2008.
4. Kristal, Efrain, ed. *The Cambridge Companion to the Latin American Novel*. Cambridge: Cambridge University Press, 2006.
5. Reisman, Rosemary, ed. *Latin American Poets*. Massachusetts: Salem Press, 2012.
6. Swanson, Philip. *Latin American Fiction*. Oxford: Blackwell Publishing, 2005.
7. Wood, Michael. *Landmarks of World Literature -One Hundred Years of Solitude*. Cambridge: Cambridge University Press, 1990.

**Course Title:** Contemporary Literary Theory

**Course Code:** ENG-E-15

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To introduce the students to the basic concepts of Contemporary Literary Theory.
2. To introduce the students to major schools of literary theory.
3. To develop the ability in the students to apply literary theory to analyze a work of literature.

**2. Learning Outcomes:** By the end of the course the student will be able to:

1. Make a comparative study of the different schools of literary theory.
2. Comprehend the basic tenets of modern literary theory and the jargon associated with it.
3. Apply literary theory and critically appreciate works of literature.

**3. Number of Hours: 04 hours per week**

**4. Course Content:**

**Total number of hours: 60**

**Unit I: Marxist view of Literature**

**12 hours**

1. Society and History : Marxist view
2. Major Marxists schools
3. Marxism and literature:
  - a) Literature and ideology
  - b) Autonomy in Literature
4. Marxist approach to Literature

**Unit II: Psychoanalysis**

**13 hours**

1. Views of Freud on human mind
2. Freudian approach to literature
3. Views of Lacan
4. Lacanian Criticism
5. Impact of psychoanalysis of literature

**Unit III: Structuralism and Post-structuralism**

**15 hours**

1. From New Criticism to Structuralism

2. Important Tenets of Structuralism
3. Contribution of Saussure
4. Contribution of Jonathan Culler, A. J. Greimas, Roman Jakobson, Roland Barthes
5. Structuralist Approach to Literature
6. Defining Deconstruction
7. Deconstructing Structuralism
8. From 'Work to Text'
9. Death of the author
10. Deconstruction an example
11. Deconstructing Deconstruction

**Unit IV: Voices of the Subaltern: Feminist, Queer & Post-Colonial Theories**

**20 hours**

**1. Feminist Theories**

- a) Features of Feminist Criticism
- b) Development to Feminist thought
- c) Major contributors to Feminist Criticism
  - i. Mary Wollstonecraft
  - ii. Virginia Woolf
  - iii. Simon De Beauvoir
  - iv. Elaine Showalter
  - v. Helen Cixous, Julia Kristeva
- d) Gynocriticism
- e) Feminist Criticism and Language
- f) Feminist approach to literature

**2. Lesbian/Gay criticism**

- a) Lesbian and Gay theory
- b) Lesbian feminism
- c) Queer theory
- d) Lesbian/Gay criticism-An example

**3. Postcolonial Theory**

- a) Edward Said - Orientalism
- b) Gayatri Spivak- Views on subalternity
- c) Homi K. Bhabha - Concept of mimicry

#### 4. Reference Books:

##### Primary References:

1. Abrams M. H. *A Glossary of Literary Terms*. Prism Publishers, 1999.
2. Barry Peter. *Beginning Theory*. Manchester United Press, Manchester, 1995.
3. Bertens Hans. *Literary Theory: Title Basics*. Routledge, London, 2001.
4. Eagleton Terry. *Literary Theory: An Introduction*. Blackwell, London, 1983.
5. Hawthorn Jeremy. *A Glossary of Contemporary Literary Theory*. Edward Arnold, London, 1994.
6. Selden Raman. *A Reader's Guide To Contemporary Literary Theory*. Harvester, London, 1993.
7. Webster Roger. *Studying Literary Theory: An Introduction*. Arnold Publishers, London, 1990.

##### Secondary References:

1. Ashcoft Bill, Griffiths Gareth, Tiffin Helen (ed). *The Post-Colonial Reader*. Routledge, New York, 1995.
2. Ashcoft Bill, Griffiths Gareth, Tiffin Helen (ed). *The Empire Writes Back*. Routledge, New York, 2010.
3. Butler Judith. *Gender Trouble*. Routledge India, 2016.
4. Jameson Fedric. *The Political Unconscious*. Routledge, New York, 1983.
5. Hawkes Terence. *Structuralism and Semiotics*. Routledge, New York, 2009.
6. Woods Tim. *Beginning Post-modernism*. Manchester University Press, Manchester, 2009.
7. Sarup Madan. *An Introductory Guide to Post-structuralism and Postmodernism*. 2<sup>nd</sup> Edition. The University of Georgia Press, Georgia, 1993.
8. Sedgwick Kosofsky Eve. *Epistemology of the Closet*. University of California Press, 2<sup>nd</sup> revised edition, 2008.
9. Vanita Ruth, Kidwai Saleem (eds). *Same-Sex Love in India: A Literary History*. Penguin India, 2008.

### **Secondary References:**

1. Mcquail, Denis. *Mass Communication Theory*. Vistaar Publications. 2007.
2. *The Associated Press Style Book and Libel Manual* Norm The A.P, 1994.
3. Hilliard, Robert. *Writing for Television, Radio and New Media (Seventh Ed.)*. Wadsworth. 2006.
4. Pavlik, J.V. *Media in the Digital Age*. 2008.
5. Perry, David K. *Theory and Research in Mass Communication*. Lawrence Erlbaum Associates, 2002.
6. Ruberg, Michelle. *Handbook of Magazine Article Writing*. Writer's Digest. 2009
7. Stadler, Jane and McWilliam, Kelly. *Screen Media – Analysing Film and Television*. Allen & Unwin. 2009.
8. White, Ted. *Broadcast News Writing, Reporting & Production*. Macmillan.



**Course Title:** Representation of Gender and Sexuality in Literature

**Course Code:** ENG-E-8

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To open classroom discussions in an easily accessible manner to students learning to comprehend gender and sexuality in practical situations as well as in literature.
2. To aid an understanding of the distinction between the concepts of gender and sexuality, and explore to explore its ever expanding reach.
3. To discover the interplay of gender and sexuality.
4. To help students understand the fluid natures of gender and sexuality.
5. To understand and appreciate the different artistic expressions of gender and sexuality.

**2. Learning Outcomes:** By the end of the course the student will be able to::

1. Appreciate the fluid nature of gender and sexuality.
2. Recognize the literal/ symbolic meanings depicted in literature related to gender and sexuality.
3. Decipher the interplay between gender and sexuality as seen through depictions, imagery and so on.
4. Recognize various themes seen in literature pertaining to gender and sexuality.

**3. Number of hours: 04 hours per week**

#### 4. Course Content:

Total number of hours: 60

#### UNIT I: Introduction:

20 hours

(“Why,What, How)

1. Introducing Women, Gender, Sexuality Studies
  - a) Video: *Gender fluidity*: Gabrielle Burton at TEDxColumbus
2. Thinking about Gender, Sexuality and Culture
  - a) Video: *Straightlaced: How Gender’s Got Us All Tied Up* (YouTube)
  - b) Marilyn Boxer, Ch. 1: Feminist Advocacy, Scholarly Inquiry, and the Experience of Women. *When Women Ask the Questions*.
3. Key Concepts and Theoretical Frameworks (Difference, Experience, Performance, Intersectionality)
  - a) “Doing Gender” in Gendered Society Reader- Candace West & Don Zimmerman
  - b) Gender: Judith Butler (Chapter 2)Sara Salih
4. Contemporary Contestations – Intersex and Transgender Movements
  - a) The Five Sexes: Why males and females are not enough- Anne Fausto-Sterling
  - b) Video: *Changing Gender Dynamics in Current Structure of India*. Laxmi Narayan Tripathi. TEDxSIUHinjewadi
  - c) Ashwini Sukthankar. *Facing the Mirror: Lesbian Writing from India*. Penguin Books Australia. 1999.
5. Reproduction & Family Politics
  - a) De-constructing ‘choice’: The social imperative and women’s use of the birth control pill - Granzow, Kara

#### UNIT II: Prose

15 hours

1. Novel:
  - a) The Truth About Me: A Hijra Life Story- A. Revathi
2. Essays:
  - a) Selected reading on Masculism from Popular Masculine Cultures in India: Critical Essays - Rohit K. Dasgupta (ed.) (any two essays)

**UNIT III: Plays****10 hours**

1. Mr. Behram - Gieve Patel

**UNIT IV: Poems****15 hours**

1. Suniti Namjoshi
  - a) I Give her the Rose
  - b) Well then let slip the masks
2. Maya Angelou
  - a) Phenomenal Woman
3. Kamala Das
  - a) The Old Playhouse
4. Sylvia Plath
  - a) Spinster
5. Trace Peterson
  - a) After and Before After
6. Hoshang Merchant
  - a) Selected poems from *Flower to Flame*

**Note to Instructor:**

1. As the syllabus (Unit I) features a large part theoretical/ essays on Gender and Sexuality, it is recommended that the instructor ensure that a rapport between student and teacher, and student and student is developed prior to moving forward to Unit II, III and IV.
2. Comfort in openly discussing their views and listening patiently to the views of their peers is necessary.
3. Recommended method of examination:
  - a) CAs – Students may be allowed the option of either a) writing an original report/ essay, commenting on the text they are studying (Secondary Reading list open); b) writing an original report/ essay viewing a literary piece through the lens of the essay(s); or c) class presentations based on syllabus topics featuring their own stance(s) and backed up with justifying arguments.
  - b) Semester End Exam –This may be a research paper written under the guidance of the instructor.

**5. Reference Books:****Primary References:**

1. A. Revathi. *The Truth About Me: A Hijra Life Story*. Penguin, 2010.

2. Boxer, Marilyn. *When Women Ask the Questions*. Baltimore and London: The Johns Hopkins University Press.
3. Fausto-Sterling, Anne. "The Five Sexes: Why males and females are not enough." *The Sciences*, 33 (2), 1994. Pgs. 20-25.
4. Granzow, Kara. "De-constructing 'choice': The social imperative and women's use of the birth control pill". *Culture, Health & Sexuality*, 9(1), 2007. Pgs. 43–54.
5. Jain, Jasbir (ed). *Women in Patriarchy: Cross – Cultural Reading*. New Delhi: Rawat Publications, 2005.
6. Ruth Vanita & Kidwai Saleem. *Same Sex Love in India: Readings from Literature and History*. New Delhi: Macmillan, 2000.
7. Salih, Sara. Chapter 2: Gender: *Judith Butler*. London: Routledge, 2002.
8. Tendulkar, Vijay. *Mitrachi Goshta: A Friend's Story: A Play in Three Acts*. Oxford University Press, 2000.
9. Peterson, Trace. *After and Before After*. Online. [Link](#)
10. West, Candace and Don Zimmerman. "Doing Gender". *Gendered Society Reader*. eds. Michael Kimmel & Amy Aronson. Oxford, 2000. Pgs. 146- 163.
11. Merchant, Hoshang. *Flower to Flame*. Rupa & Co. ,1992.
12. Dasgupta, Rohit K. *Popular Masculine Cultures in India: Critical Essays*. Setu Prakashani, 2013.

### **Secondary References:**

1. Brabon, Benjamin & Genz Stephanie. *Postfeminism*. Edinburgh University Press, 2009.
2. Bristow, Joseph. *Sexuality*. Routledge, 2013.
3. Butler, Judith. *Gender Trouble*. Routledge, 2012.
4. Shahni, Parmesh. *Gay Bombay: Globalization, Love and (be)longing in Contemporary India*. Sage Publications India Pvt. Ltd, 2008.
5. Sharma, Prabhat. *The Plays of Vijay Tendulkar: Critical Explorations*. Sarup & Sons, 2008.
6. Wake, Paul & Malpas Simon. *The Routledge Companion to Critical Theory*. Routledge, 2008.

7. Merchant, Hoshang. *Forbidden Sex, Forbidden Texts: New India's Gay Poets*. India: Routledge, 2009.
8. Bose, Brinda (Ed.), Subhabrata Bhattacharyya (Ed.). *Phobic And The Erotic: The Politics Of Sexualities In Contemporary India*. Seagull Books, 2007.

**Suggested Readings:**

1. Gilbert, Sandra & Gubar Susan. *The Madwoman in the Attic*. UK: Yale University Press, 1984.
2. Millett, Kate. *Sexual Politics*. University of Illinois Press, 2000.
3. Mohanty, Chandra Talpade. "Feminist Encounters: Locating the Politics of Experience". *Destabilizing Theory: Contemporary Feminist Debates*. eds. Michele Barrett and Anne Phillips. Stanford: Stanford University Press, 1992.
4. Monette, Paul. *Borrowed Time: An AIDS Memoir*. Mariner Books; 1 edition (June 1, 1998)
5. Sedgwick Eve Kosofsky. *Epistemology of the Closet*. University of California, 1990.
6. Seth, Vikram. *The Humble Administrator's Garden*. India: Penguin, 2012.

**Videos:**

1. *Changing Gender Dynamics in Current Structure of India*. Laxmi Narayan Tripathi. TEDxSIUHinjewadi [Link](#)
2. *Gender fluidity*: Gabrielle Burton at TEDxColumbus [Link](#)
3. *Straightlaced: How Gender's Got Us All Tied Up* (YouTube) [Link](#).

**Suggested Films:**

1. Campillo, Robin. *120 BPM (Beats per Minute)*. 2017.
2. Epstein, Rob and Jeffrey Friedman. *Howl*. 2010.
3. Kechiche, Abdellatif. *Blue Is the Warmest Colour*. 2013.

**Course Title:** Women's Writing in India

**Course Code:** ENG-E-12

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To offer students women's perspective of life and womanhood in India.
2. To acquaint the students with the distinct stylistic features of Indian women writers.
3. To evaluate the position of woman in the Indian patriarchal society and as reflected in literature written by women writers.
4. To enable students to re-examine texts that project women in rigid cultural and social constructs.

**2. Learning Outcomes:**

By the end of the course the students:

1. To appreciate woman's point of view regarding life.
2. To understand the life of a woman in patriarchal society of India.
3. To understand distinct features of women's writing.

**3. Number of hours: 04 hours per week**

**4. Course Content:**

**Total number of hours: 60**

**Unit I: Feminism, Language and Literature**

**08 hours**

Women's oppression, patriarchal values, reinforcement of traditional feminine roles-conflicts, contradiction, conformity, non-conformity revolt Gender bias in Language, Women's Talk and silence.

**Unit II: History of Women's writing in India**

**12 hours**

**A. Indian Feminism: Thinkers and Activists**

Women in Ancient Indian Tradition: Vedas, Epics and Smritis Women in Ancient Indian Thought: Arthashastra (Kautilya) and Manusmriti (Manu) Women in Bhakti tradition: Meera Bai, Vachana Garties, AkkaMahadevi Women in Modern Indian Thought: - Feminists in Colonial India: Begum Rokeya Sakhawat Hussein( Sultana's

Dream), Tara Bai Schinde ( Stee-Purush Tulane) Gandhi and Ambedkar's writing on Women

**B. Representation of Women in Literature of major Indian Languages.** (A case Study of Kuvempu and Rabindranath Tagore) Emergence of Women's question in since 19th Century in Indian Literature

**Unit III: Fiction**

**20 hours**

1. Rudali - Usha Ganguli
2. Eating Wasps – Anita Nair

**Unit IV: Poetry**

**14 hours**

1. Kamala Das                    a) The Descendants
2. Mamta Kalia                 a) After eight years of marriage
3. Melanie Silgado            a) For Father on the Shelf
4. Imtiaz Dharker:            a) Puradah I
5. Hira Bansode                a) Slave
6. Mina Gaybhiye              a) Both are Useless
7. Toru Dutt                    a) Our Casuarina Tree
8. Jyoti Lanje                  a) The Nameless One
9. Amrita Pritam              a) I Ask Waris Shah Today
10. Tamsila Aho                a) Prayer of a Monolith

**Unit V: Non Fiction**

**06 hours**

1. It's always Possible: Transforming One of the Largest Prisons in the World (Chapter One) - Bedi Kiran
2. Real and Imagined Women: Gender, Culture and Postcolonialism -Rajeswari Sunder Rajan.
3. Women writing in India: The twentieth century- Tharu, Susie & Ke Lalitha K.

(The teacher can select any four articles from the above mentioned book)

**Suggested Readings:**

1. Geetanjali Gangoli. (2005). *Indian Feminisms Law Patriarchies and Feminism in India*. Ashgate Publishing Company.

2. Krisnaraj Maithreyi and Thorner Alice. (2000). *Ideals Images and Real Lives: Women in Literature and History*. Orient Longman, New Delhi.
3. Padma Anagol. (2010). *The Emergence of Feminism in India Features*. Publisher Sashgate Publishing Limited.
4. Radha Chakravarthy. (2007). *Feminism and Contemporary Women Writers: Rethinking Subjectivity*. Routledge Publisher, India.
5. Tharu, Susie & Ke Lalitha K. (1993). *Women writing in India: (600 B.C. to Early 20<sup>th</sup> century) Delhi*. Oxford University Press, Bombay.
6. Vidyut Bhagwat. (2004). *Feminist Social Thought: an Introduction to six key Thinkers*. Rawat Publications, New Delhi.

## 5. Reference Books:

### Primary References:

1. Bedi Kiran. *It's always Possible: Transforming One of the Largest Prisons in the World*. Sterling Publishers Pvt.Ltd ,India; 6th edition , 2005.
2. *Deshpande, Shashi. Writing From the Margin & Other Essays*. Penguin Books, 2003.
3. Ganguli Usha. *Rudali*. Radhakrishan Prakashan, 1<sup>st</sup> edition, 2004.
4. Mulk Raj Anand and Zelliott Eleanor (Ed). *An Anthology of Dalit Literature*. Gyan Publishing House, New Delhi, 1992.
5. Nair, Anita. *Eating Wasps*. Context Publisher, India, 2018.
6. Prasad Madhusudan. *Contemporary Indian English Stories*. Sterling P. 1988.

### Secondary References:

1. Naik M.K. , Narayan Shyamala. *Indian English Literature 1980-2000: A Critical Survey*. Pencraft International, Delhi, 2016.
2. Pawar M.S. *New Women Novelists with New Horizons*. Shruti P. Jaipur, 2011.
3. Ray Mohit. *Indian Writing in English*. Atlantic Publishers, New Delhi, 2008.





Parvatibai Chowgule College of Arts and Science  
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**DEPARTMENT OF ENGLISH  
PARVATIBAI CHOWGULE COLLEGE**

# **SYLLABUS 2020-2021 ONWARDS**



**COGITO ΣΕΩΩ SVM**

**DEPARTMENT OF ENGLISH PROGRAMME STRUCTURE****THREE YEAR B.A. DEGREE PROGRAMME IN ENGLISH 2020 - 2021 ONWARDS**

<b>SEME STER</b>	<b>CORE COMPULSORY</b>					<b>OPTIONAL</b>
<b>I</b>	<b>ENG-I.C-1</b> Understanding Poetry & Drama					<b>FC-ENG-I</b>  Effective Communication (Arts Stream)
	<b>ENG-I.C-2</b> History of English Literature from Fifth Century to the Eighteenth Century					
<b>II</b>	<b>ENG-II.C-3</b> Understanding Fiction					<b>FC-ENG-I</b>  Effective Communication (Science Stream)
	<b>ENG-II.C-4</b> An Introduction to Linguistics and Stylistics					
<b>SEME STER</b>	<b>CORE COMPULSORY</b>	<b>CORE ELECTIVE</b>				<b>SEC</b>
<b>III</b>	<b>ENG-II.C-5</b> Contemporary Indian English Literature	<b>ENG-E-2</b> American Literature	<b>ENG-E-4</b> New Literatures in English	<b>ENG-E-12</b> Women's Writing in India	---	<b>ENG-SEC-1</b> Writing for the Media I
						<b>ENG-SEC-2</b> Creative Writing 1
<b>IV</b>	<b>ENG-II.C-6</b> Literary Criticism	<b>ENG-E-5</b> The Literature of the Indian Diaspora	<b>ENG-E-7</b> Visual Literature	<b>ENG-E-16</b> World Literature	----	<b>ENG-SEC-3</b> Writing for the Media II
						<b>ENG-SEC-4</b> Creative Writing II
<b>V</b>	<b>ENG-II.C-7</b> Nineteenth Century English Literature	<b>ENG-E-1</b> Goan Literature and Culture	<b>ENG-E-9</b> Shakespeare Today	<b>ENG-E-17</b> Modern Indian Literature in Translation	<b>ENG-E-11</b> Film Studies	<b>PROJECT</b>
<b>VI</b>	<b>ENG-II.C-8</b> Twentieth Century English Literature	<b>ENG-E-13</b> ELLT	<b>ENG-E-14</b> Latin American Literature	<b>ENG-E-15</b> Contemporary Literature	<b>ENG-E-8</b> Representati on of Gender and Sexuality	<b>PROJECT</b>

**B.A. in English**  
**PROGRAMME OUTCOMES**

<b>Programme Outcomes (PO)</b>	<b>Short Title of the POs</b>	<b>Description of the Programme Outcomes</b>
		<b>Graduates will be able to :</b>
PO-1	Problem Analysis and Solutions	Think critically, identify, analyze problems/ situations and further attempt to design/ develop solutions that meet the specified goals.
PO-2	Use of Technology	Apply appropriate IT tools efficiently in their daily activities of communication and academics.
PO-3	Environment and Sustainability	Analyze and attempt solutions to environmental issues and commit themselves to sustainable development in the local/ national and global context.
PO-4	Ethics	Recognize and understand professional ethics /human values and be responsible for the same.
PO-5	Individual and Team work	Function effectively at various levels, capacities and situations.
PO-6	Communication	Communicate proficiently (oral and written) as a responsible member of society.
PO-7	Research Aptitude	Understand general research methods and be able to analyse, interpret and derive rational conclusions.
PO-8	Life Skills	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of domain specific change.
<b>PROGRAMME SPECIFIC LEARNING OUTCOMES (PSLO)</b>		
After successful completion of a Bachelor's degree in English, the students will:		
PLO-1	<b>Core Concepts , evolving forms and traditions in literature</b>	Define, recognize and appreciate major literary forms as well as understand the nature, functions and schools of literary criticism and literary theory; appreciate the impact of the major texts and traditions of literature written in English in their social, cultural and historical context.
PLO-2	<b>Synthetic thinking and analysis of literature &amp; culture</b>	Identify and explain the historical, cultural and literary connections between texts, analyze, interpret and describe the critical ideas, values and themes that appear in literary and cultural texts and understand the way these ideas, values and themes inform and impact culture and society, both now and in the past.
PLO-3	<b>Analytical &amp; Ethical writing and research</b>	Write analytically in a variety of formats, including essays, research papers, reflective writing and critical reviews of secondary sources. Ethically gather, understand, evaluate and synthesize information from a variety of written and electronic sources.
PLO-4	<b>Skills &amp; Life Skills</b>	Recognize and analyze various linguistic features of language and practice four linguistic skills, and Apply Skills developed through courses like writing for the media, creative writing and ELLT (creating basic teaching methods in ELLT).

## **SEMESTER I – CORE COURSE**

**Course Title:** Understanding Poetry & Drama

**Course Code:** ENG-I.C-1

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To acquaint students with major poetic forms and trends in English Poetry.
2. To enable students to read and appreciate poems.
3. To improve the literary and critical competence of the students.
4. To teach students to appreciate English Drama.
5. To instill the appreciation of Drama and the universality of its reach.
6. To train students to identify basic elements in a Drama.

### **2. Course Outcomes:**

Upon completion of the course the student should be able:

CO1: Define major poetic forms such as lyric poetry, narrative poetry.

CO2: Identify rhyme, rhythm meter and recite the poems prescribed.

CO3: Explain and appreciate the literal and symbolic/inner meaning (connotative and denotative meaning) of a poem.

CO4: Identify and show special stylistic features of poetry such as imagery, tone, atmosphere, special linguistic and stylistic features, imagery.

CO5: Chart out the evolution of two major forms in Drama – Tragedy, and Comedy - through its varying definitions and content

CO6: Analyze elements and structures in a play – plot, character, setting, theme, and conflict; stage, act, scene division, stage directions

### **3. Number of hours: 04 hours per week**

**4. Course Content:**

**Total Number of hours: 60**

**Unit I: Background to Poetry & Drama**

**12 hours**

1. Poetry as a Literary form
2. Nature and types of lyric poetry
3. Evolution of lyric as a literary form
4. Nature and forms of narrative poetry
5. Evolution of the English Drama
6. Nature of Tragedy & Comedy in Drama

**Unit II: Lyric Poetry:**

Songs, Sonnets, Odes, Elegies and Dramatic Monologues

**12 hours**

1. Edmund Spenser a) Whilst in Prime
2. William Shakespeare a) Marriage of True Minds
3. John Donne a) Batter my Heart
4. Robert Herrick a) To Daffodils
5. William Blake a) Lamb  
b) Tyger
6. William Wordsworth a) The Daffodils
7. Percy Bysshe Shelley a) Mutability
9. John Keats a) Ode on a Grecian Urn
10. Robert Browning a) My Last Duchess

**Unit III: Narrative Poetry: Ballads, Mock Epic**

**12 hours**

1. The Rime of the Ancient Mariner (Section 1) - Samuel Taylor Coleridge
2. Rape of the Lock (Canto I) - Alexander Pope

**Unit IV: Drama: Tragedy & Comedy**

**24 hours**

1. An Enemy of the People - Henrik Ibsen
2. The Admirable Crichton - James Matthew Barri

## 5. Reference Books :

### Primary References:

1. Barrie. J. M. *The Admirable Crichton*.
2. Ibsen, Henrik. *An Enemy of the People*.

### Secondary References:

1. Abrams, M. H. *A Glossary of Literary Terms*. 11<sup>th</sup> Cengage Learning, 2014.
2. Bowra C.M. *Heroic Poetry*. Macmillan, 1966.
3. Ed. Bloom Harold. *William Shakespeare's Sonnets*. Viva Books, 2007.
4. Ed. Bottrall Margaret. *William Blake: Songs & Innocence & Experiences*.
5. Macmillan, 1970.
6. Bradley. A.C. *Oxford Lectures on Poetry*. Atlantic, 2009.
7. Broadbent J.B. *Poetic Love*. Chatto & Windus London, 1964.
8. Chandra NDR, Sebastian A.J. *Literary Terms in English Poetry*. Authors Press, Delhi, 2001.
9. Cuddon J A. *The Penguin Dictionary of Literary Terms and Literary Theory*. Penguin Books, 1999.
10. Dobson, Michael and Wells, Stanley. *The Oxford Companion to Shakespeare*. Oxford, 2001.
11. Gardner Stanley. *Blake*. P. Evans Brothers Ltd, 1968.
12. Jump, John D.(Ed.) *Critical Idiom Series*. Law Book Co of Australasia, 1974.
13. Gridley Roy E. *Browning*. Routledge & Kegan Paul, 1972.
14. Ed. Grose Kenneth H. *Keats*. Evans Brother Ltd, 1969.
15. Hudson, W. H. *An Introduction to the Study of Literature*. B.I. Publications, 1972.
16. Klarer Mario. *An Introduction to Literary Studies*. Routledge, 2004.
17. Lever J.W. *The Elizabethan Love Sonnets*. Methuen & Co. Ltd, 1966.
18. Ed. O'Neill Judith. *Critics on Keats*. George Allen & Unwin Ltd, 1967.
19. O'Neill Judith. *Critics of Pope*. George Allen & Unwin Ltd., London, 1968.
20. Prasad, B. *Background to the Study of English Literature for Indian Students*. Trinity Press, 2014.
21. Read Herbert. *Wordsworth*. Faber & Faber Ltd, 1957.
22. Sarker Sunil Kumar. *Shakespeare's Sonnets*. Atlantic Publisher, 2006.

23. Rees, *R. J. Introduction to English Literature*. New Delhi: Macmillan India, 1973.
24. Smith Hallett. *Elizabethan Poetry*. Ann Arbor Paperbacks, 1968.
25. Ed. Ward Sir W. & Walter A.R. *The Cambridge History of English Literature*. Cambridge University Press, 1914.
26. Westland Peter. *Literary Appreciation*. The English University Press Ltd, 1964.

## **F.Y.B.A – SEMESTER I – CORE COURSE**

**Course Title:** History of English Literature from Fifth Century to the Eighteenth Century

**Course Code:** ENG-I.C-2

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To provide a comprehensive overview of major periods in the History of English literature.
2. To introduce to the students the historical and cultural contexts in which English Literature has developed through the ages.
3. To provide a view of major writers and their works in different ages.
4. To explore the complex relationship between literature and its context through discussion of particular literary trends, texts and issues within each period.

### **2. Course Outcomes:**

Upon completion of the course the student should be able:

CO 1: Thoroughly inspect an overview of the impactful periods in the history of English literature.

CO 2: Compare and strategically impart culture of English literature's development through time.

CO 3: Construct a comprehensive list of major writers and their works through important periods of English history.

CO 4: Examine the relationship between literature and its context by evaluating particular literary trends, texts and issues.

CO 5: Create a positive view of history of English literature by being engaged in hands on activities in and outside the classroom.

### **3. Number of hours: 04 hours per week**



#### 4. Course Content:

**Total Number of hours: 60**

#### **Unit I: Anglo Saxon Age**

**12 hours**

1. The dark ages and the Norman conquest<sup>^</sup>
2. Development of English Language (Old English and Middle English)<sup>^</sup>
3. The age of Chaucer/From Chaucer to Renaissance (1350- 1516)<sup>^</sup>
4. Age of unrest and transition, Religious movements, <sup>^</sup>
5. New learning of classical antiquity Petrarch, Giovanni Boccaccio <sup>^</sup>
6. Anglo Saxon Literature- Beowulf <sup>^\*</sup>
7. Works of Major prose writers- John Wyclif, Sir John Mandeville <sup>^\*</sup>
8. Works of Major Poets- Geoffrey Chaucer, William Langland, John Gower <sup>^\*</sup>

#### **Unit II: The English Renaissance/ The age of Shakespeare (1578-1625) 18 hours**

1. Renaissance and Reformation
2. Development of drama from Miracle and Morality Plays<sup>#</sup>
3. War of the Roses, Anglican Clergy, Elizabethan age and Geographical discoveries
4. Interludes to University Wits<sup>^</sup>
5. Shakespeare<sup>#</sup> and Humanism
6. Poetry- Songs and sonnets of the 16th century, Bacon's Essays
7. Prose- Translations (Wyclif, Tyndale, Coverdale, Authorized Version of 1611),  
Historical and biographical works, Literary Criticism, Religious writings, Humanistic  
writings, Elizabethan satirical writings (Nash, Lodge, etc.)<sup>#</sup>

#### **Unit III: The Seventeenth Century**

**18 hours**

1. Political Background:  
England under James I (Jacobean Period) and Charles I (Cavaliers)<sup>^</sup>  
Commonwealth, the triumph of Puritanism<sup>^</sup>  
Restoration: Charles II<sup>^</sup>
2. Literary Movements:  
The age of John Milton and John Dryden<sup>1625- 1700</sup><sup>^</sup>
3. Religious Movement: Puritanism<sup>^</sup>  
Prose- Sir Thomas Browne, <sup>^(#)</sup>  
The Puritan writers<sup>^(#)</sup>  
Restoration prose: (Hobbes, Newton)<sup>^(#)</sup>

Diarist of the Age: Samuel Pepy, John Evelyn,^(#)  
 Moral Essays(Cowley, Temple)^, John Bunyan,^ George Fox,Thomas Ellwood,\*  
 Establishment of Royal Society and the development of modern prose Poetry – The  
 Cavalier  
 Poets^\*(#)  
 The Metaphysical Poet: John Donne^(#), John Milton,Dryden \*(#)  
 Restoration Drama: William Congreve^(#), John Vanburgh, George Farqahar,  
 William  
 Wycherley, George Etherege \*(#)  
 Literary Criticism: Dryden ^(#)

#### **Unit IV: The Eighteenth Century**

**12 hours**

##### 1. Political Background:

Reign of Queen Anne ^

##### 2. Literary Movements:

The Age Alexander Pope and Dr. Samuel Johnson (1700-1789)^

Periodical Essays ^

The Age of Prose and Reason^

Satires of the age^

The rise of the novel Sentimental Comedy^

##### 3. Society:

The Coffee House Culture^(#)

Periodical Essays: Thomas Addison\*(#) and Dr. Samuel Johnson^(#)

Satires of the age – Johnathan Swift^(#)

Neoclassicism Augustan Reflective poetry - Alexander Pope^(#), Lady Anne Finch of  
 Winchilsea\*(#)

Precursors of Romantic Poetry: Thomas Collins^(#), Thomas Gray\*(#) and Oliver  
 Goldsmith\*(#) Robert Burns\*(#) and William Cowper \*(#)

**NOTE:** There shall be further changes made to the syllabus wherein certain topics shall be assigned for self-study.

**Key:** \* -Self-study, ^ -Discussed in class by the Instructor, # -shall be given as Assignments and Presentations

## **5. Reference Books:**

### **Primary References:**

1. Daiches David. *A Critical History of English Literature*. Allied Publishers Ltd. New Delhi, 1999.
2. Ford Boris Ed. *The Pelican Guide to English Literature*. Penguin Books UK, 1964.
3. Hudson William. *An Outline History of English Literature*. B I Publications, Bombay, 1972.
4. Poplawski Paul ed. *English Literature in Context*. New Delhi: Cambridge University Press, 2008.

### **Secondary References:**

1. Compton-Rickett Arthur. *A History of English Literature*. Universal Book Stall, Delhi, 1969.
2. Evans I for. *A Short History of English Literature*. The English Language Book Society & Penguin Books, 1970.
3. Legouis Emile, and Cazamian Louis, Vergnas Raymond. *A History of English Literature*. London: J.M. Dent and Sons LTD, 1964.

## **CORE COURSE**

**Course Title:** Understanding Fiction

**Course Code:** ENG-II.C-3

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To help students understand the evolution of the Novel and Short Story as distinct Literary Forms.
2. To help students understand the contribution of various other literary forms like Medieval Romances, Character Sketch etc. to the evolution of the novel.
3. To help students understand how the socio-economic conditions prevalent in the 18<sup>th</sup> century contributed to the rise of the Novel, and how the conditions prevalent in the 19<sup>th</sup> century contributed to the rise of the Short Story.
4. To help students understand the contribution of various other literary forms like Parables, Fables etc. to the evolution of the Short Story.
5. To help students understand the characteristics of the short story through the study of few popular short stories.
6. To teach students to appreciate English Fiction.
7. To instill the ability of recognizing the various elements of Fiction.

### **2. Learning Outcomes:** Upon the completion of the course the student will be able:

CO1: Identify elements of Short Stories, Novella and Novel such as Plot, Character, Setting, Theme.

CO2: Compare and contrast the structural difference between a short story and a novel.

CO3: Critically analyze short stories and novels.

CO4: Explain the origin of the short story, novella and novel.

### **3. Number of hours:**

**04 hours per week**

#### 4. Course Content:

**Total Number of hours: 60**

#### **Unit I: Background**

**10 hours**

1. Contribution Of Medieval Prose Romances to evolution of English Novel
2. Other Literary Forms That Contributed to the Novel (diaries and journals, biographies/autobiographies, letters, character sketch)
3. Reasons for Emergence and Growth of the Novel as a Distinct Literary Genre In the 18<sup>th</sup> Century
4. Characteristics of the contemporary novel
5. Elements of the Novel
6. Contribution of writers of Asian, African, Latin American origin to the Contemporary English Novel.
7. **Ancient Roots/origins of the short story** (Stories of the Old Testament, Parables Of the New Testament, Fables, Panchatantra Stories, Boccaccio's Decameron etc.)
8. Reasons for the emergence of the short story in the 19<sup>th</sup> century
9. Characteristics Of the short Story
10. Difference between Novella and Short Story.

#### **Unit II: Novel**

**25 hours**

1. Lord of the Flies - William Golding

**Unit III: Short stories****10 hours**

1. The Gift Of the Magi - O Henry
2. The Cask Of Amontillado - Edger Alan Poe
3. Darling - Chekov
4. A Wrong Man in Worker's Paradise - Rabindranath Tagore
5. The Tiger In the Tunnel - Ruskin Bond
6. The Doctor's word - Rasipuram Krishnaswami Iyer Narayanaswami
7. Vengeful Creditor - Chinua Achebe
8. Good Advice Is Rarer then Rubies - Salman Rushdie
9. The Monkey's Paw - William Wymark Jacobs

**Unit IV: Novella****15 hours**

1. Animal Farm - George Orwell

(NOTE: Some short stories as well as background topics will be given for self study)

## **5. Reference Books:**

### **Primary References:**

1. Achebe, Chinua. *Girls At War*. Johannesburg, South Africa: Penguin Books, 2009. Print.
2. Cross, Wilbur. *The Development of the English Novel*. New York: Atlantic Publishers and Distributors, 2001. Print.
3. Desai, Anita. *Fasting, Feasting*. New York: Mariner Original, 1999. Print.
4. Golding William- *Lord of the Flies*. Penguin; Deluxe edition, 2017. Print.
5. Hunter, Adrian. *The Cambridge Introduction To The Short Story In English*. New Delhi: Cambridge University Press, 2007. Print
6. Hoppenstand, [Gary , W.W. Jacobs](#). *The Monkey's Paw and Other Tales of Mystery and the Macabre*. Chicago Review Press; Revised ed. Edition. 2005. Print.
7. Kohli. Suresh (ed). *Modern Indian Short Stories: An Anthology*. New Delhi: Arnold Heinemann Publishers, 1974. Print.
8. Orwell, George. *Animal Farm*. Penguin India; Fourth edition, 2011. Print.

### **Secondary References:**

1. Abrams M. H. *A Glossary of Literary Terms*. Bangalore. Prism Books. 1999.
2. Daiches, David. *A Critical History Of English Literature Vol 1. 2<sup>nd</sup> ed.* New Delhi: Allied Publishers Pvt. Ltd., 2004. Print.
3. Reid, Ian. *The Short Story*. New York: Barnes and Nobel, 1977. Print

## **SEMESTER II – CORE COURSE**

**Course Title:** An Introduction to Linguistics and Stylistics

**Course Code:** ENG-II.C-4

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To acquaint the students with the basic concepts in linguistics.
2. To introduce the students to various sub disciplines of linguistics.
3. To know the connection between linguistics and stylistics.
4. To understand the concept of style in literature.
5. To provide hands on experience in analysing texts, fiction and poetry.

### **2. Course Outcomes:**

Upon completion of the course the student should be able:

CO 1: Have a fundamental understanding of the basic nature, branches and history of linguistic inquiry.

CO 2: Develop competence in linguistic analysis of English sound system, word, sentence structures in English.

CO 3: Understand stylistic features of works in English language.

CO 4: Ability to distinguish between different registers of English, international varieties of English.

### **3. Number of hours: 04 hours per week**



**4. Course Content:**

**Total Number of hours: 60**

**Unit I: Nature of Language**

**05 hours**

1. Language and communication
2. Origin of language
3. Characteristics of human language
4. Language varieties: standard and non-standard language, dialect, register, slang, pidgin, Creole; International varieties of English
5. Language change

**Unit II: English Phonetics and Phonology**

**10 hours**

1. The Speech mechanism
2. Phonemes of English: Description and Classification
3. Syllable: Structure and Types
4. Word Stress, Degrees of Stress, Stress Shift, Grammatical Stress
5. Sentence Stress: Use of Weak and Strong Forms
6. Intonation Patterns/Uses of Tones

**Unit III: English Morphology**

**10 hours**

1. Morphemes: Free and bound morphemes; Morphs and allomorphs
2. Word Formation in English: Simple, complex, compound, and compound- complex words; affixes, stems, roots; inflectional vs. derivational morphology
3. The process of word formation: Backformation, reduplication, blends, clippings, acronyms
4. Meaning change: Generalization, specialization, change in connotations

**Unit IV: Syntax and Grammar**

**10 hours**

1. Different approaches to syntax
2. Parts of speech, Basic sentence structures, Types of sentences, clauses, phrases

**Unit V: Semantics**

**10 hours**

1. Words as signs, transparent and opaque words
2. Conceptual vs. associative meaning

3. Lexical relations: synonymy, antonymy, hyponymy, homophony, homonymy, polysemy

**Unit VI: Applied Linguistics**

**15 hours**

1. Linguistic approach to literature: Difference between ordinary language and language of literature
2. Use of linguistics in the study of literature (stylistics): Figurative language; linguistic deviations; Phonological patterns of rhyme metre, alliteration, assonance, clustering of vowel and consonant sounds
3. Linguistics and language teaching: First language acquisition; Second language learning, barriers in learning second language, Methods of teaching second language: Grammar-translation method, Direct method, audio-lingual method, the communicative approach

## 5. Reference Books:

### Primary References:

1. Akmajian, Demers, Farmer, Harnish. Linguistics. *An Introduction to Language and Communication*. PHI Learning Private Limited, New Delhi, 2009.
2. Leech Geoffrey. *Linguistic Guide to Poetry*. Routledge London, 1969.
3. Jones Daniel. *An Outline of English Phonetics*. Cambridge Uni. Press, 1972.
4. Lyons John. *Language and Linguistics an Introduction*. Cambridge University Press, 2003.
5. Quirk Randolph, Greenbaum Sidney. *A university Grammar of English*. Pearson Education Ltd. 2012.
6. Wallwork J F. *Language and Linguistics: An Introduction to the study of Language*. Heinemann Educational Books London, 1969.
7. Yule George. *The Study of Language: An Introduction*. Cambridge University Press, 1985.

### Secondary References:

1. Aarts, Bas and April McMahon. *The Handbook of English Linguistics*. Malden: Blackwell Publishing, 2006.
2. Broderick, John P. *Modern English Linguistics - A Structural and Transformational Grammar*. Thomas Y. Crowell Company, 1975.
3. Cobley, Paul, ed. *Semiotics and Linguistics*. London: Routledge, 2001.
4. Dixon, R. M. W. *A Semantic Approach to English Grammar*. 2nd. Oxford University Press, 2005.
5. Hyland, Ken, ed. *English for Academic Purposes - An advanced resource book*. New York: Routledge, 2006.
6. Kretschmar Jr, William A. *The Linguistic of Speech*. New York: Cambridge University Press, 2009.
7. Meyer, Charles. *Introducing English Linguistics*. Edinburgh: Cambridge University Press, 2009.
8. Radden, Gunter and Rene Dirven. *Cognitive English Grammar*. John Benjamins Publishing Company, 2007.
9. Trask, R. L. *Language & Linguistics - The Key Concepts*. Ed. Peter

Stockwell. New York: Routledge, 2007.

10. Trousdale, Graeme and Nikolas Gisborne. *Constructional Approaches to English Grammar*. Berlin: Mouton de Gruyter, 2008.



## **F.Y.B.A. /F.Y.B.Sc.– SEMESTER/II– OPTIONAL ENGLISH**

**Course Title:** Effective English Communication

**Course Code:** FC-ENG-I

**Marks:** 100

**Credits:** 4

**Duration:** 60 hours

### **1. Course Objectives:**

1. To help students develop proficiency in oral communication in English.
2. To help students understand the importance of developing good listening skills.
3. To help students become proficient in listening, writing and speaking skills

### **2. Course Outcomes:**

Upon completion of the course the student should be able:

CO1: Build confidence while conversing and writing in formal English.

CO2: Make use of the benefits of good communication skills.

CO3: Agree on the profit of having a proficient grasp on written skills like letter writing, minutes of a meeting and agendas.

CO4: Create a purposeful use of English with correct grammar and pronunciation.

**3. Number of hours:                      04 hours per week**

#### 4. Course Content:

**Total Number of hours:60**

##### **Unit I: Fun with Grammar**

**15 hours**

Students need to have a basic proficiency in Grammar to complete this course.

Pre-requisite to the course: Knowledge of Basic Grammar –Articles,Adjectives, adverbs, Conjunctions, Sentence Structures– SVO etc

The above can be revised briefly. Grammar component will be taught incidentally and in conjunction with Unit II.

1. Parts of Speech
2. Reported Speech
3. Punctuation
4. Phrases and Clauses
5. Active and Passive
6. Basic Errors in English Language
7. Spotting Errors and correcting them
8. Revising and Editing

Note: The teacher concerned can make use of the following, to teach Grammar.

1. Reading a picture
2. Quiz
3. Wordplay
4. Dialogues

##### **Unit II: Spoken English**

**15 hours**

###### **1. Individual Presentation Skills**

5 hours

Students are to be taught public speaking using Presentation skills through application based teaching; public speaking is to be taught and application of these skill in formal and informal settings.

- a) Concepts:
  - i. Importance of Body Language and Eye Contacti n Spoken Communication
  - ii. Ways to Overcome Fear of Speaking

- iii. Pace, Tone and Intonation
- iv. Listening as an Essential Part of Communication. How to be an Effective Listener

b) Applied:

Students will be given topics to present before the class. They can use a host of methods to do so

- 1. Presentation with material-Formal
- 2. Oral presentation
- 3. Formal/ Informal Speeches–Welcome, Introduction to a dignitary, Raising a toast, Farewell Speech, celebratory speeches

2. Pair Based Activities 5 hours

- a) Telephone Etiquette
- b) Speaking and Listening Classroom Practice Exercises in Pairs and Groups.

3. Group Based Activities 5 hours

Minutes of the meeting can be used as a group based activity.  
Group Discussions of Formal and Informal nature.

**Unit III: Written English**

**15 hours**

1. Letters

a) Formal Letters

- i. Job Application Letters
- ii. Enquiry Letters
- iii. Orders and Complaints letters
- iv. RTI
- v. Representations

vi. Writing a resume

b) Social Letters

- i. Invitation & Reply
- ii. Condolence & Reply
- iii. Congratulations & Reply
- iv. Thankyou & Reply



**UnitIV: Digital StoryTelling(DST)**

**15 hours**

Descriptive Writing– (Open to the Teacher to explore this writing in various areas  
Fiction and Non-Fiction and creative expression of personal writing)

## 5. ReferenceBooks:

### Primary References:

1. Azar, Betty Schramper. *Basic English Grammar*. New York: Pearson Education, 1996.
2. Biber, Douglas, Susan Conrad and Geoffrey Leech. *Longman Student Grammar of Spoken and Written English*. Edinburgh: Pearson Education Limited, 2002.
3. Bullock, Richard. *The Norton Field Guide to Writing*. New York: W.W. Norton & Company, 2009.
4. Jain, A.K. and Dr. Pravin. S.R. Bhatia. *Professional Communication Skills*. New Delhi: S.Chand & Company Ltd, 2000.
5. Mohan, Krishna and Singh, N. P. *Speaking English Effectively*. Macmillan India Ltd.
6. Sadanand, Kamelesh and Susheela Punitha. *Spoken English: A Foundation Course- Part I*. Hyderabad: Orient Blackswan Private Limited, 2009.
7. Stanek, William. *Effective Writing for Business, College and Life*. Reagent Press, 2005.

### Secondary References:

1. Bullock, Richard. *The Norton Field Guide to Writing*. New York: W.W. Norton & Company, 2009.
2. Chakravarty, Auditi and Bonnie Boehme. *Grammar & Usage for Better Writing*. New York: Amsco School Publications, 2004.
3. Downing, Angela and Philip Locke. *English Grammar A University Course*. London and New York: Routledge, 2006.
4. Hewings, Martin. *Advanced Grammar in Use*. 2nd. Great Britain: Cambridge University Press, 2005.
5. Naylor, Helen and Raymond Murphy. *Grammar in Use Supplementary Exercises*. Edinburgh: Cambridge University Press, 2001.

## **S.Y.B.A. – SEMESTER III – CORE COURSE**

**Course Title:** Contemporary Indian English Literature

**Course Code:** Eng-III.C-5

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To introduce the students to different genres of contemporary Indian writing in English.
2. To acquaint the students with the narrative of India's struggle for independence.
3. To familiarize the students with various themes and cultural contexts of Contemporary Indian English Writing.

### **2. Course Outcomes:**

By the end of this course students:

- CO 1. Analyse the common tropes in prose literature of partition and children's literature.
- CO 2. Define and recognize contemporary Indian English Literature.
- CO 3. Identify various genres employed by the contemporary Indian English writers.
- CO 4. Explain and analyse themes and narrative techniques employed by contemporary Indian English writers.
- CO 5. Identify the special features of contemporary Indian Poetry and Drama.

**3. Number of Hours per week: 04**

#### **4. Course Content:**

**Total Number of Hours: 60**

#### **Unit I - Poetry:**

**Number of Hours: 15**

##### 1. Keki Daruwalla

- a) Boat-ride Along the Ganga
- b) Draupadi
- c) Bars

Secondary Reading – Hawk

##### 2. Adil Jussawala

- a) On First Approaching Santacruz Airport, Bombay

##### 3. Nissim Ezekiel

- a) Goodbye Party for Miss Pushpa T.S.
- b) Background Casually
- c) Poet, Lover, Birdwatcher

##### 4. Arun Kolatkar

- a) The Bus
- b) An Old Woman
- c) Ajamil and the Tigers

##### 5. Jayanta Mahapatra

- a) Hunger
- b) Indian Summer

##### 6. A. K. Ramanujan

- a) Love Poem for a Wife
- b) Looking for a Cousin on a Swing
- c) A River

##### 7. Kamala Das

- a) An Introduction
- b) My Grandmother's House
- c) Summer in Calcutta

#### **Unit II - Drama**

**Number of Hours: 18**

##### 1. Mahesh Dattani - Final Solutions

##### 2. Girish Karnad - Yayati

## Unit III - Prose

Number of Hours: 12

### 1. Short Stories

- a) R. K. Narayan - A Horse and Two Goats
- b) Ruskin Bond - The Blue Umbrella
- c) Khushwant Singh – Portrait of a Lady
- d) Vilas Sarang - (one short story to be selected from either *Fair Tree of the Void* or *The Women In Cages: Collected Stories*)

### 2. Novel

Number of Hours: 15

Khushwant Singh - Train to Pakistan

### 5. Reference Books:

#### Primary References:

1. David Davidar. *A Clutch of Indian Masterpieces*. New Delhi: Aleph Book Company, 2014.
2. Girish Karnad. *Yayati*. New Delhi: Oxford University Press, 2007.
3. Singh Khushwant. *Train to Pakistan*. Penguin, 2016.
4. Vilas Sarang. *Fair Tree of the Void*. Penguin Books Ltd.

#### Secondary References:

1. Iyengar, K.R.S. *Indian Writing in English*. New Delhi: Sterling Publishers Pvt. Ltd., fourth edition, 1984.
2. Joshi, Dr. Rakesh. *Girish Karnad's Plays*. Jaipur: Mark Publishers, 2011.
3. Khair Tabish. *Babu Fictions: Alienation in Contemporary Indian English Novels*. UP: Oxford UP, 2001.
4. King, Bruce. *Modern Indian Poetry in English*. USA: Oxford University Press, 2005.
5. Mehrotra Arvind Krishna. *Twelve Modern Indian Poets*. New Delhi: Oxford India Courseback, 1993.
6. Naik, M.K., S.K. Desai and G.S. Amur. *Critical Essays on Indian Writing in English*. New Delhi: MacMillan, 1968.
7. Paranjape, Makarand R. *Indian Poetry in English*. New Delhi: Macmillan, 1993.

8. Parthasarathy,R.(ed.).*Ten Twentieth-Century Indian Poets*(NewPoetryinIndia). NewDelhi:OxfordUniversityPress,1976.
9. Shama,Ram.*Recent Indian English Literature*.Delhi:ManglamPublications,2012.
- 10.VilasSarang.*The Women In Cages: Collected Stories*.PenguinIndia,2006.
- 11.Warma,Monica.*Modern Indian Poetry in English*.NewDelhi:OxfordUniversity Press, 2010.

**Weblinks:**

- <https://indianpoetry.wordpress.com/>
- <https://www.poetryinternational.org/pi/poets/filter/country/27/page/0/en/tile>
- <https://www.raintaxi.com/the-poetry-of-india/>
- <https://scroll.in/article/694635/five-reasons-indian-poetry-matters-more-than-ever>
- <https://www.livemint.com/mint-lounge/features/girish-karnad-and-the-women-who-defied-norms-11591760364724.html>
- <http://www.imagi-nation.com/moonstruck/clsc79.html>
- <https://www.loc.gov/acq/ovop/delhi/salrp/khushwantsingh.html>

**Course Title : American Literature of the Twentieth Century**

**Course Code:** ENG-E-2

**Marks:** 100

**Credits:** 4

**1. Course Objectives:**

1. To study the American Experience as captured in the seminal works of masters of American Literature of the twentieth century.
2. To expose the students through prose and poetry and drama to the various main trends, ideas and forces that shaped the writing of those times.
3. To acquaint students with the following literary movements in America – Realism, Modernism and Harlem Renaissance.

**2. Learning Outcomes:**

By the end of the course the students will be able to:

CO1: Assess the genres related to American literature of the Twentieth Century.

CO2:Determine the major writers from the canon of Twentieth cent American Literature .

CO3:Demonstrate through class discussion and writing their ability to contextualize a given work of American literature historically.

CO4:Describe the development of American literature during twentieth century

CO5:Demonstrate an awareness of the social, historical, literary historical, and cultural elements of these changes.\

CO6:Evaluate the efficacy of using poetry as a vehicle to comprehend subjects like the Great Depression, the Harlem Renaissance and Confessionalism.

**3. Number of hours: 04 hours per week**

#### **4. Course Content**

**Total Number of hours: 60**

##### **Unit I: Novel 15 hours**

1. The Colour Purple - Alice Walker

##### **Unit II: Drama**

**15 hours**

1. Death of a Salesman - Arthur Miller

##### **Unit III: Poetry**

**15 hours**

1. Robert Frost
  - a) Mending Wall
  - b) Stopping by the Woods
  - c) The Road not taken
2. Theodore Roethke
  - a) My Papa's Waltz
  - b) The Waking
3. Wallace Stevens
  - a) The Emperor of Ice Cream
4. John Crowe Ransom
  - a) Bells for John Whiteside's Daughter
5. Allen Ginsberg
  - a) America
  - b) Ode to Failure
6. Robert Lowell
  - a) To Speak of Woe that is Marriage
7. Sylvia Plath
  - a) Crossing the water
  - b) Lady Lazarus
8. Langston Hughes
  - a) Dreams
  - b) I Too



## **Unit IV: Background**

**15 hours**

(Some topics could be assigned for self study and presentations in class)

1. The American Dream
2. The Great Depression
3. Social Realism and the American Novel
4. Beat Poets
5. Confessional Poets

### **5. Reference Books:**

#### **Primary References:**

1. Miller, Arthur. *Death of a Salesman*. Penguin UK, 2011.
2. Poulin, A. Jr & Michael Waters, ed. *Contemporary American Poetry*. 8th Edition. Houghton Mifflin Company, 2006.
3. Thomas, C.T. *Twentieth Century Verse- American Anthology*. Delhi: Macmillan India Ltd, 1999.
4. Walker, Alice. *The Colour Purple*. US: Mariner, 2006.

#### **Secondary References:**

1. Brown, John Russell, ed. *American Theatre*. London, Edward Arnold, 1967.
2. Cullum, E. Linda, ed. *Contemporary American Ethnic Poets: Lives, works, sources*. Greenwood Publication group Inc, 2004.
3. Daniel Hoffman (ed.) Harward. *Guide to Contemporary American Writing*. New Delhi: Oxford University Press, 1979.

4. Gould, Jean. *Modern American Playwrights*. Bombay: Popular Prakashan, 1969.
5. Horto Rod, ed. *Background of American Literary Thought*. New Jersey: Prentice Hall, 1974.
6. Matthiessen F. O. *American Renaissance*. New York: Oxford University Press, 1941.
7. Pearce, Roy H. *The continuity of American Poetry*. Princeton University Press, 1979.
8. Shaw, R.B, ed. *American Poetry since 1960: Some Critical Perspectives*. 1974.

## **ELECTIVE COURSE**

**Course Title:** New Literatures in English

**Course Code:** ENG-E-4

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To introduce students to the marginalized voices in society through their literatures.
2. To help students understand the contribution of the marginalized to mainstream literature.
3. To establish the voices of the marginalized through their representative texts, authors and movements.
4. To inculcate an atmosphere of cultural acceptance through the texts
5. To introduce students to the marginalization of the female gender through their works in literature

### **2. Course Outcomes:** By the end of the course the student will be able:

CO1: Assess the concept of the marginalized segments in society.

CO2: Critique writers, forms, and movements associated with the marginalized.

CO3: Analyze works of literatures critically, keeping in mind the segmented.

CO4: Write reflective and research essays to present their responses to New Literatures in English. .

### **3. Number of hours: 04 hours per week**

#### 4. Course Content:

**Total number of hours: 60**

#### **Unit I: Contextual Study**

**8 hours**

**Note:** The following areas will be covered along with their representative texts

1. American Civil War and its consequences
2. The Harlem Renaissance - the rise and fall of the Black cultural movement with reference to the Black Panthers
3. Feminism - the waves and the main proponents of Feminism
4. Introduction to post-colonial themes

#### **Unit II: Play**

**20 hours**

1. *The Lion and the Jewel* - Wole Soyinka
2. *Pantomime* - Derek Walcott

#### **Unit III: Poetry**

**18 hours**

1. Langston Hughes      a) The Weary Blues,  
   b) The Negro Speaks of Rivers  
*Secondary poems*      a) Black Panther, b) Dinner Guest: Me
2. Countee Cullen:      a) Heritage,  
   b) Karengé ya Marengé  
   c) A Brown Girl Dead,  
   d) Incident  
*Secondary Poems*      a) Yet do I Marvel  
   b) Mood
3. Paul Lawrence Dunbar      a) The Plantation Child's Lullaby  
   b) The wraith  
*Secondary Poems*      a) We Wear the Mask
4. Edward Braithwaite      a) Bread  
*Secondary poems*      a) Prelude



**Unit IV: Short Stories**

**14 hours**

1. *Miguel Street* - V.S. Naipaul
  - a) Bogart
  - b) His Chosen Calling
  - c) The Thing Without a Name
  - d) Man-Man
  - e) George and the Pink House
  - f) B. Wordsworth
  
2. *The Tomorrow-Tamer* - Margaret Laurence
  - a) The Tomorrow-Tamer
  - b) The Merchant of Heaven
  
3. *Lives of Girls and Women* - Alice Munro
  - a) The Flats-Land
  - b) Lives of Girls and Women

## 5. Reference Books:

### Primary References:

1. Bajaj, Nirmal. *Search for Identity in Black Poetry*. Atlantic Publications
2. Chavan, Sunanda. *The Fair Voice-A Study of Women Poets in English*. Sterling.
3. Kulkarni, Harihar. *Black Feminist Fiction*. Creative Books
4. Loomba, Ania. *Colonialism/Postcolonialism -The New Critical Idiom*. Routledge.
5. Naipaul V.S. *Miguel Street*. New York Vintage International Edition, 1984.
6. Pushpa, M. *The plays of Wole Soyinka*. Prestige.
7. Rehman, Anisur. *New literatures in English*. Creative.
8. Sumana, K. *The Novels of Toni Morrison- A study in Race, Gender & Class*. New Delhi: Prestige Books
9. V.S. Naipaul. *Miguel Street*. New York: Vintage International Edition, 1984.

### Secondary References:

1. Bhelande, Anjali; Pandurang, Mala (ed). *Articulating Gender*.  
Delhi: Pencraft International
2. Kearns, Francis. *Black Identity*. N.Y.: Holt, Rinehart & Winston.
3. Ray, Mohit; Kundu, Rama, Kundu. *Studies in Women Writers in English*. Atlantic.
4. Wright, Derek. *Wole Soyinka revisited*. N.Y. Twayne Pubs.

## **ELECTIVE COURSE**

**Course Title:** Women's Writing in India

**Course Code:** ENG-E-12

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To offer students women's perspective of life and womanhood in India.
2. To acquaint the students with the distinct stylistic features of Indian women writers.
3. To evaluate the position of woman in the Indian patriarchal society and as reflected in literature written by women writers.
4. To enable students to re-examine texts that project women in rigid cultural and social constructs.

### **2. Course Outcomes:**

By the end of the course the students:

- CO 1. To appreciate woman's point of view regarding life.
- CO 2. To understand the life of a woman in patriarchal society of India.
- CO 3. To understand distinct features of women's writing.

### **3. Number of hours: 04 hours per week**



#### 4. Course Content:

Total number of hours: 60

#### Unit I: Feminism, Language and Literature

08 hours

Women's oppression, patriarchal values, reinforcement of traditional feminine roles- conflicts, contradiction, conformity, non-conformity revolt  
Gender bias in Language, Women's Talk and silence.

#### Unit II: History of Women's writing in India

12 hours

##### A. Indian Feminism: Thinkers and Activists

Women in Ancient Indian Tradition: Vedas, Epics and Smritis

Women in Ancient Indian Thought: Arthashastra (Kautilya) and Manusmriti (Manu)

Women in Bhakti tradition :Meera Bai, Vachana Garties, Akka Mahadevi

Women in Modern Indian Thought

Feminists in Colonial India: Begum Rokeya Sakhawat Hussein (Sultana's Dream),

Tara Bai Schinde (Stee-Purush Tulane)

Gandhi and Ambedkar's writing on Women

##### B. Representation of Women in Literature of major Indian Languages.

(A case Study of Kuvempu and Rabindranath Tagore) Emergence of Women's question in since 19th Century in Indian Literature

#### Unit III: Fiction

20 hours

1. *Rudali*- Usha Ganguli
2. *Eating Wasps*- Anita Nair

#### Unit IV: Poetry

14 hours

1. Kamala Das a) The Descendants
2. Mamta Kalia a) After eight years of marriage
3. Melanie Silgado a) For Father on the Shelf
4. Imtiaz Dharker: a) Puradah I
5. Hira Bansode a) Slave
6. Mina Gaybhiye a) Both are Useless
7. Toru Dutt a) Our Casuarina Tree

- |                  |                           |
|------------------|---------------------------|
| 8. Jyoti Lanje   | a) The Nameless One       |
| 9. Amrita Pritam | a) I Ask Waris Shah Today |
| 10. Temsula Ao   | a) Prayer of a Monolith   |

**Unit V: Non Fiction**

**06 hours**

1. It's always Possible: Transforming One of the Largest Prisons in the World (Chapter One)- Bedi Kiran
2. Real and Imagined Women: Gender, Culture and Postcolonialism- Rajeswari Sunder Rajan.
3. Women writing in India: The twentieth century- Tharu, Susie & Ke Lalitha K.  
(The teacher can select any four articles from the above mentioned book)

**Suggested Readings:**

1. Geetanjali Gangoli. (2005). *Indian Feminisms Law Patriarchies and Feminism in India*. Ashgate Publishing Company.
2. Krisnaraj Maithreyi and Thorner Alice. (2000). *Ideals Images and Real Lives: Women in Literature and History*. Orient Longman, New Delhi.
3. Padma Anagol. (2010). *The Emergence of Feminism in India Features*. Publisher Sashgate Publishing Limited.
4. Radha Chakravathy. (2007). *Feminism and Contemporary Women Writers: Rethinking Subjectivity*. Routledge Publisher, India.
5. Tharu, Susie & Ke Lalitha K. (1993). *Women writing in India: (600 B.C. to Early 20<sup>th</sup> century)* Delhi. Oxford University Press, Bombay.
6. Vidyut Bhagwat. (2004). *Feminist Social Thought: An Introduction to six key Thinkers*. Rawat Publications, New Delhi.

## **5. ReferenceBooks:**

### **Primary References:**

1. Bedi Kiran. *It's always Possible: Transforming One of the Largest Prisons in the World*. Sterling Publishers Pvt. Ltd, India; 6th edition , 2005.
2. *Deshpande, Shashi. Writing From the Margin & Other Essays*. PenguinBooks, 2003.
3. Ganguli Usha. *Rudali*. RadhakrishanPrakashan, 1<sup>st</sup> edition, 2004.
4. Mulk Raj Anand and Zelliott Eleanor (Ed). *An Anthology of Dalit Literature*. Gyan Publishing House, New Delhi, 1992.
5. Nair, Anita. *Eating Wasps*. ContextPublisher, India, 2018.
6. Prasad Madhusudan. *Contemporary Indian English Stories*. SterlingP. 1988.

### **Secondary References:**

1. Naik M.K. , Narayan Shyamala. *Indian English Literature 1980-2000: A Critical Survey*. PencraftInternational, Delhi, 2016.
2. Pawar M.S. *New Women Novelists with New Horizons*. Shruti P. Jaipur, 2011.
3. Ray Mohit. *Indian Writing in English*. Atlantic Publishers, New Delhi, 2008.

## **S.Y. B.A. – SEMESTER III – SKILL ENHANCEMENT COURSE**

**Course Title:** Writing for the Media- I

**Course Code:** ENG-III.SEC-2

**Marks:** 50

**Credits:** 2

### **1. Course Objectives:**

1. To give students an over view of Media into day's world.
2. To promote interest in skilled Writing and to emphasize the importance of accurate use of English language in the field
3. To develop critical and analytical languages skills to be applied in the field of Mass Media.
4. To train students to be self-sufficient professionals capable of undertaking independent work and applying theoretical knowledge to real- life situations.
5. To prepare the foundation for careers in Media as an option for students.

### **2. Course Outcomes:**

Upon completion of the course the student should be able:

CO1: Interpret jargon, key-terms and concepts in Mass Media

CO2: demonstrate proficiency in writing in one or more professional media writing applications

CO3: Create layouts for print media (traditional/digital) with original content based on ethical media guidelines.

CO4: Produce simple original TV/Radio News, entertainment, and advertising content

CO5: Generate original digital media through blogs, social media, and video/audio sharing sites.

CO6: skill themselves in industry standard softwares in DTP, and audio/video editing

### **3. Total number of lectures: 30 (1hour Lectures)**

**considering a term/semester runs over 15 weeks PERWEEK 2 HOURS**

#### 4. Course Content:

30 hours

**Note:** To ensure the competency of students in the field after graduation, emphasis should be given to the written aspect of the course, while ensuring that the students understand various aspects of each field along with key-terms, and the differences in the written aspect.

#### Unit I: PRINTMEDIA: Newspapers

10 hours

Introduction: The Media and the Message-Message depends on Medium Introduction to Print

Media: Audience for the News

Advertising in Print Media: Promotional Literature: Copywriting for Leaflets, Pamphlets, Brochures, Classifieds- Text, Captions

#### Newspaper Writing:

**Concepts: News Reporting-**(datelines/Credit-line/Bylines/Nut-graph/Headlines )**News Writing-**Appropriate angle for a new story- Structuring news(Lead/Climax form-Inverted Pyramid Form; Chronological form)- Qualities of effective leads-Using significant details-Effective revision Basic principles of AP Style (Associated Press Style Book) for Writing-Use of the Style Book- Style as a Manner of Writing- Clarity in Writing- Readability-Five 'W' and 'H' of Writing.

**Other Writing-** Features/Articles-Editorials- Letters to the Editor- Book and Film reviews- Interviews-Oped Pieces

**Basic Layout and Composition-**Balanced/Unbalanced/Circular Layout- column setups- photograph additions-final look

**Applied:** Reporting -Climax form -Inverted Pyramid Form;Chronological form Editorials- Letters to the Editor -Book and Film Reviews- Headlines- Oped Pieces -Layout & Composition; copywriting for Print Advertisement

#### Editing:

Concepts & Applied: Copy editing process-Guiding principles of editing Grammar- Punctuation-Subbing-Proof-reading(Proof-reading notations)- [The AP style book can be a great guide here.]

**Note :***The Editing component is to be taught simultaneously along with the applied component of the paper. The teaching should be graded- Beginning with the basic knowledge of grammar and its application up to a level where the student is competent enough to not only edit their own written works but also others'. This part of component I should be*

*taught over the rest of the components as well, ensuring an increase in the level of efficiency of the student.*

## **Unit II: ELECTRONIC MEDIA: Radio and TV**

**10 hours**

*Concepts:* Radio as a Mass Medium–Radio Skills–Broad cast Writing–Broadcast Terms–Scripting for Radio– Story Structure–Lead ,Body, Ending– Writing Radio News and Features-Programmes for Radio (Features, News, Interviews, Skits ,Music Programmes, etc.), Advertising in Radio

*Applied:* Planning a Newscast– Radio Jockeying- Scripting for the Radio–Recording, Radio Ads, Radio PSA

## **TELEVISION**

*Concepts:* Television as a Mass Medium–Television Skills–Scripting for TV- Programmes for TV(Features ,News, Interviews, Music Programmes, etc.), TV Advertising - Story Idea to story board to screen play to shoot

*Applied–* Anchoring; Interviewing, TV PSA, Parody Ads, The 3 shot ad movie

## **UNIT III: DIGITALMEDIA-Internet and New Media**

**10 hours**

*Concepts:* Kinds of Digital Media & New Media

E-book/E-magazine–E-journal–E-newspaper–Internet–World Wide Web Mobile Media-Video Games

*Concepts :* Writing for Digital Media: An Interactive Media

Web Writing–Blogging.-Introduction to Profile Writing–Broadcast News Analysis–Caption Writing–Headline, Blurb, Lead-Digital Correspondence–Digital Editing

*Applied:* Web Writing-Blogging; Caption writing

## **5. Reference Books/CDs/Websites:**

### **Primary References:**

1. *Writing for Television, Radio and New Media (Seventh Ed.)*. Hilliard, Robert-Wadsworth 2006
2. *Writing for the Mass Media* (Sixth edition). James Glen Stovall Pearson Education, 2006
3. *Basic News Writing* Melvin Menchar William. C. Brown Co., 1983
4. *Writing and Reporting News: A Coaching Method* Carol e Rich Wadsworth/Thomson Learning, 2003
5. *News Writing & reporting* James A Neal & Suzane S Brown Surjeeth Publications, 2003
6. *Broadcast News Writing, Reporting & Production* Ted White Macmillan
7. *An Introduction to Digital Media* Tony Feldman (Blueprint Series) 1996
8. *Advertising* Ahuja & Chhabra Sujeeth Publications, 1989
9. *The Screenwriter's Workbook* Syd Field Dell Publishing, 1984
10. *E-Writing* Dianna Boother Macmillan, 2008
11. *Mass Communication Theory* Denis Mcquail Vistaar Publications, 2007
12. *The Associated Press Style Book and Libel Manual* norm The A.P, 1994
13. *Hand book of Magazine Article Writing*, Michelle Ruberg, Writer's Digest, 2009

### **Secondary Reading:**

1. *Writing and Producing News* Eric Gormly Surjeet Publications, 2005
2. *A Crash Course in Screenwriting* David Griffith Scottish Screen, 2004
3. *Digital Media: An Introduction* Richard L Lewis Prentice Hall
4. *The Art of Editing the News* Robert. C. McGiffort Chilton Book Co., 1978
5. *Digital Media Tools* Dr. Chapman Nigel (Paperback-26 Oct 2007)
6. *News reporting and Editing* K.M Srivastava Sterling Publications
7. *The News Writer's Handbook: an Introduction to Journalism* M. L Stein, Paterno, Susan. F Surjeeth Publications, 2003
9. *The TV Writer's Workbook :A Creative Approach to Television* Ellen Sandler Delta, 2007
10. *Understanding Journalism* Lynette Sheridan Burns Vistaar Publications, 2004
11. *Media and Society in the Digital Age* Kevin Kawamoto Pearson Education, 2002
12. *Media in the Digital Age* J.V Pavlik (Paperback-1 May 2008)

## **S.Y. B.A. – SEMESTER III – SKILL ENHANCEMENT COURSE**

**Course Title:** Creative Writing I

**Course Code:** ENG-III.SEC-1

**Marks:** 50

**Credits:** 2

### **1. Course Objectives:**

1. To explore creative writing genres (Poetry, Drama, Fiction) through practical writing classes
2. To build on the foundation of basic knowledge of students' interest in creative writing
3. To develop ones' own style of writing through reading, discussion and experimenting in writing
4. To encourage students' to get their works published using traditional means and modern media
5. To encourage students' to use modern media in their creative effort
6. To create a writing portfolio for each student

### **2. Course Outcomes:** By the end of the course the student will :

CO1: Demonstrate an understanding of concepts related to the creative writing genres.

CO2: Present their ideas/opinions confidently through creative writing genres.

CO3: Create a sample of their own creative output (individual/group).

CO4: Critique and edit their own work as well as others'.

CO5: Utilize ICT & Digital technology in their creative endeavor.

### **3. Number of hours: 02 hours per week**



#### **4. Course Content:**

**Total number of hours: 30**

**Note:** This course will focus on the creative *writing* process. Thus, emphasis will be given to the written aspect of the course. Theoretical concepts, learnings, and innovations in the forms and fields will be imparted through praxis. Students will maintain a journal and submit a finale portfolio of their creative output. The editing aspect of the writing process (revision, editing and proof reading) is to be taught concurrently with the units, while focusing on the particular needs of the forms.

#### **Unit I: Poetry**

**10 hours**

*Concepts:* Metre and rhyme ;form(and subverting form);free verse; syllabics; figures of speech and its use

Reading techniques—charm set, space, cold open, silence, blending music

Use of technology in performance, exposing our work to others

*Applied:* Students will apply some strategies of contemporary poetry in the writing of several poems and the analysis of published poetry. They will demonstrate, through the writing and performing of several poems, an understanding of some of the aesthetic aspects of contemporary poetry, such as manipulation of stanzas and line lengths, figures of speech, symbolism, setting, tone, and imagery. They will identify the aesthetic aspects of poetry in published poems and poems written by classmates.

*Portfolio:* Rhyming poems (with various rhyme scheme and forms), free verse

#### **Unit II: Drama**

**10 hours**

*Concepts:* Structures of a stage plays (physical/written) ;Acts/scenes; Scripting a stage play; story/dialogue/description; Contrast creating conflict; characters and idiom; overwriting; individual voice

Exposition -Using monologues; subtext; dramatic irony; status

*Applied:* Students will apply strategies of story- telling in the medium of a play and the analysis of published drama. They will demonstrate, through the writing of a play an understanding of some of the aesthetic aspects of drama, such as scripting action for the stage, use of dialogue and creating powerful characters through use of monologues and dramatic irony. They will have the ability identify these aspects of drama in published plays and work written by classmates.

*Portfolio:* One act play

### **Unit III: Fiction**

**10 hours**

*Concepts:* Short Fiction– Flash Fiction, Short Fiction (not more than 1000 words)

Descriptive Writing in Plot/Scenes; Character; point of view/ narrative voice; conflict/crises;  
Setting/time

Micro-tales/Nano -tales–analysis of social media and innovative story- telling techniques

*Applied:* Students will apply strategies of story- telling in the writing of atleast five short story/flash fiction; and the analysis of published fiction. They will demonstrate, through the writing of an original work, an understanding of some of the following elements of story- telling: plot, characterization, setting, point of view, symbolism, and style. They will identify the narrative techniques and elements of storytelling used in published works of fiction and stories written by classmates.

*Portfolio :*Short-story, Flash Fiction

**N.B:** the number of hours for each unit includes time for continuous assessment, portfolio building(with instructor feedback and review) as well as writing classes.

**Additional note:** As a supplementary skill, the students should be taught how to prepare and submit a piece of work for publication. They should display the ability of using a word-processor, and desk-top publishing software to format their manuscript so as to be print ready and ready for submission to an editor, or publisher. They should also be taught, if not given opportunities for publication. These can be achieved using a portfolio method of assessing the students work.(Desk-to publishing software such as Adobe In design/Publisher/Illustrator)

Instructors should use pre editing and group workshop method within the classroom as a method of giving and receiving constructive criticisms. This will also open opportunities for students to perform and read out their work, there by taking care of the spoken word aspect of creative writing, as and when it may apply.

## 5. Reference Books:

### Primary References:

1. Burroway, Janet. *Writing Fiction: A Guide To Narrative Craft*. New York : Longman Publishers, 2000.
2. Cheney, Theodore A. Rees. *Writing Creative Nonfiction-Fiction Techniques for Crafting Great Nonfiction*. California: Ten Speed Press, 1987. ebook.
3. Earnshaw, Steven. *The Handbook of Creative Writing*. Edinburgh University Press, Edinburgh. 2007.
4. Greenwell, Bill and Linda Anderson. *A Creative Writing Handbook- Developing Dramatic Technique, Individual Style and Voice*. Ed . Derek Neale. London : A & C Publishers Ltd., 2009.
5. Miller, Brenda and Suzanne Paola. *Tell it Slant- Writing and Shaping Creative Nonfiction*. McGraw- Hill, 2005.
6. Mills, Paul. *The Routledge Creative Writing Coursebook*. Routledge, 2006. ebook.
7. Morley, David. *The Cambridge Introduction to Creative Writing*. Cambridge: Cambridge University Press, 2007.
8. Smith, Marc Kelly and Joe Kraynak. *Take the Mic- The Art of Performance Poetry, Slam and the Spoken Word*. Illinois: Source books Media Fusion, 2009. ebook.
9. Strunk, William and E.B. White. *The Elements of Style*. New York: The Penguin Press, 2005.

### Secondary References:

1. Boden, Margaret. *The creative mind - myths and mechanisms*. 2nd. New York: Routledge, 2004.
2. Bolton, Gille. *Write Yourself-Creative Writing and Personal Development*. London: Jessica Kingsley Publishers, 2011.
3. Hamand, Maggie. *Creative Writing For Dummies*. West Sussex: John Wiley & Sons, Ltd, 2009.
4. Harper, Graeme. *On Creative Writing*. London: Short Run Press, 2010.
5. Kaufman, Scott Barry and James Kaufman. *The Psychology of Creative Writing*. New York: Cambridge University Press, 2009.
6. May, Steve. *Doing creative writing*. Oxon: Routledge, 2007.
7. Smith, Marc Kelly and Joe Kraynak. *Stage a Poetry Slam*. Illinois: Sourcebooks Media Fusion, 2009, Publishers, 2008.

## **SEMESTER IV – CORE COURSE**

**Course Title:** Literary Criticism

**Course Code:** ENG-IV.C-6

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To enable the students to understand the nature of literary criticism.
2. To acquaint them with the terminology of literary criticism.
3. To provide them the knowledge of the important schools of literary criticism with the help of representative texts.
4. To help the students grasp methods and techniques of interpreting literature.
5. To be able to apply literary theory to text.

### **2. Course Outcomes:**

Upon completion of the course the student will be able to:

CO 1: Demonstrate an understanding of key concepts in literary Criticism.

CO 2: Explain the meaning, significance, and value of specific works literary criticism.

CO 3: Use literary theoretical concepts to develop one's own interpretations of literary texts.

CO 4: Analyze specific literary theories in order to distinguish them from other theories and to identify the structure and logic of their arguments.

CO 5: Think critically about a range of literary theories.

### **3. Number of hours: 04 hours per week**

#### 4. Course Content:

Total Number of hours: 60

##### Unit I: Introduction to literary Criticism

05 hours

1. What is literature?
2. Difference between Literary Theory and Literary Criticism.
3. Functions of literary Criticism
4. Types of literary Criticism.
5. A brief survey of major critical schools

##### Unit II: Classical Criticism

14 hours

1. Features of Classical Criticism
2. Plato on Imitation and Art
3. Aristotle's *Poetics*
4. Longinus' *On the Sublime*

##### Unit III: Neo-Classical Criticism

13 hours

1. Features of Neo-Classical Criticism
2. John Dryden- *Essay of Dramatick Poesie*
3. Alexander Pope- *Essay on Criticism*
4. Dr. Samuel Johnson- *Preface to Shakespeare*

##### Unit IV: Romantic Criticism

14 hours

1. Features of Romantic Criticism
2. William Wordsworth- *Preface to Lyrical Ballads*.
3. Samuel Taylor Coleridge- *Biographia Literaria* –His concept of fancy and imagination, language of poetry.

##### Unit V: New Criticism

14 hours

1. Features of New Criticism
2. Thomas Stearns Eliot - *Tradition and the Individual Talent*
3. Ivor Armstrong Richards - *Four Kinds of Meaning*

## 5. Reference Books:

### Primary References:

1. Aristotle. *The Poetics of Aristotle*. Emereo Publishing, Australia, 2012.
2. Aivanhov, Omraam Mikhael. *T. S. Eliot: Tradition and the Individual Talent*. Prakash Book Deport Bareilly, U.P., 2012.
3. Arnold, Thomas. *Dryden: An Essay of Dramatic Poesy*. Atlantic Publisher, New Delhi, 2006.
4. Daiches, David. *Critical Approaches to Literature*. Orient Longman, Mumbai, 1967.
5. Giles, Herbert Allen. *Longinus on the Sublime*. Kessinger Publishing, U.S., 2010.
6. Habib M. A. R. *A History of Literary Criticism and Theory*. Blackwell Publishing, U.S.A., 2008.
7. Leavis F.R. *Revaluation: Tradition and Development in English Poetry*. Ivan R. Dee Publisher, Chicago, 1998.
8. Nandwani Aditya. *S.T. Coleridge-Biographia Literaria*. Anmol Publications Pvt. Ltd., New Delhi, 2009
9. Narasimhaiah C. D (ed). *Indian response to American literature*. UEFI, New Delhi, 1967.
10. Plato. *The Republic*. Rupa Publications, India, 2013.
11. Ransom J. C. - *The New Criticism Essay*. New Directions, New York, 1941.
12. Richards I. A. *Four Kinds of Meaning*. Transaction Publishers, 2004.
13. Samuel Johnson. *Preface to Shakespeare*. Hardpress Publishing, U.S.A., 2010
14. Scott James R.A. *The Making of Literature*. Nabu Press, South Carolina, 2011.
15. Warren Robert Penn. *A Poem of Pure Imagination: An Experiment in Reading*. Renal & Hitchcock, New York, 1946.
16. Wellek Rene. *A History of Modern Criticism*. Yale University Press, U.S., 1986

### Secondary References:

1. Brooks Cleanth. *The Well Wrought Urn*. Mariner Books, 1956.
2. Butcher S.H. *Aristotle's Theory of Poetry and Fine Art*. Dover P, USA, 1951.
3. Lodge David, Nigel Wood. *Modern Criticism and Theory*. Pearson Publishing, UP India, 2007.
4. Richards I. A. *Practical Criticism*. London, 1929.
5. Shawcross, John(ed). *Shelley's Literary and Philosophical Criticism*. Oxford, U.K.

1909.

6. Wimsat W. K. and Cleanth Brooks. *Literary Criticism: A Short History*. Routledge Kegan Paul, London, 1957.

## **ELECTIVE COURSE**

**Course Title:** The Literature of the Indian Diaspora

**Course Code:** ENG-E-5

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To introduce to the students the types of Diaspora theories and writings.
2. To enable students to read and appreciate Diaspora themes, identity and culture.
3. To teach students to appreciate cross-cultural and multicultural studies.
4. To understand multiple consciousness in Diaspora writings.

### **2. Course Outcomes:**

Upon completion of the course the student should be able:

CO 1: Demonstrate, through writing, an understanding of important issues presented in Indian diasporic literature.

CO 2: Examine in detail select works of some recent authors of the Indian diaspora.

CO 3: To understand the unique features of Indian Diaspora writings.

CO 4: To examine themes and concerns in Indian Diaspora writings.

### **3. Number of Hours: 04 Hours per week**



#### **4. Course Content:**

**Total Number of hours: 60**

#### **Unit I: Background**

**07 hours**

1. Nature and themes of Diasporic writings
  - a) Exile literature
  - b) Displacement and the Diasporic identity
  - c) Culture and hybridity
2. Gender and Diaspora politics
3. Major Diaspora writers of India

#### **Unit II: Poetry**

**15 hours**

1. Sujata Bhatt
  - a) The Voices
  - b) The Dream
  - c) Search for my tongue
2. Meena Alexander
  - a) On Indian Road
  - b) Birthplace with Buried Stones
3. Chitra Banerjee Divakaruni
  - a) Indigo
  - b) Tiger Mask Ritual
4. Saleem Peeradina
  - a) To whom it may concern
  - b) Song of the makeover
5. Ratin Bhattacharjee
  - a) The Indian Diaspora

**Unit III: Novel****15 hours**

1. A River Sutra - Geeta Mehta
2. Bye Bye Blackbird - Anita Dessai (Non –evaluative Secondary text)

**Unit IV: Short stories****15 hours**

1. A Temporary Matter
2. When Mr. Pirzada Came To Dine
3. Interpreter Of Maladies
4. The Third And Final Continent
5. A Real Durwan

**Unit V: Essays****08 hours**

1. Salman Rushdie
  - a) Imaginary Homelands
  - b) New empire within Britain

**Unit VI: Films (Non-Evaluative)**

1. Anita and Me (film) - Meera Syal. Directed by Metin Hüseyin and Produced by Paul Raphael (UK) 2002
2. Namesake (film) - Jhumpa Lahiri. Produced and Directed by Meera Nair (India) 2007

## 5. Reference Books:

### Primary References:

1. Bhatt Sujatha. *Collected Poems*. Carcanet Press Limited, 2013.
2. Bhatt Sujatha. *Point No Point: Selected Poems*. Carcanet Press Limited, 1997.
3. Dessai Anita. *Bye Bye Black Bird*. Orient Paperbacks, New Delhi, 2005.
4. Lahiri Jhumpa. *Interpreter of Maladies*. Harper Collins Publishers, 2008.
5. Mehta Gita. *A River Sutra*. Penguin, 2000.
6. Peeradina Saleem. *Contemporary Indian English Poetry*. Macmillan, Chennai, 2010.
7. Rushdie Salman. *Imaginary Homelands: Essays and Criticism* RHUK, 2004.

### Secondary References:

1. Agarwal Beena. *Women Writers and Indian Diaspora*. Authors press, 2011.
2. Agarwal Malti. *English Literature: Voices of Indian Diaspora*. Atlantic Publisher, 2009.
3. Bande Usha and Jasbir Jain (series ed). *Gita Mehta- Writing Home/Creating Homeland*. New Delhi: Rawat Publication, 2008.
4. Chakrabarti A. S. A. P. T Kavita. *Contextualizing Nationalism, Transnationalism and Indian Diaspora*. Creative Publisher, 2010.
5. Das Nigamananda. *Jhumpa Lahiri: Critical Perspectives*. Pencraft International, 2008.
6. Deb Kushal. *Mapping Multiculturalism (1<sup>st</sup> Edition)*. Rawat Publications , 2002.
7. Gupta K. Surendra. *Specifications of Indian Diaspora Study of Emerging Sandwich Cultures*. Atlantic Publisher, 2012.
8. Jain Jasbir. *Dislocations and Multiculturalisms: (1st Edition)*. Rawat Publications, 2004.
9. Jain Jasbir. *Writers of the Indian Diaspora*. Rawat Publications, 1998.
10. Kadekar Narayan Laxmi and Sahoo Kumar Ajaya .*Global Indian Diaspora:History, Culture and Identity*. Rawat Publications, 2012.
11. Knott Kim. *Diasporas: Concepts, Intersections, Identities*. Rawat Publications, 2011.
12. Tiffin Griffiths Ashcroft Menin. *The Empire Writes Back*. Taylor & Francis Ltd, 2002

## **ELECTIVE**

**Course Title:** Visual Literature

**Course Code:** ENG-E-7

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To introduce students to visual literature – in the form of graphic novels, comics and digital comics
2. To understand core concepts in the field of visual literature.
3. To understand how to read graphic novels, comics, and other forms of visual literature.
4. To establish the contribution of visual literature to literature on the whole.

### **2. Course Outcomes:**

By the end of the course the student will be able:

- CO 1: read Graphic literature, with knowledge of core concepts germane to the Comic form.
- CO2: assess writers, forms, and their works vis-à-vis others, in the graphic literature tradition
- CO 3: exhibit their knowledge of visual literature through constructivist learning
- CO 4: critically analyze works of visual literature, using concepts from the field.

### **3. Number of Hours: 04 hours per week**

#### 4. Course Content:

Total Number of hours: 60

#### Unit I: The Comics Genre – History, Formats to Key terms:

12 hours

History of comics (from paper to digital), Graphic novels and other visual literature

The major comics-creating nations and introduction to comics traditions

- a) America - Titles from DC Comics, Marvel, Vertigo, Dark Horse and others
- b) Europe - *Tintin; Asterix*, French and British Comics
- c) Japan (Manga) - *Akira*
- d) Indian Comics tradition - *Tinkle, Amar Chitra Katha, Jataka & Panchatantra tales*

The single panel comic to syndication

- a) R.K. Laxman's collection
- b) *Calvin & Hobbes* - William Patterson

Adapted Comics - The League of Extraordinary Gentlemen - Alan Moore

Advent of Digital Comics/web comics -

- a) Gavin Aung Than - [www.zenpencils.com](http://www.zenpencils.com)
- b) Rob Denbleyker - [www.explosm.net](http://www.explosm.net)

Key terms - Sequential Art, panel, gutter, tier, splash, spread, speech balloon, caption, sound effects, narration, formats, canon

[**Please Note:** Noted graphic novelists and comics creators will be introduced to students as they cover the history of the genre.]

#### Unit II: The Modern Classic

16 hours

1. The Complete Maus - Art Spiegelman

**Recommended Secondary Reading** -Persepolis - Marjane Satrapi

#### Unit III: A Realistic look at the 'Superhero'

16 hours

1. Watchmen - Alan Moore
2. V for Vendetta - Alan Moore

**Recommended Secondary Reading**

- a) Batman Year One - Frank Miller
- b) The Dark Knight Returns- Frank Miller
- c) Superman: Man of Steel - John Byrne

**Unit IV: Alternative Comics/Graphic Novels**

**16 hours**

1. Fun Home - Alison Bechdel
2. A Contract with God - Will Eisner

**Recommended Secondary Reading** -Underwater Welder - Jeff Lemire

**N.B:** The number of lectures for each unit includes time for continuous assessment.

Secondary Reading will not be evaluated in the Semester End Exam, but may be used for

Continuous assessment if it is used as an extension of the scope of the course.

It is recommended for the students to read the suggested secondary readings in order to fully comprehend the material to be discussed in class.

## 5. Reference Books:

### Primary References:

1. Bechdel, Alison. *Fun Home: A Family Tragicomic*. Boston: Houghton Mifflin, 2006.
2. Chaney, Michael A., ed. *Graphic Subjects: Critical Essays on Autobiography and Graphic Novels*. Wisconsin: University of Wisconsin Press, 2011.
3. Eisner, Will. *A Contract with God and Other Tenement Stories*. New York: DC Comics, 1996.
4. —. *Comics & Sequential Art*. Florida: PoorHouse Press, 1985.
5. Heer, Jeet and Kent Worcester. *Arguing Comics: Literary Masters on a Popular Medium*. Jackson: University Press of Mississippi, 2004.
6. Liddo, Annalisa di. *Alan Moore: Comics as Performance, Fiction as Scalpel*. Mississippi: University Press of Mississippi, 2009.
7. McCloud, Scott. *Making Comics- Story Telling Secrets of Comics, Manga and Graphic Novels*. New York: Harper Collins, 2006.
8. —. *Understanding Comics: The Invisible Art*. New York: HarperCollins, 1993.
9. McLaughlin, Jef, ed. *Comics as Philosophy*. Jackson: University Press of Mississippi, 2005.
10. Miller, Frank. *Batman: Year One*. New York: DC Comics, 2005.
11. Mills, Anthony R. *American Theology, Superhero Comics, and Cinema: The Marvel of Stan Lee and the Revolution of a Genre*. New York: Routledge, 2014.
12. Moore, Alan (w) and David (a) Lloyd. *V for Vendetta*. DC Comics, 2008.
13. Moore, Alan. *The League of Extraordinary Gentlemen*. La Jolla: CA: America's Best Comics, 2000.
14. Moore, Alan and Dave Gibbons. *Watchmen*. New York: Warner Books, 1987.
15. Morris, Tom and Matt Morris. *Superheroes and Philosophy: Truth, Justice and the Socratic Way*. Illinois: Open Court, 2005.
16. Peterson, Robert S. *Comics, and Manga, Graphic Novels: A History of Graphic Narratives*. California: Praeger, 2011.
17. Robb, Brian J. *Superheroes: From Superman to the Avengers, The Evolution of Comic Book Legends*. London: Robinson, 2014.
18. Satrapi, Marjane. *Persopolis*. London: Vintage Books, 2008.

19. Spiegelman, Art. *MetaMaus*. New York: Pantheon Books, 2011.
20. —. *The Complete Maus*. USA: Pantheon Books, 1996.
21. White, Mark D. *Watchmen and Philosophy: A Rorschach Test*. New Jersey: John Wiley & Sons, Inc, 2009.

### Secondary References:

1. Berninger, Mark, John Ecke and Gideon Haberkon. *Comics as a Nexus of Cultures: Essays on the Interplay of Media, Disciplines and International Perspectives*. London: McFarland & Company, Inc. Publishers, 2010.
2. Dalton, Russell. *Marvelous Myths: Marvel Superheroes and Everyday Faith*. Missouri: Chalice Press, 2011.
3. Daniels, Les. *DC Comics: A Celebration of the World's Favorite Comic Book Heroes*. New York: Bulfinch Press, 1995.
4. Hahn, Joel. "A Librarian's Guide to DC Comics." *Serials Review* (1998): 64-78.
5. Hatfield, Charles. *Alternative Comics: An Emerging Literature*. Jackson: University Press of Mississippi, 2005.
6. Lavin, Michael. "A Librarian's Guide to Dark Horse Comics." *Serials Review* (1998): 76-93.
7. —. "A Librarian's Guide to Marvel Comics." *Serials Review* (1998): 41-63.
8. Lopes, Paul. *Demanding Respect: The Evolution of the American Comic Book*. Philadelphia: Temple University Press, 2009.
9. MacWilliams, Mark W., ed. *Japanese Visual Culture-Explorations in the World of Manga and Anime*. New York: East Gate, 2008.
10. Than, Gavin Aung. *Zen Pencils: Cartoon Quotes from Inspirational Folks*. Missouri: Andrew McMeel Publishing, 2014.
11. —. *Zen Pencils-Volume Two - Dream the Impossible Dream*. Missouri: Andrew Mcmeel Publishing, 2015.
12. Weiner, Robert G. *Marvel: Graphic Novels and Related Publications- An Annotated Guide-Comics, Prose Novels, Children's books, Articles, Criticism and Reference Works, 1965 -2005*. London: McFarland & Company, Inc., Publishers, 2008.



## **ELECTIVE**

**Course Title:** World Literature

**Course Code:** ENG-VI.E-16

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

- a) To expose students to representative works of world literature to develop their sensitivity to cultural diversity.
- b) To promote intellectual growth by strengthening student's abilities to read analytically and critically.
- c) To promote an understanding of the works in their cultural/historical contexts.

### **2. Course outcomes:** By the end of the course the student will be able to:

- CO1: Compare and contrast the diverse representative works in World Literature.
- CO2: Classify world literature, keeping in mind the cultural diversity.
- CO3: Identify the various themes and narrative techniques of World Literature.
- CO4: Critically analyze significant texts from the World Literature canon.

**3. Number of hours:** 04 hours per week

**4. Course Content:**

**Total number of hours: 60**

**Unit I: Novel**

**15 hours**

1. Chinua Achebe: Things Fall Apart

**Unit II: Drama**

**15 Hours**

1. J. M. Synge - Riders to the Sea

**Unit III: Poetry**

**15 Hours**

1. M. Klein- Indian Reservation: Caughnawaga
2. P.K. Page -First Neighbours
3. Margaret Atwood- Journey to the Interior
4. David Rubadiri- A Negro Labourer In Liverpool
5. Arthur Nortje- Letter From Pretoria Central Prison
6. Wole Soyinka -Telephonic Conversation
7. Kath Walker – a) A Song of Hope  
b) Dawn is at Hand
8. Les Murrays -The Widower in the Country

**Unit IV: Short Stories**

**15 hours**

- 1) Alice Munro- Child's play
- 2) Anton Chekvo- The Bet
- 3) Edwidge Danicat- Children of the sea
- 4) Henry Lawson- The Drover's Wife

## 5. References:

### Primary References:

1. Achebe, Chinua. *Things Fall Apart*. Penguin Books, New Delhi, 2001.
2. Chekhov Anton. *Masterpieces of World Fiction: Selected Stories*. Rupa Publications, New Delhi, 2014.
3. Henry, Lawson. *The Penguin Henry Lawson Short Stories*. Penguin Books, New Delhi, 1998.
4. Klein. A.M. *The Rocking Chair and other Poems*. Toronto, McGraw-Hill, Ryerson, 1948.
5. Munro, Alice. *Too Much Happiness*. Penguin, Canada, 2012.

## **S.Y.B.A. – SEMESTER IV – SKILL ENHANCEMENT COURSE**

**Course Title:** Writing for the Media II

**Course Code:** ENG-IV.SEC-4

**Marks:** 50

**Credits:** 2

### **1. Course Objectives:**

1. To give students an overview of Media in today's world.
2. To promote interest in skilled Writing and to emphasize the importance of accurate use of English language in the field
3. To develop critical and analytical language skills to be applied in the field of Mass Media.
4. To train students to be self-sufficient professionals capable of undertaking independent work and applying theoretical knowledge to real- life situations.
5. To prepare the foundation for careers in Media as an option for students.

### **2. Course Outcomes:**

Up on completion of the course the student should be able:

CO1: Interpret jargon, key-terms and concepts in Mass Media

CO2: demonstrate proficiency in writing in one or more professional media writing applications

CO3: Create layouts for print media (traditional/digital) with original content based on ethical media guidelines.

CO4: Produce simple original TV/Radio News, entertainment, and advertising content

CO5: Generate original digital media through blogs, social media, and video/audio sharing sites.

CO6: skill themselves in industry standard softwares in DTP, and audio/video editing

**3. Total number of hours: 30 (1hour lectures) considering a term/semester runs over 15 weeks PER WEEK 2 HOURS**

#### **4. Course Content:**

**Note:** To ensure the competency of students in the field after graduation, emphasis should be given to the written aspect of the course, while ensuring that the students understand various aspects of each field along with key-terms, and the differences in the written aspect.

#### **Unit I: Print Media - Magazines**

**10 hours**

Introduction: The Media and the Message-Message depends on Medium

Difference in writing styles between Newspaper and Magazines

#### **Writing for Magazines:**

*Concepts:* Demographics (Target Audience); Types of Magazines and How writing differs in them; Differences/Similarities in writing Between Newspaper writing and Magazine writing; Editorials; Layout and Composition **Article writing**– Structuring for greatest effect–Preparation and organization of article– Specific angle–specific audience.

Feature writing–structure– organization– feature angles–simplicity in Style.

*Applied:* Feature and Article Writing-Creation of a Magazine-Layout/Composition- Photographs to enhance written word, Product/information based advertisements

#### **Editing:**

Concepts & Applied: Copy editing process–Guiding principles of editing Grammar– Punctuation–Subbing–Proof-reading (Proof-reading notations)– [The A P stylebook can be a great guide here.]

**Note:** *The Editing component is to be taught simultaneously along with the applied component of the course. The teaching should be graded- Beginning with the basic knowledge of grammar and its application up to a level where the student is competent enough to not only edit their own written works but also others'. This part of component should be taught over the rest of the components as well, ensuring an increase in the level of efficiency of the student.*

**Unit II: Electronic Media- Cinema**

**10 hours**

**Television:** *Concepts* :Television as a Mass Medium–Television Skills–Scripting for TV-  
Programs for TV

*Applied*–Scripting for a show

**Film :** *Concepts*: Fundamentals of Film Story Writing (The Three Act Story  
Structure),Scripting, Screenplay and Production ,Documentary Film. Writing for the  
screen–Writing effective film reviews

*Applied*–The Three Act Story Structure , Writing Short Screen plays, Film Reviews.

**Unit III: Digital Media-Internet and New Media**

**10 hours**

*Concepts*: Writing for Digital Media: An Interactive Media

Web Writing- Technical Writing–Blogging.-Introduction to Profile Writing–Broadcast News  
Analysis–Caption Writing–Copy Writing/Content Writing–Story Structure and Planning-  
Inverted Pyramid-Headline, Blurb, Lead-Digital Correspondence–Digital Editing

*Applied*: Technical Writing; Content Writing using blogs, Social media content generation

## **5. Reference Books/CDs/Websites:**

### **Primary References:**

1. *Writing for Television, Radio and New Media (Seventh Ed.)*. Hilliard, Robert-Wadsworth 2006
2. *Writing for the Mass Media* (Sixth edition). James Glen Stovall Pearson Education, 2006
3. *Basic News Writing* Melvin Menchar William. C. BrownCo.,1983
4. *Writing and Reporting News: A Coaching Method* Carole. RichWadsworth/Thomson Learning, 2003
5. *News Writing & Reporting* James A Neal & Suzane S Brown Surjeeth Publications,2003
6. *Broadcast News Writing, Reporting & Production* Ted White Macmillan
7. *An Introduction to Digital Media* Tony Feldman (Blueprint Series)1996
8. *Advertising* Ahuja & Chhabra Sujeeth Publications,1989
9. *The Screen writer's Workbook* Syd Field Dell Publishing,1984
10. *E-Writing* Dianna Booher Macmillan,2008
11. *Mass Communication Theory* Denis Mcquail Vistaar Publications, 2007
12. *The Associated Press Style Book and Libel Manuel* Norm The A.P,1994
13. *Handbook of Magazine Article Writing*, Michelle Ruberg, Writer's Digest,2009

### **Secondary References:**

1. *Writing and Producing News* Eric Gormly Surjeet Publications,2005
2. *A Crash Course in Screen writing* David Griffith Scottish Screen, 2004
3. *Digital Media: An Introduction* Richard L Lewis Prentice Hall
4. *The Art of Editing the News* Robert C Mc Giffort Chilton Book Co.,1978
5. *Digital Media Tools* Dr. Chapman Nigel (Paperback-26Oct2007)
6. *News reporting and Editing* K. M Srivastava Sterling Publications
7. *The News Writer's Handbook: an Introduction to Journalism* M. L Stein, ,Paterno, Susan. F Surjeeth Publications, 2003
8. *The T V Writer's Workbook: A Creative Approach to Television* Ellen Sandler Delta, 2007
9. *Understanding Journalism* Lynette Sheridan Burns Vistaar Publications,2004
10. *Media and Society in the Digital Age* Kevin Kawamoto Pearson Education,2002
11. *Media in the Digital Age* J. V Pavlik (Paperback-1May2008)

## **S.Y.B.A. – SEMESTER IV– SKILL ENHANCEMENT COURSE**

**Course Title:** Creative Writing II

**Course Code:** ENG-IV.SEC-3

**Marks:** 50

**Credits:** 2

### **1. Course Objectives:**

1. To explore creative writing genres (Poetry, Drama ,Fiction) through practical writing classes
2. To build on the foundation of basic knowledge of students' interest in creative writing
3. To develop ones' own style of writing through reading, discussion and experimenting in writing
4. To encourage students' to get their works published using traditional means and modern media
5. To encourage students' to use modern media in their creative effort
6. To create a writing portfolio for each student

### **2. Course Outcomes:** By the end of the course the student will :

CO1: Demonstrate an understanding of concepts related to the creative writing genres.

CO2: Present their ideas/opinions confidently through creative writing genres.

CO3: Create a sample of their own creative output (individual/group).

CO4: Critique and edit their own work as well as others'.

CO5: Utilize ICT & Digital technology in their creative endeavor

### **3. Number of hours: 02 hours per week**



#### 4. Course Content:

**Total number of hours: 30**

**Note:** This course will focus on the creative *writing* process. Thus, emphasis will be given to the written aspect of the course. Theoretical concepts, learning and innovations in the forms and fields will be imparted through praxis. Students will maintain a journal and submit a finale portfolio of their creative output. The editing aspect of the writing process (revision, editing and proof reading) is to be taught concurrently with the units, while focusing on the particular needs of the forms.

#### **Unit I: Poetry**

**10 hours**

*Concepts:* Meaning and being of language- power of reference/pop culture/allusions; form (and subverting form); syllabics; shaping a sequence and collection; Spoken Word-writing, speaking, and performing ; Reading techniques—charm, set, space, cold open, silence, blending music

Use of technology in performance, exposing your work to others

*Applied:* Students will apply some strategies of contemporary poetry in the writing of several poems and the analysis of published poetry. They will demonstrate ,through the writing and performing of several poems, an understanding of some of the aesthetic aspects of contemporary poetry, such as manipulation of stanzas and line lengths, figures of speech, symbolism, setting, tone, and imagery. They will identify the aesthetic aspects of poetry in published poems and poems written by classmates.

*Portfolio:* Rhyming poems, free verse, Slam poetry, Spoken word

#### **Unit II: Drama**

**10 hours**

*Concepts:* Scripting a stage play; Original v/s adapted; story/dialogue/description; Contrast creating conflict; characters and idiom; overwriting; individual voice

Exposition -Using monologues; subtext; dramatic irony; status

Staging-Action; Sets; stage directions and visual narrative; Using off stage effectively;

Dramatic action; Staging scenes

Radio Drama: creating pictures with sound; constraints of the medium; Radio drama script; Adaptation; using voices

*Applied:* Students will apply strategies of story-telling in the medium of a play and the analysis of published drama. They will demonstrate, through the writing of a play

(three act)an understanding of some of the aesthetic aspects of drama, such as scripting action for the stage, use of dialogue and creating powerful characters through use of monologues and dramatic irony. They will have the ability identify these aspects of drama in published plays and work written by classmates.

*Portfolio:* three act play, Radio play

### **Unit III: Fiction                    10 hours**

*Concepts:* Short Fiction– Short Stories, Novella, and Novel (only introduction to Novella/novel form)

Form/Structure; Plot/Scenes; Character; point of view/narrative voice; conflict/crises; Setting/time

Novella/Novel: literary novel v/s genre novels exploring story lines, multiple/parallel plots; reality v/s imagination; research and its importance; structuring your chapters vis-à-vis your novel

Creative Non-Fiction–Devices; Basic structure; Speaking with the reader–Your spoken voice; Passion involvement; Writing about yourself– You as a story; Memoir and memory; Writing about people and the world; finding atopic; field work and interviews; literature of hope

*Applied:* Students will apply strategies of story telling in the writing of atleast one short story/flash fiction; novella/novel (or works of creative non-fiction, or graphic novels) and the analysis of published fiction. They will demonstrate, through the writing of an original work, an understanding of some of the following elements of story-telling: plot, characterization, setting, point of view, symbolism, and style. They will identify the narrative techniques and elements of story telling used in published works of fiction and stories written by classmates.

*Portfolio:* Short-story, Creative Non-fiction Novel/Novella (Structuring/idea conception and writing of atleast 3 chapters)

**N.B :** the number of hours for each unit includes time for continuous assessment, portfolio building(with instructor feedback and review) as well as writing classes.

**Additional note:** As a supplementary skill, the students should be taught how to prepare and submit a piece of work for publication. They should display the ability of using a word-processor, and desk-top publishing of word to format the manuscripts to be

print ready and ready for submission to an editor, or publisher. They should also be taught ,if not given, opportunities for publication. These can be achieved using a portfolio method of assessing the students work . (Desk-top publishing of tware such as Adobe In design/Publisher/Illustrator)

Instructors should use peer editing and group workshop method within the classroom as a method of giving and receiving constructive criticisms. This will also open opportunities for students to perform and read out their work, there by taking care of the spoken word aspect of creative writing, as and when it may apply.

## **5. Reference Books:**

### **Primary References:**

1. Burroway, Janet. *Writing Fiction: A Guide To Narrative Craft*. New York: Longman Publishers, 2000.
2. Cheney, Theodore A. Rees. *Writing Creative Nonfiction-Fiction Techniques for Crafting Great Nonfiction*. California: Ten Speed Press, 1987. e book.
3. Earnshaw, Steven. *The Handbook of Creative Writing*. Edinburgh University Press, Edinburgh. 2007.
4. Greenwell, Bill and Linda Anderson. *A Creative Writing Handbook-Developing Dramatic Technique, Individual style and Voice*. Ed. Derek Neale. London: A&C Publishers Ltd., 2009.
5. Miller, Brenda and Suzanne Paola. *Tell it Slant-Writing and Shaping Creative Nonfiction*. McGraw-Hill, 2005.
6. Mills, Paul. *The Routledge Creative Writing Course book*. Routledge, 2006. ebook.
7. Morley, David. *The Cambridge Introduction to Creative Writing*. Cambridge: Cambridge University Press, 2007.
8. Smith, Marc Kelly and Joe Kraynak. *Take the Mic-The Art of Performance Poetry, Slam and the Spoken Word*. Illinois: Source books Media Fusion, 2009. e book.
9. Strunk, William and E.B. White. *The Elements of Style*. New York: The Penguin Press, 2005.

### **Secondary References:**

1. Boden, Margaret. *the creative mind - myths and mechanisms*. 2nd. New York: Routledge, 2004.
2. Bolton, Gille. *Write Yourself- Creative Writing and Personal Development*. London: Jessica Kingsley Publishers, 2011.
3. Hamand, Maggie. *Creative Writing For Dummies*. West Sussex: John Wiley & Sons, Ltd, 2009.
4. Harper, Graeme. *On Creative Writing*. London: Short Run Press, 2010.
5. Kaufman, Scott Barry and James Kaufman, *The Psychology of Creative Writing*. New York: Cambridge University Press, 2009.
6. May, Steve. *Doing creative writing*. Oxon: Routledge, 2007.
7. Smith, Marc Kelly and Joe Kraynak. *Stage a Poetry Slam* Illinois: Sourcebooks Media Fusion, 2009

## **T.Y.B.A. – SEMESTER V – CORE COURSE**

**Course Title:** Nineteenth Century English Literature

**Course Code:** ENG-V.C-7

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To acquaint the students with English literature of the nineteenth century.
2. To reveal the impact of socio-economic aspects of the nineteenth century on literature written during the period.
3. To acquaint the students with the prevalent literary genres as well as stylistic feature of literature written during the nineteenth century.
4. To encourage independent critical reading of the literary texts written during the nineteenth century.

### **2. Course Outcomes:**

Upon the completion of the course the students should be able:

CO1: Identify the socio-economic facets of nineteenth century and its impact on literature written during the time.

CO2: Critically analyze the socio-economic impact on literature written during the time.

CO3: Identify the essential features of Romanticism and Victorianism

CO4: Critically evaluate the literary texts written during the Nineteenth Century.

CO5: Critically estimate the social issues of the era as reflected in the literature of the age.

### **3. Number of Hours: 04 Hours per week**

**4. Course Content:**

**Total Number of hours: 60**

**Unit I: Background:**

**05 hours**

1. Romanticism
2. French Revolution and Romanticism
3. Features of Victorian literature
4. Georgian Poetry
5. Industrial Revolution; Darwinism

**Unit II: Poetry**

**25 hours**

1. William Wordsworth a) We are Seven  
b) Tables Turned  
c) Lines Written in Early Spring  
d) To a Skylark  
e) Simone Lee: The Old Huntsman
2. Samuel Taylor Coleridge a) Kubla Khan
3. John Keats a) Ode to Autumn  
b) When I have Fears that I may cease to be  
c) Ode to Nightingale
4. Percy Bysshe Shelley a) To a Skylark  
b) Ozymandias
5. Alfred Lord Tennyson a) Break, Break, Break  
b) In memoriam-(Prologue, Epilogue)
6. Robert Browning a) The Bishop orders his Tomb at saint Praxed's Church
7. Matthew Arnold -a) Dover Beach  
b) To Marguerite

**UNIT III: Drama**

**10 hours**

1. Pygmalion - George Bernard Shaw

**UNIT IV: Novels**

**20 hours**

1. Jane Eyre - Charlotte Bronte

## **5. Reference Books:**

### **Primary References:**

1. Charlotte Bronte. *Jane Eyre*. Harper Press, 2010.
2. Green David. *The Winged Word*. Macmillan, Madras, 1974.
3. Shaw George Bernard. *Pymalion*. Penguin Edition, 2009.

### **Secondary References:**

1. Churchill R.C. *English Literature of the Nineteenth Century*. University Tutorial Press; First Edition, 1956.
2. Daiches David. *A Critical History of English Literature, Volume 4: The Romantics to the Present Day*. Martin Secker & Warburg Ltd, 1968.
3. Ford Boris (ed.). *Pelican Guide to English Literature (Vol. 5, 6)*. Penguin Books, London, 1957.
4. Gridley E. Roy. *Browning*. Routledge & Kegan Paul, London, 1972.
5. Latham Jacqueline (ed.). *Critics on Matthew Arnold*. George Allen and Unwin Ltd. , U.K., 1973.
6. O'Neill Judith (ed.). *Critics On Keats*. George Allen & Unwin Ltd., U.K. 1967.
7. Sen S. Wordsworth William. *Preface to the Lyrical Ballads: A Critical Evaluation*. Unique Publishers (I) Pvt. Ltd, 2014.

## **ENGLISH ELECTIVE COURSE**

**Course Title:** Goan Literature and Culture

**Course Code:** ENG-E-1

**Marks:** 100

**Credits:** 4

### **1. Course Objectives**

1. To introduce students to different genres of literary works of Goan Literature in English and translated works by Goan writers.
2. To acquaint students with Goan ethos and culture through the exploration of selected texts of Goan literature.
3. To examine selected texts of Goan Literature and folk lore to establish Goan identity.

### **2. Learning Objectives:** By the end of this course students:

CO1:Identify Goan Diasporic writers

CO2: Explain Goanness and Goan ethos.

CO3:Determine the historical, psychological, religious and political realities during the pre-colonial and post colonial period.

CO4:Identify diverse literary and cultural trends that helped form Goan Literature.

CO5:Critically analyze the Goan literary texts.

CO6: Compare different genres of Goan literature.

### **3. Number of hours: 04 hours per week**



#### **4. Course Content**

**Total Number of hours:60**

#### **Unit I: Background (Socio- Political and cultur**

**08 hours**

##### 1. Historical

a) Colonialism

b) Post colonialism

##### 2. Art and Artists of Goa (Folklore, Folkdance and Cartoonists)

a) Tiatr (difference between Khell and Tiatr, Origin and development)

b) Folklore (teacher can select any four folklores)

c) Folk dances and Songs (any four forms to be selected.)

d) Cartoonists of Goa (Alexzy and Mario Miranda)

#### **Unit II: Short stories**

**13 hours**

##### 1. Lambert Mascarenhas a) The Little Fellow

b) Blood and Lily

##### 2. Victor Rangel-Riberio a) Lonely Aging Chinese American New York Neighbour Lady

b) Loving Ayesha

##### 3. Ben Antao a) The Guardian Angel

b)The Curse

##### 4. Damodar Mauzo a) The Vignahatra

b) A Writer's Tale

##### 5. Laxmanrao Sardesai a) The Hour's End

b)The Africa Boat

##### 6. Pundalik Naik- The Turtle

**Unit III: Novels**

**24 hours**

1. Tivolem - Victor Rangel-Riberio
2. The Upheaval (translated from Konkani) - Pundalik Naik

**Unit IV: Poetry**

**15 hours**

1. Joseph Furtado a) The Secret  
b) Brahmin Girls  
c) The Neglected wife
2. Raghunath Vishnu Pandit a) His Immortal Land  
b) I'm a Gaudo
3. Eunice De Souza: a) One Man's Poetry  
b) Autobiographical  
c) He Speaks  
d) Advice to women
4. Balakrishna Bhagwant Borkar a) Ebony Black  
b) Towards the horizon  
c) Cemetery
5. Robert De Souza a) The Village Baker
6. Manohar Shetty a) Jigsaw  
b) One morning

## 5. Reference Books: Primary References:

- 1) Antao, Ben. *Mad House and other nine stories*. Margao: Cinnamon Teal Publishing, 2012.
- 2) Mascarenhas, Lambert. *In the Womb of Saudade -Stories of Goan Life*. New Delhi: Rupa Publishing House, 1994.
- 3) Mauzo, Damodar. *Theresa's Man and other Stories from Goa*. Trans Xavier Cota. New Delhi: Rupa Publications, 2014.
- 4) Naik, Pundalik . *The Upheaval*. Trans Vidya Pai. New Delhi: Oxford University Press, 2012.
- 5) Rangel-Riberio, Victor. *Loving Ayesha and Other Stories*. New Delhi: HarperCollins Publishers, 2003.
- 6) Shetty Manohar, ed. *Ferry Crossing*. New Delhi: Penguin Books, 1998.
- 7) Victor Rangel-Riebriio. *Tivolem*. UK : Milkweed Editions, 2001.

## Secondary References:

- 1) Couto, Maria Aurora. *Goa- A Daughter's Story*. New Delhi: Penguin Books, 2004.
- 2) Fernandes, Andre Rafael. *When the Curtains Rise*. Saligao: Tiatr Academy of Goa & Goa 1556, 2010.
- 3) Gomes, Cynthia James. —Tiatr : An unlimited Engagement,|| *Reflected in Water*. Jerry Pinto, ed. New Delhi: Penguin Books, 2006.
- 4) Gomes, Olvinho J.F, (retold). *Konkani Folktales*. New Delhi: National Book Trust,2008
- 5) Mauzo, Damodar. *Teresa's Man and other stories from Goa*. Trans Xavier Cota. Delhi: Rupa Publications, 2014.
- 6) Menezes, Juliao. *Goa's Freedom Struggle*. Velim: Mrs. Alzira da Almeida Charitable Trust, 2011.
- 7) Nazareth Peter, ed. *Pivoting on the Point of Return: Modern Goan Literature*. Saligao: Goa 1556 & Broadway Book Centre, 2010.
- 8) Pinto Jerry, ed. *Reflected in Water*. New Delhi: Penguin Books, 2006.

## **ELECTIVE**

**Course Title:** Shakespeare Today

**Course Code:** ENG-E-9

**Marks:** 100

**Credits:** 4

### **1. Course Objectives**

1. To acquaint the students with the various forms of literature which are based on the works of William Shakespeare.
2. To foster an interest in the students in exploring the various literary works produced by Shakespeare.
3. To establish a link between the era of Shakespeare and the contemporary times.

### **2. Learning Outcomes:**

CO1: Identify and classify the works of William Shakespeare

CO2: discuss Shakespearean texts with a critical eye

CO3: Understand Shakespeare's rich use of language and literary conventions

CO4: to apply knowledge of the social, political, and intellectual context of Elizabethan England to an understanding of Shakespeare's works.

CO5: Analyze the way in which film adaptations of Shakespeare's plays can enhance, change, and develop the meaning of the plays.

CO6: appreciate the revisions of Shakespeare in modern cinematic adaptations

### **3. Number of hours: 04 hours per week**

**4. Course Content:**

**Total Number of hours: 60**

**UNIT I: Background**

**5 hours**

1. Relevance of Shakespeare in the modern era.
2. The three genres of Shakespearean drama: Comedy, Tragedy and History.
3. The influence of Shakespeare on English Literature.
4. The impact of Shakespeare's plays on modern culture.

**UNIT II: Literature Based on Shakespeare's Plays**

**30 hours**

1. Prospero's daughter - Elizabeth Nunez (10 hours)
2. I, Iago - Nicole Galland (10 hours)
3. Hamlet (Manga Shakespeare) (10 hours)

**UNIT III: Visual Media Based on Shakespeare's Plays**

**20 hours**

Movies:

1. Hamlet (1996) - Kenneth Branagh
2. Maqbool (2003) - Vishal Bharadwaj
3. Omkara (2006) - Vishal Bharadwaj
4. Haider (2014) - Vishal Bharadwaj ( Self Study)
5. Twelfth Night (Series - Arkangel Complete Shakespeare )
6. Gnomeo & Juliet - Kelly Asbury (Shakespeare's animated play)

**UNIT IV: Review of Shakespearean Plays by Modern Schools of Criticism**

**5 hours**

1. Psychoanalytical interpretation of Shakespeare's works.
2. Post- colonial interpretation of Shakespeare's works.
3. Feminist interpretation of Shakespeare.
4. Marxist interpretation of Shakespeare's works.

**Note: *Hamlet* will be taught as a model text, which includes the original as well as the adaptations across mediums.**

## 5. References Books:

### Primary References:

1. Amanda Root, Jonathan Firth. *Twelfth Night*. Series – (Arkangel Complete Shakespeare). Bbc Audiobooks America. 2005
2. Burt, Richard. *Shakespeare After Mass Media*. Palgrave Publications, New York, 2012.
3. *BBC Television Shakespeare*. *Romeo and Juliet*. BBC 2. U.K., 3 Dec. 1978. Television.
4. Cartelli, Thomas. *Repositioning Shakespeare*. Routledge, 2009.
5. Duffield P, Appignanesi R. *Manga Shakespeare: The Tempest*. Self Made Hero Publication, London, 2007.
6. Galland, Nicole. *I, Iago: A Novel*. William Morrow & Company, New York, 2012.
7. Garber, Majorie. *Shakespeare and Modern Culture*. Random House Inc, New York, 2008.
8. *Haider*. Dir. Vishal Bharadwaj. Perf. Shahid Kapoor, Tabu, Shraddha Kapoor, Kay Kay Menon, Irrfan Khan. UTV Motion Pictures, 2014. Film.
9. *Hamlet*. Dir. Kenneth Branagh. Columbia Pictures, 1996. Film.
10. Kelly Asbury dir. *Gnomeo & Juliet*. January 2011.
11. Lenz, Carolyn. *The Woman's Part: Feminist Criticism of Shakespeare*. University of Illinois Press, Chicago, 1984.
12. Lupton, Julia. *After Oedipus: Shakespeare in Psychoanalysis*. Cornell University Press, 1993.
13. *Maqbool*. Dir. Vishal Bharadwaj. Perf. Irrfan Khan, Tabu, Pankaj Kapoor, Om Puri, Naseeruddin Shah. Kaleidoscope Entertainment Pvt. Ltd., 2003. Film.
14. Nagarajan, S & Viswanathan. R, ed. *Shakespeare in India*. S. OUP India Publishers, 1987.
15. Nunez, Elizabeth. *Prospero's Daughter*. Random House Publishing Group, New York, 2006.
16. *Omkara*. Dir. Vishal Bharadwaj. Perf. Ajay Devgan, Saif Ali Khan, Vivek Oberoi, Kareena Kapoor. Eros Entertainment, Big Screen Entertainment, Shemaroo Entertainment, 2006. Film.
17. Siegel, Paul. *Shakespeare's English and Roman History Plays: A Marxist Approach*. Associated University Presses, 1964.

### **Secondary References:**

1. Barker, Granvile and Harisson G.B. *Companion to Shakespearean Study*, Cambridge University, 1946.
2. Goddard. *The Meaning of Shakespeare*. University of Chicago Press, Chicago, 1960.
3. Halliday, F.E. *Shakespeare in His Age*, Gerald Duckworth & Co. Ltd, 1965.
4. Iyengar, Srinivasa. *Shakespeare: His World and His Art*, Sterling Publishers, 1984.
5. Kastan, David. *Shakespeare After Theory*. Routledge, New York, 1999.
6. Kott, J. *Shakespeare Our Contemporary*. W. W. Norton & Company, New York, 1974.
7. Rothwell, Kenneth S. *A History of Shakespeare on Screen: A Century of Film and Television*, Cambridge: Cambridge University Press, 2004.
8. Shakespeare, William. *Hamlet*. UBS Publishers' Distributors Pvt. Ltd, New Delhi, 2009.
9. Shakespeare, William. *Macbeth*. UBS Publishers' Distributors Pvt. Ltd, New Delhi, 2009.
10. Shakespeare, William. *Othello*. UBS Publishers' Distributors Pvt. Ltd, New Delhi, 2009.
11. Trivedi, P. and Bartholomeusz Dennis. *Shakespeare's India*. University of Delaware Press, 2005.

## **ELECTIVE**

**Course Title:** Modern Indian Literature in Translation

**Course Code:** ENG-V.E-17

**Marks:** 100

**Credits:** 4

**Duration:** 60 hours

### **1. Course Objectives:**

1. To introduce selected texts from a different Indian Languages translated in English.
2. To create awareness of subcultural variations in translated works.
3. To familiarize the students with various themes, styles in the genres of fiction, poetry and drama.

### **2. Course Outcomes:**

Upon completion of the course the student should be able:

CO 1. Identify subcultural variations in translated works.

CO2. Critically analyze the translated texts.

CO3. Demonstrate their awareness of canonization of Indian Literature in English translation.

CO4. Compare the various themes, styles in the genres of fiction, poetry and drama as reflected in the prescribed translations.

### **3. Number of hours: 04 hours per week**



**4. Course Content:**

**hours: 60**

**Total Number of**

**Unit I: Poetry**

**10 hours**

- a. Rabindranath Tagore: i) The Golden Boat  
ii) Conch  
iii) Arrival
- b. Jibananda Das: i) I shall return to this Bengal  
ii) Banalata Sen
- c. Dhasal Namdeo: i) Cruelty  
ii) Man, You Should Explode
- d. Anamika: i) The Door  
ii) Knowing
- e) Kamala Das: i) Advice to fellow Swimmers

**Unit II: Novel 20 hours**

- a. Premchand: Godan
- b. U. R. Ananthamurthy: Samaskara: A Rite for a Dead Man

**Unit III: Short Stories**

**15 hours**

- a. Imran Hussain: Hudumdao (The Rain God)
- b. Sethu: Family Tree
- c. Mahaswetha Devi: Draupadi
- d. Ashok Mitran: Stillbleeding from the wound
- e. Satyajit Ray: Fritz
- f. Tagore: Subha

**Unit IV: Drama**

**15 hours**

- a. Vijay Tendulkar- Ghashiram Kotwal
- b. Girish Karnad- Nagamandal

## 5. References:

### Primary References:

1. Ananthamurthy U.R. .Samaskara: A Rite for a Dead Man. OUP, 1997.
2. Dhasal Namdeo. Poet of the Underworld, *Poems 1972-2006* trans DilipChitre. Navayana 2019
3. Sethu: A guest for Arundhti and other stories translated by K.Kunhikrishnan. Palimpsest Publishing House, 2014.
4. Hussain Imran. "The Water Spirit and Other Stories". Harper Perennial; 1 edition (16 June 2015)
5. Karnad, Girish. Nagamandal. Oxford University Press: 1999
6. Munshi Premchand. Godan: A Novel of Peasant India. Trans. Jai Ratan and P.Lal, Bombay: Jaico, 1979.
7. Tendulkar, Vijay. "Ghashiram Kotwal". Collected Plays in Translation. New Delhi, 2003, Oxford University Press

### Weblinks:

<https://www.poetryfoundation.org/poets/rabindranath-tagore>

[https://www.parabaas.com/jd/articles/seely\\_scent\\_intro.shtml](https://www.parabaas.com/jd/articles/seely_scent_intro.shtml)

<http://m.theindependentbd.com/printversion/details/220624>

<https://www.sahapedia.org/search-of-namdeo-dhasal>

<https://www.loc.gov/acq/ovop/delhi/salrp/namdevlaxmandhasal.html>

<https://www.forwardpress.in/2018/06/who-was-revolutionary-dalit-poet-namdeo-dhasal-really/>

<http://www.matadorreview.com/samskara-by-ur-ananthamurthy>

[http://www.thechallenge.org.in/documents2/CORRUPTION\\_AND\\_TRAGEDY\\_OF\\_POWER\\_IN.pdf](http://www.thechallenge.org.in/documents2/CORRUPTION_AND_TRAGEDY_OF_POWER_IN.pdf)

<http://ijelr.in/2.1.15/279-285%20Dr.%20APEKSHA.pdf>

## **ELECTIVE**

**Course Title:** Film Studies

**Course Code:** ENG-E-11

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To introduce students to the allied field of Film Studies, its history, literature, and theory.
2. To inculcate in students an educated response to films.
3. To allow students a space to explore film Studies practically and creatively through appropriate form and structure.

### **2. Course Outcomes:** But the end of the course the student will be able:

CO1: Analyze the literature of Films through relevant exemplars.

CO2: Recognize Directors, artists, genres, and movements in Films.

CO3: Critically analyze films.

CO4: Create their own short film, informed by Film theory and Film literature.

CO5: Utilize Film & Digital technology in their creative endeavor.

### **3. Number of hours: 04 hours per week**

**4. Course Content:**

**Total number of hours: 60**

**Unit I: History of Film**

**10 hours**

1. **Silent Period (1895 – 1929):** Movements – German Expressionism, Soviet Montage, French Avant-garde; Lumiere Brothers, Georges Melies, Edwin Porter, D.W. Griffith, Thomas Ince, Mack Sennet, Charlie Chaplin, Buster Keaton, Oscar Miceaux, Carl Theodor Dreyer, Robert Flaherty, Cecil DeMille
2. **Classical Period (1930 – 1945):** Movements: French poetic realism; Frank Capra, Josef Von Sternberg, Howard Hawks, John Ford, Maya Deren
3. **Postwar Period (1946 – 1959):** Movements: Italian neorealism, Japanese art Cinema; Orson Welles, Douglas Sirk, Nicholas Ray, Ingmar Bergman, Satyajit Ray
4. **Transitional Period (1960 – 1979):** Movements- French New Wave, Feminist Film, Direct Cinema, Structural film, Third World Cinema ; John Cassavetes Arthur Penn, Sam Peckinpah, Francis Ford Coppola, Robert Altman, Stan Brakhage, Ousmane Sembene, Luis Bunuel, Woody Allen, Stanley Kubrick, George Lucas, Martin Scorsese
5. **Contemporary Period (1980 - present):** Movements – American Independent cinema, East Asian Cinema, Iranian Cinema, New British cinema, Personal documentary; Steven Spielberg, Oliver Stone, Lars von Trier, David Cronenberg, Ridley Scott, Mira Nair

**Note: Students are to be briefly introduced the context of the periods through clips, montages, extracts. Focus should be on the movements, emphasis should be in understanding the movements.**

## Unit II: Literature of Film

15 hours

1. **Film Form:** Mise en Scene –Setting, Performance & Movement, Costume and Props; Cinematography –Shot types; Camera Lenses; Camera Angles; Camera Movements, Lighting & Colour
2. **Sound & Editing** – Effects, Music, Perspective Sound, dialogue Overlaps/ Sound Bridges; Optical Effects, Continuity, Spatiotemporal effects
3. **Narrative-** Story & Plot, Narrative development, Narration, Narrative meaning; Time

**Note: Instructor, in conjunction with their class, should select movies, TV series, Documentaries etc to understand the Literature of Films. Each aspect and concept needs to be underlined with actual extracts, and clips of visuals.**

## Unit III: Film Genres &Theory:

15 hours

1. **Genre Theory:** Genre as Film Language; Genres- Gangster, Western, Horror, Science Fiction, Musical, Romantic Comedy, Fantasy, Parody, Animation, Found Footage, Realism, Blaxploitation  
Bollywood vs Hollywood – a comparison  
Adaptations, Sequels and current forms of Film Trends – Studio Blockbusters, Shared Universe
2. **Film Theory:** Medium Specific, Realism, Auteur Theory, Semiotics & Structuralism,  
Ideology theory, Feminist film Theory, Cultural Studies, Cognitive Theory

**Note: Instructor, in conjunction with their class, should select movies, TV series, Documentaries etc to discuss the various genres and Theory. Each Theory needs to be underlined with actual extracts, and clips of visuals. Adapted texts can also be taken.**

## **Unit IV: Practical Application of Learning**

**20 hours**

### **1. Reader-Response**

Reader-Response to Unseen Films: Reviews, comparisons, and breakdowns of movies/TV/documentaries in written forms and structures.

### **2. Application of Film Form**

Message & Values, Mise en Scene, Cinematography, Sound & Editing, Narrative,

Genre and Film theory

Story, Storyboard, Screenplay

Creation of movies using concepts learnt in Units 1, 2, and 3.

**Note: Instructor should create a learning environment where concepts can be applied.**

**Movies, TV series, Documentaries should be viewed and analyzed. Students should also create their own short films informed with the concepts learnt in the previous units.**

## 5. Reference Books:

### Primary References:

1. Andrew, Dudley. *concepts in FILM THEORY*. Oxford: Oxford University Press, 1984.
2. Aufderheide, Patricia. *Documentary Film A Very Short Introduction*. Oxford: Oxford University Press, 2007.
3. Benyahia, Sarah, Freddie Gaffeny and John White. *AS Film Studies The Essential Introduction*. New York: Routledge, 2006.
4. Butler, Andrew. *The Pocket Essentials Film Studies*. Berks: [www.pocketessentials.com](http://www.pocketessentials.com), 2005.
5. Dancyger, Ken. *The Technique of Film & Video Editing Fifth Edition*. Oxford: Focal Press, 2011.
6. Nelmes, Jill, ed. *Introductin to Film Studies, 05th Edition*. London: Routledge, 1996.
7. Pearson, Roberta and Philip Simpson, *Critical Dictionary of Film and Television Theory*. New York: Routledge, 2001.
8. Stadler, Jane and Kelly McWilliam. *Screen Media Anlaysiaing Film and Television*. NSW: Allen & Unwin, 2009.
9. Stam, Robert. *Film Theory An Introduction*. Massachusetts: Blackwell Publishing, 2000.
10. Thompson, Kristin and David Bordwell. *Film History An Introduction Second Edition*. New York: McGraw Hill, 2003.
11. Villarejo, Amy. *Film Studies The Basics*. New York: Routledge, 2007.
12. Welsh, James and Peter Lev, *The Literature/Film Reader*. Plymouth: The Screcrow Press, 2007.

## Secondary References:

1. Fabe, Marilyn. *Closely Watched Films An Introduction to the Art of Narrative Film Technique*. New York: University of California Press, 2004.
2. Grant, Barry Keith, ed. *Film Genre reader III*. Austin: University of Texas Press, 1986.
3. Gynn, William, ed. *The Routledge Companion to Film History*. New York: Routledge, 2011.
4. Hart, John. *The Art of the Storyboard A Filmmaker's Introduction*. Oxford: Elsevier, 2008.
5. Monaco, James. *How to Read a Film The World of Movies, Media, and Multimedia*. New York: Oxford University Press, 200.
6. Jess-Cooke, Carolyn and Constantine Verevis, *Second Takes Critical Approaches to the Film Sequel*. New York: State University of New York Press, 2010.
7. Roberts, Graham. *Key Film Texts*. New York: Oxford University Press, 2002.



## **SEMESTER VI- CORE COURSE**

**Course Title:** Twentieth Century English Literature

**Course Code:** ENG-VI.C-8

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To introduce the students to novel, play and poems drawn from the English-language literatures of the twentieth century.
2. To examine how authors have responded to historical and cultural change throughout the twentieth century.
3. To probe the growth of modernism, and the appearance of post-colonialism and postmodernism

### **2. Course Outcomes:**

By the end of the course the students will be able:

CO 1: Identify different modern prose styles as well as colloquial rhythms of modern poetry.

CO 2: Critically evaluate the impact of World Wars and psychology on Literature.

CO 3: Examine the historical background of the age.

CO 4: To examine themes and concerns and stylistic features of twentieth century literature

### **3. Number of Hours: 04 hours per week**

**4. Course Content:**

**Total number of Hours 60**

**Unit I: Poems**

**20 hours**

1. William Butler Yeats
  - a) The Second Coming
  - b) The Wild Swans at Coole
  - c) Sailing to Byzantium
  
2. Thomas Stearns Eliot
  - a) Love Song of Alfred Prufrock
  - b) The Journey of the Magi
  
3. Wilfred Owen
  - a) Insensibility
  - b) Strange Meeting
  
4. Siegfried Sassoon
  - a) The Death Bed
  - b) Lamentations
  
5. Rupert Brooke
  - a) The Dead
  - b) The Solider
  - c) Futility
  
6. Ezra Pound
  - a) At the Metro Station
  - b) The Garden
  
7. Carl Sandburg
  - a) Fog
  - b) Grass
  
8. Stephen Spender
  - a) An Elementary School Classroom in a Slum
  
9. Dylan Thomas
  - a) Do not go gentle into the good night
  - b) Fern Hill
  
10. Louis MacNeice
  - a) Prayer before birth

**Unit II: Novel**

**17 Hours**

1. James Joyce- A Portrait of the Artist as a Young Man

**Unit III: Drama**

**16 Hours**

1. Harold Pinter- The Home Coming

**Unit IV: Background**

**07 Hours**

1. Modernist Thematic Concerns
2. Techniques and Style of Modernist writers
3. Impact of psychology on literature & Stream of Consciousness technique
4. Impact of the World wars on Literature of the 20<sup>th</sup> Century Literature
5. Surrealism, Expressionism and Impressionism

## 5. Reference Books:

### Primary References:

1. James Joyce. *A Portrait of the Artist as a Young Man*. Fingerprint Publishing, 2016.
2. Pinter Harold. *The Homecoming*. Avalon Travel Publishing, 1994.

### Secondary References:

1. Abraham, M.H. *The Norton Anthology of English Literature*. W. W Norton, Incorporated, 2003.
2. Bloom, Harold. *Dramatists and Dramas*. Chelsea House publishing, US, 2005.
3. Brown, Dennis, John Theodore. *The Modernist Self in Twentieth-Century English Literature: A Study in Self Fragmentation*. New York, Palgrave Macmillan, 1989.
4. Corcoran, Neil ed. *The Cambridge Companion to Twentieth-Century English Poetry*. Cambridge University Press, New York, 2007.
5. Friedman, Alan Warren. *Modernism and Literature: An Introduction and Reader*. Routledge, 2013.
6. Greenblatt, Stephen, et al., eds. *The Norton Anthology of English Literature*. Volume F: The Twentieth Century and After. New York, W. W. Norton , 2012
7. Marcus, Laura, Peter Nicholls ed. *The Cambridge History of Twentieth Century English Literature*. Cambridge University Press, UK, 2004.
8. Matz, J. *The Modern Novel: A Short Introduction*. Blackwell Publishing, US, 2004.
9. Meredith, James H. *Understanding the Literature of World War I: A Student Casebook to Issues ...* Green Wood Press, London, 2004.
10. Polleta, Gregory T. , ed. *Issues in Contemporary Criticism*. Boston: Little, Brown and Company, 1973.
11. Roberts, Neil. *A Companion to Twentieth-Century Poetry*. Blackwell publishing, UK, 2004
12. Silverstein, Marc. *Harold Pinter and the Language of Cultural Power*. Associate University Press, London, 1993.
13. Stringer, Jenny. *The Oxford Companion to Twentieth Century English Literature*. Oxford University Press, New York, 1996.

## **ELECTIVE**

**Course Title:** English Language and Literature Teaching

**Course Code:** ENG-E-13

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To introduce students to the fundamentals of English Language and Literature Teaching.
2. To introduce students to methods and approaches to teaching English Language and Literature.
3. To prepare students for the field of teaching with practical approaches to ELLT.

### **2. Course Outcomes:** But the end of the course the student will be able:

CO 1: Recognize concepts, methods, and approaches in teaching ELLT.

CO 2: analyze and apply teaching methodologies and approaches in English language and literature

CO 3: create instructional paradigms (approach, instruction, assessment) and demonstrate working knowledge in the classroom

### **3. Number of hours: 04 hours per week**

#### 4. Course Content:

Total number of hours: 60

#### Unit I: English Language Teaching

15 hours

**Introduction:** English in the world today, Brief History of English Language teaching  
Principles of Language Teaching – Cognitive, Social, Linguistic

Fundamentals: Listening, Speaking, Reading, Writing, Pronunciation, Vocabulary  
Curriculum Building

**Methods:** Grammar-Translation Method, Direct Method, Audio-Lingual Method,  
Silent Way, Desuggestopedia, Community Language Learning, Total  
Physical Response, Communicative Language teaching; Content based,  
Task-Based, and Participatory Approaches, Learning Strategy  
Training, Cooperative Learning and Multiple Intelligences

Issues in English Language teaching with focus on India

Discussion topics - *Literature as Autobiography* and *Fiction as Lies*.

New Paradigms & Current innovations in ELT

#### Unit II: Praxis of English Language Teaching:

15 hours

Preparation – Organization – Dissemination - Feedback

Use of teaching Methods using methods learnt in Unit 1 for crafting language  
teaching modules: Lecture Method, Demonstration Method, Problem  
Solving Method, Project Method, Vee – Mapping, Discussion Method,  
Play Method, Individualized Instruction Method, Discovery Method,  
Guided Discovery Method, Concept Mapping, Team Teaching

Use of ICT/Technology, Mixed-Media teaching

Innovations in teaching – Student-Centric, Flipped classrooms, POGIL,

Constructivism Student Innovation

### **Unit III: English Literature Teaching**

**15 hours**

Curriculum Building

**Approaches:** Language- based approach, Culture-based approach, Personal Growth approach (Reader-Response), Integrated Approach, Cultural-Response Method, Active Learning, Explanatory & Experiential Approach, Dramatic Method, Close reading, Reader-Response

Form & Genre: Poetry, Drama, Novel, Graphic-Novel, Non-Fiction, Creative Non-Fiction

### **Unit IV: Praxis of Teaching English Literature**

**15 hours**

Preparation – Organization – Dissemination - Feedback

Use of teaching Methods using methods learnt in Unit 3 for crafting literature

teaching modules: Lecture Method, Demonstration Method

Interactive Method Using: Problem Solving Method, Project Method, Vee – Mapping, Discussion Method, Play Method, Individualized Instruction Method, Discovery Method, Guided Discovery Method, Concept Mapping, Team Teaching

Use of ICT/Technology, Mixed-Media teaching

Innovations in teaching – Student-Centric, Flipped classrooms, POGIL,

Constructivism Student Innovation

## 5. Reference Books:

### Primary References:

1. Broughton, Geoffrey, et al. *Teaching English as a Foreign Language*. New York: Routledge, 1978.
2. Carter, Ronald and David Nunan, *The Cambridge Guide to Teaching English to Speakers of Other Languages*. Cambridge: Cambridge University Press, 2001.
3. Chambers, Ellie and Marshall Gregory. *Teaching & Learning English Literature*. London: Sage, 2006.
4. Davison, Jon and John Moss, *Issues in English Teaching*. London: Routledge, 2000.
5. Irvine, Colin C., ed. *Teaching the Novel across the Curriculum - A Handbook for Educators*. Westport: Greenwood Press, 2008.
6. Jeffcoate, Robert. *Starting English Teaching*. London and New York: Routledge, 1992.
7. Larsen-Freeman, Diane. *Teaching and Principles in Language Teaching*. New York: Oxford University Press, 2003.
8. Nunan, David. *Language Teaching Methodology - A textbook for teachers*. Prentice Hall, 1991.
9. Richards, Jack and Theodore Rodgers. *Approaches and Methods in Language Teaching*. Cambridge: Cambridge University Press, 1986.
10. Richards, Jack and Willy Renandya. *Methodology in Language Teaching*. New York: Cambridge University Press, 2002.
11. Wyse, Dominic, Richard Andrews and James Hoffman, *The Routledge International Handbook of English, Language and Literacy Teaching*. New York: Routledge, 2010.



## Secondary References:

1. Chambers, Ellie and Marshall Gregory. *Teaching and Learning English Literature*. London: Sage Publications, 2006.
2. Ken, Bain. *What the Best College Teachers Do*. Massachusetts: Harvard University Press, 2004.
3. Nunan, David. *Learner-Centred English Language Education*. Devon: Routledge, 2013.
4. —. *Research Methods in Language Learning*. New York: Cambridge University Press, 1992.
5. —. *Teaching English to Speakers of Other Languages*. New York: Routledge, 2015.
6. Richards, Jack and Richard Schmidt. *Dictionary of Language Teaching & Applied Linguistics*. Edinburgh: Pearson, 2010.
7. Thurston, Cheryl Miller. *Ideas That Really Work!* Colorado: Cottonwood Press, 1991.

## **ELECTIVE**

**Course Title:** Latin American Literature

**Course Code:** ENG-E-14

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To introduce students to the Latin American culture through their Literatures.
2. To help students understand the contribution of Latin American Writers to world literature.
3. To encourage students to discover the various themes, and movements associated with Latin American Literature.
4. To inculcate an atmosphere of cultural acceptance through the texts.

### **2. Course Outcomes:** By the end of the course the student will be able:

CO 1: assess the literary landscape of Latin American Literature

CO 2: recognize writers, forms, and movements associated with Latin American Literature

CO 3: exhibit their knowledge of Latin American Literature and Culture through constructivist learning

CO 4 : analyze Latin American literature, in context of their culture.

**3. Number of Hours:            04 Hours per week**

#### **4. Course Content:**

**Total number of hours: 60**

#### **Unit I: Contextual Study:**

**10 hours**

**Note:** The following areas should be covered along with their representative texts. If representative texts are not present, extracts of such may be used

1. Brief History of Latin America
2. Movements : Modernismo, indigenismo, Romanticism/Realism/Naturalism, Mulatto
3. Andrade, Oswaldo de. (Brazil) “*Anthropophagie Manifesto*” - Transculturalism
4. The Boom, Magical Realism, Post-boom writers/writings

#### **Unit II: Fiction:**

**25 hours**

1. *100 Years of Solitude* – **Gabriel Garcia Marquez (Colombia)**
2. *The Psychiatrist* - **Machado de Assis (Brazil)**

#### **Unit III: Poetry**

**15 hours**

1. *Sonnet XVIII, The Song of Despair, A song for Bolivar* - **Pablo Neruda (Chile)**
2. *Flame, speech; Proem, extract from Sunstone* (first 15 stanzas) - **Octavio Paz (Mexico)**
3. *The Psychology of Composition, The Hen’s Egg* – **Joao Cabral de Neto (Brazil)**
4. *The Other, Antigone* – **Gabriela Mistral (Chile)**

#### **Unit IV: Short Stories**

**10 hours**

1. Selected Stories from *The Cubs and other stories* – **Mario Vargas Llosa (Peru)**  
*The Cubs, The Challenge*
2. Selected Stories of **Julio Cortazar (Argentina)**  
*House taken Over, Bestiary*
3. Selected Stories of **Jorge Luis Borges (Argentina)**  
*The Library of Babel, Death and the Compass*

**Note: Secondary readings of the selected authors, poets, critics are open to students to explore and should be encouraged for use in internal assessments.**

## 5. Reference Books:

### Primary References:

1. Borges, Jorge Luis. *Aleph and other Stories*. Ed. Norman Thomas Di Giovanni. Trans Norman Thomas Di Giovanni. New York: Bantam Books, 1970.
2. Cortazar, Julio. *Blow-Up and Other Stories*. Trans. Paul Blackburn. New York: Pantheon Books, 1967.
3. Llosa, Mario Vargas. *The Cubs and Other Stories*. Trans. Gregory Kolovakos and Ronald Christ. New York: Farrar, Straus and Giroux, 1979.
4. Loundo, Dilip, ed. *Tropical Rhymes, Topical Reasons*. Brazil: National Book Trust, 2001.
5. Marquez, Gabriel Garcia. *One Hundred Years of Solitude*. Trans. Gregory Rabassa. New York: Avon Books, 1971.
6. —. *One Hundred Years of Solitude*. Trans. Gregory Rabassa. New York: Avon Books, 1967.
7. Mistral, Gabriela. *Madwomen*. Trans. Randall Couch. Chicago: University of Chicago Press, 2008.
8. Neruda, Pablo. *Twenty Love Poems and a Song of Despair*. Trans. W. S. Merwin. London: Penguin Books, 1976.
9. Neto, Joao Cabral De Melo. *Selected Poetry 1937 - 1990*. Hanover: Wesleyan University Press, 1994.
10. Paz, Octavio. *Selected Poems*. Ed. Eliot Weinberger. New York: New Directions, 1984.
11. —. *Sunstone*. Trans. Raymond Souard and Cassandra Kramer. Seattle: Burning Man Books, 1957.

### Secondary References:

1. Bloom, Harold. *Bloom's Critical Views - Gabriel Garcia Marquez*. New York: Chelsea House Publishers, 2007.
2. —. *Bloom's Major Short Story Writers - Julio Cortazar*. Ed. Harold Bloom. Philadelphia: Chelsea House Publishers, 2004.
3. Castro-Klaren, Sara, ed. *A Companion to Latin American Literature and Culture*. Oxford: Blackwell Publishing, 2008.
4. Kristal, Efrain, ed. *The Cambridge Companion to the Latin American Novel*. Cambridge: Cambridge University Press, 2006.
5. Reisman, Rosemary, ed. *Latin American Poets*. Massachusetts: Salem Press, 2012.
6. Swanson, Philip. *Latin American Fiction*. Oxford: Blackwell Publishing, 2005.
7. Wood, Michael. *Landmarks of World Literature -One Hundred Years of Solitude*. Cambridge: Cambridge University Press, 1990.

## **ELECTIVE**

**Course Title:** Contemporary Literary Theory

**Course Code:** ENG-E-15

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To introduce the students to the basic concepts of Contemporary Literary Theory.
2. To introduce the students to major schools of literary theory.
3. To develop the ability in the students to apply literary theory to analyze a work of literature.

### **2. Course Outcomes:**

Upon the completion of the course the students should be able:

- CO 1: Understand different modern prose styles as well as colloquial rhythms of modern poetry.
- CO 2: Critically evaluate the impact of World Wars and psychology on Literature.
- CO 3: Examine the historical background of the age.
- CO 4: To examine themes and concerns and stylistic features of twentieth century literature.

### **3. Number of Hours: 04 hours per week**

**4. Course Content:**

**Total number of hours: 60**

**Unit I: Marxist view of Literature**

**12 hours**

1. Society and History : Marxist view
2. Major Marxists schools
3. Marxism and literature:
  - a) Literature and ideology
  - b) Autonomy in Literature
4. Marxist approach to Literature

**Unit II: Psychoanalysis**

**13 hours**

1. Views of Freud on human mind
2. Freudian approach to literature
3. Views of Lacan
4. Lacanian Criticism
5. Impact of psychoanalysis of literature

**Unit III: Structuralism and Post-structuralism**

**15 hours**

1. From New Criticism to Structuralism
2. Important Tenets of Structuralism
3. Contribution of Saussure
4. Contribution of Jonathan Culler, A. J. Greimas, Roman Jakobson, Roland Barthes
5. Structuralist Approach to Literature
6. Defining Deconstruction
7. Deconstructing Structuralism
8. From 'Work to Text'
9. Death of the author
10. Deconstruction an example
11. Deconstructing Deconstruction

## **Unit IV: Voices of the Subaltern: Feminist, Queer & Post-Colonial Theories 20 hours**

### **1. Feminist Theories**

- a) Features of Feminist Criticism
- b) Development to Feminist thought
- c) Major contributors to Feminist Criticism
  - i. Mary Wollstonecraft
  - ii. Virginia Woolf
  - iii. Simon De Beauvoir
  - iv. Elaine Showalter
  - v. Helen Cixous, Julia Kristeva
- d) Gynocriticism
- e) Feminist Criticism and Language
- f) Feminist approach to literature

### **2. Lesbian/Gay criticism**

- a) Lesbian and Gay theory
- b) Lesbian feminism
- c) Queer theory
- d) Lesbian/Gay criticism-An example

### **3. Postcolonial Theory**

- a) Edward Said - Orientalism
- b) Gayatri Spivak- Views on subalternity
- c) Homi K. Bhabha - Concept of mimicry



#### **4. Reference Books: Primary References:**

1. Abrams M. H. *A Glossary of Literary Terms*. Prism Publishers, 1999.
2. Barry Peter. *Beginning Theory*. Manchester United Press, Manchester, 1995.
3. Bertens Hans. *Literary Theory: Title Basics*. Routledge, London, 2001.
4. Eagleton Terry. *Literary Theory: An Introduction*. Blackwell, London, 1983.
5. Hawthorn Jeremy. *A Glossary of Contemporary Literary Theory*. Edward Arnold, London, 1994.
6. Selden Raman. *A Reader's Guide To Contemporary Literary Theory*. Harvester, London, 1993.
7. Webster Roger. *Studying Literary Theory: An Introduction*. Arnold Publishers, London, 1990.

#### **Secondary References:**

1. Ashcoft Bill, Griffiths Gareth, Tiffin Helen (ed). *The Post-Colonial Reader*. Routledge, New York, 1995.
2. Ashcoft Bill, Griffiths Gareth, Tiffin Helen (ed). *The Empire Writes Back*. Routledge, New York, 2010.
3. Butler Judith. *Gender Trouble*. Routledge India, 2016.
4. Jameson Fedric. *The Political Unconscious*. Routledge, New York, 1983.
5. Hawkes Terence. *Structuralism and Semiotics*. Routledge, New York, 2009.
6. Woods Tim. *Beginning Post-modernism*. Manchester University Press, Manchester, 2009.
7. Sarup Madan. *An Introductory Guide to Post-structuralism and Postmodernism. 2nd Edition*. The University of Georgia Press, Georgia, 1993.
8. Sedgwick Kosofsky Eve. *Epistemology of the Closet*. University of California Press, 2nd revised edition, 2008.
9. Vanita Ruth, Kidwai Saleem (eds). *Same-Sex Love in India: A Literary History*. Penguin India, 2008.

## **ELECTIVE**

**Course Title:** Representation of Gender and Sexuality in Literature

**Course Code:** ENG-E-8

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To open classroom discussions in an easily accessible manner to students learning to comprehend gender and sexuality in practical situations as well as in literature.
2. To aid an understanding of the distinction between the concepts of gender and sexuality, and explore to explore its ever expanding reach.
3. To discover the interplay of gender and sexuality.
4. To help students understand the fluid natures of gender and sexuality.
5. To understand and appreciate the different artistic expressions of gender and sexuality.

### **2. Course Outcomes:** Upon completion of the course, the student should be able to:

CO 1: Discuss the need to appropriately define and comprehend the various terms within a discussion of gender and sexuality

CO 2: Demonstrate the ability to construct well founded arguments on controversial pieces of text and art

CO 3: Identify correctly the implication of specific historical events on gendered literature and culture

CO 4: Appraise the affect gender and sexuality has on pop culture

### **3. Number of hours: 04 hours per week**

**4. Course Content:**

**Total number of hours: 60**

**UNIT I: Introduction:**

**20 hours**

**(“Why, What, How)**

1. Introducing Women, Gender, Sexuality Studies

a) Video: *Gender fluidity*: Gabrielle Burton at TEDx Columbus

2. Thinking about Gender, Sexuality and Culture

a) Video: *Straightlaced: How Gender’s Got Us All Tied Up* (YouTube)

b) Marilyn Boxer, Ch. 1: Feminist Advocacy, Scholarly Inquiry, and the Experience of Women. *When Women Ask the Questions*.

3. Key Concepts and Theoretical Frameworks (Difference, Experience, Performance, Intersectionality)

a) “Doing Gender” in Gendered Society Reader- Candace West & Don Zimmerman

b) Gender: Judith Butler (Chapter 2) Sara Salih

4. Contemporary Contestations – Intersex and Transgender Movements

a) The Five Sexes: Why males and females are not enough- Anne Fausto-Sterling

b) Video: *Changing Gender Dynamics in Current Structure of India*. Laxmi Narayan Tripathi. TEDx SIUHinjewadi

c) Ashwini Sukthankar. *Facing the Mirror: Lesbian Writing from India*. Penguin Books Australia. 1999.

5. Reproduction & Family Politics

a) De-constructing ‘choice’: The social imperative and women’s use of the birth control pill - Granzow, Kara

**UNIT II: Prose****15 hours**

## 1. Novel:

- a) The Truth About Me: A Hijra Life Story- A. Revathi

## 2. Essays:

- a) Selected reading on Masculism from Popular Masculine Cultures in India:  
Critical Essays - Rohit K. Dasgupta (ed.) (any two essays)

**UNIT III: Plays****10 hours**

- 1. Mr. Behram - Gieve Patel

**UNIT IV: Poems****15 hours**

## 1. Suniti Namjoshi

- a) I Give her the Rose
- b) Well then let slip the masks

## 2. Maya Angelou

- a) Phenomenal Woman

## 3. Kamala Das

- a) The Old Playhouse

## 4. Sylvia Plath

- a) Spinster

## 5. Trace Peterson

- a) After and Before After

## 6. Hoshang Merchant

- a) Selected poems from *Flower to Flame*

**Note to Instructor:**

1. As the syllabus (Unit I) features a large part theoretical/ essays on Gender and Sexuality, it is recommended that the instructor ensure that a rapport between student and teacher, and student and student is developed prior to moving forward to Unit II, III and IV.
2. Comfort in openly discussing their views and listening patiently to the views of their peers is necessary.
3. Recommended method of examination:
  - a) CAs – Students may be allowed the option of either a) writing an original report/ essay, commenting on the text they are studying (Secondary Reading list open); b) writing an original report/ essay viewing a literary piece through the lens of the essay(s); or c) class presentations based on syllabus topics featuring their own stance(s) and backed up with justifying arguments.
  - b) Semester End Exam –This may be a research paper written under the guidance of the instructor.

## 5. Reference Books:

### Primary References:

1. A. Revathi. *The Truth About Me: A Hijra Life Story*. Penguin, 2010.
2. Boxer, Marilyn. *When Women Ask the Questions*. Baltimore and London: The Johns Hopkins University Press.
3. Fausto-Sterling, Anne. "The Five Sexes: Why males and females are not enough." *The Sciences*, 33 (2), 1994. Pgs. 20-25.
4. Granzow, Kara. "De-constructing 'choice': The social imperative and women's use of the birth control pill". *Culture, Health & Sexuality*, 9(1), 2007. Pgs. 43-54.
5. Jain, Jasbir (ed). *Women in Patriarchy: Cross – Cultural Reading*. New Delhi: Rawat Publications, 2005.
6. Ruth Vanita&KidwaiSaleem. *Same Sex Love in India: Readings from Literature and History*. New Delhi: Macmillan, 2000.
7. Salih, Sara. Chapter 2: Gender: *Judith Butler*. London: Routledge, 2002.
8. Tendulkar, Vijay. *Mitrachi Goshta: A Friend's Story: A Play in Three Acts*. Oxford University Press, 2000.
9. Peterson, Trace. *After and Before After*. Online. Link
10. West, Candace and Don Zimmerman. "Doing Gender". *Gendered Society Reader*. eds. Michael Kimmel & Amy Aronson. Oxford, 2000. Pgs. 146- 163.
11. Merchant, Hoshang. *Flower to Flame*. Rupa&Co. ,1992.
12. Dasgupta, Rohit K. *Popular Masculine Cultures in India: Critical Essays*. SetuPrakashani, 2013.

### **Secondary References:**

1. Brabon, Benjamin & Genz Stephanie. *Postfeminism*. Edinburgh University Press, 2009.
2. Bristow, Joseph. *Sexuality*. Routledge, 2013.
3. Butler, Judith. *Gender Trouble*. Routledge, 2012.
4. Shahni, Parmesh. *Gay Bombay: Globalization, Love and (be)longing in Contemporary India*. Sage Publications India Pvt. Ltd, 2008.
5. Sharma, Prabhat. *The Plays of Vijay Tendulkar: Critical Explorations*. Sarup & Sons, 2008.
6. Wake, Paul & Malpas Simon. *The Routledge Companion to Critical Theory*. Routledge, 2008.
7. Merchant, Hoshang. *Forbidden Sex, Forbidden Texts: New India's Gay Poets*. India: Routledge, 2009.
8. Bose, Brinda (Ed.), Subhabrata Bhattacharyya (Ed.). *Phobic And The Erotic: The Politics Of Sexualities In Contemporary India*. Seagull Books, 2007.

### **Suggested Readings:**

1. Gilbert, Sandra & Gubar Susan. *The Madwoman in the Attic*. UK: Yale University Press, 1984.
2. Millett, Kate. *Sexual Politics*. University of Illinois Press, 2000.
3. Mohanty, Chandra Talpade. "Feminist Encounters: Locating the Politics of Experience". *Destabilizing Theory: Contemporary Feminist Debates*. eds. Michele Barrett and Anne Phillips. Stanford: Stanford University Press, 1992.

4. Monette, Paul. *Borrowed Time: An AIDS Memoir*. Mariner Books; 1 edition (June 1, 1998)
5. Sedgwick Eve Kosofsky. *Epistemology of the Closet*. University of California, 1990.
6. Seth, Vikram. *The Humble Administrator's Garden*. India: Penguin, 2012.

**Videos:**

1. *Changing Gender Dynamics in Current Structure of India*. Laxmi Narayan Tripathi.  
TEDxSIUHinjewadiLink
2. *Gender fluidity*: Gabrielle Burton at TEDxColumbusLink
3. *Straightlaced: How Gender's Got Us All Tied Up* (YouTube)Link.

**Suggested Films:**

1. Campillo, Robin. *120 BPM (Beats per Minute)*. 2017.
2. Epstein, Rob and Jeffrey Friedman. *Howl*. 2010.
3. Kechiche, Abdellatif. *Blue Is the Warmest Colour*. 2013





## **ELECTIVE COURSE**

**Course Title:** Ancient Indian Classics in Translation

**Course Code:** ENG-E-10

**Marks:** 100

**Credits:** 4

### **1. Course Objectives:**

1. To acquaint the students with Indian culture of the past.
2. To introduce the students to great ancient Indian classics.
3. To acquaint the students with Indian poetics.

### **2. Course Outcomes:**

Upon the completion of the course the students should be able:

CO1: To perceive aesthetic, social and cultural aspects on Ancient Indian Society.

CO2: To critically appreciate ancient Indian classics: The Ramayan and the Mahabharat.

CO3: To recognize and analyze the basic concepts of Indian Poetics.

CO4: To apply the literary concepts of Indian Poetics to various Literary texts.

CO5: To critically appreciate ancient Indian Poetry.

### **3. Number of Hours: 04 Hours per week**

**4. Course Content:**

**Total Number of hours: 60**

**Unit I: The Mahabharat**

**15 hours**

1. Extracts from the Mahabharat:
  - a) Droupadi – Svayamvara Parva – Volume I (Pages 437-458)
  - b) Vaivahka Parva Volume I (Pages 458-473)
  - c) Dyuta Parva Volume II (Pages 185 to 247)
  - d) Amba – Upakhyana Parva – Volume 5 (Pages 1 to 60)

**Unit II: The Ramayana**

**15 hours**

1. Book I – Canto
  - a) XXXVI - L
  - b) LXVI – LXVIII
  - c) LXXVII
2. Book II – Canto
  - a) I
  - b) VII - XIX
  - c) XXVI - XXVII
  - d) XXXVII - XLIII
  - e) LI – LXIV
3. Book III – Canto
  - a) IX - XX
  - b) XXXI -LVII

(Note: Book III - Self Study)

**Unit III: Poems from Sanskrit in translation**

**15 hours**

1. Verse nos. 1-15; 18-21 ; 24; 26; 30; 32; 39; 40-45; 47; 51-53; 61; 63; 65; 67 ; 69-71 ; 73;74; 86;87; 97-101; 103; 104; 110; 111; 114 -116; 118; 119; 122; 123; 125; 131;135; 136; 138-140.

## 2. Indian Poetics / Indian Literary Criticism

- a) Bharata – Ntaya – Manjiri (1975) - G. K. Bhatt: On Natya and Rasa: Aesthetics of Dramatic experience.
- b) Bhatrihari -Vakyapadiya.  
Text: From Vakyapadiya - K. Raghavan Pillai.
- c) Dandin from the Kavyadarsa. Translated - Vavilla Venkateswara Sastrulu.  
Dandin's Marga Theory.
- d) Anandvardhana's from Dhuanyaloka ( sphota theory).
- e) Kuntaka -Vakrokti.
- f) Abhinava Gupta's concept of Shantarasa. Rasa - dvani theory

### Unit IV: Philosophical Writings

15 hours

1. Bhagavat Gita – Chapter II -The Karmayoga
2. Isha Upanishad (trans.) - Sri. Aurobindo

## 5. Reference Books:

### Primary References:

1. Brough John. *Poems from the Sanskrit*. Pelican Books, England, 1968.
2. Debroy Bibek (trans.). *The Mahabharata*. Pelican Books, New Delhi, 2012.(Vol. I, II, IV, V)
3. Devy G.N. (Ed.). *Indian Literary Criticism: Theory and Interpretation*. Orient Longman, New Delhi, 2002.
4. Griffeth Ralph (trans.). *The Ramayan of Valmiki*. Low Price Publications, Delhi, 2003.
5. Ryden W. Arthur(trans.). *Kalidas' Shakuntala* . In Parentheses Publication Sanskrit
6. Sri. Aurobindo (trans.). *Isha Upanishad*. Sri. Aurobindo Ashram, Pondicherry, 2003.

### Secondary References:

1. Banker Ashok K. *Ramayana* . Little, Brown Book Group, 2005.
2. Pattanaik Devdutt. *My Gita*. Rupa Publications, New Delhi, 2015.
3. R.K. Narayan. *God, Demons and others*. University of Chicago Press, 1993.
4. Sinha M.P. , Agnihotri Meeraj. *Critical Theories- Indian and Western*. Atlantic Publications, New Delhi, 2013.
5. Smith John (Abridged Trans.) *The Mahabharata*. Penguin Book, India, 2009.
6. Swami Chinmayanada. *The Holy Geeta*. Central Chissmaya Mission Trust, Mumbai, 1996.
7. Swami Parthasarthy. *Bhagvad Gita*. Vedanta World, 2 ed. , 2011.
8. Valmiki, Sattar Arshia. *The Ramayana*. Penguin Random House India, 2016.
9. Zakaria Rafiq. *Discovery of God*. Popular Prakashan Publisher

**FRENCH**

**Parvatibai Chowgule College of Arts and Science  
(Autonomous)**

DEPARTMENT OF FRENCH

**2015**

**Course Title: Language in Context: Developing Reading and Writing Skills - LEVEL 1  
PART 1**

**Course Code: FRE-I.C-1**

**Marks: 100**

**Credits: 4**

**Duration: 60 Hours**

**Prerequisites: A minimum of 70% in French at the Higher Secondary School Examination.**

**COURSE OBJECTIVES:**

1. The course aims to equip students with the skills and competencies required to successfully comprehend and produce simple texts in French. The lessons are oriented to developing the student's socio-cultural competencies so as to enable them to communicate with members of the target culture.
2. It aims to help students to develop their creative writing abilities.
3. It aims to initiate students to literary works in French.
4. The course also aims at enabling the students to apply these skills in real life situations.
5. The course also aims at enabling the students to work either individually or in small groups.

**COURSE OUTCOMES:**

At the end of the course the students will be able to:

- CO1: Demonstrate reading and writing proficiency in French at level A1.1 as prescribed by CEFR (Common European Framework of Reference) (Cadre Européen Cummun de Référence)
- CO2: Communicate in basic written French, in the context of introducing oneself and others including famous personalities and present oneself on an internet forum.
- CO3: Display skills in writing a postcard, informal letters and make diary entries and be able to read and comprehend simple poems in French.
- CO4: Write short articles on the themes of recent travel experience.

## SYLLABUS:

Name of Text: **ECHO – Level 1**

### Module1 (15 hrs)

Leçon 0: Comment vous vous appelez? Vous parlez français ? Vous êtes allemand ? Tu habites où ? Qu'est-ce que c'est ? Qui est-ce ? Vos papiers s'il vous plaît ? Cartes postales et messages.
Leçon 1 : Grammaire : Conjugaison des verbes (présentation), Masculin/féminin, Singulier/pluriel, Interrogation (intonation), Négation simple
Leçon 1 : Vocabulaire : L'identité, Les lieux de la ville, les mots du savoir vivre
Leçon1 : Discours en continu : se présenter à un groupe
Leçon1 : Compréhension des textes : Écrits de la rue
Leçon1 :Écriture : Correspondance
Leçon1 : Civilisation : l'espace francophone
Leçon 2 : Grammaire : Conjugaisons (verbes en -er), accorder des noms et des adjectifs, articles définis et indéfinis, interrogations (Est-ce que, Qu'est-ce, Qu'est-ce que c'est, Où)
Leçon 2 : Vocabulaire : L'état civil, personnes et objets caractéristiques d'un pays,
Leçon 2 : Discours en continu : Énumérer ce que l'on connaît, ce que l'on aime à propos d'un pays, d'une ville, etc
Leçon 2 : Compréhension des textes : article de presse, portrait d'une personne
Leçon 2 : Écriture : Se présenter sur un site internet
Leçon 2 : Civilisation : Première approche de la société française ( noms, âges, origines, lieux d'habitation)

### Module 2 (15 hrs)

Leçon 3 : Grammaire : Conjugaison (faire, aller, venir, vouloir, pouvoir, devoir) future proche, pronoms après une préposition, On=nous.
Leçon 3 : Vocabulaire : Les loisirs (sports, spectacles, activités)
Leçon 3 : Discours en continu : parler de ses activités et loisirs)
Leçon 3 : Compréhension des textes : Cartes et messages d'invitation, d'acceptation sr de refus
Leçon 3 : Écriture : Cartes et messages d'invitation, d'acceptation sr de refus
Leçon 3 : Civilisation : Première approche de l'espace de la France. Repérage de quelqueslieux de loisirs
Leçon 4 : Grammaire : Passé Composé (Présentation d'un événement passé), La date et l'heure
Leçon 4 : Vocabulaire : les moments de la journée, de l'année, Événements liés au temps
Leçon 4 : Discours en continu : raconter un emploi du temps passé
Leçon 4 : Compréhension des textes : journal personnel,



Compréhension d'une chronologie
Leçon 4 : Écriture : Rédaction d'un fragment de journal personnel
Leçon 4 : Civilisation : Rythmes de l'année et rythmes de vie en France, Personnalités du monde francophone

### **Module 3 (15 hrs)**

Leçon 5: Grammaire : Comparaisons, Adjectifs démonstratifs, Adjectifs possessifs
Leçon 5 : Vocabulaire : Les voyages, Les transports
Leçon 5: Discours en continu : Présenter les avantages et les inconvénients d'une activité
Leçon 5 : Compréhension des textes : articles de presse, relation d'un événement
Leçon 5: Écriture : Récit des circonstances d'un voyage
Leçon 5 : Civilisation : Les transports en France

### **Module 4 (15 hrs)**

Leçon 6: Grammaire : Articles partitifs, Emploi des articles, Interrogation (forme avec inversion), Réponses, Oui--si--non, forme possessif : à+pronom
Leçon 6: Vocabulaire : La nourriture, les repas, la fête
Leçon 6: Discours en continu : Décrire et raconter un repas ou une fête
Leçon 6 : Compréhension des textes : Extrait de guide touristique : restaurants originaux de Paris
Leçon 6: Écriture : Se présenter sur un site internet
Leçon 6 : Civilisation : Les habitudes alimentaires de français

### **References:**

Méthodes : Alter Ego – Niveau 1 / Michel Guilloux –Publisher :HachetteChampion – Niveau1/ Annie Monnerie-Goarin – Publisher : CLE International

Panorama – Niveau 1/ Jacky Giradet, Jean Marie Cridlig - Publisher : CLE International

**Web References :** Français avec Pierre  
Podcastfrançaisfacile.com  
Comme une française  
Un flux RSS  
Duolingo.com  
Les Zexperts FLE

**Course Title : Developing Listening and Speaking Skills-LEVEL 1 PART 1**

**Course Code : FRE-I.C-2**

**Marks : 100**

**Credits : 4**

**Duration : 60 Lectures**

**Prerequisites : A minimum of 80% in French at the Higher Secondary School Examination.**

### **COURSE OBJECTIVES:**

1. The main aim of this course is to develop student's listening and speaking skills through a wide range of communication activities and role plays. The course will focus on training students to use language in various scenarios.
2. The course aims at integrating the various aspects of language-learning which are complementary to one another. Thus, a single language activity will deal with learning communicative strategies, grammatical structures as well as cultural and civilizational elements
3. The course aims at enhancing the skills in oral comprehension and expression by exposing the students to various movies, songs, plays, dialogues etc. in simple French.
4. The course also aims at enabling the students to work either individually or in small groups.

### **COURSE OUTCOMES**

**At the end of the course the students will:**

CO1: have achieved the skills of oral communication at Level A1.1 as prescribed by the CECR.

CO2: be able to communicate in different day-to-day situations (make requests, express likes and dislikes, speak about hobbies and make purchases and fix a rendez-vous).

CO3: be able to comprehend basic dialogue by native French speakers pertaining to everyday life.

CO4: be able to emulate the rhythm and intonations specific to the basic expressions in French.

### **SYLLABUS**

#### **TEXT: ECHO - LEVEL 1**

##### **Module 1 (15 hrs)**

Leçon 0: Exercices orales : Comment vous vous appelez? Vous parlez français ? Vous êtes allemand ? Tu habites où ? Qu'est-ce que c'est ? Qui est-ce ? Vos papiers s'il vous plaît? Cartes postales et messages.
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Leçon 1 : Situations orales : Aborder quelqu'un, dire son nom, saluer, prendre congé
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Leçon 1 : Situations orales : remercier, dire si on comprend
Leçon1 : Phonétique : Repérage des sons difficiles, rythmes et enchainements
Leçon1 : Compréhension orales des textes : Écrits de la rue
Leçon1 : exercices d'écoute : expression orale
Leçon1 : exercices d'écoute : compréhension orale

## **Module 2 (15 hrs)**

Leçon 2 : Expressions orales sur les interrogations (est-ce que, Qu'est-ce, Qu'est-ce que c'est, Où)
Leçon 2 : Situations orales : Identifier une personne ou un objet, exprimer ses goûts
Leçon 2 : Situations orales : demander quelque chose : jeux de rôle
Leçon 2 : Compréhension orale des textes : article de presse, portrait d'une personne
Leçon 2 : Phonétique : Marques orales du féminin et du pluriel,
Leçon 2 : Phonétique : Différenciation « je », « J'ai », « J'aime ». rythmes et enchainements
Leçon 3 : Expressions orales avec des verbes(faire, aller, venir, vouloir, pouvoir, devoir) future proche, pronoms après une préposition, On=nous.
Leçon 3 : Situations orales : Proposer : accepter ou refuser une proposition
Leçon 3 : Situations orales : demander une explication
Leçon 3 : Situations orales : Exprimer la possibilité, l'impossibilité, l'obligation
Leçon 3 : Phonétique : (v), (t), Rythme du groupe Verbe+verbe et de la phrase négative
leçon 3 : Exercices d'écoute, jeux de rôle

## **Module 3 (15 hrs)**

Leçon 4 : Expressions orales sur Passé Composé (Présentation d'un événement passé), La date et l'heure
Leçon 4 : Compréhension orales sur les moments de la journée, de l'année, Événements liés au temps
Leçon 4 : Situations orales : Demander/donner des précisions sur le temps
Leçon 4 : Situations orales : demander/dire ce qu'on a fait, Féliciter
Leçon 4 : Phonétique : Différenciation Présent/passé, Enchaînement avec « t »et « n »
leçon4 :Exercicesd'écoute
Leçon 5: Expressions orales sur : Comparaisons, Adjectifs démonstratifs, Adjectifs possessifs
Leçon 5 : Situations orales : Choisir, négocier une activité commune

## **Module 4 (15 hrs)**

Leçon 5: Situations orales : Faire des recommandations, Demander/donner une explication
Leçon 5 : Situations pratiques relatives au voyage
Leçon 5: :Phonétique : Sons o - Différenciation {y} {u}
leçon 5 : Différenciation : {b} {v} {f}
Leçon 6:Expressions orales sur: Articles partitifs, Emploi des articles, Interrogation (forme avec inversion), Réponses, Oui--si--non, forme possessif : à+pronom
Leçon 6: Expressions orales sur : La nourriture, les repas, la fête
Leçon 6: Situations orales : situations pratiques à l'hôtel et au restaurant
Leçon 6 : Compréhension orale des textes : Extrait de guide touristique : restaurants originaux de Paris
Leçon 6: Phonétique : Rythme et intonation de la question, Rythme de la phrase négative,
leçon 6 : Jeux de rôles sur: Les habitudes alimentaires

### **References:**

Méthodes : Alter Ego – Niveau 1 / Michel Guilloux –Publisher :Hachette  
Champion – Niveau1/ Annie Monnerie-Goarin -- Publisher : CLE  
International  
Panorama – Niveau 1/ Jacky Giradet, Jean Marie Cridlig - Publisher :  
CLE International

**Web References:** Français avec Pierre  
podcastfrançaisfacile.com  
Comme une française  
Frenchspin.com  
Duolingo.com  
Les Zexperts FLE  
Lexiquefle.free.fr.famille

**Course Title: Language in Context: Developing Reading and Writing Skills- LEVEL 1 PART 2**

**Course Code: FRE-II.C-3**

**Marks: 100**

**Credits: 4**

**Duration: 60 Hours**

**COURSE OBJECTIVES:**

1. The course aims at enabling the students acquire, to the greatest possible extent skills in comprehending, producing and speaking the French language. The students will be also trained to develop a socio-cultural competency so as to be able to communicate with members of the target culture.
2. The course also aims at enabling the students to acquire skills in creative writing and also comprehension of literary works written in simple French.
3. The course also aims at enabling the students to apply these skills in real life situations.
4. The course also aims at enabling the students to work either individually or in small groups.

**LEARNING OUTCOME:**

At the end of the course, students will be able to:

1. Demonstrate proficiency in comprehension and expression in French at level 1.
2. Demonstrate the ability to describe and express their viewpoints on various topics of the units completed.
3. Apply , question and summarize in French based on the content of the units completed

**Syllabus:**

Lessons 7,8,9,10,11 and 12 of the text: ‘Méthode de français ECHO- Level A1’, will be the syllabus for semester II

**Leçons 7 -12**

Topic No	Content	No. of Hrs
1	Leçon 7 : Grammaire : La conjugaison pronominale, l’impératif, L’expression de la quantité, (peu, un peu, quelques, etc)	04
2	Leçon 7 : Vocabulaire : Les activités quotidiennes, Les achats, l’argent	03
3	Leçon7 : Discours en continu : Raconter sa journée	02
4	Leçon7 : Compréhension des textes :extraits d’un guide touristique, les activités gratuites en France	01

5	Leçon7 : Écriture : Rédaction d'un bref document d'information	01
6	Leçon7 : Civilisation : comportement en matière d'achat et d'argent	01
7	Leçon 8 : Grammaire : Prépositions et adverbess de lieu, Verbes exprimant un déplacement (emploi des prépositions)	02
8	Leçon 8: Vocabulaire : Le logement, la localisation, l'orientation, l'état physique, le temps qu'il fait	04
9	Leçon 8 Discours en continu : Parler d'un cadre de vie (lieu-climat-etc) , Décrire un logement	02
10	Leçon 8 :Compréhension des textes : Lettre ou carte postale (nouveau logement et nouveau cadre de vie)	01

11	Leçon 8 : Écriture : Rédaction d'une carte ou d'un message de vacances	01
12	Leçon 8 : civilisation : le climat en France, les cadres de vie (ville et campagne)	01
13	Leçon 9 : Grammaire : L'imparfait, Emploi du passé composé et de l'imparfait, Expression de la durée, L'enchaînement des idées (alors -donc-mai), Le sens réciproque	02
14	Leçon 9: Vocabulaire : Les moments de la vie, la famille, les relations amicales, amoureuses, familiales)	02
15	Leçon 9 : Discours en continu : Raconter brièvement un souvenir, Présenter sa famille, Faire brièvement la biographie d'une personne	01
16	Leçon 9 : Compréhension des textes : Pages spectacles d'un magazine, présentation des films sur le thème du couple)	01
17	Leçon 9 : Écriture : Rédactions de commentaires de photos	01
18	leçon 9 : civilisation : Le couple et la famille	01
19	Leçon 10 : Grammaire : Les pronoms compléments directs, Les pronoms compléments indirects de personne, L'expression de la fréquence et de la répétition	02
20	Leçon 10 : Vocabulaire : Les moyens de communication (courrier, téléphone, internet)	02
21	Leçon 10 : Discours en continu :Parler des moyens de communication	01

22	Leçon 10: Compréhension des textes : messages de vœux, souhaits, remerciements, félicitations , excuses	01
23	Leçon 10: Écriture :Rédaction de petits messages	01
24	leçon 10: civilisation : Conseils de savoir-vivre en France	02

25	Leçon 11 : Grammaire : Passé récent, présent progressif, future proche, action achevée/ inachevée	03
26	Leçon 11 Vocabulaire: Le corps, la santé et la maladie	01
27	Leçon 11 : Discours en continu : parler de ses activités de loisirs	02
28	Leçon 11: Compréhension des textes :extraits de magazines :instructions	01
29	leçon 11 Écriture : Bref exposé écrit d'un problème personnel	01
30	Leçon 11 Civilisation : Conseils pour faire face aux situations d'urgence	01
31	Leçon 12: Grammaire : La place de l'adjectif, la proposition relative avec « qui », C'est/Il est, impératif des verbes avec pronoms, la formation des mots	03
32	Leçon 12: Vocabulaire : La description physique et psychologique des personnes, les vêtements, les couleurs	02
33	Leçon 12: Discours en continu : Exposer un problème personnel (santé, relation, etc), donner des conseils à quelqu'un qui a un problème personnel	02
34	Leçon 12 : Compréhension des textes : Extraits de magazine : description de comportements	01
35	Leçon 12: Écriture : Se présenter par écrit	01
36	leçon 12: civilisation :quelques styles comportementaux et vestimentaire en France	02

### References:

Méthodes : Alter Ego - Niveau 1 / Michel Guilloux -Publisher :Hachette  
 Champion - Niveau1/ [Annie Monnerie-Goarin](#) -- Publisher : CLE  
 International  
 Panorama - Niveau 1/ Jacky Giradet, Jean Marie Cridlig -  
 Publisher : CLE International

**Course Title: Language in Context: Developing Listening and Speaking Skills- LEVEL 1 PART 2**

**Course Code: FRE-II.C-4**

**Marks: 100**

**Credits: 4**

**Duration: 60 Lectures**

**COURSE OBJECTIVES:**

1. The students will be trained to use the language in a realistic setting rather than to merely focus on written exercises. Language will be used to perform tasks involving a meaningful communication between language speakers.
2. The various aspects of language-learning will not be treated separately but as complementary to one another. Thus, a single language activity will deal with learning communicative strategies, grammatical structures as well as cultural and civilizational elements
3. The course also aims at enabling the students to acquire skills in oral expression and also comprehension of songs, plays, dialogues etc. in simple French.
4. The course also aims at enabling the students to work either individually or in small groups.

**LEARNING OUTCOME:**

At the end of the course, students will be able to:

1. Demonstrate speaking proficiency in French at level 1,
2. Present ideas in French in a coherent manner using the oral skills acquired.
3. Understand the utterances of native speakers.
4. Sustain conversation on a general topic with a speaker of the target language.
5. Demonstrate comprehension of French in a variety of listening situations.

**Syllabus:**

Oral comprehension based on the units 7,8,9,10,11 and 12 of the text :‘Méthode de français ECHO- Level A1’

Leçons 7 -12

Topic No	Content	No. of Hrs
1	Leçon 7 : Expressions orales sur : La conjugaison pronominale, l’impératif, L’expression de la quantité, (peu, un peu, quelques, etc)	04
2	Leçon 7 : Expressions orales sur: Les activités quotidiennes, Les achats, l’argent	03



3	Leçon7 : Situations orales : Demander des nouvelles de quelqu'un, choisir, acheter et payer un objet	02
4	Leçon7 : Situations orales : S'informer sur la présence ou l'existence d'une personne ou d'un objet	01
5	Leçon7 : Phonétique : Rythme de la conjugaison pronominale	01
6	Leçon7 : Phonétique : Intonation de l'impératif, Prononciation des pronoms toniques	02
7	Leçon 8 : Expressions orales sur : Prépositions et adverbess de lieu, Verbes exprimant un déplacement (emploi des prépositions)	02
8	Leçon 8:Expressions orales sur: Le logement, la localisation, l'orientation, l'état physique, le temps qu'il fait	02
9	Leçon 8 : Situations orales : S'informer sur l'état physique de quelqu'un, s'informer sur un itinéraire, une orientation	03
10	Leçon 8 : Situations orales : Demander de l'aide, Exprimer une interdiction	02

11	Leçon 8 : Phonétique : Différenciation [s],[z],[a],ã	01
12	Leçon 8 : Phonétique : Différenciation du masculin et du féminin des adjectifs	01
13	Leçon 9 : Expressions orales sur : L'imparfait, Emploi du passé composé et de l'imparfait, Expression de la durée, L'enchaînement des idées (alors -donc-mai), Le sens réciproque	02
14	Leçon 9: Expressions orales sur : Les moments de la vie, la famille, les relations amicales, amoureuses, familiales)	02
15	Leçon 9 : Situations orales: Raconter brièvement un souvenir, Présenter sa famille,	01
16	Leçon 9 : Situations orales : Demander /donner des informations sur la biographie d'une personne,	01
17	Leçon 9 : Situations orales : Demander /donner des informations sur ses relations amicales ou familiales	01
18	leçon 9 : Phonétique : Le[j], Différenciation [ɔ] et	01
19	Leçon 10 : Expressions orales sur: Les pronoms compléments directs, Les pronoms compléments indirects de personne, L'expression de la fréquence et de la répétition	02
20	Leçon 10 : Expressions orales sur : Les moyens de	02

	communication (courrier, téléphone, internet)	
21	Leçon 10 : Situations orales : Aborder quelqu'un	01
22	Leçon 10: Situations orales : se présenter, faire valoir son droit	02
23	Leçon 10: Situations orales : Exprime une opinion sur la vérité d'un fait	01
24	Leçon 10 : Phonétique : Rythme des constructions avec pronoms, Différenciation [ f], [ʒ],[ s],[z]	01
25	Leçon 11 : Expressions orales sur : Passé récent, présent progressif, future proche, action achevée/ inachevée	03
26	Leçon 11 : expressions orales sur: Le corps, la santé et la maladie	02
27	Leçon 11 : Situations orales : parler de ses activités de loisirs	01
28	Leçon 11: Situations orales : Téléphoner/prendre rendez-vous	01
29	leçon 11 : Situations orales : Exposer un problème/réagir	01
30	Leçon 11 : Phonétique : son[y], Rythme des constructions négatives	01
31	Leçon 12: Expressions orales sur: La place de l'adjectif, la proposition relative avec « qui », C'est/Il est, impératif des verbes avec pronoms, la formation des mots	03
32	Leçon 12: Expressions orales sur: La description physique et psychologique des personnes, les vêtements, les couleurs	02
33	Leçon 12: Situations orales : Demander/donner une explication	01
34	Leçon 12 : Jeux de rôle	01
35	Leçon 12: Phonétiques : Différenciation masculin/féminin	01
36	leçon 12: Phonétiques : Différenciation [ø] , jeux de rôle	02

**References:**

Méthodes : Alter Ego - Niveau 1 / Michel Guilloux -Publisher :Hachette  
Champion - Niveau1/ [Annie Monnerie-Goarin](#) – Publisher : CLE  
International  
Panorama - Niveau 1/ Jacky Giradet, Jean Marie Cridlig -  
Publisher : CLE International

**Course Title: Language in Context: Developing Reading and Writing Skills LEVEL 2 PART 1**

**Course Code : FRE-III.C-5**

**Marks : 100**

**Credits : 4**

**Duration : 60 Hours**

**Prerequisites ; NIL**

**Name of Text: PANORAMA Niveau -2**

### **COURSE OBJECTIVES:**

1. The course aims at enabling the students to acquire competence in general communication: both oral and written.
2. The students learn the nuances of the french language as well as the culture and civilisation of the country and the behaviour patterns and life style of modern France.
3. The course aims at enabling the students to apply these skills in real life situations.
4. The course aims at enabling the students to work individually or in small groups.

### **COURSE OUTCOMES:**

At the end of the course the students will be able to:

CO1: Demonstrate reading and writing proficiency in French at level A2.1 of CECR.

CO2: Draft formal letters (job application, request for information, draft a CV and complaint letters).

CO3: Create basic promotional material pertaining to a popular tourist spot.

CO4: Understand short press articles on various topics and comment on the same.

CO5: Appreciate short literary extracts from theatre and films.

### **Syllabus:**

Units 1, 2,3 of Méthode de Français Panorama 2, will be the syllabus for Semester 3

### **Module 1 (15 hrs)**

Leçon 1

Grammaire : Présent et présent progressif,  
passé composé, imparfait  
passé récent, futur et futur proche.

Vocabulaire : biographie,  
les arts plastiques

Compréhension et expression écrite :  
Se présenter dans une lettre officielle  
Compréhension d'une biographie  
Art classique et art moderne

Leçon 2:

Grammaire : Le système des pronoms compléments.  
Constructions : forme affirmative, forme négative, forme interrogative  
et forme impérative.

Vocabulaire : Comportement et Personnalité  
La ville

Compréhension et expression écrite :  
La cohérence du texte grâce à l'emploi des pronoms  
Descriptions et commentaire  
La province  
Une petite ville de Bretagne : Dinan

Leçon 3 :

Grammaire : formes du subjonctif présent :  
Emploi dans l'expression de la volonté, la demande, la nécessité,  
l'obligation.  
Les formes de l'interrogation

Vocabulaire : savoir, mémoire  
Oubli, vérité et mensonge  
Les gestes et les attitudes

Compréhension et expression écrite :  
Se plaindre, Compréhension d'un dialogue de théâtre  
Comportements face à l'information  
La comédie de boulevard  
Plaisanteries et canulars.

## **Module 2 (15 hrs)**

Leçon 4 :

Grammaire : Le sens passif : forme passive  
Forme se faire + verbe  
Forme pronominale a sens passif

Vocabulaire : les sports  
La télévision

Compréhension et expression écrite :  
Présenter une organisation  
Compréhension d'opinions  
Les sports en France  
Problèmes de media

Leçon 5 :

Grammaire : expression de la durée.

Vocabulaire : Les faits divers :  
Catastrophes, accidents  
crimes, délits

Compréhension et expression écrite :  
Compréhension de faits divers  
Les banlieues  
Panorama socio-économique de la France

### **Module 3 (15 hrs)**

Leçon 6 :

Grammaire : Expression de la certitude et du doute  
De la possibilité ou de l'impossibilité  
De la probabilité ou de l'improbabilité  
Discours rapporte au présent

Vocabulaire : L'architecture  
Vocabulaire propre à l'expression de la fonction et de l'organisation

Compréhension et expression écrite:  
Compréhension et rédaction d'un texte à caractère informatif.  
Les grands travaux des années 80 et 90 à Paris  
Le rôle historique de Général de Gaulle  
Mai 1968

Unité 3, Leçon 7

Grammaire : Le conditionnel présent

Vocabulaire : Le budget  
Les monuments

Compréhension et expression écrite :  
Formuler une demande officielle  
Quelques moments célèbres

### **Module 4 (15 hrs)**

Leçon 8:

Grammaire : Pronoms interrogatifs  
Pronoms possessifs  
Pronoms démonstratifs

Vocabulaire : Le théâtre  
Les mouvements et les actions  
Le décor

Compréhension et expression écrite :  
Raconter une suite d'actions  
Le théâtre actuel (satire des comportements)

Leçon 9 :

Grammaire : Le plus que parfait  
Le discours rapporté au passé.

Vocabulaire : Sentiments et réactions face à une réalité agréable ou désagréable.  
Le cinéma

Compréhension et expression écrite :  
Féliciter-complimenter  
Lettres de félicitations  
Aspects du cinéma- La « Nuit des Césars »

### **References:**

- 1) Echo – Méthode de français B-2 – Clé International Jacky Girardet; Jacques Pécheur; Colette Gibbe
- 2) Expression Ecrite, Niveau 2 Authors : Michèle Barféty / Patricia Beaujourn

**Web References:**

Français avec Pierre

Podcastfrançaisfacile.com

Comme une française

Un flux RSS

Duolingo.com

Les Zexperts FLE

DEL F A2: French studies diploma level A2 : DELF – DALF

**Course Title: Language in Context: Developing Reading and Writing Skills LEVEL 2 PART 2**

**Course Code: FRE-IV.C-6**

**Marks: 100**

**Credits: 4**

**Duration: 60 Hours**

**Name of Text : *PANORAMA Niveau 2***

### **COURSE OBJECTIVES:**

The course aims at

1. enabling the students to acquire competence in general communication both oral and written.
2. The students learn the nuances of the french language as well as the culture and civilisation of the country and the behaviour patterns and life syle of modern France.
3. The course aims at enabling the students to apply these skills in real life situations.
4. The course aims at enabling the students to work individually or in small groups.

### **LEARNING OUTCOME:**

At the end of the course the students will be able to:

1. Demonstrate reading and writing proficiency in French at level 2
2. Demonstrate the ability to describe and express their viewpoints on various topics of the units completed.
3. Apply, question and summerize in french based on the contents of the units completed.

**Syllabus:**

**Units 4,5, 6 of Méthode de Français Panorama 2, willbe the syllabus for semester 4**

### **Unité 4 Leçon 10**

**Grammaire :** Les adverbes

Le Gérondif

La proposition participe présent

No. of Hours :2

**Vocabulaire :** L'amitié et l'amour

La haine

Les impôts

No. of Hours: 02

**Compréhension et expression écrite :**

Caractériser des actions

Décrire une évolution

Les relations entre homme et femmes

Sujets de préoccupations au cours de l'année.

No. ofHours: 03

## **Leçon 11**

**Grammaire :** Les adjectifs et les pronoms indéfinis

Expression de la quantité

No. ofHours : 02

**Vocabulaire :** La chanson

Sensation et perceptions

No. ofHours : 02

**Compréhension et expression écrite :**

Exprimer un idéal, un rêve passé ou présent

La chanson française

Ideaux et comportements dans l'année 70, 80,90

No. ofHours : 03

## **Leçon 12**

**Grammaire :** Les proposition relatives avec qui, que , où , dont

No. ofHours : 02

**Vocabulaire :** Les objets et les actions de la vie domestique

No. Of Hours : 01

**Compréhension et expression écrite :**

Réalisation des textes poétique à partir de structures grammaticales fixes



Quelques poètes contemporains

Les français et l'humour

No of Hours : 03

### **Unité 5 Leçon 13**

**Grammaire :** Le conditionnel passe

Le futur antérieur

No. Hours

**Vocabulaire :** attitudes et sentiments ; courage, peur, timidité

Dangers et risques – sécurité et protection

No. Of Hours : 02

**Compréhension et expression écrite :**

Mettre en garde- avertir- conseiller

No. Of Hours: 02

### **Leçon 14**

**Grammaire :** expression de but, de la cause et de la conséquence

No. Of Hours: 02

**Vocabulaire :** l'agriculture

Les végétaux

L'écologie

No of Hours: 02

**Compréhension et expression écrite:**

Comprendre un explication

Rassurer-donner des garantis

La protection de l'environnement et du paysage, parcs régionaux et réserves naturelles

No. ofHours: 03

### **Leçon 15**

**Grammaire :** Situer dans le temps

Constructions avec deux pronoms antéposés

No. ofHours: 02

**Vocabulaire :** la loi, le droit

La responsabilité

No. ofHours: 02

**Compréhension et expression écrite:**

Demande/ donner une autorisation

Informatique, nouvelles technologies et libertes

La ville de Strasbourg

No. of Hours: 03

**Unité 6, Leçon 16**

**Grammaire :** sens et emploi des articles

Comparaison et appréciation des quantités

No. ofHours: 02

**Vocabulaire :** Objets et fonctionnements technologiques dans la vie quotidienne

Les professions

No. of Hours: 02

**Compréhension et expression écrite:**

Faire un constat (accident, défectuosité etc.)

Nouveaux comportements professionnels

Nouvelles professions

No. ofHours: 03

**Leçon 17**

**Grammaire :** Révision des temps du récit

Compréhension du passe simple

No. ofHours: 02

**Vocabulaire :** Les sciences

La médecine et la santé

No. ofHours: 02

**Compréhension et expression écrite:**

Comprendre un récit au passé simple

Découvertes scientifiques et technologiques

La génétique en question

No. ofHours: 03

**Leçon 18****Grammaire :** La nominalisation

Expression de l'opposition

No. of Hours: 02

**Vocabulaire :** La justice

L'éducation

No. ofHours: 02

**Compréhension et expression écrite:**

Faire une liste d'arguments

Développer un argument

Controverses, débats et procès d'actualités

No. ofHours: 02

**References:**

1) Echo – Méthode de français B-2 – Clé International

2) Expression Ecrite, Niveau 2

Authors : Michèle Barféty

Patricia Beaujourn

**2016**

**Course Title: Language in Context: Developing Listening and Speaking Skills LEVEL 2  
PART 1**

**Course Code: FRE-III.E-1**

**Marks: 100**

**Credits: 4**

**Duration: 60 Hours**

**Prerequisites: NIL**

**Name of Text : PANORAMA Niveau 2**

**COURSE OBJECTIVES:**

1. The students will be trained to use the language in realistic settings rather than to focus merely on written exercises. Language will be used to perform tasks involving a meaningful communication between language speakers.
2. The course aims at enabling the students to acquire skills in oral expression and also comprehension of songs, plays, dialogues etc in simple french.
3. The course also enables the students to work individually or in small groups.

**COURSE OUTCOMES:**

At the end of the course students will be able to:

CO1: Demonstrate listening and speaking proficiency at level A2.1 of CECR.

CO2: Express one's dissatisfaction, regrets, convince or persuade, express approval and disapproval, give instructions and ask for information.

CO3: Comprehend audio extracts from day-to-day situations.

CO4: Create a video clip (short film, reporting an event, news snippets).

CO5: Conduct short interviews, perform short plays and recite poetry.

**Syllabus:**

**Oral comprehension based on the units 1, 2 and 3 of the text Panorama 2**

**Module 1 (15 hrs)**

Unit 1

Présenter, caractériser une personne, aborder quelqu'un, apprécier, se plaindre, revendiquer, faire des suppositions, convaincre, émettre des réserves, exprimer son ignorance, les voyelles non nasalisées, les voyelles nasalisées, intonation de l'interrogation.

Unit 2

Raconter les étapes d'une entreprise, raconter une suite de faits, situations en relation avec les acquisitions grammaticales, jeux avec voyelles en position finale, le son (y)

Unit 3

Exprimer une supposition, faire une hypothèse, suggérer de faire quelque chose, exprimer de la possession, choisir, donner des instructions, s'indigner-se disputer, demander des informations sur des faits passés, poser un cas de conscience, regretter, approuver et désapprouver, articulation des consonnes.

### **Module 2 (15 hrs)**

Listening comprehension of these units.

### **Module 3 (15 hrs)**

Recitation, role play, simulation through audio-visual resources.

### **Module 4 (15 hrs)**

Presentation based on the topics of each unit, exploring online references etc. to improve oral skills.

### **References :**

- 1) Echo – Méthode de français B-2 – Clé International  
Authors: Jacky Girardet; Jacques Pécheur; Colette Gibbe

- 2) Expression Ecrite, Niveau 2

Authors : Michèle Barféty  
Patricia Beaujourn

**Web References:** Français avec Pierre  
podcastfrançaisfacile.com  
Comme une française  
Frenchspin.com  
Duolingo.com  
Les Zexperts FLE  
Lexiquefle.free.fr.famille

**Course Title: French for Tourism and Hospitality PART 1**

**Course Code: FRE-E-2**

**No. Of Credits: 4**

**Marks: 100**

**Duration: 60 Hours**

**Prerequisites: NIL**

**Name of Text: *Bon Voyage***

### **COURSE OBJECTIVES:**

1. To acquire basic skills required to work in the domain of tourism and hospitality and to create an ability to understand and communicate (read, write, speak and understand in French) in basic situations.
2. To develop oral and written skills in French, in the domain of tourism and hospitality.
3. To enable the students to apply the skills in real life situations and to understand and use documents in the target language from various media eg tariff cards, reservation forms, tourist guide literature.
4. To write composition on subjects of personal interest based on the Tourism and hotel industry and enable the students to compare and contrast France and India and other francophone countries with respect to tourist locations and the different categories of tourists.
5. To use different media for course related tasks: dictionaries, internet, newspapers, television and documentaries.

### **COURSE OUTCOMES:**

At the end of the course the students will be able :

- CO1: To understand and draft a CV, introduce one's company and job profile, successfully, conduct a telephonic conversation in a formal setting, note down and understand a telephonic message and leave a message.
- CO2: To communicate with a client, give directions, suggest tourist spots, handle hotel bookings and cancellations and provide information on transport facilities in French.
- CO3: To welcome and serve passengers on flight, inform about the various services and restrictions on board a plane, handle ticket bookings, reservations and cancellations.
- CO4: To be aware of the different types of tourism and be able to prepare promotional material, prepare a well-guided multicity itinerary and understand and explain a menu card.

CO5: To have a general understanding of the intercultural nuances, history and architecture and narrate a few anecdotes related on touristic sites and monuments.

### **Module 1 (15 hrs)**

**a) Vocabulary and utilisation and significance of expressions**

i) Se présenter, présenter quelqu'un, parler de soi, de son travail, de sa famille

ii) Renseigner sur : les horaires, l'indicatif pour téléphoner, les jours et heures d'ouverture et de fermeture

iii) Décrire un objet perdu, un hôtel, une chambre, un restaurant

**b) Grammaire:**

i) les nationalités, les professions, les chiffres, ii) Est-ce que, iii) la négation,

i) l'heure, ii) les jours de la semaine, iii) les préposition avec les verbes « arriver » et « partir »

i) Décrire un objet perdu ii) un hôtel une chambre iii) un restaurant)

**c) Jeu de rôle**

-Je vous présente...., Le vol part à

- C'est un grand hôtel luxueux

**d) L'expression écrite**

(Rediger des récits et des dialogues)

### **Module 2 (15 hrs)**

**a) Vocabulary and utilisation and significance of expressions**

-se renseigner et renseigner sur un hôtel, renseigner sur le climat et les vêtements

- décrire un lieu, une ville, une région, un pays, et les loisirs qu'ils offrent, exprimer une préférence, indiquer un chemin.

- Annoncer l'itinéraire aux touristes, initiation à la rédaction écrite d'un itinéraire

**b) Grammaire:**

- l'interrogation, la négation, les caractéristiques d'un hôtel : situation, confort, facilité etc.

les saisons, les mois, les vêtements.

- Le verbe faire et les prépositions, l'emploi des verbes aimer/préférer, les adjectifs démonstratifs, les sports et les loisirs, completion of exercises based on grammar and Text

- Le futur proche et futur simple, les adverbes de lieu y et en, les expressions de temps.

**c) Jeu de rôle (à la réception, à l'office du tourisme, dans le bus touristique)** -C'est un hôtel deux étoiles, Quel beau temps ! A la reception

- C'est à 3 kilometres... Dars La rue

- Ce matin on va visiter, Cette région vous offre ...Dars le car / bus touristique.

**d) L'expression écrite**

(Rediger des récits et des dialogues)

### **Module 3 (15 hrs)**

**a) Vocabulaire et utilisation et signficance des expressions**

-s'excuser, apaiser un client, expliquer, proposer une solution, prendre et transmettre des messages.

- Décrire un plat et une recette, conseiller des plats aux clients

- raconter un événement au passé, parler de l'histoire d'un monument, renseigner sur : les tarifs, les services d'un hôtel, location d'une voiture.

**b) Grammaire:**

- Les expressions pour s'excuser, se plaindre et apaiser, pronoms personnels : lui, leur, le, la, les

Les expressions d'une conversation téléphonique, Article partitif, pronoms personnels : en  
adverbes de quantité, completion of exercises based on grammar and text

- Passé composé, Imparfait, les services de l'hôtel

**c) Jeu de rôle**

-Nous sommes vraiment désolés, voudriez-vous laisser un message ?

- C'est du poulet avec.....

- Il faut payer un supplément....

**d) L'expression écrite**

- Rediger des récits et des dialogues

### **Module 4 (15 hrs)**

a) Vocabulaire / utilisation et signification des expressions

- Décrire une ville, un pays, une région

- Renseigner à l'oral et à l'écrit sur un hôtel

- Conseiller un client a propos : d'un circuit, du code de la route, des



vêtements à emporter.

**b) Grammaire:**

- Le comparatif, le superlatif, les pronoms relatifs, la négation : ne rien, ne jamais.
- Les vêtements, les expressions utilisées pour interdire, Si + présent + future.
- Les verbes pronominaux, Questionnaire de satisfaction.

**c) Jeu de rôle**

- C'est la ville la plus belle
- Il ya 300 chambres avec...
- Je regrette...il est conseillé de prévoir

**d) L'expression écrite.**

(Rediger des récits et des dialogues)

**References:**

- 1) Carnet de voyage : Craig Thompson
- 2) French for Hotel Management & Tourisme Industry : S. Bahattacharya/ Uma S. Bhalerao
- 3) Service Compris- Author : Serge Heliot
- 4) A votre Service - Part 2 - Author: Rajeswari Chandrasekar, Rekha Hanga.

**Web References :**

1. Le tourisme en France – Worldcat.org  
Tourisme en France, les principaux chiffres et sites
2. Tourisme en France avec TV5
3. Le Tourisme en France : les chiffres clés du secteur  
Dix chiffres sur le Tourisme en France et dans le monde
4. Paris – Office du Tourisme – site officiel
5. France tourisme.fr

**Course Title: Study of Selected Elementary Text in French**

**Course Code: FRE-E-3**

**Crédits: 4**

**Marks : 100**

**Duration: 60 Hours**

**Prerequisites: NIL**

**Name of Text : Selected two text from the collection ‘Français Facile’ (Drama/Novel/Short Stories)**

**COURSE OBJECTIVES:**

1. The course aims at enabling the students to get acquainted with classic French writers.
2. The course also aims at enabling the students to acquire skills to comprehend and comment on various themes of the text.
3. The course also aims to motivate the students to appreciate the other French writers.

**COURSE OUTCOMES:**

At the end of the course, students will be able to:

CO1: Read and comprehend two literary texts in French.

CO2: Comment on the different themes of the text.

CO3: Create simple texts in French to summarize and critically appreciate the text.

CO4: Gain and understand the historical and socio-cultural contexts of the texts.

Text Prescribed:

Texte en Français Facile : **Texte 1 – roman/nouvelle**

Le temps des secrets - Marcel Pagnol

Le château de ma mère – Marcel Pagnol

Candide – Voltaire

**Texte 2 – pièce de théâtre**

Le malade Imaginaire - Molière

**Module 1 (15 hrs)**

De l’auteur et ses œuvres.

Lecture et compréhension du text 1.

**Module 2 (15 hrs)**

Discussions des themes et redaction de petits commentaires.

**Module 3 (15 hrs)**

De l’auteur et ses œuvres.

Lecture et compréhension du text 2.

## **Module 4 (15 hrs each)**

Discussions des themes et redaction de petits commentaires.

### **References:**

- 1) Littérature progressive du français.

Authors: N. Blondeau

F. Allouache

M. F. Né

### **Web References:**

SZEtude de Candide de Voltaire/superprof

Candide – 27 citations – References citations

Marcel Pagnol : Wikipedia

Le temps des secrets: Wikipedia

Le temps des secrets : Goodreads

**Course Title: Language in Context: Developing Listening and Speaking Skills LEVEL 2 PART 2**

**Course Code: FRE- IV.E-5**

**Marks : 100**

**Credits: 4**

**Duration: 60 Hours**

**Name of Text : *PANORAMA Niveau 2***

**COURSE OBJECTIVES:**

1. The students will be trained to use the language in realistic settings rather than to focus merely on written exercises. Language will be used to perform tasks involving a meaningful communication between language speakers.
2. The course aims at enabling the students to acquire skills in oral expression and also comprehension of songs, plays, dialogues etc in simple French.
3. The course also enables the students to work individually or in small groups.

**LEARNING OUTCOMES:**

At the end of the course students will be able to:

1. Demonstrate reading proficiency at level 2
2. Present ideas in French in a coherent manner using the oral skills acquired.
3. Communicate effectively in French on various topics.

**Syllabus:**

**Oral Comprehension based on the units 4,5 and 6 of the text *Panorama 2***

**Unit 4:**

Décrire une évolution, décrire un comportement, séquences d'actes de parole dans des situations quotidiennes, expression de l'indifférence, expression des sensations, négocier, prendre une décision en groupe,

No. of Hours : 05

**Unit 5 :**

Anticiper sur des événements futurs, faire une hypothèse au passé – regretter, avertir- mettre en garde, expliquer, mettre en relation une série de faits, rassurer-donner des garanties, raconter un souvenir, juger, critiquer un acte, une attitude.

No. of Hours : 05

**Unit 6 :**

Situations courantes de dialogues entre professionnels et non-professionnels, raconter une recherche, une découverte, accuser- défendre, argumenter.

Prononciation des mots d'origine étrangère, intonations expressives propres à l'argumentation.

No. of Hours : 05

Listening comprehension of these units. (No. of Hours:15)

Recitation role play, simulation through audio-visual resources. (No. Of Hours: 15)

Presentation based on the topics of each unit, songs etc. to improve oral skills. (No. of Hours: 15)

**References :**

1) Echo – Méthode de français B-2 – Clé International

2) Expression Ecrite, Niveau 2

Authors : Michèle Barféty  
Patricia Beaujourn

**Course Title: French for Tourism and Hospitality Part 2**

**Course Code: FRE-IV.E-6**

**Credits: 4**

**Marks: 100**

**Duration: 60 Hours**

**Name of Text: TOURISME.COM**

**COURSE OBJECTIVE:**

1. The acquisition of an extended competence in spoken French with a marked evolution (in comparison to volume 2 part 1) towards situations related to tourism proper: description of excursions, guided tours of historical sites etc.
2. Understand the various aspects of the French civilisation and thus develop intercultural awareness.
3. Understanding various expressions that can be used in real life communication situations.
4. Translation Techniques.

**LEARNING OUTCOMES:**

1. At the end of the course the students will have acquired the necessary skills of expression and comprehension of French required in the domain of Hotelier and tourism industry at level 2.
2. Students will be able to draft slogans and advertisements for travel agencies and draft travel itineraries for travel organisations.
3. Undertake telephonic bookings and cancellations and make alternate arrangements by suggesting alternate solutions.

Units 4, 5, 6 of Tourisme.com will be the syllabus for Semester IV

Chapter wise break-up of teaching Hourss amounting to a total of 60 Hourss.

**UNIT 4**

**Leçon 1** : Informer à l'office du tourisme : 2hrs

Savoir faire : Renseigner sur les activités proposées par une ville

Grammaire : Préposition de lieu

**Leçon 2** : Traiter des demandes écrites

Savoir faire : Rédiger une lettre commerciale : mise en forme et formules

Grammaire : Formes linguistiques de la lettre commerciale

**Leçon 3** : Promouvoir un site touristique : 2hrs

Savoir faire : Rédiger une lettre publipostage

Grammaire : Place des adjectifs qualificatifs

**Leçon 4** : Des brochures pour informer : 2hrs

Savoir faire : Comprendre le demande d'un visiteur et proposer une Documentation adéquate

Grammaire : Expression de la comparaison : comparatif et superlatif

**Activité** : Faites le point grammatical, faites le point professionnel

## **UNIT 5**

**Leçon 1** : Identifier des produits touristique : 2hrs

Savoir faire : Connaitre les caractéristiques techniques des produits Touristiques

Grammaire : Adjectifs indéfinis

**Leçon 2** : Rédiger un circuit : 2hrs

Savoir faire : se familiariser avec la mise en forme, le style des Brochures des voyagistes

Grammaire : Adjectifs indéfinis

**Leçon 3** : Mener un entretien de vente : 2hrs

Savoir faire : Connaitre les différentes étapes d'un entretien de vente

Connaitre : Nominalisation

**Leçon 4** : Annuler une réservation : 2 hrs

Savoir faire : Annuler une réservation et proposer des solutions de remplacements

Grammaire : Pronoms personnels directs, doubles pronoms Personnels compléments

**Activité** : Faites le point grammatical, faites le point professionnel

## UNIT 6

**Leçon 1** : S'informer pour bien guider : 2hrs

Savoir faire : Utiliser des outils documentaires : guide et  
Cartographie

Grammaire : Imparfait et passé composé

**Leçon 2** : Visiter la ville : 2hrs

Savoir faire : Préparer une visite guidée

Grammaire : Expression du temps : Actif et passif

**Leçon 3** : Présenter un monument : 2hrs

Savoir faire : Décrire un monument : son histoire,  
Son architecture et les anecdotes qui lui sont liées

Grammaire : Pronoms relatifs : dont, où

**Leçon 4** : Gérer un groupe : 2hrs

Savoir faire : Adapter commentaires et attitudes au groupe

Grammaire : Pronoms personnels : en et y, négation ne plus, ne rien,  
Ne personne, ne jamais

Activités : Faites le point professionnel, : 2hrs

Faites le point grammatical

### References :

1) FrançaisHôtellerie – Restauration. Com

Authors : J.L. Penfornis/ S. Corbeau/ Ch. Dubois/L. Sémichon/ L. Habert

2) Français du Tourisme

3) Bon Voyage

4) A votre Service –Level 2

5) Carnet de voyage

6) French for Hotel Management &Tourisme Industry : S. Bahattacharya/ Uma S. Bhalerao

7) Service Compris- Author : Serge Heliot

8) Bon Voyage- Author : Mc-Graw Hill Education

9) A votre Service-Part 2 -Author :RajeswaniChanderasek Krishnan.



**Course Title: Introduction to Francophony**

**Course Code: FRE- IV. E- 7**

**Credits: 4**

**Marks: 100**

**Duration: 60 Hours**

**Name of Text : Civilisation progressive de la Francophonie: Niveau Débutant**

**COURSE OBJECTIVES:**

1. The course aims at enabling the students to get acquainted with different aspects of the civilisation of francophone countries.
2. The course also aims at enabling the students to acquire skills to comprehend and comment on various themes of the text.

**LEARNING OUTCOMES:**

At the end of the course, students will be able to:

1. Demonstrate reading and writing proficiency with reference to the prescribed text.
2. Demonstrate the ability to describe and comment on the themes of the text.
3. Write in simple French small texts to summarize the different themes of the text.

PrescribedText: Civilisation progressive de la Francophonie: Niveau Débutant

**Topics:**

1. La Francophonie, c'est quoi ? L'évolution de la Francophonie. Les pays Francophones, Le fonctionnement de la Francophonie, Les opérateurs de la Francophonie.

No. of Hours: 4 (1 Hours each)

2. Les danses. No. of Hours: 4 (1 Hours each)

3. La musique. No. of Hours: 4 (1 Hours each)

4. Les fêtes. No. of Hours: 4 (1 Hours each)

5. Les traditions. No. of Hours: 3 (1 Hours each)

6. L'habitat, No. of Hours: 3(1 Hours each)

7. La religion. No. of Hours: 3 (1 Hours each)

8. Les jeux. No. of Hours: 3(1 Hours each)

9. La cuisine. No. of Hours: 3 (1 Hours each)

10. Les modes de vie. No. of Hours: 3 (1 Hours each)

11. Les languesmaternelles . No. of Hours: 3 (1 Hours each)

12.La mode. No. of Hours: 3 (1 Hours each)

13. Les grandscinéastes. No. of Hours: 3 (1 Hours each)

14. Les grandsécrivains. No. of Hours: 3 (1 Hours each)

15. Activités: Questions et réponses, récitation, rédiger le commentaire, etc. No. of Hours: 14 (1 Hours each)

**References:**

1) Civilisation progressive de la francophonie

Author: J. Noutchié

**Course Title: Initiation to Translation**

**Course Code: FRE-V.E-8**

**Marks: 100**

**Credits: 4**

**Duration: 60 Hours**

## **COURSE OBJECTIVES**

1. To familiarize students with the various techniques of translation and the theoretical and cultural fundamentals associated with it.
2. To give students an opportunity to develop translation skills by concurrently offering methodology and practice.
3. To enhance student's translation technique in domains undertaking literary, non-literary, business and technical translations by making them aware of the semantic and structural differences involved, the different approaches to follow and the different expectations to be met in each case.
- 4. Give students an understanding of the difficulties and responsibilities faced by a translator and offer guidance to follow the principles of ethics in Translation studies in general.
5. To develop practical and marketable skills for foreign language students, and ensure that they are at par with similar courses of study elsewhere in the world.

## **COURSE OUTCOMES**

The students will be:

1. familiar with the translation techniques and display a good level of proficiency while dealing with translation works, through the use of the various strategies put at their disposal.
2. Effectively convey a message from one language to another, by shaping their thoughts into words and finding solutions to puzzling semantic and structural obstacles.
3. Move beyond literal translations to a fluid and idiomatic rendition of the source text having acquired broad linguistic and cultural knowledge in English and French.
4. Search, find, Identify and be able to use tools (both online and offline) that are required to conduct literary and non literary translations from French to English and vice versa.
5. Understand the complexities and problems of translation and the translator's role as an intermediary. .
6. Display knowledge of the structure of the French language and the origin of expressions and words.

7. Critically compare and evaluate their own translations and those of others, based on the knowledge acquired by them as well as justify their own works of translation.

8. Display remarkable competence in other areas of foreign language acquisition such as: reading and writing skills, pronunciation, grammar, vocabulary, memory recall and oral comprehension and thus communicate in French in a very efficient manner.

9. Function effectively in situations relating to interlinguistic and intercultural mediation such as: organisers of events that make use of interpreting skills, organizers of translation work, editors and others in the publishing field, and those who work in the media, in public relations, tourism and hotel industry and in similar areas.

10. Display team spirit and group work abilities, participate in group activities, cooperate with others, recognise other people's opinions and perform one's duties and defined roles within the group/team.

**Name of the Text : The Beginning Translators Workbook: The ABCs of French to English Translation**

**Author: Michele H. Jones**

**SYLLABUS** : Selected topics from the text book will be used as the syllabus for the course.

Sr. No.	Topics	Subtopics	Hours
1.	Introduction, Definitions and Translation Units	- Basic Terminology - Linguistics and metalinguistic - Formation of language - Elements that influence formation of language - What are translation unit and what is their purpose	6 hours
2.	Words in context	- Polysemy: Words and their semantic range - Literal v/s figurative - Standard language v/s language of speciality - Gender problems - Computer translations and the problem of polysemy	6 hours
3.	Deceptive Cognates	- Faux amis - Cognates and deceptive cognates - Partial faux amis - Unrelated similar looking words	6 hours
4.	Translation Techniques	- Main problems in translation - What strategies do translators have at their disposal - The various translation	3 hours

		techniques	
5.	Borrowing	<ul style="list-style-type: none"> <li>- Borrowing and its purpose</li> <li>- Examples of linguistic deficiencies</li> <li>- French-English: history of mutual borrowing</li> <li>-Creative borrowing</li> <li>-Use of borrowing</li> </ul>	5 hours
6.	Calque	<ul style="list-style-type: none"> <li>- What is calque</li> <li>- Semantic and structural calques</li> <li>- calque and neologisms</li> <li>- Calque v/s borrowing</li> </ul>	5 hours
7.	Literal Translation	<ul style="list-style-type: none"> <li>-What is literal translation</li> <li>- Structural obstacles to literal translation</li> <li>-Differences in word order</li> <li>- Gallicisms and Anglicism</li> <li>-Special problems with verb tenses</li> </ul>	5 hours
8.	Transposition	<ul style="list-style-type: none"> <li>- What is transposition</li> <li>- Examples of necessary and optional transpositions</li> <li>- Noun / verb transposition</li> <li>-Cross transposition</li> </ul>	5 hours
9.	Modulation	<ul style="list-style-type: none"> <li>- What is modulation</li> <li>- Word modulations</li> <li>- Grammatical modulation</li> <li>-Message modulations</li> <li>- Necessary and optional modulations</li> <li>- Modulation and Transposition</li> </ul>	5 hours
10.	Equivalence	<ul style="list-style-type: none"> <li>- What is Equivalence</li> <li>- Exclamations and reflex formulas</li> <li>-Greetings and letter closings</li> <li>-Clichés and idioms</li> <li>- Slang and slang expressions</li> <li>-official signs and warnings</li> </ul>	5 hours
11.	Adaptation	<ul style="list-style-type: none"> <li>- What is adaptation</li> <li>- Linguistic deficiency and compensation</li> <li>-Adaptation in traditions, usages and institutions</li> </ul>	4 hours
12	Exercises and practice	Translation of Literary texts/ non-literary text/ newspaper articles, magazine extracts etc.	5 hours

References: A vast list of references have been provided by the text book.

**2017**

**Course Title: Overview of 17<sup>th</sup> Century French Literature**

**Course Code: FRE-V.E-10**

**Marks: 100**

**Credits: 4**

**Duration: 60 hours**

**COURSE OBJECTIVES:**

1. To enable the students to get an overview of the different aspects of 17<sup>th</sup> century French literature.
2. To strengthen the critical thinking abilities of the students and enable students to identify and appreciate the key literary trends of the 17<sup>th</sup> century.
3. To enable the students to get acquainted with specific literary expressions of the 17<sup>th</sup> century literature.
4. To enable the students to understand the connections between the different literary trends.

No. of hrs.

Topic 1 : la préciosité : aspects importants des œuvres précieuses.	03
Topic 2 : Les règles théâtrales classiques.	04
Topic 3 : La querelle de anciens et des modernes.	04
- La tragédie classique – Jean-Baptiste Racine et Pierre Corneille.	04
- La comédie classique – Molière	05
Topic 4 : Le caractéristiques du roman.	05
Topic 5 : les femmes écrivains	05
Topic 6 : Le fabuliste La Fontaine et son œuvre : Les Fables	05
: Étude en détails des fables suivantes : la composition, les thèmes, la description, les morales, la philosophie, etc.	25

- i) Le loup et l'agneau
- ii) Le lion et le rat
- iii) le renard et le bouc
- iv) L'alouette et ses petits avec le maître d'un champ
- v) Le laboureur et ses enfants
- vi) Le lion malade et le renard
- vii) La laitière et le pot au lait
- viii) Les femmes et le secret
- ix) Le gland et la citrouille
- x) La tortue et les deux canards

**LEARNING OUTCOME:**

At the end of the course, students will be able to:

1. Have an understanding of the principles of literary criticism and critical theory of seventeenth century French literature.
2. Acquire familiarity with a wide range of literary terms and genres including figurative language.
3. Display the ability to express acquired notions in a literary form.

**Reference books:**

1. Histoire de la littérature française XVII siècle : Lagard et Michard
2. Histoire de la littérature française XVII siècle : Castex et Surer
3. La Littérature française : Ligny et Rousselot.
4. Les Fables : Aesop / Panchantantra

**Pattern of question paper**

- |   |          |
|---|----------|
| QI) Reference to context based on the Fables. (Any 3 out of 4)              | 12 marks |
| QII) Answer in 4-6 lines questions based on topics 1 to 5. (Any 3 out of 4) | 12 marks |
| QIII A or QIII B. Answer in 12 -15 lines questions based on topics 1to5.    | 12 marks |
| QIV A or QIV B. Answer in 12-15 lines questions based on topic 6.           | 12 marks |
| QV A or QV B. Answer in 12-15 lines questions based on topic 6.             | 12 marks |

**Course Title: Overview of 18<sup>th</sup> Century French Literature**

**Course Code: FRE-V.E-11**

**Marks: 100**

**Credits: 4**

**Duration:60 hours**

**Syllabus introduced in 2017**

**COURSE OBJECTIVES:**

1. To enable the students to get an overview of the different aspects of French literature during eighteenth century.
2. To strengthen the critical thinking abilities of the students and enable them to identify and appreciate the literary trends of the 18<sup>th</sup> century litterature.
3. To enable the students to get acquainted with specific literary expressions of the 18<sup>th</sup> century literature.
4. To make the students understand the connections between different literary movements and note how each significant movement influences the next.

No.ofhrs.

Topic 1: - la naissance de la philosophie : Henri Bayle et Bernard Le Bovier de Fontenelle 09  
- la pensée politique : la réflexion sur des sociétés réelles...l'élaboration des lois

...vers

- un idéal politique : Voltaire, Montesquieu et Jean –Jacques Rousseau
- Philosophie et réflexion historique : Voltaire

Topic 2 : Les contes philosophiques : Voltaire 04

Topic 3 : L'œuvre de Diderot 06  
- L'œuvre de Rousseau

Topic 5 : La comédie amoureuse : Marivaux 06  
- La comédie satirique : Beaumarchais

Topic 6 : Étude en détails de la comédie « Le jeu de l'amour et du hasard » : le sujet de l'amour le marivaudage, les personnages, l'intrigue, le commencement, le déroulement de l'action, le dénouement, etc. 35

**LEARNING OUTCOME:**

At the end of the course, students will be able to:

1. have an understanding of the principles of literary criticism and critical theory of eighteenth century French literature.
2. acquire familiarity with a wide range of literary terms and genres including figurative language.
3. display an ability to express acquired notions in a literary form.

**Reference books:**

- 1.Histoire de la littérature française XVIII siècle : Lagard et Michard
2. Histoire de la littérature française XVIII siècle : Castex et Surer
- 3.La Littérature française : Ligny et Rousselot.
4. Le jeu de l'amour et du hasard: Marivaux



### **Pattern of question paper**

- Q I) Reference to context based on « Le jeu de l'amour et du hasard ». (Any 3 out of 4) 12 marks
- Q II) Answer in 4-6 lines questions based on topics 1 to 5. (Any 3 out of 4) 12 marks
- Q III A or QIII B. Answer in 12 -15 lines questions based on topics 1 to5. 12 marks
- Q IV A or QIV B. Answer in 12-15 lines questions based on topic 6. 12 marks
- QV A or QV B. Answer in 12-15 lines questions based on topic 6. 12 marks

**Course Title: Overview of 19<sup>th</sup> Century French Literature**

**Course Code: FRE-V.E-13**

**Marks: 100**

**Credits: 4**

**Duration: 60 hours**

**COURSE OBJECTIVES:**

1. To enable the students to get an overview of the different aspects of 19<sup>th</sup> century French literature .
2. To enable the students to understand the flow of the literary movements from the previous centuries up to the 19<sup>th</sup> century.
3. To get the students acquainted with literary expressions in the 19<sup>th</sup> century works.
4. To make the students understand the connections between the literary movements of the 19<sup>th</sup> century and note how each significant movement influences the next.

No.ofhrs.

Topic 1: - aspects importants de la sensibilité romantique : Chateaubriand et Mme de Staël. 05

Topic 2 : La poésie romantique : Alphonse de Lamartine, Victor Hugo, Alfred de Vigny et Alfred de Musset.

05

Topic 3 : Le drame romantique : Alexandre Dumas, Alfred de Vigny, Victor Hugo et Alfred de Musset.

05

Topic 4 : Le roman romantique : Victor Hugo, George Sand.

04

Topic 5 : Le roman réaliste : Honoré de Balzac, Stendhal, Gustav Flaubert, Emile Zola.

06

- Le naturalisme : Guy de Maupassant.

03

- Le symbolisme : Paul Verlaine.

02

Topic 6: Le drame romantique « RuyBlas ».

30

drame romantique...mélange des genres...personnages... le sujet.. exposition ...  
action..dénouement...etc.

**LEARNING OUTCOME:**

At the end of the course, students will be able to:

1. Have an understanding of the principles of literary criticism and critical theory of nineteenth century French literature.
2. Acquire familiarity with a wide range of literary terms and genres including figurative language.
3. Display an ability to express acquired notions in a literary form.

**References:**

- 1.Histoire de la littérature française XIX siècle : Lagard et Michard
2. Histoire de la littérature française XIX siècle : Castex et Surer
- 3.La Littérature française : Ligny et Rousselot.
4. RuyBlas : Victor Hugo

**Pattern of question paper**

QI) Reference to context based on Ruy Blas. (Any 3 out of 4)	12 marks
QII) Answer in 4-6 lines questions based on topics 1 to 5. (Any 3 out of 4)	12 marks
QIII A or QIII B. Answer in 12 -15 lines questions based on topics 1to5.	12 marks
QIV A or QIV B. Answer in 12-15 lines questions based on topic 6.	12 marks
QV A or QV B. Answer in 12-15 lines questions based on topic 6.	12 marks

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**Course Title: Business Communication in French**

**Course Code: FRE-VI.E-14**

**Marks: 100**

**Credits: 4**

**Duration: 60 hours**

**Introduced in 2017**

Textprescribed: affaires.com (Niveau avancé) (Unités 1,3,4 and 5)

**COURSE OBJECTIVES:**

1. To develop an ability to communicate in French in business situations.
2. To initiate the students to acquire the oral and written skills in French related to specific situations in the corporate world.
3. To enable the students to apply French language skills to professional life.

No. of hrs

Topic 1 : Acteurs économiques : 20

- a) Paroles d'actifs : distinguer différents types de travailleurs, décrire une journée de travail.
- b) Diversité des entreprises : identifier et classer les entreprises.
- c) Banque de crédit : découvrir les services bancaires, lire/mettre en page une lettre commerciale.
- d) Défense du consommateur : identifier les revenus des ménages, examiner les droits du consommateur.
- e) Rôle de l'État : identifier le rôle de l'État, caractériser l'impôt, participer à un forum internet.
- f) correspondance professionnelle : écrire une lettre de réclamation.

Topic 2 : Ressources humaines : 20

- a) Contrat de travail : analyser un contrat de travail/ une lettre d'engagement
- b) Profil de manager : consulter une offre d'emploi, dresser le profil d'un manager, rédiger un e-mail à l'attention de ses collaborateurs
- c) Organisation du travail : analyser/comparer différentes méthodes d'organisation et cultures d'entreprise
- d) Réunion de travail : préparer/assister à/ animer une réunion, rédiger un compte rendu de réunion
- e) examiner /apprécier les motifs de licenciement, analyser le droit de grève

Topic 3 ) Marketing :

- a) étude de marché : réaliser un questionnaire de marché, formuler des questions.
- b) définition du produit : positionner un produit, rédiger un rapport.
- c) méthodes de distribution : analyser les formes de distribution, rédiger un compte rendu
- d) moyens de communication : analyser différents moyens de communication, concevoir un message publicitaire.
- e) force de vente : examiner le rôle du vendeur et les techniques de vente
- f) révision de grammaire : l'impératif, la comparaison, adverbes de lieu, le discours rapporté, l'infinitif

- a) Prise de contact : identifier les partenaires de l'entreprise
- b) commande en ligne : comparer différents moyens de passer commande.
- c) service clientèle : formuler et traiter une réclamation (par lettre/téléphone/ e-mail)
- d) règlement de facture : demander un délai de paiement, répondre à cette demande

**References:** Internet resources.

Magazine and news paper articles.

**LEARNING OUTCOME :**

At the end of the course, students will be able to:

1. Interact more confidently when dealing with French speaking nations.
2. Understand the basics of French business environment.

**Pattern of question paper**

- QI) Questions on grammar(Any 3 out of 4) (Topics 1 to 4) 12 marks
- QII) A or B. questions to be answered in 12-15 lines based on topic 1 of 12 marks each/  
2 questions of 6 marks under A or B
- QIII) A or Q B. questions to be answered in 12-15 lines based on topic 2 of 12 marks each/  
2 questions of 6 marks under A or B
- QIV) A or Q B. questions to be answered in 12-15 lines based on topic 3 of 12 marks each/  
2 questions of 6 marks under A or B
- QV) A or Q B. questions to be answered in 12-15 lines based on topic 4 of 12 marks each/  
2 questions of 6 marks under A or B

**Course Title: Study of Collection of French Short Stories**

**Course Code: FRE-VI.E-15**

**Marks: 100**

**Credits: 4**

**Duration: 60 hours**

**Objectives:**

1. To initiate students to read and understand short stories using different perspectives.
2. To reinforce grammar rules, phrases and vocabulary.
3. To improve reading skills, encounter new words and phrases.

No.ofHrs.

Topic 1) Le genre : le conte, la nouvelle	02
Topic 2) Maupassant comme conteur : le naturalisme dans ses contes.	03
Topic 3) Les thèmes dans les contes de Maupassant : le pessimisme, la mort, l'humour, la misère, la pauvreté.	10
Topic 4) Les contes choisis :	45
i) Toine	
ii) Le papa de Simon	
iii) Mon oncle Jules	
iv) La parure	
v) La dot	
vi) Miss Harriet	
vii) La bête de maître Belhomme	
viii) La ficelle	
ix) L'auberge	
x) Denis.	

**LEARNING OUTCOME:**

At the end of the course, students will be able to:

1. Develop the abilities to analyze, organise and present the acquired information in a cogent fashion.
2. Critically appreciate the texts.
3. Identify the themes and contextualise the themes from the text studied.

**Reference books:**

1. Histoire de la littérature française XIX siècle: Lagard et Michard
2. Histoire de la littérature française XIX siècle: Castex et Surer
3. La Littérature française: Ligny et Rousselot.

**Pattern of question paper**

QI) Reference to context based on short stories (Any 3 out of 4)	12 marks
QII) Answer in 4-6 lines questions based on short stories (Any 3 out of 4)	12 marks
QIII A or QIII B. Answer in 12 -15 lines questions based on topics 1to 3	12 marks
QIV A or QIV B. Answer in 12-15 lines questions based on topic 4	12 marks
QV A or QV B. Answer in 12-15 lines questions based on topic 4	12 marks

# **GEOGRAPHY**

BA



**SYLLABUS FOR AUTONOMOUS COURSES IN GEOGRAPHY  
BACHELOR OF ARTS**

**SEMESTER III**

**REVISED AS ON 7<sup>TH</sup> APRIL 2018**

**CORE**

**Course Title:** GEG- III.C5 Cartography (Theory)

**Marks:** 75

**Credits:** 3

**Duration:** 45 lectures of 1 hour each

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**Course Objectives:** The course aims to provide basic cartographic concepts. This forms the basis for advanced cartographic techniques.

**Learning outcome:** After completion of the course, students will be familiar with basic cartographic concepts. This will help in developing cartographic skills taught in the practical component of this Course.

Unit	Topic	No. of hours	Marks
I	<b>Introduction:</b> Cartography. Scope of Cartography. Growth of modern cartography. Spatial data – Data nature and data sources. <b>Mapping Organizations in India</b> – Survey of India, NATMO, NRSCA, Lettering and color scheme in SOI Maps <b>Map symbolization:</b> Mapping qualitative data and quantitative data- using point, line and area symbols. Maps- Types- physical and cultural maps, SOI Conventional signs and symbols and Colour.	20	30
II	<b>Map projections:</b> General Principles: Classification, properties and choice of map projections. Merits and demerits. Cylindrical, conical and zenithal projections	15	25
III	<b>Introduction to topographical maps:</b> Indexing. Marginal information. Scales and gridding.	10	20
		45	75

**References**

1. Bygott, J. (2007), An Introduction to Map work and Practical Geography,
2. Campbell, J.(2004): Introductory Cartography, Prentice Hall Inc., Englewood Cliff
3. Misra, R.P. and Ramesh, A., (2005): Fundamentals of Cartography, Concept Publishing Company, New Delhi
4. Monkhouse, F.J. & Wilkinson, H.R., (2009): Maps & Diagrams, B.I. Publications, New Delhi
5. Robinson, A.H., et al: (2000) Elements of Cartography, John Wiley & Sons, New York ,
6. Raisz, E. ( 2004) Principles of Cartography, McGraw Hills, London ,
7. Singh, R. & Singh, R.: (2001) Map Work & Practical Geography, Central Book Depot, Allahabad.
8. Sarkar, Ashis (2000), Practical Geography: A Systematic Approach, Orient Longman Pvt. Ltd., Kolkata.
9. Talukder, S., (2008): Introduction to Map Projections, Eastern Book House, Guwahati

**CORE**

**Course Title: GEG-III.C5 Cartography (PRACTICAL)**

**Marks: 25**

**Credits: 1**

**Duration: 15 sessions of 2 hours each**

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**Course Objectives:** The course aims to develop skills of construction of scales, projections and preparation of map.

**Learning outcome:** After the completion of this course students are expected to be familiar with map projections.

Unit	Topic	Practical Sessions	Marks
I	Cylindrical Projections. Mercators Equidistance and Equal area	5	07
II	Conical Projections: One standard parallel. 2 standard parallel and Equal area	5	07
III	Zenithal Projections: Sterographic, Gnomonic, Orthographic	5	06
IV	Journal		05

**References**

1. Bygott, J. (2007), An Introduction to Map work and Practical Geography,
2. Campbell, J.(2004): Introductory Cartography, Prentice Hall Inc., Englewood Cliff
3. Elhance, D.N.,(2002): Fundamentals of Statistics, KitabMahal, Allahabad
4. Gregory, S., (2003): Statistical Methods and Geographers, Longman, London
5. Hammond, R. and McCullagh, P. (2005): Quantitative Techniques in Geography, Clarendon Press, Oxford Sarkar, Ashis, Practical Geography: A Systematic Approach, Orient Longman Pvt. Ltd., Kolkata.
6. Misra, R.P. and Ramesh, A., (2005): Fundamentals of Cartography, Concept Publishing Company, New Delhi
7. Monkhouse, F.J. & Wilkinson, H.R., (2009): Maps & Diagrams, B.I. Publications, New Delhi
8. Mahmood, A., (2009): Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi.
9. Robinson, A.H., et al: (2000)Elements of Cartography, John Wiley & Sons, New York ,
10. Raisz, E. ( 2004) Principles of Cartography, McGraw Hills, London ,
11. Singh, R. & Singh, R.: (2001)Map Work & Practical Geography, Central Book Depot, Allahabad.
12. Sarkar, Ashis (2000), Practical Geography: A Systematic Approach, Orient Longman Pvt. Ltd., Kolkata.
13. Talukder, S., (2008): Introduction to Map Projections, Eastern Book House, Guwahati

**ELECTIVE**

**Course Title: GEG-E1: Socio Economic Survey (THEORY)**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

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**Course Objectives:** The primary objective is to provide basic methodology in field based socio-economic survey.

**Learning outcome:** After the completion of this course, students will be familiar with techniques of socio-economic survey.

<b>Unit</b>	<b>Topic</b>	<b>No. of hours</b>	<b>Marks</b>
<b>I</b>	Socio-economic survey in Geography: Meaning and significance ,indicators of development Socio-economic indicators, Sources of data, Types of data – Social, Economic, Geographical and Demographic	15	25
<b>II</b>	Types of surveys: Historical, Social, Descriptive and Action Surveys. Sampling Techniques. Preparation of Questionnaire, Interview, Group Discussion, Planning Strategy and Implementing of Survey.	15	25
<b>III</b>	Based on the objective of the Survey. Pilot Survey, Planning for Main Survey, Pre-Survey and Post Survey Work. Safety Measures, Responsibility Sharing and Plan of Action. (a) Academic report – structure, layout, reporting language (b) Comprehensive report representation – photos, sketch, maps, etc.	15	25
		45	75

**References**

1. Bagavathi, V. & Pillai R. S. N. (2005) Statistical Theory and Practice, S. Chand Publication, New Delhi.
2. Gosh, B N (2007) Scientific Methods and Social Research, sterling Publishers Private Limited.
3. Kothari, C.R., (2004) Research Methodology- Methods and techniques, New Age International (P) Limited, New Delhi.
4. Mahmood, A., (2009): Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi.
5. Saravanavel, P.,( 2014), Research Methodology, KitabMehal, New Delhi
6. Singh, Gopal., (2010 ) Map Work and Practical Geography, Vikas Publishing House, New Delhi

**ELECTIVE**

**Course Title: GEG-E1: Socio Economic Survey (PRACTICAL)**

**Marks:25**

**Credits: 1**

**Duration: 15 Sessions of 2 hours each**

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**Course Objective:** The objective is to enable students to prepare questionnaires and carry out socio-economic surveys.

**Learning outcome:** The students will be able to conduct field surveys and independently write survey report. They also will be able to use computer for data analysis.

<b>Unit</b>	<b>Topic</b>	<b>Practical Sessions</b>	<b>Marks</b>
<b>I</b>	Questionnaire Formulation Field Book Preparation Literature Survey	04	05
<b>II</b>	Conducting on-field survey (Village, Market, Ward)	08	05
<b>III</b>	Data analysis using MS Excel and compilation	03	05
<b>IV</b>	Report		10

**References**

1. Bagavathi, V. & Pillai R. S. N. (2005) Statistical Theory and Practice, S. Chand Publication, New Delhi.
2. Gosh, B. N., (2007), Scientific Methods and Social Research, Sterling Publishers Private Limited., New Delhi
3. Kothari, C.R., (2004) Research Methodology- Methods and techniques, New Age International (P) Limited, New Delhi.
4. Mahmood, A., (2009): Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi.
5. Saravanel. P,( 2014), Research Methodology, KitabMehal, New Delhi
6. Singh, Gopal., (2010 ) Map Work and Practical Geography, Vikas Publishing House, New Delhi

**ELECTIVE****Course Title: GEG- E2: Field Survey in Physical Geography (THEORY)****Marks: 75****Credits: 3****Duration: 45 lectures of 1 hour each**

**Course Objectives:** The primary aim of this Course to introduce various surveying instrument used in Physical Geography. Students will learn the operation and the application of the instruments and methods of surveying.

**Learning outcomes:** At the end of this course students will be able to understand functions and applications of dumpy level, Plane table and Global Positioning Systems (GPS) in field based studies.

Unit.	Topic	No. of hours	Marks
I	Significance and Methods of Survey; Classification of Surveying; Fundamentals of Plane Table and Prismatic Compass Survey: a) Radiation Method b) Intersection Method Pre survey work: Safety Measures, Field Book Preparation Post field survey work Report Writing.	15	25
II	Dumpy level surveying : meaning, functioning elements, applications and Methods: Rise-fall and Collimation method Pre survey and Post survey tasks.	15	25
III	GPS survey: Meaning, Space Segment, Ground Segment and GPS Receivers, Applications.	15	25
		45	75

**REFERENCES**

6. Campbell, J. (2004), Introductory Cartography, Prentice Hall, Inc Englewood
7. Khullar.D.R. (2007), Essentials of Practical Geography, New Academic Publishing Co.,Jalandher
8. Misra, R.P. and Ramesh, A. (2005), Fundamentals of Cartography, Concept Pub. Co., New Delhi
9. Monkhouse, I.J. and Wilkinson, H.R. (2009), Maps and Diagram, B.I. Publication, New Delhi
10. Singh, R.L. and Singh Rana P.B.(2008), Elements of Practical Geography, Kalyani Publishers, New Delhi
11. Sarkar, Ashis (2000), Practical Geography: A Systematic Approach, Orient Longman Pvt. Ltd., Kolkata

**ELECTIVE**

**Course Title: GEG-E2: Field Survey in Physical Geography (PRACTICAL)**

**Marks: 25**

**Credits:1**

**Duration: 15 Sessions of 2 hours each**

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**Course Objectives:** The main objective of this course is to provide hands-on training in Plane Table, Dumpy Level and GPS survey.

**Learning outcome:** At the end of this course, students will be able to independently handle survey instruments and prepare maps and field reports.

Unit	Topic	Practical sessions	Marks
I	Plane table and Prismatic Compass Survey: a) Radiation Method :1 Exercises b) Intersection Method: 1 Exercises	07	10
II	Dumpy Level Survey: Rise-Fall GPS Survey: Use of GPS in Mapping And Location Observation Of Slope, River and Coastal Morphology on Field	08	10
III	Journal /Field report		5
		15	25

**References**

1. Campbell J. (2004), Introductory Cartography, Printice Hall, Inc Englewood
2. Khullar.D.R (2007), Essentials of Practical Geography, New Academic Publishing Co. Jalandher
3. Misra, R.P. and Ramesh, A. (2005), Fundamentals of Cartography, Concept Pub. Co., New Delhi
4. Monkhouse, I.J. and Wilkinson, H.R.(2009), Maps and Diagram, B.I. Publication, New Delhi
5. Singh, R.L. and Singh Rana P.B.(2008), Elements of Practical Geography, Kalyani Publishers, New Delhi
6. Sarkar, Ashis (2000), Practical Geography: A Systematic Approach, Orient Longman Pvt. Ltd., Kolkata.

**ELECTIVE**

**Course Title: GEG-E3: Participatory Rapid Appraisal Techniques (THEORY)**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

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**Course Objectives:** To introduce the basics of Participatory Rapid Appraisal techniques in geographical studies. This will facilitate students in their field work and further research.

**Learning outcome:** At the end of this course, students will be familiar with the conceptual framework of PRA techniques, model mapping, and field techniques. This will also enable students to appreciate spatio-temporal perspective in geographical studies.

Unit	Topic	No. of hours	Marks
I	PRA :Meaning Nature and Scope, evolution <b>Principles of Participatory Rapid Appraisal</b> -Offsetting biases, Rapid and Progressive Learning, Reversal of Roles, Focused Learning, Seeking for Diversity and Differences, Crosscheck by using different methods (Triangulation).	15	15
II	<b>Mapping Models:</b> Creating a Community Inventory Focus Group Discussions Matrix Ranking and Scoring Wealth Ranking Trend Analysis Timeline Venn diagrams Traditional management systems and local-resource collections Folklore, Songs, Poetry, And Dance	20	25
III	<b>PRA techniques:</b> Transect walks and guided field walks, Daily-activity profiles, Semi structured interviewing, Field report writing : techniques and structure.	10	35
		45	75

**References**

1. Bartle Phil, (2003),Methods of Participatory Appraisal, CSMED
2. Mukherjee A, Chambers R,( 2004), Participatory Rural Appraisal: Methods and Applications in Rural Planning, Concept Publishing Company, New Delhi
3. MikkelsenBritha, (2005), Methods for Development Work and Research: A New Guide for Practitioners, SAGE publications, New Delhi
4. Narayanasamy.N, (2008), Participatory Rural Appraisal: Principles, Methods and Application, SAGE publications, New Delhi
5. PokharelRidish, Balla Mohan, (2003), A Process for Participatory Rural Appraisal, Institute of Forestry, Pokhar.

**ELECTIVE**

**Course Title: GEG-E3:Participatory Rapid Appraisal Techniques (Practical)**

**Marks: 25**

**Credits: 1**

**Duration: 15 Sessions of 2 hours each**

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**Course Objectives:** Skill development in PRA Techniques and facilitate students in field work and research.

**Learning outcome:** At the end of this course, students will be familiar with the techniques in PRA.

<b>Unit</b>	<b>Topic</b>	<b>Practical Sessions</b>	<b>Marks</b>
<b>I</b>	Exercise 1. Preparing a field Plan Exercise 2. Preparation of time scale. Exercise 3. Social mapping chart. Exercise 4.Semi-structured interview. Exercise 5. Timeline	07	10
<b>II</b>	Exercise 6. Time chart Exercise 7. Wealth ranking. Exercise 8. Venn diagram preparation. Exercise 9. Daily activity profiling.	08	10
<b>III</b>	Journal / Viva voce	-	05
		15	25

**Note: This practical is based on field work**

**References**

1. Bartle Phil, (2003),Methods of Participatory Appraisal, CSMED
2. Mukherjee A, Chambers R,( 2004), Participatory Rural Appraisal: Methods and Applications in Rural Planning, Concept Publishing Company, New Delhi
3. MikkelsenBritha, (2005), Methods for Development Work and Research: A New Guide for Practitioners, SAGE publications, New Delhi
4. Narayanasamy.N, (2008), Participatory Rural Appraisal: Principles, Methods and Application, SAGE publications New Delhi
5. PokharelRidish, Balla Mohan, (2003), A Process for Participatory Rural Appraisal, Institute of Forestry, Pokhar.



**ELECTIVE****Course Title: GEG-E4: Application of Computer in Geography (Theory)****Marks: 75****Credits: 3****Duration: 45 lectures of 1 hour each**  
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**Course Objectives:** The course in application of computer in geography will enable student to use basic computer skills in geography to represent dimensional cartograms and data models.

**Learning outcome:** The students will be able to prepare cartograms that can be used for various geographical applications.

Unit	Topic	No. of hours	Marks
I	Application of computers in cartography, E sources of geographical data. (e.g. Census ,Bhuvan, IMD, Easy tide, India Water Portal, portal of rural data)	15	15
II	Representation of Geographic data using computer: Cartograms of one, two and three dimensions, (Graphical Representation-Histogram, Bar Graphs, Line Graphs, Multiple Line Graphs, Scatter Diagrams, Pie Diagrams, Frequency polygon, Frequency curve, Cumulative frequency curve or Ogive	20	25
III	Geographic data and GIS: Fundamentals of raster and vector data models.(sources of data)	10	35
		45	75

**Reference Books**

1. Brunn Stanley, Cutter L. Susan, Harrington. J.W,(2004), Geography and Technology, Published by Kluwer Academic Publishers, P.O.Box 17, 3300 AA Dordrecht, The Netherlands.
2. Demers N. Michael, (2008), Fundamentals of Geographic Information systems, Published by Wiley India Pvt Ltd
3. Khullar.D.R. (2007), Essentials of Practical Geography, New Academic Publishing Co.,Jalandher
4. Robinson, A.H., et al: (2000)Elements of Cartography, John Wiley & Sons, New York
5. Sarkar Ashis, (2015), Practical Geography: A systematic Approach, Published by Orient Blackswan Pvt.Ltd., Telangana
6. Sui, Daniel & Morrill, Richard. (2004). Chapter 5 Computers And Geography: From Automated Geography To Digital Earth. 123-123. 10.1007/978-1-4020-2353-8\_5.
7. Wilbanks. J, Thomas. (2004). Geography and Technology. Pg: 3-16. 10.1007/978-1-4020-2353-8\_1.

**ELECTIVE****Course Title: GEG-E4: Application of Computer in Geography (Practical)****Marks: 25****Credits: 1****Duration: 15 Sessions of 2 hours each**  
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**Course Objectives:** The course in application of computer in geography will enable students to use basic computer skills in geography to represent dimensional cartograms and data models.

**Learning outcome:** The students will be able to prepare cartograms that can be used for various geographical applications.

Unit	Topic	Practical Sessions	Marks
I	Use of computer application in thematic mapping – Map Layouts, choropleth, dot density	08	07
II	Cartograms of one, two and three dimensions, One dimensional plot: The Dot plot, Box and Whisker Plot	09	07
III	Two and Three dimensional: Histogram, Frequency Polygon, Cumulative frequency curve or Ogive (Graphical Representation-Histogram, Bar Graphs, Line Graphs, Multiple Line Graphs, Pie Diagrams, Frequency polygon, Frequency curve, Cumulative frequency curve or Ogive with the help of computers) Representation of point, line and polygon	08	06
	Journal		05

**Reference Books**

1. Brunn Stanley, Cutter L. Susan, Harrington. J.W,(2004), Geography and Technology, Published by Kluwer Academic Publishers, P.O.Box 17, 3300 AA Dordrecht, The Netherlands.
2. Demers N. Michael, (2008), Fundamentals of Geographic Information systems, Published by Wiley India Pvt Ltd
3. Khullar.D.R. (2007), Essentials of Practical Geography, New Academic Publishing Co.,Jalandher
4. Robinson, A.H., et al: (2000)Elements of Cartography, John Wiley & Sons, New York
5. Sarkar Ashis, (2015), Practical Geography: A systematic Approach, Published by Orient Blackswan Pvt.Ltd., Telangana
6. Sui, Daniel & Morrill, Richard. (2004). Chapter 5 Computers And Geography: From Automated Geography To Digital Earth. 123-123. 10.1007/978-1-4020-2353-8\_5.
7. Wilbanks. J, Thomas. (2004). Geography and Technology. Pg: 3-16. 10.1007/978-1-4020-2353-8\_1.

**ELECTIVE****Course Title: Basics of Climatology (THEORY)****Course Code: GEG-V. E-9****Marks: 75****Credits: 3****Duration: 45 lectures of 1 hour each**

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**Course Objectives:** The focus of this Course is to introduce key concepts of climatology in general and Indian monsoon in details.

**Learning outcomes:** On completion of this course students will able to understand and apply the concepts in analyzing and applying climatological concepts.

<b>Unit</b>	<b>Title</b>	<b>No. Lectures</b>	<b>Marks</b>
I	<b>Fundamental of Atmospheric circulation</b> Atmospheric Stability. Cloud Development and Stability. Clouds seeding and artificial rain, Atmospheric Disturbance, Air Masses and its types. Fronts and types. Tropical and temperate Cyclones. El-nino and la-nina.	15	25
II	<b>Indian Climatology: Monsoons</b>  <b>Pre monsoon:</b> Cyclonic storms, frequency, cyclone genesis, intensity, landfall and associated weather. <b>South West monsoon :</b> onset and advance of southwest monsoon, links to El Nino/Southern Oscillation, Indian Ocean Dipole and Madden Julian Oscillation Index. <b>Post monsoon:</b> withdrawal of southwest monsoon, Northeast monsoon, cyclonic storms in the Indian seas, trends in cyclonic disturbances, western disturbances, Easterly waves..	15	25
III	<b>Indicators of climate change</b> Ocean in relation to long range changes in Monsoon, tropical cyclones and climate, Land use change and climate. Cloud burst,  Climate and its application in agriculture, health and disaster risk reduction	15	25
		45	75

## REFERENCES

1. Barry R.G. and Chorley, R. J., 2009: Atmosphere, Weather and Climate, Routledge
2. Bunnett R.B. , 1993: Physical geography in Diagrams, Longman
3. Critchfield, H.J, 1998 : General Climatology, Prentice-Hall
4. Lal, D.S., 2011: Climatology, ShardaPustakBhavan
5. Monkhouse, F.J., 1975 – Principles of Physical Geography , Hodder Murray Publishers
6. P. Birot, 1966: General Physical Geography, Longman, Green & Co Strahler, A.H., 1983: Modern Physical Geography, John Wiley and Sons
7. Strahler A. M. and Strahler A.H., 1983: Elements of Physical Geography, John Wiley and Sons
8. Stringer, E.T., 1972: Foundation of Climatology: An Introduction to Physical, Dynamic, Synoptic, and Geographical Climatology, W.H. Freeman & Co. Ltd.
9. Tikka - R.N., 1998 - Physical Geography. KedarNath Ram Nath, Meerut
10. Trewartha, G.T., 1968: Introduction to Climate, McGraw-Hill

**ELECTIVE**

**Course Title: Basics of Climatology (PRACTICAL)**

**Course Code: GEG-V. E-9**

**Marks: 25**

**Credits: 01**

**Duration: 15 sessions of 2 hours each**

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**Course Objectives:** The objective of this course is to provide basic practical tools in understanding weather and climate.

**Learning outcome:** At the end of this course, students will be able interpret and analyze weather and climatic phenomena.

Unit	Title	Practical sessions	Marks
I	Representation of weather phenomena using isolines Isohyets map Isotherm map Isobars Representation of wind data Evapotranspiration Preparation of weather Station Model.	05	8
II	<ul style="list-style-type: none"><li>• Study of weather symbols and IMD weather charts. Interpretation of IMD weather charts (at least 1 map of three seasons)</li><li>• Visit to IMD for hands- on- training: handling of weather instruments, taking readings, temperature, pressure, sunshine chart interpretation and forecasting</li></ul>	10	12
III	Journal		5
		15	25

**References**

1. Bygot, J., 2001: An Introduction to Map Work and Practical Geography
2. Campbell, J., 2004: Introductory Cartography, Prentice Hall, Inc Englewood
3. Chorley, Richard. J. (ed.), 2001: Water, Earth and Man, Methuen & Co., London
4. Misra, R.P. and Ramesh, A., 2009: Fundamentals of Cartography, Concept Publishing Co., New Delhi
5. Monkhouse, F.J. and Wilkinson, H.R., 2009: Maps and Diagrams, B.I. Publications Pvt. Ltd., New Delhi
6. Raisz, E., 2005: General Cartography, McGraw Hills Co., London
7. Robinson, A.H., et al, 2003: Elements of Cartography, John Wiley and Sons, New York
8. Singh, R.L., 2000: Elements of Practical Geography, Kalyani Publishers, New Delhi
9. Singh, R ; Singh L.R., 2001: Mapworks in Practical Geography, Central book Depot, Allahabad

**ELECTIVE****Course Title: Introduction to Regional Planning (THEORY)****Course Code: GEG-VI.E-13****Marks: 75****Credits: 3****Duration: 45 lectures of 1 hours each**

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**Course objectives:** to understand and evaluate the concept of regional planning, its role and relevance in region planning. To identify issues relating to the development of a region. To identify the causes of regional disparities in development, perspectives and policy imperatives.

**Learning outcomes:** at the end of this course, students are expected to understand the concept of regional planning and its variations across time and space. They will be able to correlate and differentiate the various types of regional planning and apply the same to the local settings.

Unit	Topic	No. Of hours	Marks
I	<b>Definition and methods:</b> Planning – definition, approach, Levels of planning (national, state, local planning) basis of planning.	15	25
II	<b>Types of planning</b> Concept of planning region Land use planning. Delineation of planning region Regional policy and regional planning Types of planning : sectoral /area , physical/perspective	15	25
III	<b>Levels of development, disparities and case studies:</b> Indicators of development, planning unit Economic, social, demographic and ecological implications	15	25
		45	75

**References:**

1. Chand, Mahesh And Puri K(1983), Regional Planning In India, All Publishers, New Delhi
2. Freeman T. W.(1958), Geography And Planning, Hutchinsen University, London
3. Gadgild.R., Planning In India, Asia Publishing House
4. Glicksen A. (1955), Regional Planning And Development, Leiden
5. John Glasson And Timmarshall (2007): Regional Planning; Taylor And Francis
6. Mishra R.P. Regional Planning, a Reader, Concept Tools, Techniques and Case Studies, Mysore University Press.
7. Sundaram K. V. (1977), Urban And Regional Planning In India, Vikas Publishing House, New House, New Delhi.

**ELECTIVE**

**Course Title: Practicals in Regional Planning (PRACTICAL)**

**Course Code: GEG-VI.E-13**

**Marks: 25**

**Credits: 1**

**Duration: 15 session of 2 hours each**

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**Course objectives:** the objective of practical is to develop skills among the students in the practical ways of planning for a region (district/mega/metro region). The focus is to understand the scale of the problem and how to tackle them.

**Learning outcomes:** after completing this course, the student will have substantial knowledge of basic concepts in regional planning from a geographer’s perspectives.

Unit	Topic	Practical sessions	Marks
I	<b>Delineation of planning region</b> Five functional regions	7	10
II	<b>Delineation of planning region</b> Five formal regions	8	10
III	Journal		5

**References:**

1. Chand Mahesh & Puri, V.K. (2000), Regional Planning In India
2. Kumar, et. Al., (2016): urban and regional planning education-learning for India. Springer, Singapore
3. Matthew Dalbey, (2002): Decentralization And Regional Planning: Practical And Ideological Problems, Springer, U.S.
4. United States. National Resources Planning Board(1940), Is Planning Practical For Your Town?: New England Regional Planning Commission, Boston, Mass
5. William Ian Morrison, Peter Smith, 1977: Input-Output Methods In Urban And Regional Planning: A Practical Guide; Pergamon Press

**ELECTIVE****Course Title: Quantitative Techniques in Geography****Course Code: GEG-VI.E-16****Marks: 100****Credit: 04****Duration: 60 hours**

**Course objectives:** To introduce statistical techniques, relevant to geographical research. To acquaints students about their potentials and applications.

**Learning outcomes:** The knowledge of drawing inferences using the geographical database. An understanding and appreciation of the mutual dependence of different techniques and their relevance.

Unit No.	Course Content	No. of hours	Marks
I	<b>Non- Parametric Statistics</b> Co-relation and Regression analysis a) Scatter Diagram b) Karl Person's Co-efficient correlation c) Spearman's rank correlation d) Kendall's rank correlation regression analysis. <b>Parametric</b> Hypothesis testing a) Meaning, types of hypothesis Testing of hypothesis i) Chi-square test ii) ANOVA iii) t-test	15	30
II	Index numbers Unweighted, weighted indices and Cost of Living Index	15	30
III	Analysis of geographical dataset using appropriate software, interpretation and report writing	30	40
		60	100

**REFERENCES**

1. Gregory, 1963: Statistical methods and the Geographer, Longman S. London
2. Gupta S.P.; 1979: Practical Statistics; S. Chand and Co.
3. Johnson R.J. 1980: Multivariate statistical Analysis in Geography, Longman
4. Khan Z.A 1998: Text book of practical Geography – New Delhi
5. Pal Saroj K. 1982: Statistical Techniques: A basic approach to Geography: Tata –McGraw Hill, New Delhi.
6. P.K. Majumdar 2002 : Statistics: A Tool for Social Sciences, Rawat Publications: Jaipur & New Delhi.
7. Rastogi R.S.(2005): Elementary Statistics: Rohit Publications – Delhi-110 006
8. Succheti D.C. and Kapoor V.K. 2002 - statistics (Theory, methods and application)
9. Zamir Alvi 2000: Statistical Geography: Method and Applications Rawat Publications, New Delhi



**Parvatibai Chowgule College of Arts and Science**

**(Autonomous)**

**DEPARTMENT OF GEOGRAPHY**

**COURSE STRUCTURE**

**THREE YEAR B.A. DEGREE COURSE IN GEOGRAPHY**

<b>SEMESTER</b>	<b>CORE COMPULSORY</b>		<b>CORE ELECTIVE</b>			
I	GEG-I.C-1: Introduction to Geography	GEG-I. C-2: Fundamentals of Physical Geography				
	GEG-I.C-1: Measurement Systems in Geography (Practical)	GEG-I. C-2: Practicals in Physical Geography (Practical)				
II	GEG-II.C-3: Basics of Human Geography	GEG-II. C-4: Basics of Regional Geography				
	GEG-II.C-3: Practicals in Human Geography (Practicals)	GEG-II. C-4: Practicals in Regional Geography (Practicals)				
III	GEG-III.C-5: Cartography		GEG-III.E-1: Socio- Economic Survey	GEG-III.E-2: Field Survey in Physical Geography	GEG-III.E-3: Participatory Rapid Appraisal Techniques	GEG-III.E-4: Application of Computer in Geography
IV	GEG-IV.C-6: Advanced Regional Geography And Development		GEG-IV.E-5: Regional Geography of Goa	GEG-IV.E-6: Regional Geography of India	GEG-IV.E-7: Regional Geography of South Asia (Sri Lanka)	GEG-IV.E-8: Regional Geography of USA
V	GEG-V. C-7: Basics of Geomorphology		GEG-V.E-9: Basics of Climatology	GEG-V.E-10: Basics of Oceanography	GEG-V.E-11: Geography of Rural Settlements	GEG-V.E-12: Geography of Urban Settlements
VI	GEG-VI. C-8: Fundamentals of Population Geography		GEG-VI.E-13: Introduction to Regional Planning	GEG-VI.E-14: Fundamentals of Economic Geography	GEG-VI.E- 15: Geography of Tourism	GEG-VI.E-16: Quantitative Techniques in Geography

**SYLLABUS FOR AUTONOMOUS COURSES IN GEOGRAPHY**

**BACHELOR OF ARTS**

**SEMESTER I**

**Paper Title: Introduction to Geography (THEORY)**

**Paper Code: GEG- I.C 1**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

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**Course Objectives:** This introductory paper is intended to acquaint the students with distinctiveness of Geography as a field of learning. The philosophy of the subject is to be taught in order to develop a keen interest in the subject and to pursue it for higher studies.

**Learning outcomes:** At the end of this course students are expected to have a holistic understanding of fundamental concepts of geography and thereby be able to analyze the interrelationships among them.

<b>UNIT NO.</b>	<b>COURSE CONTENT</b>	<b>TEACHING PERIODS</b>	<b>Marks</b>
I	<b>Introduction of Geography</b> Definition, Meaning, nature and scope of geography; Major divisions of geography (General v/s Regional, Physical v/s Human Geography), Interdisciplinary approach, Concepts of Geographical Thought (Determinism, Possibilism, Neo-determinism), Recent trends in Geography, Careers in Geography. Major themes in Geography – location, region process, space and time.	15	25
II	<b>Introduction to Geosphere: I</b> <b>Atmosphere:</b> Meaning & Definitions- Composition & Structure of Atmosphere, Elements of Weather & Climate and their inter-relation. <b>Biosphere &amp; Nanosphere</b> Structure, significance, Man induced environment change- Climate change.	15	25
III	<b>Introduction to Geosphere: II</b> <b>Lithosphere:</b> Evolution of Earth, Geological Time scale.- Orders of Relief (I, II, III), oceans and continents, classification of mountains, plateau and plains, ocean relief. Hypsometric curve, bathymetric curve. <b>Hydrosphere:</b> Hydrological Cycle-Definition, Evaporation, Factors affecting evaporation, Evapo-transpiration, Humidity & It's Types , Forms of Condensation, Forms of Precipitation, Types of Rainfall. Spatial distribution of water on earth.	15	25

## REFERENCES

1. Dikshit R.D (2004): The Arts, Science of Geography, Integrated Readings Prentice Hall of India, New Delhi
2. Lal . D. S. (2007) : Climatology, Pushtak mahal, Allahabad
3. Goh Cheng Leong (2003): Certificate Physical and Human Geography, Oxford university press, New Delhi
4. Das Gupta and Kapoor (2013): Principles of Physical Geography, S. Chand & Company Pvt. Ltd.
5. Singh Savindra (2005) : Environmental Geography, Prayag Pustak Bhavan, Allahabad

**Paper Title: Measurement Systems in Geography (Practical)**

**Paper Code: GEG- I.C 1**

**Marks: 25**

**Credits: 01**

**Duration: 15 sessions of 2 hours each**

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**Course Objectives:** The course aims to develop skills of map reading and understanding. It also encourages students to understand and correlate the different measurement systems which are essential to understand the geographical concepts.

**Learning outcome:** After the completion of this course students are expected to be familiar with the basic cartographical skills such as basic elements of map and map reading. Besides, they will be acquainted with the cartographic techniques such as area measurements, time calculation, which will help in learning advanced techniques as they progress.

Unit	Title	Practical sessions	Marks
I	Scales and its types: Verbal Statement. Representative Fraction. Linear scale- Simple and comparative- time and distance Calculation of area by square method. Identification of location and extension based on latitude and longitudes. Finding directions. Calculation of time based on longitude	10	15
II	Types and Elements of map- Title. Scale. Legend, Direction, Signs and symbols. Grid reference system.	05	05
III	Journal		5
		15	25

**References**

1. Campbell, J.(2004) Introductory Cartography, Prentice Hall, Inc Englewood
2. Misra, R.P. and Ramesh, A., (2005): Fundamentals of Cartography, Concept Pub. Co., New Delhi
3. Monkhouse, I.J. and Wilkinson, H.R., (2009): Maps and Diagram, B.I. Publication, New Delhi
4. R. P Mishra. (2014) Fundamentals of Cartography, Concept Pub. Co., New Delhi
5. Gopal Singh. (2014), : Map Work and Practical Geography, 4<sup>th</sup> Edition, Sterling Book House Mumbai

**Paper Title: FUNDAMENTALS OF PHYSICAL GEOGRAPHY (THEORY)**

**Paper Code: GEG- I.C 2**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

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**Course Objectives:** The course aims to introduce fundamental concepts of physical geography. The course focuses of various spheres of the earth and their related concepts.

**Learning outcome:** After the completion of this course students are expected to be familiar with the different spheres of the earth and the interrelation amongst them.

Unit.	Title	Lecture	Marks
I	<b>Concept and Nature:</b> Introduction to physical geography: development of physical geography. Branches of physical geography. Significance of physical geography. Nature of physical geography. Recent developments in physical geography.  <b>Layers of the Earth:</b> Lithospheric system: Interior of the earth. Layering of the earth- Mechanical layering and chemical layering. Processes of Denudation. Rocks and its types. Soil- definition and profile.	15	25
II	<b>Basic concepts of climatology:</b> Definition and scope of climatology. Aims and objectives of climatology. Heat budget. Insolation and factors affecting Insolation. Temperature inversion, its types and effects.	15	25
III	<b>Oceans:</b> The oceans: Their shape, size location and configuration. Dynamics of ocean- Tides, waves and surface currents (Indian Ocean and Atlantic Ocean). Types of marine resources.	15	25
		45	75

**References:**

1. Bloom, Arthur L., 2008: Geomorphology – A Systematic Analysis of Late Cenozoic Landforms, Prentice Hall, Engle Wood Cliff, New Jersey.
2. Ahmed, E., 2005: Geomorphology, Kalyani Publishers, New Delhi
3. Sharma, V.K., 2006: Geomorphology, Earth Surface, Process and forms, Tata McGraw Hill, New York
4. Lal.D.S , 2004: Oceanography, Prayag Pustak Bhavan, Allahabad
5. Strahler, A.N., 2005: Physical Geography, 3rd Ed., Wiley Publications
6. Singh, S. 2005: Physical Geography, Prayag Pustak Bhawan, Allahabad
7. Thornbury, W.D., 1969: Principles of Geomorphology, 2nd Ed., Wiley International Edition, Wiley Eastern Reprint, 2004
8. Wooldridge, S.W. and Morgan, R.S., 2008: The Physical Basis of Geography, Longman (First published in 1937)
9. Worcestor, P.G., 2005: A Textbook of Geomorphology, Van Nostrand, 2nd Ed., East West Edition, New Delhi.

10. Chorley, Richard J., 2002: Spatial Analysis in Geomorphology, Harper and Row Publishers, New York, London.
11. Dayal, P. (2nd edition) 2006: A Textbook of Geomorphology, Shukla Book Depot, Patna
12. Sharma, H.S. (ed), 2002: Perspective in Geomorphology, Vol. I & IV, Concept, New Delhi.
13. Sharma, V.K., 2006: Geomorphology, Earth Surface Processes and Forms, Tata Mc. Graw Hill, New Delhi.
14. Sparks, B.W., 2000: Geomorphology, Longman, London, 2nd edition.

**Paper Title: Practical in Physical Geography**

**Paper Code: GEG-I.C 2**

**Marks: 25**

**Credits: 1**

**Duration: 15 sessions of 2 hours each**

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**Course Objectives:** The course aims to develop skills of relief representation and Toposheet reading, climate data analysis and interpretation. This exercise demands a higher order skill of converting signs and symbols into words.

**Learning outcome:** After the completion of this course students are expected to be familiar with techniques of representing different relief features and interpretation of the characteristics and association with other relief features. Student will be able to analyze, interpret and represent climate data through graphs.

Unit	Title	Practical	Marks
I	Methods of Representation of Relief features – Spot Heights, Bench Marks. Contours diagrams with cross sections- gentle slope, steep slope, concave and convex slope, hills, plateaus, cliff, V-shaped valley, waterfall, Ria coast, Fiord coast. Profile Drawing from contour diagram.	10	15
II	Calculation of mean, average, range of temperature. Calculation of lapse rate and Relative Humidity.	5	05
	Journal		05

References

1. Chorley, Richard. J. (ed.), 2009: Water, Earth and Man, Methuen & Co., London
2. Goudie, Andrew, et al. (eds), 2001: Geomorphological Technique, George Allen & Unwin, London
3. Gregory, K.J. and Walling, D.E., 2003: Drainage Basin – Form and Process, Edward Arnold, London
4. King, C.A.M., 2006: Techniques in Geomorphology, Edward Arnold, London
5. Leopold, L.B, Wolman, M.G. and Miller, J.P., 2004: Fluvial Processes in Geomorphology, Freeman, San Francisco
6. Misra, R.P. and Ramesh, A., 2009: Fundamentals of Cartography, Concept Publishing Co., New Delhi
7. Monkhouse, F.J. and Wilkinson, H.R., 2009: Maps and Diagrams, B.I. Publications Pvt. Ltd., New Delhi
8. Singh, R.L. and Singh Rana P.B., 2008, Elements of Practical Geography, Kalyani Publishers, New Delhi

# SYLLABUS FOR AUTONOMOUS COURSES IN GEOGRAPHY

## BACHELOR OF ARTS

### SEMESTER II

**Paper Title: Basics of Human Geography (Theory)**

**Paper Code: GEG-II. C 3**

**Marks: 75**

**Credits: 3**

**Duration:45 lectures of 1 hour each**

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**Course Objectives:** The course provides the basic conceptual framework of Human Geography. It focuses on cultivating basic knowledge through understanding and analysis of the fundamental concepts in Human geography.

**Learning outcomes:** At the end of this course students are expected to have a holistic understanding of fundamental concepts of Human Geography and thereby be able to understand human related issues.

Unit	Topic	Lectures	Marks
I	<b>Concept and Nature ;</b> Meaning, Scope and Development of Human Geography. Basic principles-Principle of Activity or Change, Principle of Terrestrial Unity or whole. Approaches in human geography (humanistic, scientific, welfare and behavioural)	15	25
II	<b>World population-</b> Growth, distribution. Density. Concepts of under population, over population, age and gender composition. Fertility, mortality, migration Ageing population.	15	25
III	<b>Society and Culture</b> Evolution of man (Australopithecus, Homo Erectus, Homo sapiens. Man's spread over the earth during the Pleistocene). World Human Races-Classification, Characteristics and Distribution. Culture- meaning and components. Contemporary social problems: Gender disparity and related issues (case study of India).Ethnicity and the related issues.	15	25
		45	75

Note : The course should focus on basic conceptual aspects.

#### Reference

- 1) H.J De Blij, Alexander B.Murphy, Erin H. Fouberg. (2007) *Human Geography: people,place and culture*. John Wiley and sons. USA.
- 2) Panigrahi .P.K. (2011).*Human Geography-Landscape of Human Activities*. Murari Lala and sons. New Delhi.



- 3) Sharma Y.K. (2007) *Human Geography*. Lakshmi Narain Agrawal, Agra.
- 4) Rubenstein J M (2010) *Contemporary Human Geography*. PHI learning pvt, New Delhi.
- 5) Hussain, M. (2004) *Human Geography*. Rawat Publication. New Delhi.
- 6) Chandna, R.C. (2006) *Geography of Population*. Kalyani Publishers. New Delhi
- 7) Hagget, P.(2002) *Geography: A Modern Synthesis*. Harper & Row, New York
- 8) De Blij, H.J., *Human Geography, Culture, Society and Space*, John Wiley, New York, 2006
- 9) Fellman, J.L. *Human Geography-Landscapes of Human Activities*, Brown and Bench man, Pub. U.S.A. 2007.
- 10) Arun Kumar Sharma, 2012: *Principles of Human Geography*, Rastogi Publications, Meerut

**Paper Title: Practicals in Human Geography**

**Paper Code: GEG-II. C 3**

**Marks: 25**

**Credits: 1**

**Duration: 15 sessions of 2 hours each**

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**Course Objectives:** The course provides the basic quantitative aspects of Human Geography. It focuses on cultivating quantification and diagrammatic representation of population data. This enables students to understand, quantify and precisely represent population data.

**Learning outcomes:** At the end of this course students are expected to have a holistic understanding of basic quantitative techniques used in Human geography. They should be able to diagrammatically represent population data and diagrams.

Unit.	Title	Practical sessions	Marks
1	Calculation and interpretation of: <b>Fertility measures:</b> Crude Birth Rate, General Fertility Rate, Total Fertility Rate, Age Specific Fertility Rate. Child Women Ratio. Net Replacement Rate. <b>Mortality measures:</b> Crude Death Rate, Age and Gender Specific Death Rates. Cause Specific Death Date. Infant Mortality Rate. <b>Age data Analysis:</b> Age composition. Construction of Population Pyramid	8	10
2	<b>Literacy measures:</b> Crud Literacy Rate. Male-female Literacy Rate, urban-rural, Gross Enrolment Ratio. Work Participation Ratio. Gender Ratio. Calculation of population density. Population concentration index. Population change.	7	10
3	Journal and viva		5
		15	25

**References:**

1. Bogue, D. J., 2001: Principles in Demography, John Wiley, New York
2. Bose, Ashish et. al., 2004: Population in India's Development, Vikas Publishing House, New Delhi
3. Census of India, India : A State Profile, 2001.
4. Chandna, R.C. Geography of Population : Concept, Determinants and Patterns, Kalyani Publishers, New York 2000.
5. Crook, Nigel Principles of Population and Development. Pergmon Press, New York 2007.
6. Daugherty, Helen Gin, Kenneth C.W. Kammeryir, An Introduction to Population (Second Edition). The Guilford Press, New York, London 2008.
7. Mitra, Asok, India's Population. Aspects of quality and Control Vol. I & II. Abhinav Publication. New Delhi 2008.
8. Srinivsan, K. and M. Vlassoff. Population Development Nexus in India : Challenges for the New Millennium. Tata mcGraw Hill, New Delhi 2001.

9. Srinivasan, K. Basic Demographic Techniques and Applications Sage Publications, New Delhi 2008.
10. UNDP: Human Development Report Oxford University Press, Oxford 2000.
11. United Nations, Methods for Projections of Urban and Rural Populations. No. VIII, New York 2004.
12. Woods, R. Population Analysis in Geography, Longman, London 2009.
13. Sawant & Athavale: Population Geography, Mehta Publishing House, Pune.2005

**Paper Title: Basics of Regional Geography**

**Paper Code: GEG-II. C 4**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

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**Course Objectives:** The course aims to develop a basic understanding of the regions and recognizing the significance of geography in shaping region. It helps students to appreciate regional unique dimensions of regions.

**Learning outcome:** At the end of this course, student will gain sense of spatial organization and areal variation in human activities.

Unit	Title	Lectures	Marks
I	i) The Regional Approach- The Development of Regional Studies. Concepts- area, region, space. ii) Methods of Regionalization- Factors of the Division and of the Regional Organization of Space.	15	25
II	i.) Foundations of Regional Geography- Ecological, Economic, Social and Cultural Dimensions ii) Regional Consciousness and Identity. iii) The Region and-Political issues. (Two case studies)	15	25
III	Study of Regional Organization ASEAN, and EU: Their evolution, functions and interlinkages. Globalization and the New Territorial Order.	15	25

**References**

1. Singh, R.L.2001 (ed): India – A Regional Geography, National Geographical Society, India
2. Cole, J. : *A Geography of the World's Major Regions*, Routledge, London,2000
3. Israel, S. Johnson, D.I. and Wood, D.: *World Geography Today*,2005
4. Jackson, R.H. and Hudman, L.E.: *Regional Geography: Issues for Today*,2007
5. *An Introduction to Regional Geography*, Paul Claval, Rawat Publication, Jaipur & Delhi,2003
6. Wheeler, J.H. Jr. and Kostbade, J.T., (1990): *World Regional Geography*, Holt Rinsort and Winston, Inc
7. Holier, G.P., 2008: Regional Development in Michael Pacione (ed), *The Geography of the 3rd World: Progress & Prospects*, Rutledge, London, New York.
8. Jackson, R.H. and Hudmar, L.E.: *Regional Geography: Issues for Today* ,2004
9. Paul Claval (2008) *An Introduction to Regional Geography*, Wiley-Blackwell, ISBN 155786733X.

**Paper Title: Practical in Regional Geography**

**Paper Code: GEG-II. C 4**

**Marks: 25**

**Credits: 1**

**Duration: 15 sessions of 2 hours each**

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**Course objectives:** The course provides the basic quantitative aspects of regional Geography. It focuses on cultivating quantification and diagrammatic representation of regional data. This enables students to understand, quantify, compare of unique characteristic of different regions.

**Learning outcomes:** At the end of this course students are expected to have a holistic understanding of basic quantitative techniques used in regional geography. They should be able to diagrammatically represent interpret regional data and diagrams.

<b>Unit</b>	<b>Topic</b>	<b>Sessions</b>	<b>Marks</b>
<b>I</b>	Methods of Regional Demarcation : Interpolation, weightage matrix analysis, Value based demarcation, Matrix and composite indexing. Gravity model, Breaking point Analysis, Threshold Analysis, Sphere of Urban Influence Population potential surfaces	<b>08</b>	<b>10</b>
<b>II</b>	Network Analysis Nearest Neighbor index, Regional Hierarchies of settlements, mapping of regions.	<b>07</b>	<b>10</b>
<b>III</b>	<b>Journal and viva</b>		<b>05</b>
		<b>15</b>	<b>25</b>

**References**

1. Hegget Peter, Cliff A.D. et. al. (2001) Locational Methods, Locational Analysis in Human Geography, Vol.II Arnold – Heinemann Pub. (India)
2. Hegget Peter, Cliff A.D. et. al. (2000) Locational Models, Locational Analysis in Human Geography. Vol. I Arnold – Heinemann Pub. (India)
3. Chandna R.C. (2003): Regional Planning: A Comprehensive Text, Kalyani Publishers, Ludhiana

## SYLLABUS FOR AUTONOMOUS COURSES IN GEOGRAPHY

### BACHELOR OF ARTS

#### SEMESTER III

##### CORE COMPULSORY

Paper Title: GEG- III-C-5 **Cartography (Theory)**

Marks: 75

Credits: 3

Duration: 45 lectures of 1 hour each

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**Course Objectives:** The course aims to provide basic cartographic concepts. This forms the basis for advanced cartographic techniques.

**Learning outcome:** After completion of the course, students will be familiar with basic cartographic concepts. This will help in developing cartographic skills taught in the practical component of this paper.

Unit	Topic	Lectures	Marks
I	<b>Introduction:</b> Cartography. Scope of Cartography. Cartography as a science and art. Growth of modern cartography. Spatial data – Data nature and data sources. <b>Mapping Organizations in India</b> – Survey of India, NATMO, NRSCA, <b>Colors and Patterns</b> –Color Systems in cartography. Identification. Use of colors in maps, lettering and use of patterns. <b>Map symbolization:</b> Mapping qualitative data and quantitative data- using point, line and area symbols. Maps- Types- physical and cultural maps, SOI Conventional signs and symbols and Colour.	20	30
II	<b>Map projections:</b> General Principles: Classification, properties and choice of map projections. Merits and demerits. Cylindrical, conical and zenithal projections	15	25
III	<b>Introduction to topographical maps:</b> Indexing. Marginal information. Scales, gridding and techniques of map reading	10	20
		45	75

##### References

1. Bygott, J. (2007), An Introduction to Map work and Practical Geography,
2. Campbell, J.(2004): Introductory Cartography, Prentice Hall Inc., Englewood Cliff
3. Misra, R.P. and Ramesh, A., (2005): Fundamentals of Cartography, Concept Publishing Company, New Delhi
4. Monkhouse, F.J. & Wilkinson, H.R., (2009): Maps & Diagrams, B.I. Publications, New Delhi
5. Robinson, A.H., et al: (2000)Elements of Cartography, John Wiley & Sons, New York ,
6. Raisz, E. ( 2004) Principles of Cartography, McGraw Hills, London ,
7. Singh, R. & Singh, R.: (2001)Map Work & Practical Geography, Central Book Depot, Allahabad.
8. Sarkar, Ashis (2000), Practical Geography: A Systematic Approach, Orient Longman Pvt. Ltd., Kolkata.
9. Talukder, S., (2008): Introduction to Map Projections, Eastern Book House, Guwahati

**CORE COMPULSORY****Paper Title: GEG- III-C-5 Cartography (PRACTICAL)****Marks: 25****Credits: 1****Duration: 15 sessions of 2 hours each**

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**Course Objectives:** The course aims to develop skills of construction of scales, projections and preparation of map.

**Learning outcome:** After the completion of this course students are expected to be familiar with map projections.

Unit	Topic	Practical Sessions	Marks
I	Cylindrical Projections. Mercators Equidistance and Equal area	5	07
II	Conical Projections: One standard parallel. 2 standard parallel and Equal area	5	07
III	Zenithal Projections: Steorographic, Gnomonic , Orthographic	5	06
IV	Journal		05

**References**

1. Bygott, J. (2007), An Introduction to Map work and Practical Geography,
2. Campbell, J.(2004): Introductory Cartography, Prentice Hall Inc., Englewood Cliff
3. Elhance, D.N.,(2002): Fundamentals of Statistics, Kitab Mahal, Allahabad
4. Gregory, S., (2003): Statistical Methods and Geographers, Longman, London
5. Hammond, R. and Mc Cullagh, P. (2005): Quantitative Techniques in Geography, Clarendon Press, Oxford Sarkar, Ashis, Practical Geography: A Systematic Approach, Orient Longman Pvt. Ltd., Kolkata.
6. Misra, R.P. and Ramesh, A., (2005): Fundamentals of Cartography, Concept Publishing Company, New Delhi
7. Monkhouse, F.J. & Wilkinson, H.R., (2009): Maps & Diagrams, B.I. Publications, New Delhi
8. Mahmood, A., (2009): Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi.
9. Robinson, A.H., et al: (2000)Elements of Cartography, John Wiley & Sons, New York ,
10. Raisz, E. ( 2004) Principles of Cartography, McGraw Hills, London ,
11. Singh, R. & Singh, R.: (2001)Map Work & Practical Geography, Central Book Depot, Allahabad.
12. Sarkar, Ashis (2000), Practical Geography: A Systematic Approach, Orient Longman Pvt. Ltd., Kolkata.
13. Talukder, S., (2008): Introduction to Map Projections, Eastern Book House, Guwahati

**CORE ELECTIVE**

**Paper Title: GEG-III.E-1: Socio Economic Survey (THEORY)**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

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**Course Objectives:** The primary objective is to provide basic methodology in field based socio-economic survey.

**Learning outcome:** After the completion of this course, students will be familiar with techniques of socio-economic survey.

<b>Unit</b>	<b>Topic</b>	<b>Lectures</b>	<b>Marks</b>
<b>I</b>	Socio-economic survey in Geography: Meaning and significance Socio-economic indicators, Sources of data, Types of data – Social, Economic, Geographical and Demographic	<b>15</b>	<b>25</b>
<b>II</b>	Types of surveys: Historical, Social, Descriptive and Action Surveys, Sampling Techniques, Preparation of Questionnaire, Interview, Group Discussion, Planning Strategy and Implementing of Survey.	<b>15</b>	<b>25</b>
<b>III</b>	Data collection, Data input using MS-Excel and MS-Access, Report writing (a) Academic report – structure, layout, reporting language (b) Comprehensive report representation – photos, sketch, maps, etc.	<b>15</b>	<b>25</b>
		<b>45</b>	<b>75</b>

**References**

1. Kothari, C.R., (2004) Research Methodology- Methods and techniques, New Age International (P) Limited, New Delhi.
2. Gosh, B N (2007) Scientific Methods and Social Research, sterling Publishers Private Limited.
3. Saravanel, P.,( 2014), Research Methodology, Kitab Mehal, New Delhi
4. Mahmood, A., (2009): Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi.
5. Singh, Gopal., (2010 ) Map Work and Practical Geography, Vikas Publishing House, New Delhi
6. Bagavathi, V. & Pillai R. S. N. (2005)Statistical Theory and Practice, S. Chand Publication, New Delhi.



**CORE ELECTIVE**

**Paper Title: GEG\_III.E-1: Socio Economic Survey (PRACTICAL)**

**Marks:25**

**Credits: 1**

**Duration: 15 Sessions of 2 hours each**

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**Course Objective:** The objective is to enable students to prepare questionnaires and carry out socio-economic surveys.

**Learning outcome:** The students will be able to conduct field surveys and independently write survey report. They also will be able to use computer for data analysis.

<b>Unit</b>	<b>Topic</b>	<b>Practical Sessions</b>	<b>Marks</b>
<b>I</b>	Questionnaire Formulation: Based on the objective of the Survey. Pilot Survey, Planning for Main Survey, Pre-Survey and Post Survey Work. Safety Measures, Field Book Preparation, Literature Survey, Responsibility Sharing and Plan of Action.	<b>04</b>	<b>05</b>
<b>II</b>	Conducting on-field survey (Village, Market, Ward)	<b>08</b>	<b>05</b>
<b>III</b>	Data analysis using MS Excel and compilation	<b>03</b>	<b>05</b>
<b>IV</b>	Report		<b>10</b>

**References**

1. Kothari, C.R., (2004) Research Methodology- Methods and techniques, New Age International (P) Limited, New Delhi.
2. Gosh, B. N., (2007), Scientific Methods and Social Research, Sterling Publishers Private Limited., New Delhi
3. Saravanavel. P,( 2014), Research Methodology, Kitab Mehal, New Delhi
4. Mahmood, A., (2009): Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi.
5. Singh, Gopal., (2010 ) Map Work and Practical Geography, Vikas Publishing House, New Dehli
6. Bagavathi, V. & Pillai R. S. N. (2005) Statistical Theory and Practice, S. Chand Publication, New Delhi.

**CORE ELECTIVE**

**Paper Title: GEG-III-E-2: Field Survey in Physical Geography (THEORY)**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

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**Course Objectives:** The primary aim of this paper to introduce various surveying instrument used in Physical Geography. Students will learn the operation and the application of the instruments and methods of surveying.

**Learning outcomes:** At the end of this course students will be able to understand functions and applications of dumpy level, Plane table and Global Positioning Systems (GPS) in field based studies.

Unit.	Topic	Lectures	Marks
I	Significance and Methods of Survey; Classification of Surveying; Fundamentals of Plane Table Survey: a) Radiation Method b) Intersection Method Pre survey work: Safety Measures, Field Book Preparation, Literature Survey, Sharing Responsibilities and Plan of Action Post field survey work: Data Processing Methods, Analysis, Mapping and Report Writing.	15	25
II	Dumpy level surveying : meaning, functioning elements, applications and Methods(Rise-fall and Collimation method) Profile drawing: Beach and River. Beach and River Morphology. Observation of slope, river and coastal morphology on toposheet. Pre survey and Post survey tasks.	15	25
III	GPS survey: Meaning, Space Segment, Ground Segment and GPS Receivers, Applications.	15	25
		45	75

**REFERENCES**

- Campbell, J. (2004), Introductory Cartography, Prentice Hall, Inc Englewood
- Khullar.D.R. (2007), Essentials of Practical Geography, New Academic Publishing Co.,Jalandher
- Misra, R.P. and Ramesh, A. (2005), Fundamentals of Cartography, Concept Pub. Co., New Delhi
- Monkhouse, I.J. and Wilkinson, H.R. (2009), Maps and Diagram, B.I. Publication, New Delhi
- Singh, R.L. and Singh Rana P.B.(2008), Elements of Practical Geography, Kalyani Publishers, New Delhi
- Sarkar, Ashis (2000), Practical Geography: A Systematic Approach, Orient Longman Pvt. Ltd., Kolkata

**CORE ELECTIVE**

**Paper Title: GEG-III-E-2: Field Survey in Physical Geography (PRACTICAL)**

**Marks: 25**

**Credits:1**

**Duration: 15 Sessions of 2 hours each**

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**Course Objectives:** The main objective of this course is to provide hands-on training in Plane Table, Dumpy Level and GPS survey.

**Learning outcome:** At the end of this course, students will be able to independently handle survey instruments and prepare maps and field reports.

<b>Unit</b>	<b>Topic</b>	<b>Practical sessions</b>	<b>Marks</b>
I	Plane table survey: a) Radiation Method :2 Exercises B) Intersection Method: 2 Exercises	07	10
II	Dumpy Level Survey: Rise-Fall and Collimation Method GPS Survey: Use of GPS in Mapping And Location Observation Of Slope, River and Coastal Morphology on Field	08	10
III	Journal /Field report		5
		15	25

**References**

1. Campbell J. (2004), Introductory Cartography, Printice Hall, Inc Englewood
2. Khullar.D.R (2007), Essentials of Practical Geography, New Academic Publishing Co. Jalandher
3. Misra, R.P. and Ramesh, A. (2005), Fundamentals of Cartography, Concept Pub. Co., New Delhi
4. Monkhouse, I.J. and Wilkinson, H.R.(2009), Maps and Diagram, B.I. Publication, New Delhi
5. Singh, R.L. and Singh Rana P.B.(2008), Elements of Practical Geography, Kalyani Publishers, New Delhi
6. Sarkar, Ashis (2000), Practical Geography: A Systematic Approach, Orient Longman Pvt. Ltd., Kolkata.

**CORE ELECTIVE****Paper Title: GEG-III-E3: Participatory Rapid Appraisal Techniques (THEORY)****Marks: 75****Credits: 3****Duration: 45 lectures of 1 hour each**

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**Course Objectives:** To introduce the basics of Participatory Rapid Appraisal techniques in geographical studies. This will facilitate students in their field work and further research.

**Learning outcome:** At the end of this course, students will be familiar with the conceptual framework of PRA techniques, model mapping, and field techniques. This will also enable students to appreciate spatio-temporal perspective in geographical studies.

Unit	Topic	Lectures	Marks
I	PRA :-Meaning Nature and Scope Salient features of PRA: Participation - Flexibility –Teamwork, Optimal Ignorance –Systematic. <b>Principles of Participatory Rapid Appraisal</b> -Offsetting biases, Rapid and Progressive Learning, Reversal of Roles, Focused Learning, Seeking for Diversity and Differences, Crosscheck by using different methods (Triangulation).	10	15
II	<b>Mapping Models:</b> Creating a Community Inventory Focus Group Discussions Preference Ranking Wealth Ranking Seasonal and Historical Diagramming Institutional Mapping Venn diagrams Traditional management systems and local-resource collections Folklore, Songs, Poetry, And Dance	15	25
III	<b>PRA techniques:</b> Transect walks and guided field walks, Seasonal calendars, Daily-activity profiles, Semi structured interviewing, Sequencing and chain interviews Permanent-group interviews, Time lines, Local Histories, Local Researchers and Village Analysts, Shared presentations and analysis Villagers' attitudes toward PRA Field report writing : techniques and structure.	20	35
		45	75

**References**

1. Bartle Phil, (2003),Methods of Participatory Appraisal, CSMED
2. Mukherjee A, Chambers R,( 2004), Participatory Rural Appraisal: Methods and Applications in Rural Planning, Concept Publishing Company, New Delhi
3. Mikkelsen Britha, (2005), Methods for Development Work and Research: A New Guide for Practitioners, SAGE publications, New Delhi
4. Narayanasamy.N, (2008), Participatory Rural Appraisal: Principles, Methods and Application, SAGE publications, New Delhi
5. Pokharel Ridish, Balla Mohan, (2003), A Process for Participatory Rural Appraisal, Institute of Forestry, Pokhar.

**CORE ELECTIVE**

**Paper Title: GEG-III-E-3: Participatory Rapid Appraisal Techniques (Practical)**

**Marks: 25**

**Credits: 1**

**Duration: 15 Sessions of 2 hours each**

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**Course Objectives:** Skill development in PRA Techniques and facilitate students in field work and research.

**Learning outcome:** At the end of this course, students will be familiar with the techniques in PRA.

<b>Unit</b>	<b>Topic</b>	<b>Practical Sessions</b>	<b>Marks</b>
<b>I</b>	Exercise 1. Preparing a field Plan Exercise 2. Preparation of time scale. Exercise 3. Social mapping chart. Exercise 4. . Semi-structured interview. Exercise 5. Timeline (Historical Mapping).	<b>07</b>	<b>10</b>
<b>II</b>	Exercise 6. Time chart or Seasonal calendar. Exercise 7. Wealth ranking. Exercise 8. Venn diagram preparation. Exercise 9. Daily activity profiling. Exercise 10. Prepare questionnaire of attitude of villagers towards development.	<b>08</b>	<b>10</b>
<b>III</b>	Journal / Viva voce	-	<b>05</b>
		<b>15</b>	<b>25</b>

**Note: This practical is based on field work**

**References**

1. Bartle Phil, (2003), Methods of Participatory Appraisal, CSMED
2. Mukherjee A, Chambers R,( 2004), Participatory Rural Appraisal: Methods and Applications in Rural Planning, Concept Publishing Company, New Delhi
3. Mikkelsen Britha, (2005), Methods for Development Work and Research: A New Guide for Practitioners, SAGE publications, New Delhi
4. Narayanasamy.N, (2008), Participatory Rural Appraisal: Principles, Methods and Application, SAGE publications New Delhi
5. Pokharel Ridish, Balla Mohan, (2003), A Process for Participatory Rural Appraisal, Institute of Forestry, Pokhar.

**CORE ELECTIVE**

**Paper Title: GEG-III-E-4: Application of Computer in Geography (Theory)**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

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**Course Objectives:** The course in application of computer in geography will enable student to use basic computer skills in geography to represent dimensional cartograms and data models.

**Learning outcome:** The students will be able to prepare cartograms that can be used for various geographical applications.

<b>Unit</b>	<b>Topic</b>	<b>Lectures</b>	<b>Marks</b>
I	Application of computers in cartography, Significance of Internet in Geographical studies. E sources of geographical data. (e.g. Bhuvan, IMD, easy tide, India Water Portal, portal of rural data) Fundamentals of raster and vector data models. ,	<b>10</b>	<b>15</b>
II	Introduction to Computer and Geographic data: Cartograms of one, two and three dimensions, (Graphical Representation-Histogram, Bar Graphs, Line Graphs, Multiple Line Graphs, Scatter Diagrams, Pie Diagrams, Frequency polygon, Frequency curve, Cumulative frequency curve or Ogive with the help of computers)	<b>15</b>	<b>25</b>
III	Concept and Methods of data interpolation: Introduction to kriging, IDW,	<b>20</b>	<b>35</b>
		<b>45</b>	<b>75</b>

**Reference Books**

1. Robinson, A.H., et al: (2000)Elements of Cartography, John Wiley & Sons, New York
2. Khullar.D.R. (2007), Essentials of Practical Geography, New Academic Publishing Co.,Jalandher

**CORE ELECTIVE**

**Paper Title: GEG-III-E-4: Application of Computer in Geography (Practical)**

**Marks: 25**

**Credits: 1**

**Duration: 15 Sessions of 2 hours each**

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**Course Objectives:** The course in application of computer in geography will enable students to use basic computer skills in geography to represent dimensional cartograms and data models.

**Learning outcome:** The students will be able to prepare cartograms that can be used for various geographical applications.

<b>Unit</b>	<b>Topic</b>	<b>Practical Sessions</b>	<b>Marks</b>
I	Use of computer application in thematic mapping – Map Layouts, choropleth, isopleth, dot density and pictograms,	<b>08</b>	<b>07</b>
II	Cartograms of one, two and three dimensions, One dimensional plot: The Dot plot, Box and Whisker Plot	<b>09</b>	<b>07</b>
III	Two and Three dimensional: Histogram, Frequency Polygon, Cumulative frequency curve or Ogive (Graphical Representation-Histogram, Bar Graphs, Line Graphs, Multiple Line Graphs, Scatter Diagrams, Pie Diagrams, Frequency polygon, Frequency curve, Cumulative frequency curve or Ogive with the help of computers)	<b>08</b>	<b>06</b>
	Journal		05

**Reference Books**

1. Robinson, A.H., et al: (2000)Elements of Cartography, John Wiley & Sons, New York
2. Khullar.D.R. (2007), Essentials of Practical Geography, New Academic Publishing Co.,Jalandher

**SYLLABUS FOR AUTONOMOUS COURSES IN GEOGRAPHY  
BACHELOR OF ARTS  
SEMESTER IV**

**CORE COMPULSORY**

**Paper Title: Advanced Regional Geography and Development (THEORY)**

**Paper Code: GEG-IV.C-6**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

**Course Objectives:**

This course aims to provide students with basic understanding of regional geography by focusing on a variety of cultural, environmental, social, economic, and political issues. The course will focus on specific issues unique to each region as identified by the instructor. Lastly, the course will also consider the historic and current position of traditional regional geography in the discipline by critically assessing the role of the 'region' and its implications.

**Learning outcomes:**

1. Students will have a thorough understanding, both from a historical and contemporary perspective, of regional geography and be able to identify positive and negative aspects of its framework.
2. Besides, students will gain familiarity and be able to identify and describe key physical, cultural, social, economic, and environmental characteristics across the landscape and have the ability to identify and explain the primary causal factors influencing a geographic variability

<b>Unit</b>	<b>Topic</b>	<b>Lectures</b>	<b>Marks</b>
I	Understanding regional perspective: <ul style="list-style-type: none"> <li>• Methods of regionalization</li> <li>• measuring levels of development</li> <li>• Changing concept of regionalization in terms of economic, social and political perspective.</li> </ul>	<b>15</b>	<b>25</b>
II	Regions and Regional Geography: Federalism, centre - state relationships. <ul style="list-style-type: none"> <li>• Core - Periphery</li> <li>• Hierarchy of regions,</li> <li>• Design a representative region.</li> </ul> Regions: <ul style="list-style-type: none"> <li>• Thinking of Paths of Economic growth</li> <li>• Indian Model of Economic Development</li> </ul>	<b>15</b>	<b>25</b>
III	Regional Issues: Contemporary international relations: India - Pakistan, Kashmir Issue, Afghanistan, regional migrations and issues, <ul style="list-style-type: none"> <li>• Smart cities</li> <li>• Developing and Developed Economies,</li> <li>• India's Mixed Economy,</li> <li>• Developed and Potential regions.</li> </ul>	<b>15</b>	<b>25</b>
		<b>45</b>	<b>75</b>



**References:**

1. Bergman, Renwick and Vasantha (2008), Introduction to Geography: People, Places and Environment, Pearson Education, Inc Dorling Kindersley Pvt Ltd, New Delhi.
2. Chandna, R.C. (2015), Regional Planning and Development, Kalyani Publishers, New Delhi
3. Mahesh Chand and V. K Puri (2000): Regional Planning in India, Allied Publishers Pvt. Ltd., New Delhi

**CORE COMPULSORY****Paper Title: Advanced Regional Geography and Development (PRACTICAL)****Paper Code: GEG-IV.C-6****Marks: 25****Credits: 1****Duration: 15 sessions of 2 hours each****Course Objectives:**

The aim is to equip students with skills of demarcating regions based on certain attributes or characteristics. Students will also learn to understand the spatial aspects in geography.

**Learning outcomes:** This will provide students the confidence to demarcate the area or region and also understand their attributes

Unit	Topic	Practical Sessions	Marks
I	Temporal and Comparative time scale using GAPMINDER Basics of Regionalization Methodologies in levels of development: Point scale method in measuring regional development HDI Lorenz curve Identification of Formal Regions: (a) the fixed index method, (b) the variable index method, and (c) the cluster method Identification of Functional Regions: (a) flow analysis and (b) gravitational analysis	7	10
II	Determining hierarchy at regional levels using socio-economic indicators Gerry meandering method : Types of Gerry meandering, Maximum segregation and Maximum Integration	8	10
III	Journal		05
		<b>15</b>	<b>25</b>

**References:**

1. Bergman, Renwick and Vasantha (2008), Introduction to Geography: People, Places and Environment, Pearson edction, Inc Dorling Kindersley Pvt Ltd, New Delhi.
2. Bygot, J.: (2001) An Introduction to Map Work and Practical Geography
3. Campbell, J., (2004): Introductory Cartography, Printice Hall, Inc Englewood
4. Chandna, R.C. (2015), Regional Planning and Development, Kalyani Publishers, New Delhi
5. Misra, R.P. and Ramesh, A., 2005: Fundamentals of Cartography, Concept Pub. Co., New Delhi
6. Monkhouse, I.J. and Wilkinson, H.R., (2001): Maps and Diagram, B.I. Publication, New Delhi

**Field Geology references**

1. Mathur, S.M. (2001) Guide to Field Geology, Prentice-Hall, New Delhi.
2. Compton, R.R. (1962) Manual of Field Geology. John Willey and Sons, Inc.
3. Lahi, F.H. (1987) Field Geology. CBS Publishers. 4. Gokhale, N.W. (2001) A Guide to Field Geology, CBS Publishers.

**CORE ELECTIVE**

**Paper Title: Regional Geography of Goa**

**Paper Code: GEG-IV.E-5**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

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**Course Objectives:** The course is aimed at presenting an integrated and empirically based profile of Goa.

**Learning outcomes:** At the end of this course, students are expected to have an understanding of the inter linkages and interaction between physical and sociocultural base of Goa.

Unit	Title	Lecture	Marks
I	Location: Absolute and relative. Physiographic divisions, soils, vegetation, water and mineral resources	15	25
II	Population and its characteristics: Spatial and temporal growth, Gender composition, Age composition, Literacy levels, Work participation rate, Religious composition, Migration and related issues	15	25
III	Industrialization, Mining, Tourism, and Related environmental issues. Trade, Transport, Communication and Health Care	15	25
		45	75

**References**

- 1) Alvares Claude (2002), Fish, Curry and Rice: A Source Book on Goa, its Ecology and Lifestyle, The Goa Foundation, Goa
- 2) Anant Kakha Priolkar (1961), The Goa Inquisition, Bombay
- 3) Jakati, D.M. (2014), Resource Geography of Goa, Scholars World
- 4) Malati Mahajan (2002), Cultural History of Maharashtra and Goa: From Place Name Inscriptions Sandeep Prakashan
- 5) Olivinho J. F. Gomes (1996), Village Goa: A Study of Goan Social Structure and Change, S.Chand (G/L) & Company Ltd; Delhi

**CORE ELECTIVE**

**Paper Title: Practicals in Regional Geography of Goa**

**Paper Code: GEG-IV.E-5**

**Marks: 25**

**Credits: 1**

**Duration: 15 sessions of 2 hours each**

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**Course Objectives:** The course is aimed at presenting integrated and empirically based profile of Goa.

**Learning outcomes:** At the end of this course, students are expected to have an ability to represent inter linkages and interaction between physical aspects and resource base of Goa.

Unit	Title	Practical sessions	Marks
1	Physiographic and cultural mapping of Goa using various cartographic techniques Cross Sectional Profiles, Hypsometric Curve, Isohytes, Windrose	6	
2	Population Mapping: Population Growth (Graphs) Spatio-temporal: density, age composition, literacy, urban-rural (Chorochromatic) Industrial location, mining areas beach locations (choroschematic)	9	10
3	Journal and Viva		05
		15	25

**References**

1. Bygot, J. (2001): An Introduction to Map Work and Practical Geography,
2. Campbell, J., (2004): Introductory Cartography, Printice Hall, Inc Englewood
3. Jackson, R.H. and Hudmar, L.E. (2001): Regional Geography: Issues for today ,
4. Misra, R.P. and Ramesh, A., (2005): Fundamentals of Cartography, Concept Pub. Co., New Delhi
5. Monkhouse, I.J. and Wilkinson, H.R., (2001): Maps and Diagram, B.I. Publication, New Delhi
6. Raisz, E. (2005): General Cartography, McGraw Hills Co., London
7. Robinson, A.H., et al, (2003): Elements of Cartography, John Wiley and Sons, New York
8. Singh, R ; Singh L.R., (2001) Mapworks in Practical Geography,Central book Depot, Allahabad
9. Singh, R.L. (2000): Elements of Practical Geography, Kalyani Publishers, New Delhi

**Note: Source of Data**

1. Socio economic survey ( 2014-15), Government of Goa, Government Printing Press Panaji, Goa.
2. Census Goa – Census of India, 2001 & 2011
3. Goa Statistical Handbook

**CORE ELECTIVE****Paper Title: Regional Geography of India (Theory)****Paper Code: GEG-IV.E-6****: 75****Credits: 3****Duration: 45 lectures of 1 hour each**

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**Course Objectives:** The course is aimed at presenting an integrated and empirically based profile of India.

**Learning outcomes:** At the end of this course, students are expected to have an understanding of the inter linkages and interaction between physical aspects and resource base of India.

Unit	Title	Lecture	Marks
I	Physical bases: Location, Morphological divisions, Drainage System, Climate: Factors & Seasons	15	25
II	Resource Bases: <ul style="list-style-type: none"> <li>• Natural Resources: Soil, Forest, Mineral, Power Production</li> <li>• Population resources: density and distribution,</li> <li>• Population Composition: Ethnic, Urban-Rural, Worker - Non-Worker</li> <li>• Trends of Migration</li> </ul>	15	25
III	Resource development: Indian Agriculture: New Technology and Green Revolution Achievements Trade and Transport: Golden Quadrangle, Konkan Railway Urbanization: Metropolotization and smart cities, Industrialization : IT's, SEZ Water Resource Development: River linking, multipurpose projects <ul style="list-style-type: none"> <li>•</li> </ul>	15	25
		45	75

**References**

1. Deshpande C.D, (1992): India-A Regional Interpretation Northern Book Centre, New Delhi
2. Khullar, D.R. (2011): "Indian-A Comprehensive Geography" Kalyani Publishers, New Delhi
3. Learmonth, A.T.A. et.al(ed): Man and Land of South Asia Concept, New Delhi.
4. Mitra, A. (1967): levels of Regional Development India Census of India, Vol.I, Part I-A (i) and (ii) New Delhi,.
5. Routray, J.K. (1993): Geography of Regional Disparity Asian Institute of technology, Bangkok
6. Shafi, M, (2000): Geography of South Asia, McMillan & Co., Calcutta
7. Singh, R.L.(ed) (1971): India: A Regional Geography. National Geographical Society. India, Varnasi
8. Spate, O.H.K. and Learmonth, A.T.A. (1967): India and Pakistan - Land, People and Economy Methuen & Co., London,
9. Tiwari, R.C. (2006): "Geography of India" Prayag Pustak Bhavan, Allahabad.
10. Valdiya, K.S. (1998): Dynamic Himalaya, University Press, Hyderabad
11. Valdiya, K.S. (2004): Geology, Environment and Society, University Press, Hyderabad
12. Wadia, D.N. (1967): Geology of India, McMillan & Co., London,

**CORE ELECTIVE**

**Paper Title: Practicals in Regional Geography of India**

**Paper Code: GEG-IV.E-6**

**Marks: 25**

**Credits: 1**

**Duration: 15 sessions of 2 hours each**

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**Course Objectives:** To understand India in terms of various regional division and to analyses the natural and human resource endowment using various cartographic techniques.

**Learning outcome:** Students are expected to learn the skills of choosing appropriate cartographic techniques to quantitatively represent regional aspects of India and infer the processes that operate through space and time in different regions of India.

Unit	Title	Practical sessions	Marks
1	Cartographic representation and mapping of physiographic division, Soil, Forest, Climatic Division, Industrial Regions	8	10
2	Calculation and graphical representation of Age-sex ratio, Child-women ratio, Dependency ratio, Infant mortality rate, Age specific mortality ,Population growth rate, Population projection(as per 2001 and 2011 census)	7	10
3	Journal and Viva		05
		15	25

**References**

1. Bygot, J.: An Introduction to Map Work and Practical Geography,2001
2. Campbell, J., 2004: Introductory Cartography, Printice Hall, Inc Englewood
3. Khullar, D.R. (2011): "Indian-A Comprehensive Geography" Kalyani Publishers, New Delhi
4. Misra, R.P. and Ramesh, A., 2005: Fundamentals of Cartography, Concept Pub. Co., New Delhi
5. Monkhouse, I.J. and Wilkinson, H.R., 2001: Maps and Diagram, B.I. Publication, New Delhi
6. Raisz, E.: General Cartography, McGraw Hills Co., London ,2005
7. Robinson, A.H., et al.: Elements of Cartography, John Wiley and Sons, New York,2003
8. Singh, R.L.: Elements of Practical Geography, Kalyani Publishers, New Delhi ,2000
9. Jackson, R.H. and Hudmar, L.E.: Regional Geography: Issues for today ,2001
10. Singh, R ; Singh L.R., Mapworks in Practical Geography,Central book Depot, Allahabad,2001
11. Singh Gopal (2000), Map Work and Practical Geography, 4th Revised Edition, Vikas Publishing House Pvt. Ltd., New Delhi
12. Tiwari, R.C. (2006): "Geography of India" Prayag Pustak Bhavan, Allahabad.
13. Valdiya, K.S. (2004): Geology, Environment and Society, University Press, Hyderabad

**CORE ELECTIVE****Paper title: Regional Geography of South Asia (Sri Lanka)****Paper Code: GEG-IV.E-7****Marks: 75****Credits: 3****Duration: 45 lectures of 1 hour each**

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**Course Objective:** The objective of this course is to acquaint students with the importance of looking at the world from a spatial perspective with a regional approach with special reference to geographical aspects of Sri Lanka.

**Learning outcomes:** At the end of this course, students are expected to have a holistic understanding of the spatial aspects of Sri Lanka.

UNIT NO.	COURSE CONTENT	TEACHING PERIODS	MARKS
I	Geographical Aspects of Sri Lanka: Physiography, Climate, Geo political significance, Resources: Forest, Soil, River and mineral	15	25
II	Evolution of Regional Entity: Ethnicity, Language and Religion, Politics of Cultural Identity and its Developments post-civil war	15	25
III	Civil society and Governance: Quality of life, Socio-Economic well being, Contemporary growth in Infrastructure, Tourism: Trade, Regional Specialization Ecology and disaster management	15	25
		45	75

**REFERENCES:**

1. Bhardwaj V and Sawant N N, (2016), South Asia: Intra-Regional Conflicts and Co-operation, GB Books, New Delhi
2. Dash Kishore, (2008), Regionalism in South Asia-Negotiating co-operation institutional structures, Routledge, London
3. Gunarathna K Locana, (2006), Spatial Concern's In Development: Sri Lanka Perspectives, Published by Atlantic Publishers and Distributors, Ansari road, New Delhi- 110027
4. Mullinga M, Nadarajah Y, (2012), Rebuilding Local Communities In The Wake of Disaster: Social Recovery in Sri Lanka and India, Published by Routledge, 912 Tolstoy House, Printed and bound in India by Avantika Printers Pvt.ltd East of Kailash, New Delhi- 110001
5. Orjuela Camilla, (2008), The Identity Politics of Peace Building, published by Vivek Mehra for SAGE publications, India Pvt.ltd, New Delhi
6. Raghavan.V.R,(2011), Conflict In Sri Lanka, Published for Centre for Security Analysis, Chennai, India
7. Wickramasinghe Nira, (2014), Sri Lanka In the Modern Age: A History, Published in India by Oxford University Press, YMCA building, New Delhi-110001

**CORE ELECTIVE****Paper title: Practicals in Regional Geography of South Asia (Sri Lanka)****Paper Code: GEG-IV.E-7****Marks: 25****Credits: 1****Duration: 15 sessions of 2 hours each**

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**Course Objective:** The objective of this course is to acquaint students with the importance of looking at the world from a spatial perspective with a regional approach with special reference to the geographical perspective of Sri Lanka.

**Learning outcomes:** At the end of this course, students are expected to have a holistic understanding of the concept of the spatial perspective of Sri Lanka, utilize demographic data to show human population patterns and consequences, recognize economic factors and the influences of globalization.

<b>UNIT NO.</b>	<b>COURSE CONTENT</b>	<b>Practical sessions</b>	<b>Marks</b>
I	Physiographic and Climatic Mapping of Sri Lanka. Soil Map and Drainage Map	8	10
II	Population Mapping – Mainstream and ethnic population HDI: Calculation of Human Development Index Choroschematic Mapping for Sri Lanka	7	10
III	Journal		5
		15	25

**REFERENCES:**

1. Bhardwaj V and Sawant N N, (2016), South Asia: Intra-Regional Conflicts and Co-opertaion, GB Books, New Delhi
2. Dash Kishore, (2008), Regionalism in South Asia-Negotiating co-operation institutional structures, Routledge, London
3. Gunaratha k Locana, (2006), Spatial Concern's In Development: Sri Lanka Perspectives, Published by Atlantic Publishers and Distributors, Ansari road, new Dlehi- 110027
4. Mullinga M, Nadarajah Y, (2012), Rebuilding Local Communities In The Wake of Disaster: Social Recovery in Sri Lanka and India, Published by Routledge, 912 Tolstoy House, Printed and bound in India by Avantika Printers Pvt.ltd East of Kailash, New Delhi- 110001
5. Orjuela Camilla, (2008), The Identity Politics of Peace Building, published by Vivek Mehra for SAGE publications, India Pvt.ltd, New Delhi
6. Raghvan.V.R,(2011), Conflict In Sri Lanka, Published for Centre for Security Analysis, Chennai, India
7. Wickramasinghe Nira, (2014), Sri Lanka In the Modern Age: A History, Published in India by Oxford University Press, YMCA building, New Delhi-110001



**CORE ELECTIVE**

**Paper Title: Regional Geography of USA (THEORY)**

**Paper Code: GEG-IV.E-8**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

**Course Objectives:** This introductory paper is intended to acquaint the students with a systematic view of physical and socio-economic dimensions of the United States of America.

**Learning outcomes:** At the end of this course, students are expected to have a holistic understanding of physical, cultural and economic landscape of USA.

<b>UNIT NO.</b>	<b>COURSE CONTENT</b>	<b>TEACHING PERIODS</b>	<b>Marks</b>
I	Physical landscape: Tectonics, Mountains, Plateaus, Plains, Deserts, Islands. Climate Region. Rivers & Water Regimes. Wetlands. Plants Animal Ecology and Ecoregions. Human imprints on landscape and Environmental: management and conservation.	15	25
II	Socio-Cultural landscape: Demographic, Cultural, Political and Economic aspects. Socializing Economic Space: Culture and the Firm, Gender Economies, Ethnic Economies. Social issues and experience of living in America.	15	25
III	Determinants of Economic landscape: Incorporations and Government Transnational Corporations, Labour Power, Consumption Dynamic Economic Space: Economic Growth and development, commodity chain technology and agglomeration.	15	25
		<b>45</b>	<b>75</b>

**REFERENCES**

1. Antony Orme (2002), Physical Geography of North America. Oxford University Press, New York
2. Chris Mayda (2013), A Regional Geography of the United States and Canada: Toward a Sustainable Theme. Rowman and Littlefield Pub. UK
3. John C. Hudson (2002), Across This Land: A Regional Geography of the United States and Canada. The Johns Hopkins University Press, USA
4. Neil Coe, Philip Kelly & Henry W. C. Yeung (2007), Economic Geography: A Contemporary Introduction (2ed), Blackwell Publishing, USA

**CORE ELECTIVE**

**Paper Title: Regional Geography of USA (Practical)**

**Paper Code: GEG-IV.E-8**

**Marks: 25**

**Credits: 01**

**Duration: 15 sessions of 2 hours each**

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**Course Objectives:** The course aims to develop skills of mapping the physical and cultural attributes of the United State. It also encourages students to understand and correlate physical social and economic landscapes of USA

**Learning outcome:** After the completion of this course students are expected to be familiar with the basic cartographical skills such representation of basic physical human and economic data through thematic maps.

Unit	Title	Practical Sessions	Marks
1	Interpretation of USGS topographical Map, Indexing, Signs and symbols, colour schemes, Scales and Grids, projections Physical aspects: Relief, Drainage, Vegetation,	8	10
2	Interpretation of USGS topographical maps Cultural Aspects: Settlement, transport network, Landuse	7	10
3	Journal	-	5
		<b>15</b>	<b>25</b>

**REFERENCE BOOKS:**

1. D.S. Bhattacharya and T.C. Bagchi (1973) Elements of Geological Map Reading and Interpretation (with exercises). Orient Black Swan
2. Geological Survey and Rand McNally (2003) National Geographic Arkansas: Seamless USGS Topographic Maps. National Geographic Society.
3. Gopal Singh Map Work and Practical Geography, 4/e. Vikas Publishing.
4. Jenny Marie Johnson (2003):Geographic Information, How to Find It, How to Use It. Greenwood Press, London.
5. John B. Rowland (1955) FEATURES SHOWN ON TOPOGRAPHIC MAPS. GEOLOGICAL SURVEY CIRCULAR 368, USGS, Washington DC.
6. Nelson Petrie (2007) Analysis and Interpretation of Topographical Maps (Rev) (Getting Ahead in Social Science). Orient BlackSwan,
7. Ordnance Survey ( 2002)Reading, Wokingham and Pangbourne (Explorer M... (Map), Ordnance Survey Southampton, UK.
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9. Rachel Hewitt (2013) Map of a Nation: A Biography Of The Ordnance Survey. Granta Book.
10. Richard DE Bruin and W. Hilton Johnson American Educational 100 Topographic Maps. American Packing & Gasket
11. Robert B. Matkin ( 1992)Map Reading. Dalesman Publishing Co Ltd
12. Terry Marsh (2007) Pathfinder Map Reading Skills: An Introduction to Map Reading and Basic Navigation (Pathfinder Guide) Jarrold Publishing.
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Data Source: <http://www.map-reading.com/>

**SYLLABUS FOR AUTONOMOUS COURSES IN GEOGRAPHY  
BACHELOR OF ARTS  
SEMESTER V**

**CORE COMPULSORY**

**Paper Title:** Basics of Geomorphology

**Paper Code:** GEG-V.C-7

**Marks:** 75

**Credits:** 3

**Duration:** 45 lectures of 1 hour each

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**Course Objectives:** The course provides the basic concepts, theories and application in geomorphology

**Learning outcomes:** this course will enable the students to understand the basic concepts ,theories and its applications in various geomorphological phenomena.

Unit	Title	Lecture	Marks
I	<p><b>Introduction to geomorphology</b> Nature, scope and significance of geomorphology. Fundamental concepts and approaches in geomorphology. Recent trend in Geomorphology and application (Mining, Agriculture, Environment, Road and water transport and Urban planning)</p> <p><b>Theories in geomorphology</b></p> <ul style="list-style-type: none"> <li>• Continental drift theory</li> <li>• Theories of Isostasy: Airy and Pratt</li> <li>• Concept of Sea floor Spreading,</li> <li>• Plate tectonic and mountain building: concept, plate margins, types and movements.</li> </ul>	20	35
II	<p><b>Earth's movement Process and form</b></p> <ul style="list-style-type: none"> <li>• Endogenetic and Exogenetic forces: Concepts, processes and types</li> <li>• Folds, Fault, rift valleys</li> <li>• Vulcanicity and landforms</li> <li>• Cycle of erosion: Davis and Penck</li> <li>• Theories of slope development: King and Wood</li> </ul>	15	25
III	<p><b>Geomorphic landforms and Processes</b></p> <ul style="list-style-type: none"> <li>• Desert</li> <li>• Karst</li> <li>• Glacial</li> </ul>	10	15
		45	75

## References:

1. Ahmed, E., 2005: Geomorphology, Kalyani Publishers, New Delhi
2. Bloom, Arthur L., 2004: Geomorphology – A Systematic Analysis of Late Cenozoic Landforms, Prentice Hall, Engle Wood Cliff, N.J
3. Chorley, Richard J., 2002: Spatial Analysis in Geomorphology, Harper and Row Publishers, New York, London.
4. Dayal, P. (2nd edition) 2006: A Textbook of Geomorphology, Shukla Book Depot, Patna
5. Sharma, H.S. (ed), 2002: Perspective in Geomorphology, Vol. I & IV, Concept, New Delhi.
6. Sharma, V.K., 2006: Geomorphology, Earth Surface Processes and Forms, Tata Mc. Graw Hill, New Delhi.
7. Sharma, V.K., 2006: Geomorphology, Earth Surface, Process and forms, Tata McGraw Hill, New York
8. Singh, S. 2005 : Geomorphology, Prayag Pustak Bhawan, Allahabad
9. Sparks, B.W., 2000: Geomorphology, Longman, London
10. Strahler, A.N. 2006: Physical Geography, 3rd Ed., Wiley
11. Thornbury, W.D., 2001: Principles of Geomorphology, 2nd Ed., Wiley International Edition, Wiley Eastern Reprint,
12. Wooldridge, S.W. and Morgan, R.S., 2000: The Physical Basis of Geography, Longman.
13. Worcestor, P.G., 2005: A Textbook of Geomorphology, Van Nostrand, 2nd Ed., East West Edition, New Delhi.

**CORE COMPULSORY**

**Paper Title: Practical in Basics of Geomorphology**

**Paper Code: GEG-V.C-7**

**Marks: 25**

**Credits: 1**

**Duration: 15 sessions of 2 hours each**

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**Course Objectives:** The course aims to develop skills in basic geomorphological analysis

**Learning outcome:** After the completion of this course, students will be able to work independently on slope and fluvial analysis and reading physical aspect of toposheet.

Unit	Title	Practical sessions	Marks
I	Slope analysis: Elements , preparation of aspect map, Isotan and Isosin methods of slope analysis. River Morphometry: Calculation of various morphometric Parameters ( ordering, area, perimeter, stream length, frequency, bifurcation ratio, density)	10	12
II	Interpretation of S.O.I topographical Maps (2 exercises of any two themes) -Mountains, Plateaus, Plains, Coastal), Association of morphological features .	5	08
	Journal		5
		15	25

**References**

1. Chorley, Richard. J. (ed.), 2001: Water, Earth and Man, Methuen & Co., London
2. Goudie, Andrew, et al. (eds),2001: Geomorphological Technique, George Allen & Unwin, London
3. Gregory, K.J. and Walling, D.E., 2003: Drainage Basin – Form and Process, Edward Arnold, London
4. Kale V.S. and Gupta Avijit (2000): Introduction to Geomorphology, Orient Black Swan Publications
5. King, C.A.M., 2006: Techniques in Geomorphology, Edward Arnold, London
6. Leopold, L.B, Wolman, M.G. and Miller, J.P., 2004: Fluvial Processes in Geomorphology, Freeman, San Francisco
7. Misra, R.P. and Ramesh, A., 2009: Fundamentals of Cartography, Concept Publishing Co., New Delhi
8. Monkhouse, F.J. and Wilkinson, H.R., 2009: Maps and Diagrams, B.I. Publications Pvt. Ltd., New Delhi
9. Singh, R.L. and Singh Rana P.B., 2008, Elements of Practical Geography, Kalyani Publishers, New Delhi
10. Sarkar, Ashis, 2000: Practical Geography: A Systematic Approach, Orient Longman Pvt. Ltd., Kolkata.
11. Singh, Savindra (2006): Geomorphology, Prayag Pustak Bhavan, Allahabad
12. Strahler, A.N., 2000: Physical Geography, 3rd Ed., Wiley.

**CORE ELECTIVE**

**Paper Title:** Basics of Climatology

**Paper Code:** GEG-V. E-9

**Marks:** 75

**Credits:** 3

**Duration:** 45 lectures of 1 hour each

=====

**Course Objectives:** The focus of this paper is to introduce key concepts of climatology in general and Indian monsoon in details.

**Learning outcomes:** On completion of this course students will able to understand and apply the concepts in analyzing and applying climatological concepts.

Unit	Title	Lectures
I	<b>Fundamental of Atmospheric circulation</b> Basics of water cycle, Atmospheric Stability. Cloud Development and Stability. Atmospheric Disturbance, Air Masses and its types. Fronts and types. Tropical and temperate Cyclones. The Global Pattern of Climate. El-nino and la-nina.	15
II	<b>Indian Climatology: Monsoons</b> <b>Pre monsoon:</b> Cyclonic storms, frequency, cyclone genesis, intensity, landfall and associated weather. <b>South West monsoon :</b> onset and advance of southwest monsoon, links to EI Nino/Southern Oscillation, Indian Ocean Dipole and Madden Julian Oscillation Index. <b>Post monsoon:</b> withdrawal of southwest monsoon, Northeast monsoon, cyclonic storms in the Indian seas, trends in cyclonic disturbances, western disturbances, Easterly waves..	15
III	<b>The Earth's Changing Climate</b> <b>Climate change and sea level rise:</b> Ocean in relation to long changes in Monsoon, tropical cyclones and climate, Land use change and climate. Cloud burst, clouds seeding and artificial rain. Climate services: Climate and application in agriculture, water, health and disaster risk reduction and urban planning.	15
		45

## REFERENCES

1. Barry R.G. and Chorley, R. J., 2009: Atmosphere, Weather and Climate, Routledge
2. Bunnett R.B. , 1993: Physical geography in Diagrams, Longman
3. Critchfield, H.J, 1998 : General Climatology, Prentice-Hall
4. Lal, D.S., 2011: Climatology, Sharda Pustak Bhavan
5. Monkhouse, F.J., 1975 – Principles of Physical Geography , Hodder Murray Publishers
6. P. Birot, 1966: General Physical Geography, Longman, Green & Co Strahler, A.H., 1983: Modern Physical Geography, John Wiley and Sons
7. Strahler A. M. and Strahler A.H., 1983: Elements of Physical Geography, John Wiley and Sons
8. Stringer, E.T., 1972: Foundation of Climatology: An Introduction to Physical, Dynamic, Synoptic, and Geographical Climatology, W.H. Freeman & Co. Ltd.
9. Tikka - R.N., 1998 - Physical Geography. Kedar Nath Ram Nath, Meerut
10. Trewartha, G.T., 1968: Introduction to Climate, McGraw-Hill

**CORE ELECTIVE****Paper Title: Basics of Climatology (Practical)****Paper Code: GEG-V. E-9****Marks: 25****Credits: 01****Duration: 15 sessions of 2 hours each**

=====

**Course Objectives:** The objective of this course is to provide basic practical tools in understanding weather and climate.**Learning outcome:** At the end of this course, students will be able interpret and analyze weather and climatic phenomena.

Unit	Title	Practical sessions
I	Representation of weather phenomena using isolines Isohyets map Isotherm map Isobars Representation of wind data Evapotranspiration Determining atmospheric stability Preparation of weather Station Model.	05
II	<ul style="list-style-type: none"> <li>Study of weather symbols and IMD weather charts. Interpretation of IMD weather charts (at least 1 map of three seasons)</li> <li>Visit to IMD for hands- on- training: handling of weather instruments, taking readings, temperature, pressure, sunshine chart interpretation and forecasting. (seven Days Training in IMD</li> </ul>	10
III	Journal	
		15

**References**

1. Bygot, J., 2001: An Introduction to Map Work and Practical Geography
2. Campbell, J., 2004: Introductory Cartography, Prentice Hall, Inc Englewood
3. Chorley, Richard. J. (ed.), 2001: Water, Earth and Man, Methuen & Co., London
4. Misra, R.P. and Ramesh, A., 2009: Fundamentals of Cartography, Concept Publishing Co., New Delhi
5. Monkhouse, F.J. and Wilkinson, H.R., 2009: Maps and Diagrams, B.I. Publications Pvt. Ltd., New Delhi
6. Raisz, E., 2005: General Cartography, McGraw Hills Co., London
7. Robinson, A.H., et al, 2003: Elements of Cartography, John Wiley and Sons, New York
8. Singh, R.L., 2000: Elements of Practical Geography, Kalyani Publishers, New Delhi
9. Singh, R ; Singh L.R., 2001: Mapworks in Practical Geography,Central book Depot, Allahabad



**CORE ELECTIVE**

**Paper Title: Basics of Oceanography (Theory)**

**Paper Code: GEG- V. E-10**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

=====

**Course Objectives:** The course provides the basic conceptual framework of oceanography, its dynamism and the contemporary issues associated with Oceans.

**Learning outcomes:** At the end of this course, students are expected to have an understanding of fundamental concepts of oceanography and issues.

Unit	Title	Lecture	Marks
I	<b>Introduction to oceanography</b> - Development of oceanography as a discipline, Significance and scope, General bottom relief features. Study of Pacific, Atlantic and Indian oceans. Heat budget of oceans.	15	25
II	<b>Properties of ocean water</b> - Salinity, Temperature, Density, and relation among them. <b>Marine Deposits:</b> Classification, sources, distribution (Atlantic and Indian ocean)	15	25
III	<b>Issues in Oceanography</b> - Sea level change, acidification, Ballast water Exclusive Economic Zones in oceans.	15	25
		45	75

**References**

1. K. Siddhartha Oceanography, 2000: A Brief Introduction, Kislaya publishers
2. Defant, A., 2001: Physical Oceanography, Vol. I, Pergamon Press
3. Gautam, Alka. 2004. Climatology and Oceanography. Rastogi Publication-Meerut, UP.
4. Sharma R. C. and Vatal M., 2003: Oceanography for Geographers, Chaitanya Publishing House, Allahabad.
5. Lal, D.S., 2003: Oceanography, Sharda Pustak Bhavan, Allahabad

**CORE ELECTIVE**

**Paper Title: Basics of Oceanography (Practical)**

**Paper Code: GEG- V. E-10**

**Marks: 25**

**Credits: 1**

**Duration: 15 sessions of 2 hours each**

=====  
**Course Objectives:** The course aims to develop skills of field sampling and analysis of ocean water and interpretation of hypsometric curves and bathymetric charts.

**Learning outcome:** After the completion of this course, students will learn ocean water testing and reading of bathymetric and hydrographic charts.

Unit	Title	Practical sessions	Marks
1	Signs and symbols in hydrographic charts and reading of hydrographic chart. Reading of Bathymetric, reading of Naval Hydrographic Chart, and Maritime Bathymetric charts. Plotting of Bathymetric and Hypsometric curves.	10	15
2	Water analysis – salinity PH Conductivity and TDS.	05	05
3	Journal and Viva		05
		15	25

**References**

1. Bygot, J., 2001: An Introduction to Map Work and Practical Geography
2. Campbell, J., 2004: Introductory Cartography, Prentice Hall, Inc Englewood
3. Jackson, R.H. and Hudmar, L.E., 2001: Regional Geography: Issues for today
4. Misra, R.P. and Ramesh, A., 2005: Fundamentals of Cartography, Concept Pub. Co., New Delhi
5. Monkhouse, I.J. and Wilkinson, H.R., 2001: Maps and Diagram, B.I. Publication, New Delhi
6. Raisz, E., 2005: General Cartography, McGraw Hills Co., London
7. Robinson, A.H., et al, 2003: Elements of Cartography, John Wiley and Sons, New York
8. Singh, R.L., 2000: Elements of Practical Geography, Kalyani Publishers, New Delhi
9. Singh, R ; Singh L.R., 2001: Mapworks in Practical Geography, Central book Depot, Allahabad

**CORE ELECTIVE**

**Paper Title: Geography of Rural Settlement**

**Paper code: GEG-V.E-11**

**Marks: 75**

**Credit: 3**

**Duration: 45 sessions of 1 hour each**

=====  
**Objective:** To acquaint the students with the spatial and structural characteristics of rural settlements and to bring about awareness on special issues related to rural settlements.

**Learning Outcomes:**

The students will be able to appreciate the role of geography in rural landscape. They will be also equipped with the skills of rural settlement analysis, understanding the settlements types and changing landscape at local and regional level.

<b>Unit</b>	<b>Course Content</b>	<b>No. Of Lectures</b>	<b>Marks</b>
<b>I</b>	Introduction to settlement Geography, importance of settlement geography, Definition, Nature, approaches and scope of geography of rural settlements. Status and future of Rural Geography in India Evolution of Rural settlements and the process of settling. Role of sites in evolution of rural settlements, Functional Classification of rural Settlements.	<b>15</b>	<b>25</b>
<b>II</b>	Spatial organization of rural settlements: size, shape, distribution and hierarchy of settlements. Spacing of rural Settlements (Nucleated and Dispersed), Types of rural settlements.	<b>15</b>	<b>25</b>
<b>III</b>	Internal morphology of villages ( Any one village- Goa), Material used , house types in different regions of India and field patterns( Primitive , rectangular and Contour type ), Case Study of two villages of Goa .: Impact of urbanization on house types, pattern, functions and growth of rural settlements. Changing face of rural India.	<b>15</b>	<b>25</b>
		<b>45</b>	<b>75</b>

## References:

1. Cloke Paul, (2013), An Introduction to Rural Settlement Planning, Published by Routledge, Milton Park, Abingdon, Oxon OX14 4SB, UK
2. Clout Hugh (2007) Contemporary Rural Geographies, Routledge, Milton Park, Abingdon, Oxon OX144RN
3. Ghosh Sumita, Introduction to Settlement Geography, Orient longman, 1998.
4. Mandal. R. B, (2001), Introduction to Rural Settlement, Concept Publishing Company, New Delhi.
5. Singh R.L. et al: Reading in rural settlement: Geography Tara Publications, Varanasi.
6. Singh R.Y., 1998: Geography of Settlements, Rawat publications
7. Thomas Chris (2001) Rural Geography, Routledge, London
8. Woods Michael, (2005), Rural Geography: Processes, Responses and Experiences in Rural Restructuring, SAGE Publications Ltd, University of Wales, Aberystwyth
9. Woods Michael, Holloway Lewis & Panelli Ruth (2012) Key Concepts in Rural Geography, Sage Publication, London

**CORE ELECTIVE**

**Paper title: Fundamentals of Rural Geography (Practical)**

**Paper Code: GEG-V.E-11**

**Marks: 25**

**Credits: 01**

**Duration: 15 Sessions of 2 hours each**

=====

**Course Objective:** The objective of this course is to familiarize the students with the characteristics of rural settlements.

**Learning outcomes:** The students are expected to know that a settlement is a place where people live, recognize that there are different sizes of settlements, recognize that each settlement serves a range of purposes or functions which have changed through time and learn the location of different-sized settlements.

Unit	Title	Practical sessions	Marks
I	<b>Methods in Rural Settlement</b> <ul style="list-style-type: none"><li>• Methods of concentration of rural settlements</li><li>• Methods for measuring spacing of settlements</li><li>• Z test for environmental factors responsible for pattern variation of settlements</li><li>• Measurement of shape (pattern) of rural settlements</li></ul>	8	10
II	<b>Village Survey: Pre-field work, Field work and Post Field work</b> <ul style="list-style-type: none"><li>• Case Study for report:<ol style="list-style-type: none"><li>1. Collection of Socio-Economic and Physical Data</li><li>2. Classification and Tabulation of Data</li><li>3. Inter-relation and Analysis of Data, Maps and Diagrams</li></ol></li></ul>	7	10
III	Journal/ Report writing		5
		<b>15</b>	<b>25</b>

**References:**

1. Cloke Paul, (2013), An Introduction to Rural Settlement Planning, Published by Routledge, Milton Park, Abingdon, Oxon OX14 4SB, UK
2. Clout Hugh (2007) Contemporary Rural Geographies, Routledge, Milton Park, Abingdon, Oxon OX144RN
3. Mandal. R. B, (2001), Introduction to Rural Settlement, Concept Publishing Company, New Delhi.
4. Thomas Chris (2001) Rural Geography, Routledge, London
5. Woods Michael, (2005), Rural Geography: Processes, Responses and Experiences in Rural Restructuring, SAGE Publications Ltd, University of Wales, Aberystwyth
6. Woods Michael, Holloway Lewis & Panelli Ruth (2012) Key Concepts in Rural Geography, Sage Publication, London

**CORE ELECTIVE**

**Paper Title: Geography of Urban Settlement**

**Paper code: GEG-V.E-12**

**Marks: 75**

**Credit: 3**

**Duration: 45 sessions of 1 hour each**

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**Course objective:** To acquaint the students with the spatial and structural characteristics of urban settlements and to bring about awareness on special issues related to urban settlements.

**Learning Outcomes:** The students will be able to appreciate the role of geography in urban landscape. They will also develop understanding of various concepts of urbanization, urban systems and will be able to address certain issues of urban development.

<b>Unit</b>	<b>Course Content</b>	<b>No. Of Lectures</b>	<b>Marks</b>
<b>I</b>	Nature, approach and scope of urban geography. Development of urban geography. Definition of urban places, problems of defining urban places in Indian Context. Site and situations of urban places (towns and cities) Functional classification of towns	<b>15</b>	<b>25</b>
<b>II</b>	Hierarchy of Urban settlements, Urban morphology, theories related to urban landuse. City- Region, concept, urban systems; rank size and Primate City Model.	<b>15</b>	<b>25</b>
<b>III</b>	Problems of urbanization with special reference to slums, pollution, urban climate, garbage management. Urban planning and sustainable development of cities, concept of smart cities in India.	<b>15</b>	<b>25</b>
		<b>45</b>	<b>75</b>

**References:**

1. Cater Harold (2002 )The Study of Urban Geography, Arnold, London , U K
2. Fisher W.B (2013) Urban Geography, Elsevier Science
3. Hall T. & Barret L.H (2012) Urban Geography, Routledge, London
4. Hall Tim (2010) Urban Geography (Third Edition) Routledge, London
5. Siddhartha & Mukherjee (2007) Cities, Urbanisation and Urban Systems, Kisalaya Publications, New Delhi

**CORE ELECTIVE**

**Paper Title: Geography of Urban Settlement (Practical)**

**Paper code: GEG-V.E-12**

**Marks: 25**

**Credit: 1**

**Duration: Session of 2 hours each**

=====  
**Objectives:** This course aims to equip students with practical skills to understand demographic and linkages in Settlement geography.

**Learning Outcomes:** The students will be able to apply certain basic tools in demographic, urban hierarchy and ranking of urban settlement. The students will be able to confidently carry out basic research in urban geography.

<b>Unit</b>	<b>Content</b>	<b>Practical sessions</b>	<b>Marks</b>
<b>I</b>	<b>Demographic aspects of urban geography:</b> Time series analysis of urban growth, Applicability of Rank Size rule with settlement data (normal and log), Urban density zoning, Analysis of occupational diversity and specialisation, Calculation of CBD by Vance and Murphy. Calculation of Urban Sprawl. Urban Proportion, level of urbanization and Urban Graph.	<b>8</b>	<b>10</b>
<b>II</b>	<b>Mapping of Urban linkages:</b> Network analysis (Alpha, Beta and Gamma indices), Flow matrix, Connectivity mapping, Shortest path and longest path analysis. Calculation of Primate City, Hierarchy of settlements	<b>7</b>	<b>10</b>
<b>III</b>	<b>Journal</b>		<b>5</b>
		<b>15</b>	<b>25</b>

**References:**

1. Cater Harold (2002 )The Study of Urban Geography, Arnold, London , U. K
2. Fisher W.B (2013) Urban Geography, Elsevier Science
3. Hall T. & Barret L.H (2012) Urban Geography, Routledge, London
4. Hall Tim (2010) Urban Geography (Third Edition) Routledge, London
5. Siddhartha & Mukherjee ( 2007) Cities, Urbanisation and Urban Systems, Kaisalaya Publications, New Delhi

**SYLLABUS FOR AUTONOMOUS COURSES IN GEOGRAPHY  
BACHELOR OF ARTS  
SEMESTER VI**

**CORE COMPULSORY**

**Paper Title: Fundamentals of Population Geography (THEORY)**

**Paper code: GEG-VI.C-8**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

**Course Objectives:** To understand and evaluate the basic concept of Population dynamics, to enable students to identify different issues related to population.

**Learning Outcomes:** After completing this course, students will have understanding of Population dynamics and be able to understand population related issues.

Unit	Topic	Lectures	Marks
I	<b>Nature and Scope:</b> Determinants of population growth Definition, Nature and Scope, Spatial Distribution of Population-factors, Measures of Population Density, World and India; Population Growth- Global Trends, Trends in India. Demographic Transition Model.	15	25
II	<b>Social - Economic Attributes:</b> Population composition - Age and Sex, Urban and Rural and Economic structure. Basic Patterns, Age-Sex Structure of Developed and Developing Countries <b>Migration:</b> Nature, Types, Classification, Determinants, Consequences.	15	25
III	<b>Population Policies and Issues:</b> Population Policies in Context of Growth- Less Developed Countries & More Developed Countries. Evolution of Family Welfare Programme in India. National Population Policies in India Gender Issues and Population Dividend in India	15	25
		45	75

**References:**

1. Bhende and Kanitkar (2011), Principles of Population Studies, Himalaya Publishing House, Delhi
2. Chandna R. C.(2000), Geography of Population:Concept, Determinants and Patterns, Kalyani Publishers, New Delhi
3. Clarke J. I (1972), Population Geography, Pergamon Press, Oxford.
4. Mitra & Kamaljit Chandra, (2005) Population Studies and Demography: Vol. 4 Concept of Population Geography, Delhi
5. Sundaram, K.V. & Nangia, Sudesh (1986), Population geography- Contributions to Indian Geography. Vol 6 , Heritage Publications



**CORE COMPULSORY**

**Paper Title: Practicals in Fundamentals of Population Geography (PRACTICAL)**

**Paper code: GEG-VI.C-8**

**Marks:25**

**Credits: 1**

**Duration: 15 Session of 2 hours each**

=====

**Course Objectives:** The practical aims to equip student with the skills to find out the different demographic attributes.

**Learning Outcomes:** After completing this course, students will have basic understanding of population characteristics that can be statistically and cartographically presented.

Unit	Topic	Marks	Practical Session
I	a) Arithmetic Density (calculation and representation) b) Rural and urban Density Population Concentration Index Proportional Circles.	10	5
II	a) Population Pyramids. b) Calculation of Population Projection. (any one method)  Field visit to Census Department	10	10
III	Journal	5	

**\* All practicals to be done on computer**

**References:**

- 1) Beaujeu-Garnier J (1966): Geography of Population, Longmans, London
- 2) Census of India Series – 1 India Provisional Population Tables, Published by Register General and Census Commissioner, India 2001.
- 3) Chandna, R.C. (2010): Geography of Population : Concepts, Determinants and Patterns, Kalyani Publishers, New Delhi,.
- 4) Clark, L. 1965: Population Geography, Permagon press, New York.
- 5) Monkhouse F.J. and Wilkinson H.R. (1966): Maps and Diagrams: Their Compilation and Construction, Methuen Publishing Ltd. London
- 6) Singh Gopal (1998): Map Work and Practical Geography; Vikas Publishing House
- 7) Trewartha, G.T. 1969: A Geography of Population : World Patterns, John Willey and Sons, Inc. New York

**CORE ELECTIVE****Paper Title: Introduction to Regional Planning (THEORY)****Paper code: GEG-VI.E-13****Marks: 75****Credits: 3****Duration: 45 lectures of 1 hours each**

=====

**Course Objectives:** To understand and evaluate the concept of Regional Planning, its role and relevance in region planning. To identify issues relating to the development of a region. To identify the causes of regional disparities in development, perspectives and policy imperatives.

**Learning Outcomes:** At the end of this course, students are expected to understand the concept of Regional Planning and its variations across time and space. They will be able to correlate and differentiate the various types of regional planning and apply the same to the local settings.

<b>Unit</b>	<b>Topic</b>	<b>Lectures</b>	<b>Marks</b>
I	<b>Definition and Methods:</b> Planning - Definition and method, Approach, Need and Scope, Concept of Space, Area and Region and Time. Level and hierarchy of planning Areal Basis of Planning.	15	25
II	<b>Types of Planning and Approach:</b> Planning Region: Formal, Functional Regions: Land Use Planning. Delineation region: Criteria and delineation methods Regional Policy and Regional Planning, National, State, Local Planning Sectoral/Area , Physical/Perspective	15	25
III	<b>Levels of development, disparities and Case Studies:</b> Indicators of development, Planning Unit Economic, Social, Demographic and Ecological implications	15	25
		45	75

**References:**

1. Chand, Mahesh and Puri K(1983), Regional Planning in India, All Publishers, New Delhi
2. Freeman T. W.(1958), Geography and Planning, Hutchinsen University, London
3. Gadgil D.R., Planning in India, Asia Publishing house
4. Glicksen A. (1955), Regional Planning and Development, Leiden
5. John Glasson and Tim Marshall (2007): Regional Planning; Taylor and Francis
6. Mishra R.P. Regional Planning, A Reader , Concept Tools, Techniques And Case Studies, Mysore University Press.
7. Sundaram K. V. (1977), Urban and Regional Planning in India, Vikas Publishing House, New House, New Delhi.

**CORE ELECTIVE**

**Paper Title: Practicals in Regional Planning (PRACTICAL)**

**Paper code: GEG-VI.E-13**

**Marks:25**

**Credits: 1**

**Duration: 15 Session of 2 hours each**

=====

**Course Objectives:** The objective of practical is to develop skills among the students in the practical ways of planning for a region (district/mega/metro Region). The focus is to understand the scale of the problem and how to tackle them.

**Learning Outcomes:** After completing this course, the student will have substantial knowledge of basic concepts in regional planning from a geographer’s perspectives.

<b>Unit</b>	<b>Topic</b>	<b>Marks</b>	<b>Practical Sessions</b>
I	<b>Delineation of planning region</b> Five functional regions	10	7
II	<b>Delineation of planning region</b> Five formal regions	10	8
III	Journal	5	

**References:**

1. Chand Mahesh & V.K. Puri, (2000), Regional Planning In India
2. Kumar, et. al., (2016): Urban and Regional Planning Education-Learning for India. Springer, Singapore
3. Matthew Dalbey, (2002): Decentralization and Regional Planning: Practical and Ideological Problems, Springer, U.S.
4. United States. National Resources Planning Board(1940), Is Planning Practical for Your Town?: New England Regional Planning Commission, Boston, Mass
5. William Ian Morrison, Peter Smith, 1977: Input-Output Methods In Urban And Regional Planning: A Practical Guide; Pergamon Press

**CORE ELECTIVE**

**Paper Title: Fundamentals of Economic Geography (THEORY)**

**Paper Code: GEG-VI. E-14**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

=====

**Course Objectives:**

The course introduces economic geography as a dynamic, diverse and contested body of knowledge. Students will be familiar with basic concepts of economic geography.

**Learning outcomes:**

After completing the course, student will gain insights of the concepts and theoretical approaches in Economic Geography.

<b>Unit</b>	<b>Topic</b>	<b>Lectures</b>	<b>Marks</b>
I	Fundamental concept in Economic Geography- meaning, nature, scope and branches. Approaches in Economic Geography.	15	25
II	Models and Theories in Economic geography <ul style="list-style-type: none"><li>• Agricultural landuse _Vohn Thunen</li><li>• Industrial location - Weber</li><li>• Central place - Christaller</li></ul>	15	25
III	Applications of economic geography.	15	25
		45	75

**References:**

1. Combes Pierre-Philippe, Mayer Thierry and Thisse Jacques-François (2008) Economic Geography the Integration of Regions and Nations. Princeton University Press Princeton and Oxford, Princeton, New Jersey
2. Hanink Dean M. (2012) Principles and Applications of Economic Geography: Economy, Policy, Environment, John Wiley & Sons
3. Miroslav N. Jovanovic(2009) Evolutionary Economic Geography, Location of production and the European Union. Routledge, London and New York
4. M. Sokol (2011) Economic geography. Undergraduate study in Economics, Management, Finance and the Social Sciences, University of London.
5. Pachura Piotr.(2011) The Economic Geography of Globalization, (ED) InTech Pub.
6. Sharmistha Bagchi-Sen and Helen Lawton Smith (2006) Economic Geography Past, present and future (Edited). Routledge, USA.
7. Siddhartha K. (2016) Economic Geography, Kitab Mahal

**CORE ELECTIVE**

**Paper Title: Practicals in Fundamentals of Economic Geography (PRACTICAL)**

**Paper Code: GEG-VI-E-14**

**Marks: 25**

**Credits: 1**

**Duration: 15 sessions of 2 hours each**

=====  
**Course Objectives:**

The aim is to equip students with the knowledge of industrial location theories and calculation of parameters of location theory

**Learning outcomes:** This will enable students to understand and apply theories and models of economic geography in present day context.

<b>Unit</b>	<b>Topic</b>	<b>Marks</b>	<b>Practical Sessions</b>
I	Calculation of bid rent model Industrial location using Webbers Calculation of K3, K4 and K7	10	10
II	Field work: data collection, representation and report writing.	10	5
III	Journal	05	
		<b>25</b>	

**References:**

1. Combes Pierre-Philippe, Mayer Thierry and Thisse Jacques-François (2008) Economic Geography the Integration of Regions and Nations. Princeton University Press Princeton and Oxford, Princeton, New Jersey
2. Hanink Dean M. (2012) Principles and Applications of Economic Geography: Economy, Policy, Environment, John Wiley & Sons
3. Miroslav N. Jovanovic(2009) Evolutionary Economic Geography, Location of production and the European Union. Routledge, London and New York
4. M. Sokol (2011) Economic geography. Undergraduate study in Economics, Management, Finance and the Social Sciences, University of London.
5. Pachura Piotr (2011) The Economic Geography of Globalization, (ED) InTech Pub.
6. Sharmistha Bagchi-Sen and Helen Lawton Smith (2006) Economic Geography Past, present and future (Edited). Routledge, USA.
7. Siddhartha K. (2016) Economic Geography, Kitab Mahal

**CORE ELECTIVE****Paper Title: Geography of Tourism (THEORY)****Paper Code: GEG-VI.E-15****Marks: 75****Credits: 3****Duration: 45 lectures of 1 hour each**

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**Course Objectives:** The course aims to understand the basics of tourism and its impact on physical and human environments.

**Learning outcomes:** This course will enable the students to understand the aspects of tourism and also be familiarized with local tourism.

Unit	Title	Lectures	Marks
I	<b>Introduction to Tourism:</b> <ul style="list-style-type: none"> <li>• Meaning, definition and concept of Tourism</li> <li>• Characteristics and types of Tourism</li> <li>• Historical development of Tourism</li> <li>• Scope and importance of Tourism</li> <li>• Careers in Tourism</li> <li>• Trends in Tourism Geography</li> </ul>	15	25
II	<b>Geographic factors in Tourism Development:</b> <ul style="list-style-type: none"> <li>• Physical factors: Relief, climate, vegetation, water bodies</li> <li>• Socio-cultural factors: historical, cultural, economic, religious factors</li> </ul> <b>Geographic Areas and tourism impacts:</b> <ul style="list-style-type: none"> <li>• Economic, socio-cultural, environment and sustainable development of tourism</li> </ul>	20	25
III	<b>Tourism resources in Goa</b> <ul style="list-style-type: none"> <li>• Development of tourism in Goa</li> <li>• Types of tourism in Goa</li> <li>• Social Economic and Environmental issues</li> <li>• Emerging careers in tourism in Goa</li> </ul>	10	25
		45	75

**References:**

1. Bhatia, A.K., 2002: Tourism Development: Principles and Practices, Sterling Publishers Pvt. Ltd
2. Claude Alvares (2002): Fish Curry and Rice; A Goa Foundation Publication
3. Dhar Premnath, 2009: Development Of Tourism & Travel Industry: An Indian Perspective, Kanishka Publishers
4. Hall. C.M, Page Stephen, 2014: The Geography of Tourism and Recreation: Environment, Place, Space, Routledge Taylor and Francis Group, London and New York
5. Velvet Nelson, 2013: An Introduction to Geography of Tourism, Rowman & Littlefield Publishers
6. Williams Stephen, 2009: Tourism Geography: A new synthesis, Routledge Taylor and Francis Group, London and New York

**CORE ELECTIVE**

**Paper Title: Practicals in Geography of Tourism (PRACTICAL)**

**Paper Code: GEG-VI.E-15**

**Marks: 25**

**Credits: 1**

**Duration: 15 sessions of 2 hours each**

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**Course Objectives:** This practical course aims to understand the role of Geography in Tourism.

**Learning outcomes:** This course will enable the students to achieve the knowledge and skills in tourism Geography.

<b>Unit</b>	<b>Title</b>	<b>Marks</b>	<b>Practical sessions</b>
I	Preparation and understanding of Tourist maps Preparation tourist circuit maps	10	05
II	Preparation of Information Charts of tourism sites of India and Goa Field visit, preparing a brochure and presentation	10	10
	Journal	5	
		25	

**References**

1. Bhatia, A.K., 2002: Tourism Development: Principles and Practices, Sterling Publishers Pvt. Ltd
2. Claude Alvares (2002): Fish Curry and Rice; A Goa Foundation Publication
3. Dhar Premnath, 2009: Development Of Tourism & Travel Industry: An Indian Perspective, Kanishka Publishers
4. Hall. C.M, Page Stephen, 2014: The Geography of Tourism and Recreation: Environment, Place, Space, Routledge Taylor and Francis Group, London and New York
5. Velvet Nelson, 2013: An Introduction to Geography of Tourism, Rowman & Littlefield Publishers
6. Williams Stephen, 2009: Tourism Geography: A new synthesis, Routledge Taylor and Francis Group, London and New York

**CORE ELECTIVE****Paper Title: Quantitative Techniques in Geography****Paper Code: GEG-VI.E-16****Marks: 100****Credit: 04****Duration: 60 hours**

**Course objectives:** To introduce statistical techniques, relevant to geographical research. To acquaints students about their potentials and applications.

**Learning outcomes:** The knowledge of drawing inferences using the geographical database. An understanding and appreciation of the mutual dependence of different techniques and their relevance.

Unit No.	Course Content	Marks	Sessions
I	<b>Non- Parametric Statistics</b> Co-relation and Regression analysis a) Scatter Diagram b) Karl Person's Co-efficient correlation c) Spearman's rank correlation d) Kendall's rank correlation regression analysis. <b>Parametric</b> Hypothesis testing a) Meaning, types of hypothesis Testing of hypothesis i) Chi-square test ii) ANOVA iii) t-test	30	15
II	Matrices & Indices a) Introduction to matrices b) Index numbers: unweighted, weighted indices and Cost of Living Index	30	15
III	Analysis of geographical dataset using the above statistical techniques, interpretation and report writing using computer.	40	30
		100	60

**REFERENCES**

1. Gregory, 1963: Statistical methods and the Geographer, Longman S. London
2. Gupta S.P.; 1979: Practical Statistics; S. Chand and Co.
3. Johnson R.J. 1980: Multivariate statistical Analysis in Geography, Longman
4. Khan Z.A 1998: Text book of practical Geography – New Delhi
5. Pal Saroj K. 1982: Statistical Techniques: A basic approach to Geography: Tata –Mc Graw Hill, New Delhi.
6. P.K. Majumdar 2002 : Statistics: A Tool for Social Sciences, Rawat Publications: Jaipur & New Delhi.
7. Rastogi R.S.(2005): Elementary Statistics: Rohit Publications – Delhi-110 006
8. Succheti D.C. and Kapoor V.K. 2002 - statistics (Theory, methods and application)
9. Zamir Alvi 2000: Statistical Geography: Method and Applications Rawat Publications, New Delhi



**BSc**

**ELECTIVE**

**Course Title: Spatial Analysis (Theory)**

**Course Code: GEG- SE1**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

**Course Objectives:** The objectives of this course is to introduce the fundamentals of spatial analysis through pattern recognition, interpolation, locational and topographical analysis.

**Learning outcome:** At the end of this course, students will acquire the skills of spatial analysis, identification of suitable site, locational advantages and decision making.

Unit	Topic	No. of hours
I	<b>Introduction to Spatial Analysis:</b> concepts, functions of spatial analysis Characteristics, importance of geo-data base Topology and types Concept and sources of Spatial and Non-Spatial Data	15
II	Concept and methods of spatial Interpolation. Raster analysis. Overlay analysis.	20
III	<b>Topographic Analysis:</b> Digital Elevation Model, Slope, Aspect, Flow Accumulation, Flow Direction etc.	10
		45

**Reference Books:**

1. Alias A. Rahman and Morakot Pilouk (2008) Spatial Data Modeling for 3D GIS, Springer New York
2. Longley, P.A., Goodchild, M.F., Maguire, D.J. and Rhind, D.W. (2005). Geographic Information Systems and Science. Chichester: Wiley. 2nd edition.
3. M Goodrich (2000). Data Structures and Algorithms in Java, 2nd Edition Wiley.
4. Malczewski, J. (1999). GIS and Multicriteria Decision Analysis. New York: John Wiley and Sons
5. Ott, T. and Swiaczny, F. (2001). Time-integrative GIS. Management and analysis of spatio-temporal data. Berlin / Heidelberg / New York: Springer.
6. Thurston, J., Poiker, T.K. and J. Patrick Moore. (2003). Integrated Geospatial Technologies: A Guide to GPS, GIS, and Data Logging. Hoboken, New Jersey: Wiley.

**ELECTIVE**

**Course Title:** Spatial Analysis (Practical)

**Course Code:** GEG-SE1

**Marks:** 25

**Credits:** 1

**Duration:** 15 sessions of 2 hour each

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**Course Objectives:** The objectives of this course is to introduce the fundamentals of spatial analysis through pattern recognition, interpolation, locational and topographical analysis.

**Learning outcome:** At the end of this course, students will acquire the skills of spatial analysis, identification of suitable site, locational advantages and decision making.

Unit	Topic	Practical Sessions
I	<b>Vector Operations</b> (Single Layer): Dissolve, Buffer, Multi Ring Buffer. Vector Operations (Multi Layer): Clip, Erase, Merge, Intersect. <b>Raster Operations:</b> clip and mosaic (Extract By Mask). Spatial Queries and Non-Spatial Queries based on locations	<b>10</b>
II	<b>Interpolation:</b> Inverse Distance Weighted method Topo to Raster. <b>Overlay Operations</b> (Point in Polygon, Line in Polygon, Polygon in polygon).	<b>05</b>
III	Journal	-
		<b>15</b>

**Reference Books:**

1. Alias A. Rahman and Morakot Pilouk (2008): Spatial Data Modeling for 3D GIS, Springer New York.
2. Goodrich, M (2000). Data Structures and Algorithms in Java, 2nd Edition Wiley Longley, P.A.,
3. Goodchild, M.F., Maguire, D.J. and Rhind, D.W. (2005). Geographic Information Systems and Science. Chichester: Wiley. 2nd edition.
4. Malczewski, J. (1999). GIS and Multicriteria Decision Analysis. New York: John Wiley and Sons
5. Ott, T. and Swiaczny, F. (2001). Time-integrative GIS. Management and analysis of spatio-temporal data. Berlin / Heidelberg / New York: Springer.
6. Thurston, J., Poiker, T.K. and J. Patrick Moore. (2003). Integrated Geospatial Technologies: A Guide to GPS, GIS, and Data Logging. Hoboken, New Jersey: Wiley.

**ELECTIVE**

**Course Title:** Raster and Vector Data Models in GIS (THEORY)

**Course Code:** GEG-SE2

**Marks:** 75

**Credits:** 3

**Duration:** 45 lectures of 1 hour each

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**Course Objectives:** This course introduces basic concepts and principles of GIS and emphasizes on the role of raster and vector data models. The students will introduced data processing, transformation and visualization of data using various models.

**Learning outcomes:** The students will be able to differentiate raster and vector data models and also appreciate the role of these models in visualizing graphical outputs through GIS.

Unit	Title	No. of hours
I	GIS Concepts, Principles, Geospatial Data Models, Organization of GIS Data and System Functionality, Map Projections, Coordinate Systems and Transformations.	15
II	Fundamentals of Raster data models, metadata and data exchange 2D and 3D raster data models Fundamentals of raster maps, Raster data transformation	15
III	Vector data Basics of vector data and Generation of vector data, fundamentals of Vector map queries and statistics, Basics of Point analysis Basics of Network analysis	15
		45

**Reference :**

1. Markus Neteler and Helena Mitasova (2008) OPEN SOURCE GIS, A GRASS GIS Approach (Third Edition) Springer, USA
2. McCartney Taylor, Nik Freeman (2014) Getting Started With GIS Using QGIS (Kindle Edition) McCartney Taylor.

**Sample Data source**

1. <https://grass.osgeo.org/download/sample-data/>
2. <http://grassbook.org/datasets/datasets-3rd-edition/>
3. <http://www.qgis.org/en/site/>

**ELECTIVE**

**Course Title:** Raster and Vector Data Models in GIS (Practical)

**Course Code:** GEG-SE2

**Marks:** 25

**Credits:** 1

**Duration:** 15 Sessions of 2 hour each

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**Course Objectives:**

This course introduces basic concepts and principles of GIS and emphasis on the role of raster and vector data models. The students will be also be introduced data processing, transformation and visualization of data using various models.

**Learning outcomes:** The students will be able to differentiate raster and vector data modes and also appreciate the role of these models in visualizing and graphical outputs through GIS.

Unit	Title	Practical sessions
I	Import of raster data, Coordinate transformation, Raster map algebra Raster data transformation and interpolation Spatial analysis with raster data	8
II	Vector Datageneration Network Analysis Cluster analysis Transformations to Raster(vectorization - rasterization) Spatial Interpolation.	7
III	Journal	-

**Reference :**

1. Markus Neteler and Helena Mitasova (2008) OPEN SOURCE GIS, A GRASS GIS Approach (Third Edition) Springer, USA
2. McCartney Taylor, Nik Freeman (2014) Getting Started With GIS Using QGIS (Kindle Edition) McCartney Taylor.

**Sample Data source**

1. <https://grass.osgeo.org/download/sample-data/>
2. <http://grassbook.org/datasets/datasets-3rd-edition/>
3. <http://www.qgis.org/en/site/>

**ELECTIVE**

**Course Title: Participatory GIS (Theory)**

**Course Code: GEG-SE3**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

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**Course Objectives:** This is an introductory Course of Participatory GIS that aims to expose student to applications of GIS in the context of community and people’s participation. This helps to enhance Geographical Information through shared knowledge and information.

**Learning outcomes:** At the end of this course, students will be able to understand and acknowledge the applications of GIS for benefit of society.

<b>Unit</b>	<b>Title</b>	<b>No. of hours</b>
I	Participatory Geographic Information Systems Concepts and Methods, History (PRA, P-GIS pGIS Pgis) Ethics, Partnership, role and responsibility of the scientist. Methodology for Pgis., implementation and limitations of the participation Methods, Techniques, advantages of community mapping. Data management. Features of interest for socio-economic analysis and social development skills and training requirements. P-GIS and the livelihoods approach.	15
II	Contribution of P-GIS through Community Mapping in Water Resource Inventory. Urban and Peri-Urban Partnership and Community Empowerment Community Resource Mapping in Forest, Agriculture and Water Resources Management: Bridging the Divide between Community and Government Voluntary Information and PGIS (VI & PGIS)	15
III	Neo-geography and GIS/2 : value addition to P-GIS Needs of Participatory GIS. Perspectives on Participatory mapping and PGIS	15
		45

## References

1. Abbot, J., Chambers, R., Dunn, C., Harris, T., Merode, E. d., Porter, G., Townsend, J., Weiner, D., de Merode, E., (1998). 'Participatory GIS: opportunity or oxymoron?' PLA Notes33. IIED: Londo
2. Elwood, Sarah (2006) Participatory GIS and Community Planning: Restructuring Technologies, Social Processes, and Future Research in PPGIS Collaborative Geographic Information Systems edited by Shivanand Balram and Suzana Dragicevic, Idea Group Inc. University of Arizona, USA
3. Elwood, Sarah (2006), Critical Issues in Participatory GIS: Deconstructions, Reconstructions, and New Research Directions Transactions in GIS, 10(5): 693–708
4. McCall, Michael K. (2004) Can Participatory-GIS Strengthen Local-level Spatial Planning? Suggestions for Better Practice. Dept. of Urban & Regional Planning and Geoinformation Management ITC. Course prepared for: GISDECO 2004 Skudai, Johor, Malaysia, 10-12 May (2004)
5. Quan, Julian, Oudwater, Nicolienne, Pender, Judith and Martin, Adrienne (2001)*GIS And Participatory Approaches In Natural Resources Research*. SOCIO-ECONOMIC METHODOLOGIES FOR NATURAL RESOURCES RESEARCH BEST PRACTICE GUIDELINES. Published by Natural Resources Institute, The University of Greenwich 2001
6. Minang, Peter A. and McCall, Michael K. ( 2006) Participatory GIS and local knowledge enhancement for community carbon forestry planning: an example from Cameroon. Participatory Learning And Action.

**ELECTIVE**

**Course Title:** Participatory GIS (Practical)

**Course Code:** GEG-SE3

**Marks:** 25

**Credits:** 1

**Duration:** 15 Sessions of 2 hour each

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**Course Objectives:** The basic objective of this practical course is to equip students with skills to calculate various indices and practically apply it in case studies.

**Learning outcome:** This practical course helps in developing skills by which students will practically carry on field studies.

Unit	Title	Practical Sessions
1	Data processing and computing indices Linear Model & Linear Combination Method (LCM) Assessment Index (AI) Employment index (M) Education index (E) Health index (S) Housing index (H) Infrastructure index The Principal Component Analysis Method (PCAM) Marginality Index (MI) Human Development Index	5
2	Case study of any one of the following (mini project) Water Resource Inventory Urban and Peri-Urban Agriculture Forest and Water Resources Management Using software like GRASS ( Geographic Resources Analysis Support System) and ILWIS ( Integrated Land and Water Information System)	10
3	Project report	-

**References:**

1. Françoise Orban-Ferauge V.Aguilar, E. Alarcon, A. Carmona, N. Daix, B. Denil, A. Ignacio, J. Martinez, M. McCall, G.Miscione, E. Olivarez, M. Pandan. G. Rambaldi, R. Teruel, J. Verplanke participatory geographic information systems and land planning life experiences for people empowerment and community transformation , Technical Centre for Agricultural and Rural Cooperation ACP-EU (CTA) Wageningen, The Netherlands



**ELECTIVE**

**Course Title:** Applied GIS (Theory)

**Course Code:** GEG-SE4

**Marks:** 75

**Credits:** 3

**Duration:** 45 lectures of 1 hour each

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**Course Objectives:** This Course introduces various recent application of GIS in business, society, transportation and spatial planning.

**Learning outcomes:** At the end of this course students will be able to correlate acknowledge of GIS in the day to days life problems.

Unit	Title	No. of hours
I	<b>Geobusiness</b> Retail Application of Spatial Modelling to Solve: Retail Location Problems, Location Based Services for Mobile Applications Mass Appraisal Model, Lifestyle Segmentation Profiles, Neighbourhood Model, Housing Price Mass Appraisal Model.	15
II	<b>Social Application:</b> Assessing Clusters of Deprivation in City Regions, GIS for Joined up Government Spatial Statistical Methods to the Detection of Geographical Patterns of Crime <b>Transport and Location:</b> Demand Responsive Passenger Transport Services, Strategic Land Use / Transportation Model, Relocation of Facilities. Probability Based GIS Model.	15
III	<b>Spatial Planning</b> Modelling Migration, Modeling Regional Economic Growth, Carrying Capacity, Planning Network of Site, Assessing Service Provision,	15
		45

## References

1. Abbot, J., Chambers, R., Dunn, C., Harris, T., Merode, E. d., Porter, G., Townsend, J., Weiner, D., de Merode, E., (1998). 'Participatory GIS: opportunity or oxymoron?' PLA Notes33. IIED: Londo
2. Elwood, Sarah (2006) Participatory GIS and Community Planning: Restructuring Technologies, Social Processes, and Future Research in PPGIS Collaborative Geographic Information Systems edited by Shivanand Balram and Suzana Dragicevic, Idea Group Inc. University of Arizona, USA
3. Elwood, Sarah (2006), Critical Issues in Participatory GIS: Deconstructions, Reconstructions, and New Research Directions Transactions in GIS, 10(5): 693–708
4. McCall, Michael K. (2004) Can Participatory-GIS Strengthen Local-level Spatial Planning? Suggestions for Better Practice. Dept. of Urban & Regional Planning and GeoInformation Management ITC. Course prepared for: GISDECO 2004 Skudai, Johor, Malaysia, 10-12 May (2004)
5. Quan, Julian, Oudwater, Nicolienne, Pender, Judith and Martin, Adrienne (2001)*GIS And Participatory Approaches In Natural Resources Research*. SOCIO-ECONOMIC METHODOLOGIES FOR NATURAL RESOURCES RESEARCH BEST PRACTICE GUIDELINES. Published by Natural Resources Institute, The University of Greenwich 2001
6. Minang, Peter A. and McCall, Michael K. ( 2006) Participatory GIS and local knowledge enhancement for community carbon forestry planning: an example from Cameroon. Participatory Learning And Action.
7. Stillwell, John and Clarke, Graham (2004) Applied GIS and Spatial Analysis (Ed). John Willy and Sons LTD England

**ELECTIVE**

**Course Title:** Applied GIS (practical)

**Course Code:** GEG-SE4

**Marks:** 25

**Credits:** 1

**Duration:** 15 Sessions of 2 hour each

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**Course Objectives:** The basic objective of this practical course is to equip students with skills to apply GIS skills various issues through spatial modeling and analytical tools.

**Learning outcome:** This practical course helps in developing skills by which students will be able to under undertake various local problems and suggest realistic spatial solution to it.

Unit	Title	Practical Sessions
1	Spatial Modelling: Land Use transformation model and Transportation Model, Neighboring Model (NNI)	8
2	Spatial Statistic: Cluster Analysis, Crime Pattern Analysis, Mass Appraisal	7
3	Journal	-

**References :**

1. John Stillwell and Graham Clarke (2004) Applied GIS and Spatial Analysis (Ed). John Willy and Sons Ltd. England
2. Markus Neteler and Helena Mitasova (2008) OPEN SOURCE GIS, A GRASS GIS Approach (Third Edition) Springer, USA
3. McCartney Taylor, Nik Freeman (2014) Getting Started With GIS Using QGIS (Kindle Edition) McCartney Taylor.

**Sample Data source**

1. <https://grass.osgeo.org/download/sample-data/>
2. <http://grassbook.org/datasets/datasets-3rd-edition/>
3. <http://www.qgis.org/en/site/>

**ELECTIVE**

**Course Title: Coastal Geomorphology (Theory)**

**Course Code: GEG-SE5**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

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**Course Objectives:** The basic objective of this course is to familiarize students about the mechanism of landform development resulting from coastal processes.

**Learning outcomes:** At the end of this course, students are expected to have an understanding of the various processes and associated landforms in coastal regions. Besides learn the methods of coastal hazard management

Unit	Title	No. of hours
I	Introduction to coastal Processes Waves: Formation, Drifts and Tides. Types of coastlines, Coastal erosion and deposition. Coastal landforms.	15
II	Beach Geomorphology: Types and Configuration of beaches Coastal wetlands. Coral reefs and marine environment.	15
III	Coastal Ecosystem Management. Coastal Hazard Management.	15
		45

**References**

1. Cooke R. U. and Doornkamp J.C. (1989): Geomorphology in Environmental Management, 2<sup>nd</sup> Edition, Oxford : Clarendon Press
2. Eric Bird: Coastal Geomorphology: An Introduction, John Wiley & Sons; 1 edition (November 7, 2000),
3. Gerhard Masselink , Michael Hughes :An Introduction to Coastal Processes and Geomorphology (Hodder Arnold Publication), ISBN-10: 0340764112 , ISBN-13: 978-0340764114
4. Kale, V. S. and Gupta, A. (Rep.2011): Introduction to Geomorphology, Orient Longman, Calcutta.
5. Karlekar, S. (2009): Coastal Processes and Landforms: Diamond Publications, Pune
6. Richard Davis Jr. , Duncan Fitzgerald : Beaches and Coasts, Wiley-Blackwell; 1st edition (July 15, 2004), ISBN-10: 0632043083 , ISBN-13: 978-0632043088
7. Timothy Beatley , Anna K. Schwab , David Brower (2002):An Introduction to Coastal Zone Management, Island Press; REV edition

**ELECTIVE****Course Title: Practicals in Coastal Geomorphology****Course Code: GEG-SE5****Marks: 25****Credits: 1****Duration: 15 sessions of 2 hours each**

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**Course Objectives:** To develop the skills of identification and interpretation of coastal landforms and processes.

**Learning outcome:** At the end of the course students are expected to independently prepare geographic map and interpret coastal landscape. Besides they should be able to carry out beach profiling using instruments.

Unit	Title	Practical sessions
1	Identification of coastal features and processes on SOI toposheet.	05
2	Beach profiling & identification of major and minor coastal features on beach. Profile of various types of coast. Geomorphic mapping of Coastal Areas.	10
3	Journal and Viva	
		15

**References**

- a. Bygot, J.: An Introduction to Map Work and Practical Geography, 2001
- b. Campbell, J., 2004: Introductory Cartography, Printice Hall, Inc Englewood
4. Jackson, R.H. and Hudmar, L.E.: Regional Geography: Issues for today ,2001
5. Misra, R.P. and Ramesh, A., 2005: Fundamentals of Cartography, Concept Pub. Co., New Delhi
6. Monkhouse, I.J. and Wilkinson, H.R., 2001: Maps and Diagram, B.I. Publication, New Delhi
7. Raisz, E.: General Cartography, McGraw Hills Co., London ,2005
8. Robinson, A.H., et al.: Elements of Cartography, John Wiley and Sons, New York,2003
9. Singh, R.L.: Elements of Practical Geography, Kalyani Publishers, New Delhi ,2000
10. Singh, R ; Singh L.R., Mapworks in Practical Geography,Central book Depot, Allahabad,2001

**ELECTIVE**

**Course Title: Geography of Soil Studies (THEORY)**

**Course Code: GEG-V.SE-9**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

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**Course Objectives:** This is a basic course that focuses on understanding of soil formation, development and distribution. They will also be equipped with basics of soil structure, composition, content and conservation practices.

**Learning outcomes:** On completion of this course, the students will be able to identify and differentiate between various soils profiles and types

This will develop understanding amongst students how different types of soil formations, characteristics and importance in agricultural practices.

<b>Unit</b>	<b>Topic</b>	<b>No. of hours</b>
I	<b>Introduction to soil:</b> Concept , soil formation Soil water dynamic, Factors affecting soil formation. Soil structure, composition Soil profile, Texture	15
II	<b>Soil and organisms</b> - Organic matter of soil, Sources of organic matter – Biomass, Termites, worms, ants, algae, fungi, bacteria..., Carbon cycle – simple decomposition, Agricultural importance of soils - Nitrogen fixation	15
III	<b>Soil Conservation and management</b> Soil erosion, degradation and pollution, its sources and impacts : Soil conservation and management practices traditional and modern Case studies	15

**References:**

1. Brady Nyle. (2002). The nature and properties of soil. MacMillan Publishing company, USA
2. Foth Henry. (1984). Fundamentals of soil science. John Wiley & Sons, Inc. USA
3. Munns Donald and Singer Michael. (1996). Soils – An introduction. Prentice-Hall Inc, New Jersey, USA
4. Lal R and Stewart B.A. (1990). Advances in soil sciences. Springer-Verlag New York.
5. White Robert. (2005). Principles and Practice of Soil Science: The Soil as a Natural Resource, 4th Edition. Wiley & Sons, Inc – Blackwell. USA

**ELECTIVE**

**Course Title: Geography of Soil Studies (PRACTICAL)**

**Course Code: GEG-V.SE-9**

**Marks: 25**

**Credits: 1**

**Duration: 15 Sessions of 2 hours each**

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**Course Objectives:** This is a basic practical course in soil studies that give emphasis on lab analysis of soil sample to understand the various properties of soil sample.

**Learning outcomes:** On completion of this course, the students will be able test the soil properties and quality of collected soil samples using various instruments and prepare lab reports.

<b>Unit</b>	<b>Topic</b>	<b>Practical sessions</b>
I	Field visit: pre field, fieldwork and post fieldwork Sample preparation <b>Soil Test (physical)</b> 1. Moisture content calculation 2. Texture analysis 3. EC	10
II	<b>Soil Test (chemical)</b> 1. Soil pH levels 2. NPK level testing 3. Carbon testing	05
	Journal and Viva	
		15

Reference:

1. Brady Nyle. (2002). The nature and properties of soil. MacMillan Publishing company, USA
2. Foth Henry. (1984). Fundamentals of soil science. John Wiley & Sons, Inc. USA
3. George Estefanm, Rolf Sommer, and John Ryan. (2013) Methods of Soil, Plant, and Water Analysis: A manual for the West Asia and North Africa region. Beirut, Lebanon
4. Head K.H. (1994). Manual of soil laboratory testing. John Wiley & Sons, Inc. USA
5. Munns Donald and Singer Michael. (1996). Soils – An introduction. Prentice-Hall Inc, New Jersey, USA

**ELECTIVE**

**Course Title: Agrometeorology: Principles and Applications (THEORY)**

**Course Code: GEG-V.SE-10**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

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**Course Objectives:** This is a basic course that focuses on agrometeorology and its application in agriculture. This will help students to develop understanding of the physical and human interventions that affect agricultural systems and management practices.

**Learning outcomes:** On completion of this course, the students will be able to understand the role of climate in agricultural productivity. They will be exposed to use of geospatial technology in monitoring agricultural systems especially in the context of climate change.

Unit	Title	No. of hours
I	<b>Agrometeorology:</b> Perspectives and Applications: Definition and scope and development. <b>Solar Radiation and Its Role in Plant Growth:</b> The Source of Energy, Laws of Radiation, Earth's Annual Global Mean Radiative Energy Budget, Solar Radiation and Crop Plants, Solar Radiation Interception by Plants, Photosynthetically Active Radiation (PAR), Solar Radiation Use Efficiency <b>Environmental Temperature and Crop Production:</b> Soil and Air Temperature, Plant Injury Due to Sudden Changes in Temperature, Frost: Damage and Control, Thermoperiodism, Temperature As a Measure of Plant Growth and Development.	15
II	<b>Climatological Methods for Managing Farm Water Resources-</b> Water for Crop Production, Making Effective Use of Rainfall, Evaporation and Evapotranspiration, Water Use and Loss in Irrigation. Climatological Information in Improving Water-Use Efficiency (WUE), Reducing Water Losses from Reservoirs, <b>Drought Monitoring and Planning for Mitigation:</b> water budgeting, irrigation scheduling, Drought Monitoring and Planning for Mitigation. <b>Climate, Crop Pests:</b> Role of Weather and Climate, Some Important Insect Pests of Crop Plant.	15
III	Remote-Sensing Applications in Agrometeorology. Computer Models in Managing Agricultural Systems, Agro-climatological Services, Using Climate Information to Improve Agricultural Systems, Climate Change and Its Impact on Agriculture.	15
		45



## REFERENCES

1. Grigg, David (2005) An Introduction to Agricultural Geography (2nd Ed), Routedledge, London and New York
2. G. Kathiresan (2015) Agrometeorology: A Simplified Textbook. New India Publishing Agency
3. G.S. Mahi & P.K. Kingra (2014): Fundamentals of Agrometeorology. Kalyani Publishers
4. Harpal S. Mavi and Graeme J.,Tupper (2004), Agrometeorology Principles and Applications of Climate Studies in Agriculture. The Haworth Press, Inc., Binghamton, NY.
5. Mavi H S (2003): Introduction To Agrometeorology. Oxford & Ibh
6. Rao and Prasada (2008) Agricultural Meteorology. PHI Learning PVT. LTD., New Delhi
7. Seemann, Jochen, Chirkov, Y. I., Lomas, J., Primault, B. (2012): Agrometeorology. Springer-Verlag Berlin and Heidelberg GmbH & Co. KG
8. SR Reddy & D.S. Reddy (2014) Agrometeorology. Kalyani Publishers
9. S. Venkatraman (2015): Principles and Practice of Agricultural Meterology. BS Publications.
10. WMO (2011), Agricultural Meteorology Guide to Climatological Practices World Meteorological Organization, Geneva.

**ELECTIVE****Course Title: Agrometeorology: Principles and Applications (PRACTICAL)****Course Code: GEG-V.SE-10****Marks: 25****Credits: 01****Duration: 15 sessions of 2 hours each**

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**Course Objectives:** This course enables student to understand the role of insolation, rainfall, evapotranspiration in crop growth and development. The students will learn techniques of measurement in agrometeorology.

**Learning outcomes:** On completion of this course, the students will able to independently analyze the interaction of solar radiation, temperature, rainfall, evapotranspiration using metrological and remotely sensed data.

Unit	Title	Practical sessions
I	Green leaf response to Electro Magnetic Radiation Photosynthetically Active Radiation (PAR) Solar radiation use efficiency Temperature and crop growth	07
II	Measurement of effective rainfall(using Huggins and Kassam water balance approach) Water balance, Measurement of evaporation and calculation of evapotranspiration irrigation scheduling for crops Analyzing the water deficiency (drought) , drought index Use of thermal data in drought monitoring	08
	Journal and Viva	
		15

**References**

1. Don Ankerman; Richard Large (2013) Agronomy Handbook. Midwest Laboratories Inc., OMAHA, NE
2. Harpal S. Mavi and Graeme J. Tupper (2004), Agrometeorology Principles and Applications of Climate Studies in Agriculture, The Haworth Press, Inc., Binghamton, NY.
3. Indian Council of Agricultural Research (2011) Handbook of Agriculture, Indian Council of Agricultural Research
4. Rao and Prasada (2008) Agricultural Meteorology. PHI Learning PVT. LTD., New Delhi
5. WMO (2011), Agricultural Meteorology Guide to Climatological Practices World Meteorological Organization, Geneva.

**ELECTIVE****Course Title: Field Survey in Physical Geography (THEORY)****Course Code: GEG-V.SE-11****Marks: 75****Credits: 3****Duration: 45 lectures of 1 hour each**

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**Course Objectives:** The primary aim of this Course to introduce various surveying instrument used in Physical Geography. Students will learn the operation and the application of the instruments and methods of surveying.

**Learning outcomes:** At the end of this course students will be able to understand functions and applications of dumpy level, Plane table and Global Positioning Systems (GPS) in field based studies.

Unit.	Topic	No. of hours
I	Significance and Methods of Survey; Classification of Surveying; Fundamentals of Plane Table Survey: a) Radiation Method b) Intersection Method Pre survey work: Safety Measures, Field Book Preparation, Literature Survey, Sharing Responsibilities and Plan of Action Post field survey work: Data Processing Methods, Analysis, Mapping and Report Writing.	15
II	Dumpy level surveying : meaning, functioning elements, applications and Methods(Rise-fall and Collimation method) Profile drawing: Beach and River. Beach and River Morphology. Observation of slope, river and coastal morphology on toposheet. Pre survey and Post survey tasks.	15
III	GPS survey: Meaning, Space Segment, Ground Segment and GPS Receivers, Applications.	15
		45

**REFERENCES**

6. Campbell, J. (2004), Introductory Cartography, Prentice Hall, Inc Englewood
7. Khullar.D.R. (2007), Essentials of Practical Geography, New Academic Publishing Co.,Jalandher
8. Misra, R.P. and Ramesh, A. (2005), Fundamentals of Cartography, Concept Pub. Co., New Delhi
9. Monkhouse, I.J. and Wilkinson, H.R. (2009), Maps and Diagram, B.I. Publication, New Delhi
10. Sarkar, Ashis (2000), Practical Geography: A Systematic Approach, Orient Longman Pvt. Ltd., Kolkata
11. Singh, R.L. and Singh Rana P.B.(2008), Elements of Practical Geography, Kalyani Publishers, New Delhi

**ELECTIVE**

**Course Title:** Field Survey in Physical Geography (PRACTICAL)

**Course Code:** GEG-V.SE-11

**Marks:** 25

**Credits:**1

**Duration:** 15 Sessions of 2 hours each

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**Course Objectives:** The main objective of this course is to provide hands-on training in Plane Table, Dumpy Level and GPS survey.

**Learning outcome:** At the end of this course, students will be able to independently handle survey instruments and prepare maps and field reports.

Unit	Topic	Practical sessions
I	Plane table survey: a) Radiation Method :2 Exercises B) Intersection Method: 2 Exercises	07
II	Dumpy Level Survey: Rise-Fall and Collimation Method GPS Survey: Use of GPS in Mapping And Location Observation Of Slope, River and Coastal Morphology on Field	08
	Journal /Field report	
		15

**References**

1. Campbell J. (2004), Introductory Cartography, Printice Hall, Inc Englewood
2. Khullar.D.R (2007), Essentials of Practical Geography, New Academic Publishing Co. Jalandher
3. Misra, R.P. and Ramesh, A. (2005), Fundamentals of Cartography, Concept Pub. Co., New Delhi
4. Monkhouse, I.J. and Wilkinson, H.R.(2009), Maps and Diagram, B.I. Publication, New Delhi
5. Singh, R.L. and Singh Rana P.B.(2008), Elements of Practical Geography, Kalyani Publishers, New Delhi
6. Sarkar, Ashis (2000), Practical Geography: A Systematic Approach, Orient Longman Pvt. Ltd., Kolkata.

**ELECTIVE****Course Title: Quantitative Techniques in Geography (THEORY)****Course Code: GEG-V.SE-12****Marks: 75****Credits: 3****Duration: 45 lectures of 1 hour each**

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**Course Objectives:** The focus of this course is to expose students to basic and advance statistical methods in geography in general.

**Learning outcomes:** On completion of this course students will able to test various statistical tools applied in earth science. Further they will be able to understand various stochastic models and forecasting methods in the discipline of earth science.

Unit	Title	No. of hours
I	Statistical Methods in Geography Basics of Sampling, Data Collection and Sample Design, Hypothesis Quantification and Prediction / projection, The Concept of Variable, Probability, Frequency Function.	15
II	Frequency Analysis and Simulation, Measure of Central tendency, Dispersion, Skewness and Kurtosis, Correlation and Regression, Chi Square( $\chi^2$ )	15
III	Stochastic Modelling (Time Series Analysis) and Forecasting Processes, Autocorrelation, Moving Average. Maximum Entropy Method	15
		45

**REFERENCES**

1. Pal S. K., 1998: Statistics for Geoscientists: Techniques and Application, Concept, New Delhi.
2. Sharma, D.D. (2008): Geostatistics with Application in Earth Sciences, Springer, with Capital Publishing Company, New Delhi, India.
3. Rogerson., P. A.(2001) : Statistical Methods for Geography. SAGE Pub. New Delhi
4. Spence, N. & Owens, A. (2011) :Methods of Geographical Analysis. University of London
5. Tomislav Hengl (2009): A Practical Guide to Geostatistical Mapping. The European Communities, Luxembourg

**ELECTIVE**

**Course Title:** Quantitative Techniques in Geography (PRACTICAL)

**Course Code:** GEG-V.SE-12

**Marks:** 25

**Credits:** 01

**Duration:** 15 sessions of 2 hours each

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**Course Objectives:** The focus of this course is to enable students to learn and apply basic and advance statistical methods in geography.

**Learning outcomes:** On completion of this course students will able to test and analyze various statistical tools applied in geography. Further they will be able to formulate hypothesis and prove it applying various stochastic models and forecasting methods in the discipline of geography.

Unit	Title	Practical sessions
I	Measure of Central tendency and Dispersion Mean (Z) Estimates for the Mean, Confidence Limits for the Mean Skewness and Kurtosis Correlation and Regression, Correlation Coefficient Hypothesis testing :The Chi-square (X <sup>2</sup> ) Test, Time Series Analysis and Forecasting	07
II	Variogram and Estimation Variance Entropy Method,	08
	Journal and Viva	
		15

Note : Only physical geography data should be used.

**References**

1. A. Stewart Fotheringham, Chris Brunsdon and Martin Charlton. (2000): Quantitative Geography Perspectives on Spatial Data Analysis. SAGE Publications Ltd
2. Rogerson, Peter A. (2015 ) Statistical Methods for Geography. (4th Ed) SAGE Publications Ltd
3. Sharma, D.D. (2008): Geostatistics with Application in Earth Sciences, Springer, with Capital Publishing Company, New Delhi, India.
4. Spence, N. & Owens, A. (2011) Methods of Geographical Analysis. University of London
5. Robert Hammond, Patrick McCullagh; (1974): Quantitative techniques in geography: an introduction. Clarendon Press,

**SYLLABUS FOR AUTONOMOUS COURSES IN GEOGRAPHY  
BACHELOR OF SCIENCE  
SEMESTER VI  
REVISED AS ON 12<sup>TH</sup> OCTOBER 2018**

**CORE**

**Course Title:** Ecology and Terrestrial Environment (THEORY)

**Course Code:** GEG-VI.SC-8

**Marks:** 75

**Credits:** 3

**Duration:** 45 lectures of 1 hour each

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**Course Objectives:** The basic objective of this course is to introduce the concepts of terrestrial ecology which will help in sustainable management of the same.

**Learning outcomes:** At the end of this course, students are expected to have an understanding of Biomes, ecological factors and applications. They will be familiar with sustainable strategies for conservation of terrestrial ecology.

Unit	Title	No. of hours
I	<b>Biomes of the world:</b> <ul style="list-style-type: none"> <li>• Biogeography: Species distribution, Historic effect of plate tectonics- past and present pattern of Biogeography</li> <li>• Terrestrial Biomes : Tropical Rain Forest, Savannah, Tundra, Desert</li> </ul>	15
II	<b>Physical factors controlling terrestrial ecosystem</b> <ul style="list-style-type: none"> <li>• Soil : soil as an ecological factor, texture,</li> <li>• Water: Classification, properties of water as ecological factors: properties, composition, effect of rainfall and moisture on growth and distribution of plants and animals.</li> </ul>	15
III	<b>Climatic factors controlling terrestrial ecosystem</b> Temperature: ecological factor, range of temperature tolerance, effects on plants and animals, Precipitating : Distribution , effects on plants and animal	15
		45

**References:**

1. Dhaliwal GS, Sangha GS, Ralhan PK, 1996: Fundamentals of Environment Science, Kalyani Publishers New Delhi,
2. J.L Chapman and MJ Reiss, 1999: Ecology: Principles and Application, Second Edition, Cambridge University Press, UK
3. Kotpal RL, Bali NP, 1998: Concepts Of Ecology, Vishal Publication, Jalendhar
4. Purphit SS, Ranjan R, 2003: Ecology, Environment and Pollution, Agrobios (India) Publication, Jodhpur

**CORE**

**Course Title: Ecology and Terrestrial Environment (PRACTICAL)**

**Course Code: GEG-VI.SC-8**

**Marks: 25**

**Credits: 1**

**Duration: 15 sessions of 2 hours each**

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**Course Objectives:** The course aims to develop skills of field sampling, testing and analysis of water and soil and interpretation .

**Learning outcome:** After the completion of this course, students will learn water and soil testing

<b>Unit</b>	<b>Title</b>	<b>Practical sessions</b>
I	<b>Field Visit</b> : visit to a forest ecosystem mapping of biodiversity using quadrant method testing relationship of soil and water with forest ecology.	07
II	Field report writing and Viva	08
		15

**References :**

1. Handbook of Applied Hydrology, Ven Te Chow, Ed., Section 4-II, McGraw-Hill Book Company, New York
2. King, C. A. M. (1966): Techniques in Geomorphology, Edward Arnold Ltd., London
3. Miller, A. A. (1953): The Skin of the Earth, Methuen and Co. Ltd., London
4. Monkhouse, F. J. and Wilkinson, H. R. (1971): Maps and Diagrams, Methuen and Co., London
5. Strahler, A. N. (1964): Quantitative Geomorphology of Drainage Basins and Channel Networks,



**ELECTIVE**

**Course Title: Remote Sensing of Forest Ecology (THEORY)**

**Course Code: GEG-VI .SE-13**

**Marks: 75**

**Credits: 3**

**Duration: 45 sessions of 1 hours each**

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**Course Objectives:** The objective of this course is to introduce the fundamental application of remote sensing in the forest ecology.

**Learning outcome:** Student will be able to appreciate the use of remotely sensed data in forest applications.

<b>Unit</b>	<b>Title</b>	<b>No. of hours</b>
I	<b>Remote Sensing of Forest Environments</b> Spectral Response of Vegetation. Measuring and monitoring: General Methods of Measuring Vegetation.	15
II	Measurement of Vegetation: Biophysical Measure, Timing of Measurements, Forest Structure and Composition, Species richness and composition	15
III	Modeling Forest Productivity Using Data Acquired Through Remote Sensing Understanding Forest Dynamics: spatial and temporal changes	15
	Total	45

**References**

1. Adrian Newton (2007) Forest Ecology and Conservation, A Handbook of Techniques Techniques in Ecology & Conservation. Oxford New York
2. Hamlyn G Jones and Robin A Vaughan (2010) Remote Sensing of Vegetation Principles, Techniques, and Applications. Oxford University Press, Oxford.
3. Michael Wulder and Steven E. Franklin (2003) Remote Sensing of Forest. Environments, Concepts and Case Studies. (Ed) Springer, US.
4. Ned Horning, Julie A. Robinson, Eleanor J. Sterling, Woody Turner, and Sacha Spector (2010 )
5. Remote Sensing for Ecology and Conservation, A Handbook of Techniques. Oxford University Press, Oxford.
6. Roger M. McCoy (2005 ) Field Methods in Remote Sensing. The Guilford Press, New York London.
7. Van Der Valk, Arnold (2009) Forest Ecology Recent Advances in Plant Ecology. Springer.

**ELECTIVE**

**Course Title:** **Practical in Remote Sensing of Forest Ecology (PRACTICAL)**

**Course Code:** GEG-VI .SE-13

**Marks:** 25

**Credits:** 1

**Duration:** 15 sessions of 2 hours each

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**Course Objectives:** To develop the skills of assessing forests using remotely sensed data products.

**Learning outcome:** At the end of the course student are expected to independently prepare forest map and interpret the forest dynamics.

Unit	Title	Practical sessions
I	<b>Measurement of Forest Canopy</b> Accuracy Assessment of forest map Sub-Pixel Analysis of Forest Structure Extracting Individual Tree Information Tree Canopy structure Fragmentation Analysis using Entropy approach	10
II	<b>Vegetation indices</b> <ul style="list-style-type: none"><li>• NDVI</li><li>• Principal Component Analysis (method specify)</li><li>• Mapping forest disturbances</li></ul>	5
		15

**References**

1. Adrian Newton (2007) Forest Ecology and Conservation, A Handbook of Techniques Techniques in Ecology & Conservation. Oxford New York
2. Hamlyn G Jones and Robin A Vaughan (2010) Remote Sensing of Vegetation Principles, Techniques, and Applications. Oxford University Press, Oxford.
3. Michael Wulder and Steven E. Franklin (2003) Remote Sensing of Forest. Environments, Concepts and Case Studies. (Ed) Springer, US.
4. Ned Horning, Julie A. Robinson, Eleanor J. Sterling, Woody Turner, and Sacha Spector (2010 )
5. Remote Sensing for Ecology and Conservation, A Handbook of Techniques. Oxford University Press, Oxford.
6. Roger M. McCoy (2005 ) Field Methods in Remote Sensing. The Guilford Press, New York London.
7. Van Der Valk, Arnold (2009) Forest Ecology Recent Advances in Plant Ecology. Springer.

**ELECTIVE****Course Title: Ecology of Estuarine Environment (THEORY)****Course Code: GEG-VI.SE-15****Marks: 75****Credit: 03****Duration: 45 lectures of 1 hour each**

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**Course objectives:** This Course enables the study of estuaries and their unique ecosystems. It explores the features of estuarine ecosystem and analyzes the effects of anthropogenic activities on estuaries.

**Learning outcomes:** After the completion of this course, students will be able to understand the estuarine processes. They will be aware about anthropogenic effects on estuaries.

<b>Unit No</b>	<b>Contents</b>	<b>No. of hours</b>
1	<b>Physical attributes of Estuaries</b> <ul style="list-style-type: none"><li>• Concept and Significance.</li><li>• Physical characteristics of estuaries</li><li>• Classification of estuaries.</li><li>• Environment in estuaries: mudflats, salt marsh, mangroves, salt pans</li><li>• Sediment source, transportation and deposition in estuaries.</li></ul>	15
2	<b>Estuarine dynamics</b> <ul style="list-style-type: none"><li>• Tides and tidal currents in estuaries</li><li>• Estuarine circulation and mixing.</li><li>• Estuaries as sources of food for marine organisms and nurseries for marine organisms.</li></ul>	15
3	<b>Anthropogenic Effects on estuaries and mitigation</b> <ul style="list-style-type: none"><li>• Agricultural runoff.</li><li>• Fishing</li><li>• Urban development and Reclamation of land for development.</li><li>• Recreational activities.</li><li>• Ports and harbors</li></ul>	15
		45

**References:**

1. Dronker J and Leussen W.V ( 1988) Physical Processes In Estuaries, Springer Verlag Publishers. London
2. Dyer. K.R (1997) Estuaries- Physical Introduction, 2<sup>nd</sup> edition John Wiley and Sons, New York
3. Gade, Edward and Svendsen( 1982) Coastal Oceanography, Plenum Press London.
4. Nair N. B. and Thampy, D.M.: (1989), Textbook of Marine Ecology. Macmillan Publishers
5. Tait, R.V- (1982), Elements of Marine Ecology: An Introductory Course, 3<sup>rd</sup> Edition, Butterworth-Heinemann

**ELECTIVE****Course Title: Ecology of Estuarine Environment (PRACTICAL)****Course Code: GEG-VI.SE-15****Marks: 25****Credit: 01****Duration: 15 sessions of 2 hours each**

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**Course objectives:** this Course helps in developing the practical skills of studying estuarine ecology.**Learning outcomes:** after the completion of this course, students will be able to independently test and analyze various parameters associated with estuarine ecology and suggest remedial measures for the protection of the same.

<b>Unit No</b>	<b>Contents</b>	<b>Practical sessions</b>
I	Mapping of estuaries from Indian coasts using SOI toposheets (any 3)	6
II	<b>Mapping of estuaries in Goa:</b> <ul style="list-style-type: none"><li>• Change detection using satellite data and topographical sheet</li><li>• Estuarine channel profiling, bank erosion, associated landforms (using GPS, current meter and depth analyzer )s</li><li>• Mini project</li></ul>	9
	Journal and Viva	

**References:**

1. Dronker J and Leussen W.V ( 1988) Physical Processes In Estuaries, Springer Verlag Publishers. London
2. Dyer. K.R (1997) Estuaries- Physical Introduction, 2<sup>nd</sup> edition John Wiley and Sons, New York
3. Gade, Edward and Svendsen( 1982) Coastal Oceanography, Plenum Press London.
4. Nair N. B. and Thampy, D.M.: (1989), Textbook of Marine Ecology. Macmillan Publishers
5. Tait, R.V- (1982), Elements of Marine Ecology: An Introductory Course, 3<sup>rd</sup> Edition, Butterworth-Heinemann

**Parvatibai Chowgule College of Arts and Science**

**(Autonomous)**

**DEPARTMENT OF GEOGRAPHY**

**COURSE STRUCTURE**

**THREE YEAR B.Sc. DEGREE COURSE IN GEOGRAPHY**

<b>SEMESTER</b>	<b>CORE COMPULSORY</b>		<b>CORE ELECTIVE</b>			
I	GEG-I.SC1: Introduction to Geography	GEG-I. SC2: Fundamentals of Physical Geography				
	GEG-I.SC1: Measurement Systems in Geography (Practical)	GEG-I. SC-2: Practicals in Physical Geography (Practical)				
II	GEG-II.SC3: Basics of Human Geography	GEG-II. SC4: Basics of Regional Geography				
	GEG-II.SC3: Practicals in Human Geography (Practicals)	GEG-II. SC4: Practicals in Regional Geography (Practicals)				
III	GEG-III. SC5: Fundamentals of Remote Sensing and GIS		GEG-III.SE1: Spatial Analysis	GEG-III.SE2: Raster and Vector Data Models in GIS	GEG-III.SE3: Participatory GIS	GEG-III.SE4: Applied GIS
IV	GEG-IV. SC6: Fundamentals of Geomorphology		GEG-IV.SE5: Coastal Geomorphology	GEG-IV.SE6: Fluvial Geomorphology	GEG-IV.SE7: Watershed Management	GEG-IV.SE8: Biogeography
V	GEG-V. SC7: Fundamentals of Climatology		GEG-V.SE9: Geography of Soil Studies	GEG-V.SE10: Agro- Meteorology: Principles and Applications	GEG-V.SE- 11: Field Survey in Physical Geography	GEG-V.SE12: Quantitative Techniques in Geography
VI	GEG-VI. SC8: Ecology and Terrestrial Environment		GEG-VI.SE13: Remote Sensing and Forest Ecology	GEG-VI.SE14: Advanced Coastal Geomorphology	GEG- VI.SE15: Ecology of Estuarine Environment	GEG-VI.SE16: Disaster Management: Urban and Coastal

**SYLLABUS FOR AUTONOMOUS COURSES IN GEOGRAPHY**  
**BACHELOR OF SCIENCE**  
**SEMESTER I**  
**REVISED AS ON 11<sup>TH</sup> OCTOBER 2017**

**CORE**

**Course Title: Basics of Human Geography (Theory)**

**Course Code: GEG-II. SC3**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

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**Course Objectives:** The course provides the basic conceptual framework of Human Geography. It focuses on cultivating basic knowledge through understanding and analysis of the fundamental concepts in Human geography.

**Learning outcomes:** At the end of this course students are expected to have a holistic understanding of fundamental concepts of Human Geography and thereby be able to understand human related issues.

<b>Unit</b>	<b>Topic</b>	<b>No. of hours</b>
I	<b>Concept and Nature</b> : Meaning, Scope and Development of Human Geography. Basic principles-Principle of Activity or Change, Principle of Terrestrial Unity or whole. Approaches in human geography (humanistic, scientific, welfare and behavioral)	15
II	<b>Society and Culture</b> Evolution of man (Australopithecus, Homo Erectus, Homo sapiens. Man's spread over the earth during the Pleistocene). Culture- meaning and components. Language and religion. (Classification, distribution, issues and challenges.) Contemporary social problems: Gender disparity and related issues Ethnicity and the related issues. (Case study of India).	15
III	<b>Indicators of Development:</b> L.D.C. and M.D.C.-social, economic and demographic. (Distribution and Density. Concepts of under population, over population, age and gender composition. Fertility, mortality, migration, Ageing population.) Demographic transition.	15
		45

Note : The course should focus on basic conceptual aspects.

## Reference

- 1) H.J De Blij,Alexander B.Murphy,Erin H. Fouberg.(2007) *Human Geography:people,place and culture*.John Wiley and sons. USA.
- 2) Panigrahi .P.K. (2011).*Human Geography-Landscape of Human Activities*. MurariLala and sons. New Delhi.
- 3) Sharma Y.K. (2007) *Human Geography*.Lakshmi Narain Agrawal, Agra.
- 4) Rubenstein J M (2010) *Contemporary Human Geography*. PHI learning pvt, New Delhi.
- 5) Hussain, M.(2004)*Human Geography*. Rawat Publication. New Delhi.
- 6) Chandna, R.C. (2006)*Geography of Population*.Kalyani Publishers. New Delhi
- 7) Hagget, P.(2002)*Geography: A Modern Synthesis*. Harper & Row, New York
- 8) De Blij, H.J., *Human Geography, Culture, Society and Space*, John Wiley, New York, 2006
- 9) Fellman, J.L. *Human Geography-Landscapes of Human Activities*, Brown and Bench man, Pub. U.S.A. 2007.
- 10) Arun Kumar Sharma, 2012: *Principles of Human Geography*, Rastogi Publications, Meerut

**CORE**

**Course Title: Practicals in Human Geography**

**Course Code: GEG-II.SC3**

**Marks: 25**

**Credits: 1**

**Duration: 15 sessions of 2 hours each**

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**Course Objectives:** The course provides the basic quantitative aspects of Human Geography. It focuses on cultivating quantification and diagrammatic representation of population data. This enables students to understand, quantify and precisely represent population data.

**Learning outcomes:** At the end of this course students are expected to have a holistic understanding of basic quantitative techniques used in Human geography. They should be able to diagrammatically represent population data and diagrams.

<b>Unit.</b>	<b>Title</b>	<b>Practical sessions</b>
1	Calculation and interpretation of: <b>1. Fertility measures:</b> Crude Birth Rate, General Fertility Rate <b>2. Mortality measures:</b> Crude Death Rate, Infant Mortality Rate. <b>3. Age data Analysis:</b> Age and gender composition <b>4. Construction of Population Pyramid</b>	8
2	<b>5. Literacy measures:</b> Crude Literacy Rate. Gross Enrolment Ratio. <b>6. Work Participation Ratio.</b> <b>7. Per capita income</b> <b>8. GDP</b>	7
3	Journal and viva	
		15



## References:

1. Bogue, D. J., 2001: Principles in Demography, John Wiley, New York
2. Bose, Ashish et. al., 2004: Population in India's Development, Vikas Publishing House, New Delhi
3. Census of India, India : A State Profile, 2001.
4. Chandna, R.C. Geography of Population : Concept, Determinants and Patterns, Kalyani Publishers, New York 2000.
5. Crook, Nigel Principles of Population and Development. Pergmon Press, New York 2007.
6. Daugherty, Helen Gin, Kenneth C.W. Kammeryir, An Introduction to Population (Second Edition). The Guilford Press, New York, London 2008.
7. Mitra, Asok, India's Population. Aspects of quality and Control Vol. I & II. Abhinav Publication. New Delhi 2008.
8. Srinivsan, K. and M. Vlassoff. Population Development Nexus in India : Challenges for the New Millennium. Tata McGraw Hill, New Delhi 2001.
9. Srinivasan, K. Basic Demographic Techniques and Applications Sage Publications, New Delhi 2008.
10. UNDP: Human Development Report Oxford University Press, Oxford 2000.
11. United Nations, Methods for Projections of Urban and Rural Populations. No. VIII, New York 2004.
12. Woods, R. Population Analysis in Geography, Longman, London 2009.
13. Sawant & Athavale: Population Geography, Mehta Publishing House, Pune.2005

## CORE

**Course Title: Basics of Regional Geography**

**Course Code: GEG-II.SC4**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

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**Course Objectives:** The course aims to develop a basic understanding of the regions and recognizing the significance of geography in shaping region. It helps students to appreciate regional unique dimensions of regions.

**Learning outcome:** At the end of this course, student will gain sense of spatial organization and areal variation in human activities.

Unit	Title	No. of hours
I	Concept of Region in Geography: Definition and characteristic The Regional Approach - area, region, space. ii) Methods of Regionalization- methods of delineation of region, types of regions,	15
II	i.) Foundations of Region - Ecological, Economic, Social and Cultural Dimensions ii.) Federalism-center – state relationships. iii.) Core – Periphery iv.) Hierarchy of regions, v.) Regional Consciousness and Identity. vi.) The Regional issues. (Two case studies)	15
III	Study of Regional Organization: Their evolution, functions and inter-linkages. Globalization and the New Territorial Order.	15

## References

1. Singh, R.L.2001 (ed):India – A Regional Geography, National Geographical Society, India
2. Cole, J. : *A Geography of the World's Major Regions*, Routledge, London,2000
3. Israel, S. Johnson, D.I. and Wood, D.: *World Geography Today*,2005
4. Jackson, R.H. and Hudman, L.E.: *Regional Geography: Issues for Today*,2007
5. *An Introduction to Regional Geography*, Paul Claval, Rawat Publication, Jaipur & Delhi,2003
6. Wheeler, J.H. Jr. and Kostbade, J.T., (1990): *World Regional Geography*, Holt Rinsshort and Winston, Inc
7. Holier, G.P., 2008: Regional Development in Michael Pacione (ed), *The Geography of the 3rd World: Progress & Prospects*, Rutledge, London, New York.
8. Jackson, R.H. and Hudmar, L.E.: *Regional Geography: Issues for Today* ,2004
9. Paul Claval (2008) *An Introduction to Regional Geography*, Wiley-Blackwell, ISBN 155786733X.

**CORE**

**Course Title: Practical in Regional Geography**

**Course Code: GEG-II.SC4**

**Marks: 25**

**Credits: 1**

**Duration: 15 sessions of 2 hours each**

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**Course objectives:** The course provides the basic quantitative aspects of regional Geography. It focuses on cultivating quantification and diagrammatic representation of regional data. This enables students to understand, quantify, compare of unique characteristic of different regions.

**Learning outcomes:** At the end of this course students are expected to have a holistic understanding of basic quantitative techniques used in regional geography. They should be able to diagrammatically represent interpret regional data and diagrams.

<b>Unit</b>	<b>Topic</b>	<b>Practical Sessions</b>
<b>I</b>	Methods of Regional Demarcation: 1. Demarcation of agricultural regions (crop combination and diversification) 2. Gravity model, 3. Breaking point Analysis, 4. Sphere of Urban Influence 5. Population potential surfaces	<b>08</b>
<b>II</b>	6. Network Analysis 7. Nearest Neighbor index, 8. Centro graphic analysis	<b>07</b>
<b>III</b>	<b>Journal and viva</b>	
		<b>15</b>

**References**

1. Hegget Peter, Cliff A.D. et. al. (2001) Locational Methods, Locational Analysis in Human Geography, Vol.II Arnold – Heinemann Pub. (India)
2. Hegget Peter, Cliff A.D. et. al. (2000) Locational Models, Locational Analysis in Human Geography. Vol. I Arnold – Heinemann Pub. (India)
3. Chandna R.C. (2003): Regional Planning: A Comprehensive Text, Kalyani Publishers, Ludhiana

**SYLLABUS FOR AUTONOMOUS COURSES IN GEOGRAPHY**  
**BACHELOR OF SCIENCE**  
**SEMESTER II**  
**REVISED AS ON 11<sup>TH</sup> OCTOBER 2017**

**CORE**

**Course Title: Basics of Human Geography (Theory)**

**Course Code: GEG-II. SC3**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

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**Course Objectives:** The course provides the basic conceptual framework of Human Geography. It focuses on cultivating basic knowledge through understanding and analysis of the fundamental concepts in Human geography.

**Learning outcomes:** At the end of this course students are expected to have a holistic understanding of fundamental concepts of Human Geography and thereby be able to understand human related issues.

<b>Unit</b>	<b>Topic</b>	<b>No. of hours</b>
I	<b>Concept and Nature</b> : Meaning, Scope and Development of Human Geography. Basic principles-Principle of Activity or Change, Principle of Terrestrial Unity or whole. Approaches in human geography (humanistic, scientific, welfare and behavioral)	15
II	<b>Society and Culture</b> Evolution of man (Australopithecus, Homo Erectus, Homo sapiens. Man's spread over the earth during the Pleistocene). Culture- meaning and components. Language and religion. (Classification, distribution, issues and challenges.) Contemporary social problems: Gender disparity and related issues Ethnicity and the related issues. (Case study of India).	15
III	<b>Indicators of Development:</b> L.D.C. and M.D.C.-social, economic and demographic. (Distribution and Density. Concepts of under population, over population, age and gender composition. Fertility, mortality, migration, Ageing population.) Demographic transition.	15
		45

Note : The course should focus on basic conceptual aspects.

## Reference

- 11) H.J De Blij,Alexander B.Murphy,Erin H. Fouberg.(2007) *Human Geography:people,place and culture*.John Wiley and sons. USA.
- 12) Panigrahi .P.K. (2011).*Human Geography-Landscape of Human Activities*. MurariLala and sons. New Delhi.
- 13) Sharma Y.K. (2007) *Human Geography*.Lakshmi Narain Agrawal, Agra.
- 14) Rubenstein J M (2010) *Contemporary Human Geography*. PHI learning pvt, New Delhi.
- 15) Hussain, M.(2004)*Human Geography*. Rawat Publication. New Delhi.
- 16) Chandna, R.C. (2006)*Geography of Population*.Kalyani Publishers. New Delhi
- 17) Hagget, P.(2002)*Geography: A Modern Synthesis*. Harper & Row, New York
- 18) De Blij, H.J., *Human Geography, Culture, Society and Space*, John Wiley, New York, 2006
- 19) Fellman, J.L. *Human Geography-Landscapes of Human Activities*, Brown and Bench man, Pub. U.S.A. 2007.
- 20) Arun Kumar Sharma, 2012: *Principles of Human Geography*, Rastogi Publications, Meerut

**CORE****Course Title: Practicals in Human Geography****Course Code: GEG-II.SC3****Marks: 25****Credits: 1****Duration: 15 sessions of 2 hours each**

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**Course Objectives:** The course provides the basic quantitative aspects of Human Geography. It focuses on cultivating quantification and diagrammatic representation of population data. This enables students to understand, quantify and precisely represent population data.

**Learning outcomes:** At the end of this course students are expected to have a holistic understanding of basic quantitative techniques used in Human geography. They should be able to diagrammatically represent population data and diagrams.

Unit.	Title	Practical sessions
1	Calculation and interpretation of: <b>9. Fertility measures:</b> Crude Birth Rate, General Fertility Rate <b>10. Mortality measures:</b> Crude Death Rate, Infant Mortality Rate. <b>11. Age data Analysis:</b> Age and gender composition <b>12. Construction of Population Pyramid</b>	8
2	<b>13. Literacy measures:</b> Crude Literacy Rate. Gross Enrolment Ratio. <b>14. Work Participation Ratio.</b> <b>15. Per capita income</b> <b>16. GDP</b>	7
3	Journal and viva	
		15

**References:**

1. Bogue, D. J., 2001: Principles in Demography, John Wiley, New York
2. Bose, Ashish et. al., 2004: Population in India's Development, Vikas Publishing House, New Delhi
3. Census of India, India : A State Profile, 2001.
4. Chandna, R.C. Geography of Population : Concept, Determinants and Patterns, Kalyani Publishers, New York 2000.
5. Crook, Nigel Principles of Population and Development. Pergmon Press, New York 2007.
6. Daugherty, Helen Gin, Kenneth C.W. Kammeryir, An Introduction to Population (Second Edition). The Guilford Press, New York, London 2008.
7. Mitra, Asok, India's Population. Aspects of quality and Control Vol. I & II. Abhinav Publication. New Delhi 2008.
8. Srinivsan, K. and M. Vlassoff. Population Development Nexus in India : Challenges for the New Millennium. Tata McGraw Hill, New Delhi 2001.
9. Srinivasan, K. Basic Demographic Techniques and Applications Sage Publications, New Delhi 2008.
10. UNDP: Human Development Report Oxford University Press, Oxford 2000.
11. United Nations, Methods for Projections of Urban and Rural Populations. No. VIII, New York 2004.
12. Woods, R. Population Analysis in Geography, Longman, London 2009.
13. Sawant & Athavale: Population Geography, Mehta Publishing House, Pune.2005

## CORE

**Course Title: Basics of Regional Geography**

**Course Code: GEG-II.SC4**

**Marks: 75**

**Credits: 3**

**Duration:45 lectures of 1 hour each**

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**Course Objectives:** The course aims to develop a basic understanding of the regions and recognizing the significance of geography in shaping region. It helps students to appreciate regional unique dimensions of regions.

**Learning outcome:** At the end of this course, student will gain sense of spatial organization and areal variation in human activities.

Unit	Title	No. of hours
I	Concept of Region in Geography: Definition and characteristic The Regional Approach - area, region, space. ii) Methods of Regionalization- methods of delineation of region, types of regions,	15
II	vii.) Foundations of Region - Ecological, Economic, Social and Cultural Dimensions viii.) Federalism-center – state relationships. ix.) Core – Periphery x.) Hierarchy of regions, xi.) Regional Consciousness and Identity. xii.) The Regional issues. (Two case studies)	15
III	Study of Regional Organization: Their evolution, functions and inter-linkages. Globalization and the New Territorial Order.	15

## References

1. Singh, R.L.2001 (ed):India – A Regional Geography, National Geographical Society, India
2. Cole, J. : *A Geography of the World's Major Regions*, Routledge, London,2000
3. Israel, S. Johnson, D.I. and Wood, D.: *World Geography Today*,2005
4. Jackson, R.H. and Hudman, L.E.: *Regional Geography: Issues for Today*,2007
5. *An Introduction to Regional Geography*, Paul Claval, Rawat Publication, Jaipur & Delhi,2003
6. Wheeler, J.H. Jr. and Kostbade, J.T., (1990): *World Regional Geography*, Holt Rinsort and Winston, Inc
7. Holier, G.P., 2008: Regional Development in Michael Pacione (ed), *The Geography of the 3rd World: Progress & Prospects*, Rutledge, London, New York.
8. Jackson, R.H. and Hudmar, L.E.: *Regional Geography: Issues for Today* ,2004
9. Paul Claval (2008) *An Introduction to Regional Geography*, Wiley-Blackwell, ISBN 155786733X.

**CORE**

**Course Title: Practical in Regional Geography**

**Course Code: GEG-II.SC4**

**Marks: 25**

**Credits: 1**

**Duration: 15 sessions of 2 hours each**

=====

**Course objectives:** The course provides the basic quantitative aspects of regional Geography. It focuses on cultivating quantification and diagrammatic representation of regional data. This enables students to understand, quantify, compare of unique characteristic of different regions.

**Learning outcomes:** At the end of this course students are expected to have a holistic understanding of basic quantitative techniques used in regional geography. They should be able to diagrammatically represent interpret regional data and diagrams.

<b>Unit</b>	<b>Topic</b>	<b>Practical Sessions</b>
<b>I</b>	Methods of Regional Demarcation: 9. Demarcation of agricultural regions (crop combination and diversification) 10. Gravity model, 11. Breaking point Analysis, 12. Sphere of Urban Influence 13. Population potential surfaces	<b>08</b>
<b>II</b>	14. Network Analysis 15. Nearest Neighbor index, 16. Centro graphic analysis	<b>07</b>
<b>III</b>	<b>Journal and viva</b>	
		<b>15</b>

**References**

4. Hegget Peter, Cliff A.D. et. al. (2001) Locational Methods, Locational Analysis in Human Geography, Vol.II Arnold – Heinemann Pub. (India)
5. Hegget Peter, Cliff A.D. et. al. (2000) Locational Models, Locational Analysis in Human Geography. Vol. I Arnold – Heinemann Pub. (India)
6. Chandna R.C. (2003): Regional Planning: A Comprehensive Text, Kalyani Publishers, Ludhiana



**SYLLABUS FOR AUTONOMOUS COURSES IN GEOGRAPHY  
BACHELOR OF SCIENCE  
SEMESTER III**

**CORE**

**Course Title: Fundamentals of Remote Sensing and GIS (THEORY)**

**Course Code: GEG-III. SC-5**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

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**Course Objectives:** The focus of this Course is to introduce key concepts of Remote Sensing and GIS.

**Learning outcomes:** On completion of this course students will be able to appreciate the basic science of remote sensing and GIS as a tool of study and research in geography

<b>Unit</b>	<b>Title</b>	<b>No. of hours</b>
I	<b>Concepts of Remote Sensing : Introduction to remote sensing,</b> Electromagnetic Radiation and its components:- Characteristics of Electromagnetic Spectrum Energy Interactions with Earth's atmosphere and surface features; Spectral response of Earth's natural surface. Introduction to Sensors and platforms Aerial Photography:- Types, Error In Flying, Geometry, Scale, Relief Displacement, Stereoscopes Parallax	15
II	<b>Visual Interpretation of Satellite Images and Aerial Photographs :</b> Elements of Image interpretation, Interpretation of Multi-Spectral Imagery, Identification of Earth Surface Features <b>Introduction to digital analysis</b>	15
III	<b>Concepts in GIS :</b> Content of GIS, objectives of GIS, Elements of GIS, Hardware & Software Requirements, Point Line and Polygon ,Layers and Coverage Raster and Vector Data, Components of GPS.	15
		45

## REFERENCES

1. C.P.Lo and Albert K. W. Yeung,( 2002) Concepts and Techniques of Geographic Information System, Prentice –Hall, India.
2. Heywood I, el. (2011 ) An Introduction to Geographical Information Systems , Pearson Education Pvt. Ltd., New Delhi,
3. J.R. Jensen, (2003) Remote Sensing of Environment, An Earth Resource Perspective, , Pearson Education Pvt. Ltd., New Delhi.
4. Kang – tsung – Chang, (2002)Introduction to Geographical Information System, , McGraw Hill.
5. Lillesand T.M. and Kiefer R.W., (2002) Remote Sensing and Image Interpretation, John Wiley and Sons, New Delhi.
6. George Joseph (2005) Fundamentals of Remote Sensing, University press Private Ltd, Hyderabad.
7. P. A. Burrough and R. A. McDonnell, (2000)Principles of Geographical Information System, , Oxford University Press.
8. Paul A. Lonfley, et al.(2002), Introduction to Geographic Information Systems and Science, , John Wiley and Sons Ltd

**CORE****Course Title: Fundamentals of Remote Sensing and GIS (Practical)****Course Code: GEG-III. SC-5****Marks: 25****Credits: 01****Duration: 15 sessions of 2 hours each**

=====

**Course Objectives:** The objective of this course is to provide hands-on training in in basic Remote Sensing, GIS and GPS techniques.

**Learning outcome:** At the end of this course, students will be able interpret and analyze remotely sensed data.

Unit	Title	Practical sessions
I	Determination of scale, coverage, area, distance and height parallax. Interpretation of Satellite images and Aerial Photography. Identification of physical and cultural features constructing three dimensional view. Aerial photographs and their verification and ground truthing	07
II	Geo-referencing of scanned maps. Digitization of point, line and polygon layers. GPS survey on field and Identification of geographic feature on image and on actual ground	08
III	Journal	
		15

**References**

1. C.P.Lo and Albert K. W. Yeung, Concepts and Techniques of Geographic Information System, (2002) Prentice -Hall, India.
2. George Joseph, Fundamentals of Remote Sensing, (2004), Universities Press Pvt. Ltd., Hyderabad.
3. Heywood I, (el.) An Introduction to Geographical Information Systems , Pearson (2011 )
4. J.R. Jensen, Remote Sensing of Environment, An Earth Resource Perspective, (2003), Pearson Education Pvt. Ltd., New Delhi.
5. Kang - tsung - Chang, Introduction to Geographical Information System, (2002), McGraw Hill.
6. Lillesand T.M. and Kiefer R.W., (2002), Remote Sensing and Image Interpretation, John Wiley and Sons, New Delhi.
7. P. A. Burrough and R. A. McDonnell, Principles of Geographical Information System, (2000), Oxford University Press.
8. Paul A. Lonfley, Michel F. Goodchild, D J. Maguire and D W. Rhind, Introduction to Geographic Information Systems and Science, (2002), John Wiley and Sons Ltd

**ELECTIVE**

**Course Title: Spatial Analysis (Theory)**

**Course Code: GEG-III.SE-1**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

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**Course Objectives:** The objectives of this course is to introduce the fundamentals of spatial analysis through pattern recognition, interpolation, locational and topographical analysis.

**Learning outcome:** At the end of this course, students will acquire the skills of spatial analysis, identification of suitable site, locational advantages and decision making.

Unit	Topic	No. of hours
I	<b>Introduction to Spatial Analysis:</b> Criteria for spatial analysis, Homogeneity of input data. Characteristics, importance of geo-data base, Topology Concept of Non-Spatial Data, sources, Optimum spatial database generation guidelines, Attribute queries.	10
II	<b>Concept of Interpolation,</b> Inverse distance weighted method, Spline, Krigging <b>Basics of overlay:</b> weighted overlay analysis, Reclassification of data, Raster analysis: local, focal, zonal and global Spatial relationships, Location Analysis using multiple parameters.	15
III	<b>Topographic Analysis:</b> Digital Elevation Model, Slope, Aspect, Flow Accumulation, Flow Direction. Suitability analysis for new site and habitat, Guidelines for preparing data for suitability analysis, criteria selection, Multi criteria analysis. Application of Spatial Analysis in decision making	20
		45

**Reference Books:**

1. Alias A. Rahman and Morakot Pilouk (2008) Spatial Data Modeling for 3D GIS, Springer New York
2. Longley, P.A., Goodchild, M.F., Maguire, D.J. and Rhind, D.W. (2005). Geographic Information Systems and Science. Chichester: Wiley. 2nd edition.
3. M Goodrich (2000). Data Structures and Algorithms in Java, 2nd Edition Wiley.
4. Malczewski, J. (1999). GIS and Multicriteria Decision Analysis. New York: John Wiley and Sons
5. Ott, T. and Swiaczny, F. (2001). Time-integrative GIS. Management and analysis of spatio-temporal data. Berlin / Heidelberg / New York: Springer.
6. Thurston, J., Poiker, T.K. and J. Patrick Moore. (2003). Integrated Geospatial Technologies: A Guide to GPS, GIS, and Data Logging. Hoboken, New Jersey: Wiley.

**ELECTIVE**

**Course Title: Spatial Analysis (Practical)**

**Course Code: GEG-III.SE-1**

**Marks: 25**

**Credits: 1**

**Duration: 15 sessions of 2 hour each**

=====  
**Course Objectives:** The objectives of this course is to introduce the fundamentals of spatial analysis through pattern recognition, interpolation, locational and topographical analysis.

**Learning outcome:** At the end of this course, students will acquire the skills of spatial analysis, identification of suitable site, locational advantages and decision making.

Unit	Topic	Practical Sessions
I	<b>Vector Operations</b> (Single Layer): Dissolve, Buffer, Multi Ring Buffer. Vector Operations (Multi Layer): Clip, Erase, Merge, Intersect. <b>Raster Operations:</b> Zonal Calculations, Extract By Mask. Spatial Queries Based on Location. Non-Spatial Queries	<b>07</b>
II	<b>Interpolation:</b> Inverse Distance Weighted method, Krigging, Topo to Raster. Reclassification of vector data. <b>Overlay Operations</b> (point in Polygon, Line in Polygon, Polygon in polygon). Site Suitability using weighted overlay.	<b>08</b>
III	Journal	-
		<b>15</b>

**Reference Books:**

1. Alias A. Rahman and Morakot Pilouk (2008): Spatial Data Modeling for 3D GIS, Springer New York.
2. Longley, P.A., Goodchild, M.F., Maguire, D.J. and Rhind, D.W. (2005). Geographic Information Systems and Science. Chichester: Wiley. 2nd edition.
3. Ott, T. and Swiaczny, F. (2001). Time-integrative GIS. Management and analysis of spatio-temporal data. Berlin / Heidelberg / New York: Springer.
4. Thurston, J., Poiker, T.K. and J. Patrick Moore. (2003). Integrated Geospatial Technologies: A Guide to GPS, GIS, and Data Logging. Hoboken, New Jersey: Wiley.
5. M Goodrich (2000). Data Structures and Algorithms in Java, 2nd Edition Wiley.
6. Malczewski, J. (1999). GIS and Multicriteria Decision Analysis. New York: John Wiley and Sons

**ELECTIVE**

**Course Title:** Raster and Vector Data Models in GIS (THEORY)

**Course Code:** GEG-III.SE-2

**Marks:** 75

**Credits:** 3

**Duration:** 45 lectures of 1 hour each

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**Course Objectives:** This course introduces basic concepts and principles of GIS and emphasizes on the role of raster and vector data models. The students will introduced data processing, transformation and visualization of data using various models.

**Learning outcomes:** The students will be able to differentiate raster and vector data models and also appreciate the role of these models in visualizing graphical outputs through GIS.

Unit	Title	No. of hours
I	GIS Concepts, Principles, Geospatial Data Models, Organization of GIS Data and System Functionality, Map Projections, Coordinate Systems and Transformations. Source of Data.	15
II	Fundamentals of Raster data models and data exchange 2D and 3D raster data models Fundamentals of Viewing and managing raster maps, Raster map algebra, Raster data transformation Basics of Graphical output and visualization.	15
III	Vector data Basics of Map viewing and metadata management Fundamentals of Vector map attribute management and SQL support, Generation of vector data, fundamentals of Vector map queries and statistics, Geometrical operations, Vector network analysis, data transformations Basics of Graphical output and visualization.	15
		45

**Reference :**

1. Markus Neteler and Helena Mitasova (2008) OPEN SOURCE GIS, A GRASS GIS Approach (Third Edition) Springer, USA
2. McCartney Taylor, Nik Freeman (2014) Getting Started With GIS Using QGIS (Kindle Edition) McCartney Taylor.

**Sample Data source**

1. <https://grass.osgeo.org/download/sample-data/>
2. <http://grassbook.org/datasets/datasets-3rd-edition/>
3. <http://www.qgis.org/en/site/>

**ELECTIVE**

**Course Title:** Raster and Vector Data Models in GIS (Practical)

**Course Code:** GEG-III.SE-2

**Marks:** 25

**Credits:** 1

**Duration:** 15 Sessions of 2 hour each

=====

**Course Objectives:**

This course introduces basic concepts and principles of GIS and emphasis on the role of raster and vector data models. The students will be also be introduced data processing, transformation and visualization of data using various models.

**Learning outcomes:** The students will be able to differentiate raster and vector data modes and also appreciate the role of these models in visualizing and graphical outputs through GIS.

Unit	Title	Practical sessions
I	Downloading and installing of software, Graphical User Interfaces for GRASS & QGIS, data display, Defining the coordinate system Import of raster data, Coordinate transformation, Viewing and managing raster maps Raster map algebra Raster data transformation and interpolation Spatial analysis with raster data Landscape process modeling Graphical output and visualization. .	8
II	Vector Data. Generation of Data Layer Map Viewing and Metadata Management Attribute Management and SQL Support Queries and Statistics Geometry Operations Network Analysis Transformations to Raster(vectorization - rasterization) Spatial Interpolation and Approximation Graphical Output and Visualization.	7
III	Journal	-

**Reference :**

1. Markus Neteler and Helena Mitasova (2008) OPEN SOURCE GIS, A GRASS GIS Approach (Third Edition) Springer, USA
2. McCartney Taylor, Nik Freeman (2014) Getting Started With GIS Using QGIS (Kindle Edition) McCartney Taylor.

**Sample Data source**

1. <https://grass.osgeo.org/download/sample-data/>
2. <http://grassbook.org/datasets/datasets-3rd-edition/>
3. <http://www.qgis.org/en/site/>

**ELECTIVE**

**Course Title: Participatory GIS (Theory)**

**Course Code: GEG-III.SE-3**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

=====  
**Course Objectives:** This is an introductory Course of Participatory GIS that aims to expose student to applications of GIS in the context of community and people’s participation. This helps to enhance Geographical Information through shared knowledge and information.

**Learning outcomes:** At the end of this course, students will be able to understand and acknowledge the applications of GIS for benefit of society.

Unit	Title	No. of hours
I	Participatory Geographic Information Systems Concepts and Methods, History (PRA, P-GIS pGIS Pgis) Ethics, Partnership, role and responsibility of the scientist. Methodology for Pgis., implementation and limitations of the participation  Methods, Techniques, advantages of community mapping. Data management. Features of interest for socio-economic analysis and social development skills and training requirements. P-GIS and the livelihoods approach.	15
II	Contribution of P-GIS through Community Mapping in Water Resource Inventory. Urban and Peri-Urban Partnership and Community Empowerment Community Resource Mapping in Forest, Agriculture and Water Resources Management: Bridging the Divide between Community and Government Voluntary Information and PGIS (VI & PGIS)	15
III	Neo-geography and GIS/2 : value addition to P-GIS Needs of Participatory GIS. Perspectives on Participatory mapping and PGIS	15
		45



## References

1. Michael K. McCall (2004) Can Participatory-GIS Strengthen Local-Level Spatial Planning? Suggestions For Better Practice. Dept. Of Urban & Regional Planning and Geoinformation Management ITC. Course Prepared For: GISDECO 2004 Skudai, Johor, Malaysia, 10-12 May 2004
2. Julian Quan, Nicolien Oudwater, Judith Pender And Adrienne Martin (2001)GIS And Participatory Approaches In Natural Resources Research. SOCIO-ECONOMIC METHODOLOGIES FOR NATURAL RESOURCES RESEARCH BEST PRACTICE GUIDELINES. Published By Natural Resources Institute, The University Of Greenwich 2001
3. Abbot, J., Chambers, R., Dunn, C., Harris, T., Merode, E. D., Porter, G., Townsend, J., Weiner, D., De Merode, E., (1998). 'Participatory GIS: Opportunity Or Oxymoron?' PLA Notes33. IIED: Londo
4. PETER A. MINANG And MICHAEL K. MCCALL ( 2006) Participatory GIS And Local Knowledge Enhancement For Community Carbon Forestry Planning: An Example From Cameroon. Participatory Learning And Action.
5. Sarah Elwood: Participatory GIS And Community Planning: Restructuring Technologies, Social Processes, And Future Research In PPGIS Collaborative Geographic Information Systems Edited By Shivanand Balram And Suzana Dragicevic © (2006), Idea Group Inc. University Of Arizona, USA
6. Sarah Elwood : Critical Issues In Participatory GIS: Deconstructions, Reconstructions, And New Research Directions Transactions In GIS, (2006), 10(5): 693–708

**ELECTIVE**

**Course Title: Participatory GIS (Practical)**

**Course Code: GEG-III.SE-3**

**Marks: 25**

**Credits: 1**

**Duration: 15 Sessions of 2 hour each**

**Course Objectives:** The basic objective of this practical course is to equip students with skills to calculate various indices and practically apply it in case studies.

**Learning outcome:** This practical course helps in developing skills by which students will practically carry on field studies.

<b>Unit</b>	<b>Title</b>	<b>Practical Sessions</b>
1	Data processing and computing indices Linear Model & Linear Combination Method (LCM) Assessment Index (AI) Employment index (M) Education index (E) Health index (S) Housing index (H) Infrastructure index The Principal Component Analysis Method (PCAM) Marginality Index (MI) Human Development Index	5
2	Case study of any one of the following (mini project) Water Resource Inventory Urban and Peri-Urban Agriculture Forest and Water Resources Management Using software like GRASS ( Geographic Resources Analysis Support System) and ILWIS ( Integrated Land and Water Information System)	10
3	Project report	-

**References :**

1. Françoise Orban-Ferauge V.Aguilar, E. Alarcon, A. Carmona, N. Daix, B. Denil, A. Ignacio, J. Martinez, M. McCall, G.Miscione, E. Olivarez, M. Pandan. G. Rambaldi, R. Teruel, J. Verplanke participatory geographic information systems and land planning life experiences for people empowerment and community transformation , Technical Centre for Agricultural and Rural Cooperation ACP-EU (CTA) Wageningen, The Netherlands

**ELECTIVE**

**Course Title:** Applied GIS (Theory)

**Course Code:** GEG-III.SE-4

**Marks:** 75

**Credits:** 3

**Duration:** 45 lectures of 1 hour each

=====

**Course Objectives:** This Course introduces various recent application of GIS in business, society, transportation and spatial planning.

**Learning outcomes:** At the end of this course students will be able to correlate acknowledge of GIS in the day to days life problems.

<b>Unit</b>	<b>Title</b>	<b>No. of hours</b>
I	<b>Geobusiness</b> Retail Application of Spatial Modelling to Solve: Retail Location Problems, Location Based Services for Mobile Applications Mass Appraisal Model, Lifestyle Segmentation Profiles, Neighbourhood Model, Housing Price Mass Appraisal Model.	15
II	<b>Social Application:</b> Assessing Clusters of Deprivation in City Regions, GIS for Joined up Government Spatial Statistical Methods to the Detection of Geographical Patterns of Crime <b>Transport and Location:</b> Demand Responsive Passenger Transport Services, Strategic Land Use / Transportation Model, Relocation of Facilities. Probability Based GIS Model.	15
III	<b>Spatial Planning</b> Modelling Migration, Modeling Regional Economic Growth, Carrying Capacity, Planning Network of Site, Assessing Service Provision,	15
		45

## References

1. John Stillwell and Graham Clarke (2004) *Applied GIS and Spatial Analysis* (Ed). John Wiley and Sons LTD England
2. Michael K. McCall (2004) *Can Participatory-GIS Strengthen Local-level Spatial Planning? Suggestions for Better Practice*. Dept. of Urban & Regional Planning and GeoInformation Management ITC. Course prepared for: GISDECO 2004 Skudai, Johor, Malaysia, 10-12 May (2004)
3. Julian Quan, Nicolien Oudwater, Judith Pender and Adrienne Martin (2001) *GIS And Participatory Approaches In Natural Resources Research*. SOCIO-ECONOMIC METHODOLOGIES FOR NATURAL RESOURCES RESEARCH BEST PRACTICE GUIDELINES. Published by Natural Resources Institute, The University of Greenwich 2001
4. Abbot, J., Chambers, R., Dunn, C., Harris, T., Merode, E. d., Porter, G., Townsend, J., Weiner, D., de Merode, E., (1998). 'Participatory GIS: opportunity or oxymoron?' PLA Notes 33. IIED: Londo
5. PETER A. MINANG and MICHAEL K. MCCALL ( 2006) *Participatory GIS and local knowledge enhancement for community carbon forestry planning: an example from Cameroon*. Participatory Learning And Action.
6. Sarah Elwood: *Participatory GIS and Community Planning: Restructuring Technologies, Social Processes, and Future Research in PPGIS Collaborative Geographic Information Systems* edited by Shivanand Balram and Suzana Dragicevic © (2006), Idea Group Inc. University of Arizona, USA
7. Sarah Elwood : (2006), *Critical Issues in Participatory GIS: Deconstructions, Reconstructions, and New Research Directions* Transactions in GIS, 10(5): 693–708

**ELECTIVE**

**Course Title:** Applied GIS (practical)

**Course Code:** GEG-III.SE-4

**Marks:** 25

**Credits:** 1

**Duration:** 15 Sessions of 2 hour each

=====

**Course Objectives:** The basic objective of this practical course is to equip students with skills to apply GIS skills various issues through spatial modeling and analytical tools.

**Learning outcome:** This practical course helps in developing skills by which students will be able to under undertake various local problems and suggest realistic spatial solution to it.

Unit	Title	Practical Sessions
1	Spatial Modelling: Retail Location Based Modeling, Land Use Transportation Model, Migration Modeling, Economic Growth Modeling, Neighboring Model	5
2	Spatial Statistic: Cluster Analysis, Crime Pattern Analysis, Mass Appraisal, Segmentation Profiling, Site Suitability Analysis Location Based Services for Mobile Application	10
3	Journal	-

**References :**

1. John Stillwell and Graham Clarke (2004) Applied GIS and Spatial Analysis (Ed). John Willy and Sons Ltd. England
2. Markus Neteler and Helena Mitasova (2008) OPEN SOURCE GIS, A GRASS GIS Approach (Third Edition) Springer, USA
3. McCartney Taylor, Nik Freeman (2014) Getting Started With GIS Using QGIS (Kindle Edition) McCartney Taylor.

**Sample Data source**

4. <https://grass.osgeo.org/download/sample-data/>
5. <http://grassbook.org/datasets/datasets-3rd-edition/>
6. <http://www.qgis.org/en/site/>

**SYLLABUS FOR AUTONOMOUS COURSES IN GEOGRAPHY  
BACHELOR OF SCIENCE  
SEMESTER IV**

**CORE**

**Course Title: Fundamentals of Geomorphology (Theory)**

**Course Code: GEG-IV. SC-6**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

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**Course Objectives:** The Course provides the fundamentals of geomorphology. It also focuses on application of geomorphological knowledge to resolve the challenging issues of man environment relationships.

**Learning Outcomes:** At the end of this course, students will be familiar with fundamentals of geomorphology and learn the techniques of application of geomorphological knowledge to solve the challenging issues of man environmental relationships.

<b>Unit</b>	<b>Title</b>	<b>No. of hours</b>
I.	Interior of the Earth: Composition and Structure Endogenetic Processes : folds, faults, rift valleys, plate tectonics. Earthquakes, Volcanoes.	18
II.	Exogenetic processes: Weathering and erosion, cycle of erosion Slope development theory. Mass Movements: Concept and Types. Aeolian landscapes: Erosional & Depositional. Glacial Landscapes: Erosional and Depositions	10
III.	Application of Geomorphology: <ul style="list-style-type: none"><li>• Regional planning</li><li>• Urban planning and transportation</li><li>• Mining</li><li>• Hazard management</li><li>• Agriculture</li><li>• Environmental management</li></ul>	17
		45

## References:

1. Ahmed, E., 2005 : Geomorphology , Kalyan Publishers, New Delhi
2. Bloom, Arthur L., 2004: Geomorphology – A systematic Analysis of Late Cenozoic Landforms, Prentice Hall, Engle Wood Cliff, N.J
3. Chorley, Richard J., 2002: Spatial Analysis in Geomorphology, Harper and Row Publishers, New York, London.
4. Cooke R. U. and Doornkamp J.C. (1989): Geomorphology in Environmental Management, 2nd Edition, Oxford : Clarendon Press
5. Dayal, P. (2nd edition) 2006 A Textbook of Geomorphology, Shukla Book Depot, Patna
6. Sharma, H.S. (ed), 2002: Perspective in Geomorphology, Vol. I & Vol. IV, Concept, New Delhi.
7. Sharma, V.K., 2006 : Geomorphology, Earth Surface Processes and Forms, Tata Mc. Graw Hill, New Delhi
8. Sharma, V.K., 2006 : Geomorphology, Earth Surface, Process and forms, Tata McGraw Hill, New York
9. Singh, S: Physical Geography, Pustak BHawan, Allahabad, 2005
10. Sparks, B.W., 2000: Geomorphology, Longman, London, 2<sup>nd</sup> edition.
11. Strahler, A.N. : Physical Geography, 3<sup>rd</sup> Ed., Wiley, 2006
12. Thornbury W.D, 2001: Principles of Geomorphology , 2<sup>nd</sup> Ed., Wiley International edition, Wiley Eastern Reprint, 2001
13. Wooldridge, S.W. and Morgan, R.S., 2000: The Physical Basis of Geography, Longman.
14. Worcestor, P.G., 2005: A textbook of Geomorphology, Van Nostrand, 2<sup>nd</sup> Ed., East west Edition, New Delhi

**CORE****Course Title: Fundamentals of Geomorphology (Practical)****Course Code: GEG-IV. SC-6****Marks: 25****Credits: 1****Duration: 15 sessions of 2 hour each**

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**Course Objectives:** The Course provides the skills in rock identification and their uses. strategies to the challenging issues of man environment relationships.

**Learning Outcomes:** At the end of this course, students will be familiar with the skills of identification and application of geomorphology and the techniques of application of geomorphological knowledge to solve the challenging issues of man environmental relationships.

Unit	Title	Practical sessions
I.	Identification of rocks, their properties and uses Soil profile, Soil testing and analysis and their application in crop cultivation(sample of any three soil types)	10
II.	Interpretation of geological map, identifications of faults, lineaments, dykes and sills, rock types	5
III.	Journal and viva voce	
		15

**References:**

1. Ahmed, E., 2005 : Geomorphology , Kalyan Publishers, New Delhi
2. Bloom, Arthur L., 2004: Geomorphology – A systematic Analysis of Late Cenozoic Landforms, Prentice Hall, Engle Wood Cliff, N.J
3. Chorley, Richard J., 2002: Spatial Analysis in Geomorphology, Harper and Row Publishers, New York, London.
4. Dayal, P. (2<sup>nd</sup> edition) 2006 A Textbook of Geomorphology, Shukla Book Depot, Patna
5. Sharma, V.K., 2006 : Geomorphology, Earth Surface, Process and forms, Tata McGraw Hill, New York
6. Singh, S: Physical Geography, Pustak BHawan, Allahabad, 2005
7. Strahler, A.N. : Physical Geography, 3<sup>rd</sup> Ed., wiley, 2006
8. Thornbury W.D, 2001: Principles of Geomorphology , 2<sup>nd</sup> Ed., Wiley International edition, Wiley Eastern Reprint, 2001
9. Sharma, H.S. (ed), 2002: Perspective in Geomorphology, Vol. I & Vol. IV, Concept, New Delhi.
10. Sharma, V.K., 2006 : Geomorphology, Earth Surface Processes and Forms, Tata Mc. Graw Hill, New Delhi
11. Sparks, B.W., 2000: Geomorphology, Longman, London, 2<sup>nd</sup> edition.
12. Wooldridge, S.W. and Morgan, R.S., 2000: The Physical Basis of Geography, Longman.
13. Worcestor, P.G., 2005: A textbook of Geomorphology, Van Nostrand, 2<sup>nd</sup> Ed., East west Edition, New Delhi



**ELECTIVE**

**Course Title:** Coastal Geomorphology (Theory)

**Course Code:** GEG-IV.SE-5

**Marks:** 75

**Credits:** 3

**Duration:** 45 lectures of 1 hour each

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**Course Objectives:** The basic objective of this course is to familiarize students about the mechanism of landform development resulting from coastal processes.

**Learning outcomes:** At the end of this course, students are expected to have an understanding of the various processes and associated landforms in coastal regions. Besides learn the methods of coastal hazard management

Unit	Title	No. of hours
I	Introduction to coastal Processes Waves: Formation, Drifts and Tides. Types of coastlines, Coastal erosion and deposition. Coastal landforms.	15
II	Beach Geomorphology: Types and Configuration of beaches Coastal wetlands. Coral reefs and marine environment. Coasts of India.	15
III	Coastal Ecosystem Management. Coastal Hazard Management.	15
		45

**References**

1. Cooke R. U. and Doornkamp J.C. (1989): Geomorphology in Environmental Management, 2<sup>nd</sup> Edition, Oxford : Clarendon Press
2. Eric Bird: Coastal Geomorphology: An Introduction, John Wiley & Sons; 1 edition (November 7, 2000),
3. Gerhard Masselink , Michael Hughes :An Introduction to Coastal Processes and Geomorphology (Hodder Arnold Publication), ISBN-10: 0340764112 , ISBN-13: 978-0340764114
4. Kale, V. S. and Gupta, A. (Rep.2011): Introduction to Geomorphology, Orient Longman, Calcutta.
5. Karlekar, S. (2009): Coastal Processes and Landforms: Diamond Publications, Pune
6. Richard Davis Jr. , Duncan Fitzgerald : Beaches and Coasts, Wiley-Blackwell; 1st edition (July 15, 2004), ISBN-10: 0632043083 , ISBN-13: 978-0632043088
7. Timothy Beatley , Anna K. Schwab , David Brower (2002):An Introduction to Coastal Zone Management, Island Press; REV edition

**ELECTIVE****Course Title:** **Practicals in Coastal Geomorphology****Course Code:** GEG-IV.SE-5**Marks:** 25**Credits:** 1**Duration:** 15 sessions of 2 hours each

**Course Objectives:** To develop the skills of identification and interpretation of coastal landforms and processes.

**Learning outcome:** At the end of the course students are expected to independently prepare geographic map and interpret coastal landscape. Besides they should be able to carry out beach profiling using instruments.

Unit	Title	Practical sessions
1	Identification of coastal features and processes on SOI toposheet.	05
2	Beach profiling & identification of major and minor coastal features on beach. Profile of various types of coast. Geomorphic mapping of Coastal Areas.	10
3	Journal and Viva	
		15

**References**

1. Bygot, J.: An Introduction to Map Work and Practical Geography, 2001
2. Campbell, J., 2004: Introductory Cartography, Printice Hall, Inc Englewood
3. Misra, R.P. and Ramesh, A., 2005: Fundamentals of Cartography, Concept Pub. Co., New Delhi
4. Monkhouse, I.J. and Wilkinson, H.R., 2001: Maps and Diagram, B.I. Publication, New Delhi
5. Raisz, E.: General Cartography, McGraw Hills Co., London ,2005
6. Robinson, A.H., et al.: Elements of Cartography, John Wiley and Sons, New York,2003
7. Singh, R.L.: Elements of Practical Geography, Kalyani Publishers, New Delhi ,2000
8. Jackson, R.H. and Hudmar, L.E.: Regional Geography: Issues for today ,2001
9. Singh, R ; Singh L.R., Mapworks in Practical Geography,Central book Depot, Allahabad,2001

**ELECTIVE**

**Course Title: Fluvial Geomorphology (Theory)**

**Course Code: GEG-IV.SE-6**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

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**Course Objectives:** The Rivers being a major agent of erosion, the course assumes significance as it mainly deals with fluvial forms and processes.

**Learning outcomes:** At the end of this course, students are expected to have an understanding of the fundamental concepts of river and its processes.

<b>Unit</b>	<b>Title</b>	<b>No. of hours</b>
I	River basin and Drainage Network: River and Stream, Drainage basin and network characteristics, River Dynamics, Classification, Phases of development, Patterns.	15
II	Fluvial processes: Erosion, Transportation and Deposition. Fluvial cycle and Fluvial landforms.	15
III	Applied fluvial geomorphology: Environmental changes and river metamorphosis. Flood and its impact (case studies)	15
		45

**Reference Books:**

1. Chorley, R. J., Schumm, S. A. and Sugden, D. E. (1984): Geomorphology, Methuen, London.
2. Fairbridge, R. W. (1968): Encyclopedia of Geomorphology, Reinholdts, New York.
3. Kale, V. S. and Gupta, A. (Rep.2011): Introduction to Geomorphology, Orient Longman, Calcutta.
4. Luna Bergere Leopold, Markley Gordon Wolman, John P. Miller (1995): Fluvial Processes in Geomorphology. Dover Publications Inc., New York
5. R.J. Small (1989) Geomorphology and Hydrology (Longman modular geography series), Longman Publication, Harlow, Essex, England
6. Savindra Singh (Rep. 2011): Geomorphology, Prayag Pustak Bhawan, Allahabad
7. Strahler A. H and Strahler, A. N. (1992) : Modern Physical Geography, John Wiley, New York
8. Thornbury, W. D. (Rep.2011): Principles of Geomorphology, John Wiley and Sons, New York.

**ELECTIVE**

**Course Title: Practicals in Fluvial Geomorphology**

**Course Code: GEG-IV.SE-6**

**Marks: 25**

**Credits: 1**

**Duration: 15 sessions of 2 hours each**

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**Course Objectives:** To develop the skills of river morphometry analysis, river profiling, fluvial processes.

**Learning outcome:** At the end of the course student are expected to independently prepare drainage map and interpret fluvial landscape. Besides they should be able to carry out river profiling using instruments.

<b>Unit</b>	<b>Title</b>	<b>Practical sessions</b>
1	Preparation of drainage map. Identification and Interpretation of fluvial landforms, Patterns and processes from SOI toposheet. Slope analysis.	05
2	Drainage basin morphometry: Morphometric analysis of drainage basin. Field visit : river Profiling and to observe fluvial processes	10
3	Journal and Viva	
		15

**References**

1. Bygot, J.: An Introduction to Map Work and Practical Geography,2001
2. Campbell, J., 2004: Introductory Cartography, Printice Hall, Inc Englewood
3. Misra, R.P. and Ramesh, A., 2005: Fundamentals of Cartography, Concept Pub. Co., New Delhi
4. Monkhouse, I.J. and Wilkinson, H.R., 2001: Maps and Diagram, B.I. Publication, New Delhi
5. Raisz, E.: General Cartography, McGraw Hills Co., London ,2005
6. Robinson, A.H., et al,: Elements of Cartography, John Wiley and Sons, New York,2003
7. Singh, R.L.: Elements of Practical Geography, Kalyani Publishers, New Delhi ,2000
9. Singh, R ; Singh L.R., Map works in Practical Geography, Central book Depot, Allahabad,2001

**ELECTIVE****Course title: Watershed Management (Theory)****Course Code: GEG-IV.SE-7****Marks: 75****Credits: 3****Duration: 45 lectures of 1 hour each**

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**Course Objective:** The objective of this course is to acquaint students with basic concepts and importance of Watershed Management. This course will also help students in understanding various processes that take place and that are involved in a watershed.

**Learning outcomes:** At the end of this course, students are expected to have a holistic understanding of Watershed Management. It will help them to develop a process-based understanding of how land surface characteristics will affect fluxes of mass and energy within a watershed.

<b>Unit</b>	<b>Title</b>	<b>No. of hours</b>
I	Introduction to Watershed Management : Definition, Principles, objectives, Need of Watershed Management, Identification of problems in Watershed Management	15
II	Characteristics of watershed : Delineation, Geomorphological Characteristics, linear aspects, aerial aspects and relief aspects, land use, runoff characteristics River discharge Sediment load	15
III	Hydrological Process in Watershed : Hydrological cycle, Water Budget, Ecological Characteristics of the river Soils in Watershed: Soil characteristics, Physical, Hydrological and Processes of Soil Erosion. Erosion due to water and wind. Watershed Conservation methods.	15
		45

**REFERENCES:**

- Manual of water and soil conservation: Government of India, ICAR
  - Manuals of the USDA
1. DeBarry. A. Paul, 2004, Watersheds : Processes, Assessment, and Management, Hoboken, N.J. : John Wiley & Sons, New Jersey
  2. Heathcote. W. Isobel , 2009, Integrated Watershed Management : Principles and Practice, 2<sup>nd</sup> Edition, Hoboken, N.J. : John Wiley & Sons, New Jersey
  3. National Watershed Program Manual, The U.S. Department of Agriculture (USDA), Washington, D.C, December, 2009
  4. Narayana, V.V. Dhruva, 2002, Soil and water conservation research in India, Published by ICAR, New Delhi
  5. Singh Rajvir, 2003, Watershed Planning and Management, 2nd Edition, Yash Publishing House, Bikaner, India

**ELECTIVE****Course title: Practicals in Watershed Management****Course Code: GEG-IV.SE-7****Marks: 25****Credits: 1****Duration: 15 sessions of 2 hours each**

**Course Objective:** The objective of this practical is to acquaint students with basic concepts and importance of Watershed Management. This practical will also help students in understanding various processes that take place and that are involved in a watershed.

**Learning outcomes:** At the end of this practical, students are expected to have a holistic understanding of Watershed Management as it will help them to develop a process-based understanding of how land surface characteristics will affect fluxes of mass and energy within a watershed, so that science-based management principles may be effectively applied to watershed systems.

<b>Unit</b>	<b>Title</b>	<b>Practical Sessions</b>
I	Delineation of Watershed Area: Preparation of Contour map from Toposheet, Morphometric Analysis of drainage Basin. Relief Properties: Absolute Height, Relief Ratio, Ruggedness number. Areal Properties: Length, Width of Basin, Basin Perimeter, Drainage density; Linear. Properties: Stream Ordering, Bifurcation Ratio, Stream Length.	10
II	Measurement and Estimation of Soil Erosion – Revised Universal Soil Loss Equation (RUSLE), Field Visit and Report: Survey, Database Generation, Resource Mapping	5
III	Journal and Viva-voce	
		15

**REFERENCES:**

1. DeBarry. A. Paul, 2004, Watersheds : Processes, Assessment, and Management, Hoboken, N.J. : John Wiley & Sons, New Jersey
2. Heathcote. W. Isobel , 2009, Integrated Watershed Management : Principles and Practice, 2<sup>nd</sup> Edition, Hoboken, N.J. : John Wiley & Sons, New Jersey
3. National Watershed Program Manual, The U.S. Department of Agriculture (USDA), Washington, D.C, December, 2009
4. Narayana, V.V. Dhruva, 2002, Soil and water conservation research in India, Published by ICAR, New Delhi
5. Singh Rajvir, 2003, Watershed Planning and Management, 2nd Edition, Yash Publishing House, Bikaner, India

**ELECTIVE****Course title: Biogeography (Theory)****Course Code: GEG-IV.SE-8****Marks: 75****Credits: 3****Duration: 45 lectures of 1 hour each**

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**Course Objectives:** Biogeography deals with spatial and temporal patterns of biological diversity and the factors that govern the distribution and abundance .

**Learning Outcomes:** At the end of this course, students will be familiar with fundamentals of biogeography.

Unit	Title	No. of hours
I.	Concept of Biogeography. Historical evolution of Biogeography. Global patterns of Biodiversity.	18
II.	Niche. Speciation and extinction. Accident and invasion. Endemism, vicariance and conservation. Island biogeography. Zoogeography and its Environmental Relationship. Palaeo botanical and Palaeo Climatological records of environmental change.	10
III.	Biodiversity hotspots. Forest communities and their distribution. Conservation- laws and practices. Social Movements of conservation.	17
		45

**References:**

1. Husain, M. (ed)., 1994: Biogeography(Part I & II), Anmol Publications, Pvt. Ltd., New Delhi.
2. Newbiggin, M.I., 1939: Plants and Animal Geography.
3. Tiby, 1982: Biogeography, Longman, London.
4. Walts, D., 1971: The Principles of Biogeography, Mc. Graw Hill, London.
5. Bhattacharyya, N.N.: Biogeography, Rajesh Publications, New Delhi.
6. Singh, Savindra, 2010: Biogeography, Prayag Pustak Bhawan, Allahabad.



**ELECTIVE****Course title: Practicals in Biogeography****Course Code: GEG-IV.SE-8****Marks: 25****Credits: 1****Duration: 15 Sessions of 2 hrs each**

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**Course Objectives:** Biogeography deals with spatial and temporal patterns of biological diversity and the factors that govern the distribution and abundance .

**Learning Outcomes:** At the end of this course, students will be familiar with fundamentals of biogeography .

<b>Unit</b>	<b>Title</b>	<b>Practical Sessions</b>
I.	Vegetation Map interpretation Biodiversity indexing Biomass analysis Canopy structure Stock analysis	07
II.	NDVI Density of tree Plant tress analysis Disturbance analysis	08
III.	Journal and viva voce	
		15

**References:**

1. Husain, M. (ed)., 1994: Biogeography(Part I & II), Anmol Publications, Pvt. Ltd., New Delhi.
2. Newbigin, M.I., 1939: Plants and Animal Geography.
3. Tiby, 1982: Biogeography, Longman, London.
4. Walts, D., 1971: The Principles of Biogeography, Mc. Graw Hill, London.
5. Bhattacharya, N.N.: Biogeography, Rajesh Publications, New Delhi.
6. Singh, Savindra, 2010: Biogeography, Prayag Pustak Bhawan, Allahabad.

**SYLLABUS FOR AUTONOMOUS COURSES IN GEOGRAPHY  
BACHELOR OF SCIENCE  
SEMESTER V**

**CORE**

**Course Title: Fundamentals of Climatology (THEORY)**

**Course Code: GEG-V. SC-7**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

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**Course Objectives:** The focus of this Course is to introduce key concepts of climatology in general and Indian monsoon in details.

**Learning outcomes:** On completion of this course students will able to understand and apply the concepts in analyzing and applying climatological concepts.

<b>Unit</b>	<b>Title</b>	<b>No. of hours</b>
I	<p><b>Fundamental of Atmospheric circulation</b> Basics of water cycle, Atmospheric Stability. Air Masses and its types. Fronts and types. El-Nino and La-Nina. <b>Atmospheric disturbances:</b> Thermodynamics Koppens Classification CAPE and CINE- cloud development and stability, thunderstorm Cyclogenesis – T number (basics of cyclones)</p>	15
II	<p><b>Indian Climatology: Monsoons</b></p> <p><b>Pre monsoon:</b> Cyclone genesis, Cyclonic storms, frequency, intensity, landfall and associated weather. <b>South West monsoon :</b> Onset and advance of southwest monsoon, Semi-permanent features of monsoon, active and break in monsoon <b>Post monsoon:</b> withdrawal of southwest monsoon, Northeast monsoon, cyclonic storms in the Indian seas, trends in cyclonic disturbances, Easterly waves. <b>Winter:</b> western disturbances, fog, cold waves</p>	15
III	<p><b>The Earth's Changing Climate</b> <b>Climate change and sea level rise:</b> Ocean in relation to long changes in Monsoon, tropical cyclones and climate, Land use change and climate. Cloud burst, clouds seeding and artificial rain. <b>Climate services:</b> Climate and application in agriculture, water, health and disaster risk reduction and urban planning.</p>	15
		45

## REFERENCES

1. Barry R.G. and Chorley, R. J., 2009: Atmosphere, Weather and Climate, Routledge
2. Bunnett R.B. , 1993: Physical geography in Diagrams, Longman
3. Critchfield, H.J, 1998 : General Climatology, Prentice-Hall
4. Lal, D.S., 2011: Climatology, Sharda Pustak Bhavan
5. Monkhouse, F.J., 1975 – Principles of Physical Geography , Hodder Murray Publishers
6. P. Birot, 1966: General Physical Geography, Longman, Green & Co
7. Strahler, A.H., 1983: Modern Physical Geography, John Wiley and Sons
8. Strahler A. M. and Strahler A.H., 1983: Elements of Physical Geography, John Wiley and Sons
9. Stringer, E.T., 1972: Foundation of Climatology: An Introduction to Physical, Dynamic, Synoptic, and Geographical Climatology, W.H. Freeman & Co. Ltd.
10. Tikka - R.N., 1998 - Physical Geography. Kedar Nath Ram Nath, Meerut
11. Trewartha, G.T., 1968: Introduction to Climate, McGraw-Hill

**CORE****Course Title: Fundamentals of Climatology (Practical)****Course Code: GEG-V. SC-7****Marks: 25****Credits: 01****Duration: 15 sessions of 2 hours each**

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**Course Objectives:** The objective of this course is to provide basic practical tools in understanding weather and climate.

**Learning outcome:** At the end of this course, students will be able interpret and analyze weather and climatic phenomena.

Unit	Title	Practical sessions
I	Representation of weather phenomena using isolines Isohyets map Isotherm map Isobars Representation of wind data Evapotranspiration Determining atmospheric stability (Tephigram) Preparation of weather Station Model. Upper air chart, isotach (wind)	05
II	<ul style="list-style-type: none"> <li>• Study of weather symbols and IMD weather charts. Interpretation of IMD weather charts (at least 1 map of three seasons)</li> <li>• Visit to IMD for hands- on- training: handling of weather instruments, taking readings, temperature, pressure, sunshine chart interpretation and forecasting. (seven Days Training in IMD)</li> </ul>	10
III	Journal	
		15

**References**

1. Campbell, J. (2004), Introductory Cartography, Prentice Hall, Inc Englewood
2. Chorley, Richard. J. (ed.), 2001: Water, Earth and Man, Methuen & Co., London
3. Khullar.D.R. (2007), Essentials of Practical Geography, New Academic Publishing Co.,Jalandher
4. Misra, R.P. and Ramesh, A., 2009: Fundamentals of Cartography, Concept Publishing Co., New Delhi
5. Monkhouse, F.J. and Wilkinson, H.R., 2009: Maps and Diagrams, B.I. Publications Pvt. Ltd., New Delhi
6. Sarkar, Ashis (2000), Practical Geography: A Systematic Approach, Orient Longman Pvt. Ltd., Kolkata
7. Singh, R.L. and Singh Rana P.B., 2008, Elements of Practical Geography, Kalyani Publishers, New Delhi
8. Singh, R.L. and Singh Rana P.B.(2008), Elements of Practical Geography, Kalyani Publishers, New Delhi
9. Strahler, A.N., 2000: Physical Geography, 3rd Ed., Wiley.

**ELECTIVE**

**Course Title: Geography of Soil Studies (THEORY)**

**Course Code: GEG-V.SE-9**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

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**Course Objectives:** This is a basic course that focuses on understanding of soil formation, development and distribution. They will also be equipped with basics of soil structure, composition, content and conservation practices.

**Learning outcomes:** On completion of this course, the students will be able to identify and differentiate between various soils profiles and types

This will develop understanding amongst students how different types of soil formations, characteristics and importance in agricultural practices.

<b>Unit</b>	<b>Topic</b>	<b>No. of hours</b>
I	<b>Introduction to soil:</b> Concept , soil formation Soil water dynamic, Factors affecting soil formation. <b>Soil structure, composition and classification:</b> Soil profile, Soil taxonomy, Sub-orders, groups, families, series, Texture	15
II	<b>Soil and organisms</b> - Organic matter of soil, Sources of organic matter – Biomass, Termites, worms, ants, algae, fungi, bacteria..., Carbon cycle – simple decomposition, Agricultural importance of soils - Nitrogen fixation	15
III	<b>Soil Conservation and management</b> Soil erosion, degradation and pollution, its sources and impacts : industrial, agricultural, e-waste, nuclear, urban waste, mining, deforestation, irrigation projects. Soil conservation and management practices traditional and modern Case studies- global# and local examples.	15

#-different examples every year

**References:**

1. Brady Nyle. (2002). The nature and properties of soil. MacMillan Publishing company, USA
2. Foth Henry. (1984). Fundamentals of soil science. John Wiley & Sons, Inc. USA
3. Munns Donald and Singer Michael. (1996). Soils – An introduction. Prentice-Hall Inc, New Jersey, USA
4. Lal R and Stewart B.A. (1990). Advances in soil sciences. Springer-Verlag New York.
5. White Robert. (2005). Principles and Practice of Soil Science: The Soil as a Natural Resource, 4th Edition. Wiley & Sons, Inc – Blackwell. USA

**ELECTIVE**

**Course Title: Geography of Soil Studies (PRACTICAL)**

**Course Code: GEG-V.SE-9**

**Marks: 25**

**Credits: 1**

**Duration: 15 Sessions of 2 hours each**

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**Course Objectives:** This is a basic practical course in soil studies that give emphasis on lab analysis of soil sample to understand the various properties of soil sample.

**Learning outcomes:** On completion of this course, the students will be able test the soil properties and quality of collected soil samples using various instruments and prepare lab reports.

<b>Unit</b>	<b>Topic</b>	<b>No. of hours</b>
I	Field visit component Sample preparation Moisture content Particle size analysis (density, porosity) Soil pH levels NPK level testing Carbonate testing	07
II	Spectro-photometric analysis of soil Quality control (trace element assessment) Permeability and erodibility tests Nutrient availability of soil Soil humus fraction	08
III	Journal	
		15

**Reference:**

1. Brady Nyle. (2002). The nature and properties of soil. MacMillan Publishing company, USA
2. Foth Henry. (1984). Fundamentals of soil science. John Wiley & Sons, Inc. USA
3. George Estefanm, Rolf Sommer, and John Ryan. (2013) Methods of Soil, Plant, and Water Analysis: A manual for the West Asia and North Africa region. Beirut, Lebanon
4. Head K.H. (1994). Manual of soil laboratory testing. John Wiley & Sons, Inc. USA
5. Munns Donald and Singer Michael. (1996). Soils – An introduction. Prentice-Hall Inc, New Jersey, USA

**ELECTIVE**

**Course Title: Agrometeorology: Principles and Applications (THEORY)**

**Course Code: GEG-V.SE-10**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

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**Course Objectives:** This is a basic course that focuses on agrometeorology and its application in agriculture. This will help students to develop understanding of the physical and human interventions that affect agricultural systems and management practices.

**Learning outcomes:** On completion of this course, the students will be able to understand the role of climate in agricultural productivity. They will be exposed to use of geospatial technology in monitoring agricultural systems especially in the context of climate change.

Unit	Title	No. of hours
I	<b>Agrometeorology:</b> Perspectives and Applications: Definition and scope and development. <b>Solar Radiation and Its Role in Plant Growth:</b> The Source of Energy, Laws of Radiation, Earth's Annual Global Mean Radiative Energy Budget, Solar Radiation and Crop Plants, Solar Radiation Interception by Plants, Photosynthetically Active Radiation (PAR), Solar Radiation Use Efficiency <b>Environmental Temperature and Crop Production:</b> Soil and Air Temperature, Plant Injury Due to Sudden Changes in Temperature, Frost: Damage and Control, Thermoperiodism, Temperature As a Measure of Plant Growth and Development.	15
II	<b>Climatological Methods for Managing Farm Water Resources-</b> Water for Crop Production, Making Effective Use of Rainfall, Evaporation and Evapotranspiration, Water Use and Loss in Irrigation. Climatological Information in Improving Water-Use Efficiency (WUE), Reducing Water Losses from Reservoirs, <b>Drought Monitoring and Planning for Mitigation:</b> water budgeting, irrigation scheduling, Drought Monitoring and Planning for Mitigation. <b>Climate, Crop Pests:</b> Role of Weather and Climate, Some Important Insect Pests of Crop Plant.	15
III	Remote-Sensing Applications in Agrometeorology. Computer Models in Managing Agricultural Systems, Agro-climatological Services, Using Climate Information to Improve Agricultural Systems, Climate Change and Its Impact on Agriculture.	15
		45

## REFERENCES

1. Grigg, David (2005) An Introduction to Agricultural Geography (2nd Ed), Routedledge, London and New York
2. G. Kathiresan (2015) Agrometeorology: A Simplified Textbook. New India Publishing Agency
3. G.S. Mahi & P.K. Kingra (2014): Fundamentals of Agrometeorology. Kalyani Publishers
4. Harpal S. Mavi and Graeme J.,Tupper (2004), Agrometeorology Principles and Applications of Climate Studies in Agriculture. The Haworth Press, Inc., Binghamton, NY.
5. Mavi H S (2003): Introduction To Agrometeorology. Oxford & Ibh
6. Rao and Prasada (2008) Agricultural Meteorology. PHI Learning PVT. LTD., New Delhi
7. Seemann, Jochen, Chirkov, Y. I., Lomas, J., Primault, B. (2012): Agrometeorology. Springer-Verlag Berlin and Heidelberg GmbH & Co. KG
8. SR Reddy & D.S. Reddy (2014) Agrometeorology. Kalyani Publishers
9. S. Venkatraman (2015): Principles and Practice of Agricultural Meterology. BS Publications.
10. WMO (2011), Agricultural Meteorology Guide to Climatological Practices World Meteorological Organization, Geneva.



**ELECTIVE****Course Title: Agrometeorology Principles and Applications (Practical)****Course Code: GEG-V.SE-10****Marks: 25****Credits: 01****Duration: 15 sessions of 2 hours each**

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**Course Objectives:** This course enables student to understand the role of insolation, rainfall, evapotranspiration in crop growth and development. The students will learn techniques of measurement in agrometrology.

**Learning outcomes:** On completion of this course, the students will able to independently analyze the interaction of solar radiation, temperature, rainfall, evapotranspiration using metrological and remotely sensed data.

Unit	Title	Practical sessions
I	Green leaf response to Electro Magnetic Radiation Photosynthetically Active Radiation (PAR) Solar radiation use efficiency Temperature and crop growth	07
II	Measurement of effective rainfall(using Huggins and Kassam water balance approach) Water balance, Measurement of evaporation and calculation of evapotranspiration irrigation scheduling for crops Analyzing the water deficiency (drought) , drought index Use of thermal data in drought monitoring	08
III	Journal	
		15

**References**

1. Don Ankerman; Richard Large (2013) Agronomy Handbook. Midwest Laboratories Inc., OMAHA, NE
2. Harpal S. Mavi and Graeme J. Tupper (2004), Agrometeorology Principles and Applications of Climate Studies in Agriculture, The Haworth Press, Inc., Binghamton, NY.
3. Indian Council of Agricultural Research (2011) Handbook of Agriculture, Indian Council of Agricultural Research
4. Rao and Prasada (2008) Agricultural Meteorology. PHI Learning PVT. LTD., New Delhi
5. WMO (2011), Agricultural Meteorology Guide to Climatological Practices World Meteorological Organization, Geneva.

**ELECTIVE**

**Course Title: Field Survey in Physical Geography (THEORY)**

**Course Code: GEG-V.SE-11**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

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**Course Objectives:** The primary aim of this Course to introduce various surveying instrument used in Physical Geography. Students will learn the operation and the application of the instruments and methods of surveying.

**Learning outcomes:** At the end of this course students will be able to understand functions and applications of dumpy level, Plane table and Global Positioning Systems (GPS) in field based studies.

<b>Unit.</b>	<b>Topic</b>	<b>No. of hours</b>
I	Significance and Methods of Survey; Classification of Surveying; Fundamentals of Plane Table Survey: a) Radiation Method b) Intersection Method Pre survey work: Safety Measures, Field Book Preparation, Literature Survey, Sharing Responsibilities and Plan of Action Post field survey work: Data Processing Methods, Analysis, Mapping and Report Writing.	15
II	Dumpy level surveying : meaning, functioning elements, applications and Methods(Rise-fall and Collimation method) Profile drawing: Beach and River. Beach and River Morphology. Observation of slope, river and coastal morphology on toposheet. Pre survey and Post survey tasks.	15
III	GPS survey: Meaning, Space Segment, Ground Segment and GPS Receivers, Applications.	15
		45

**REFERENCES**

1. Campbell, J. (2004), Introductory Cartography, Prentice Hall, Inc Englewood
2. Khullar.D.R. (2007), Essentials of Practical Geography, New Academic Publishing Co.,Jalandher
3. Misra, R.P. and Ramesh, A. (2005), Fundamentals of Cartography, Concept Pub. Co., New Delhi
4. Monkhouse, I.J. and Wilkinson, H.R. (2009), Maps and Diagram, B.I. Publication, New Delhi
5. Sarkar, Ashis (2000), Practical Geography: A Systematic Approach, Orient Longman Pvt. Ltd., Kolkata
6. Singh, R.L. and Singh Rana P.B.(2008), Elements of Practical Geography, Kalyani Publishers, New Delhi

**ELECTIVE**

**Course Title: Field Survey in Physical Geography (PRACTICAL)**

**Course Code: GEG-V.SE-11**

**Marks: 25**

**Credits:1**

**Duration: 15 Sessions of 2 hours each**

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**Course Objectives:** The main objective of this course is to provide hands-on training in Plane Table, Dumpy Level and GPS survey.

**Learning outcome:** At the end of this course, students will be able to independently handle survey instruments and prepare maps and field reports.

<b>Unit</b>	<b>Topic</b>	<b>Practical sessions</b>
I	Plane table survey: a) Radiation Method :2 Exercises B) Intersection Method: 2 Exercises	07
II	Dumpy Level Survey: Rise-Fall and Collimation Method GPS Survey: Use of GPS in Mapping And Location Observation Of Slope, River and Coastal Morphology on Field	08
III	Journal /Field report	
		15

**References**

1. Campbell J. (2004), Introductory Cartography, Printice Hall, Inc Englewood
2. Khullar.D.R (2007), Essentials of Practical Geography, New Academic Publishing Co. Jalandher
3. Misra, R.P. and Ramesh, A. (2005), Fundamentals of Cartography, Concept Pub. Co., New Delhi
4. Monkhouse, I.J. and Wilkinson, H.R.(2009), Maps and Diagram, B.I. Publication, New Delhi
5. Singh, R.L. and Singh Rana P.B.(2008), Elements of Practical Geography, Kalyani Publishers, New Delhi
6. Sarkar, Ashis (2000), Practical Geography: A Systematic Approach, Orient Longman Pvt. Ltd., Kolkata.

**ELECTIVE**

**Course Title: Quantitative Techniques in Geography (THEORY)**

**Course Code: GEG-V.SE-12**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

**Course Objectives:** The focus of this course is to expose students to basic and advance statistical methods in geography in general.

**Learning outcomes:** On completion of this course students will able to test various statistical tools applied in earth science. Further they will be able to understand various stochastic models and forecasting methods in the discipline of earth science.

Unit	Title	No. of hours
I	Statistical Methods in Geography Basics of Sampling, Data Collection and Sample Design, Hypothesis Quantification and Prediction / projection, The Concept of Variable, Probability, Frequency Function.	15
II	Frequency Analysis and Simulation, Measure of Central tendency, Dispersion, Skewness and Kurtosis, Correlation and Regression, Chi Square( $\chi^2$ )	15
III	Stochastic Modelling (Time Series Analysis) and Forecasting Processes, Autocorrelation, Moving Average. Spectral Analysis (Frequency Domain) Spectrum, Discrete Fourier Transform (DFT) and Fast Fourier Transform (FFT), Maximum Entropy Method, Spectral Density and Entropy.	15
		45

**REFERENCES**

1. Pal S. K., 1998: Statistics for Geoscientists: Techniques and Application, Concept, New Delhi.
2. Sharma, D.D. (2008): Geostatistics with Application in Earth Sciences, Springer, with Capital Publishing Company, New Delhi, India.
3. Rogerson., P. A.(2001) : Statistical Methods for Geography. SAGE Pub. New Delhi
4. Spence, N. & Owens, A. (2011) :Methods of Geographical Analysis. University of London
5. Tomislav Hengl (2009): A Practical Guide to Geostatistical Mapping. The European Communities, Luxembourg

**ELECTIVE**

**Course Title: Quantitative Techniques in Geography (Practical)**

**Course Code: GEG-V.SE-12**

**Marks: 25**

**Credits: 01**

**Duration: 15 sessions of 2 hours each**

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**Course Objectives:** The focus of this course is to enable students to learn and apply basic and advance statistical methods in geography.

**Learning outcomes:** On completion of this course students will able to test and analyze various statistical tools applied in geography. Further they will be able to formulate hypothesis and prove it applying various stochastic models and forecasting methods in the discipline of geography.

Unit	Title	Practical sessions
I	Measure of Central tendency and Dispersion Mean (Z) Estimates for the Mean, Confidence Limits for the Mean Skewness and Kurtosis Correlation and Regression, Correlation Coefficient Hypothesis testing :The Chi-square (X <sup>2</sup> ) Test, Time Series Analysis and Forecasting	07
II	Spectral Analysis (Frequency Domain) Spectrum, Discrete Fourier Transform (DFT) and Fast Fourier Transform (FFT) Maximum Entropy Method, Spectral Density and Entropy Stationarity and Intrinsic Hypothesis Variogram and Estimation Variance	08
III	Journal	
		15

Note : Only physical geography data should be used.

**References**

1. A. Stewart Fotheringham, Chris Brunsdon and Martin Charlton. (2000): Quantitative Geography Perspectives on Spatial Data Analysis. SAGE Publications Ltd
2. Rogerson, Peter A. (2015 ) Statistical Methods for Geography. (4th Ed) SAGE Publications Ltd
3. Sharma, D.D. (2008): Geostatistics with Application in Earth Sciences, Springer, with Capital Publishing Company, New Delhi, India.
4. Spence, N. & Owens, A. (2011) Methods of Geographical Analysis. University of London
5. Robert Hammond, Patrick McCullagh; (1974): Quantitative techniques in geography: an introduction. Clarendon Press,

**SYLLABUS FOR AUTONOMOUS COURSES IN GEOGRAPHY  
BACHELOR OF SCIENCE  
SEMESTER VI**

**CORE**

**Course Code: GEG-VI.SC-8**

**Course Title: Ecology and Terrestrial Environment (THEORY)**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

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**Course Objectives:** The basic objective of this course is to introduce the concepts of terrestrial ecology which will help in sustainable management of the same.

**Learning outcomes:** At the end of this course, students are expected to have an understanding of Biomes, ecological factors and applications. They will be familiar with sustainable strategies for conservation of terrestrial ecology.

<b>Unit</b>	<b>Title</b>	<b>No. of hours</b>
I	<b>Biomes of the world:</b> <ul style="list-style-type: none"> <li>• Biogeography: Species distribution, Historic effect of plate tectonics- past and present pattern of Biogeography</li> <li>• Meaning and Types of Biomes</li> <li>• Terrestrial Biomes : Tropical Rain Forest, Temperate Deciduous Forest, Savannah, Tundra, Desert</li> <li>•</li> </ul>	15
II	<b>Factors controlling terrestrial ecosystem</b> <ul style="list-style-type: none"> <li>• Soil : soil as an ecological factor, formation, profile, texture,</li> <li>• Water: Classification, properties of water as ecological factors: properties, composition, effect of rainfall and moisture on growth and distribution of plants and animals.</li> <li>• Temperature: ecological factor, range of temperature tolerance, effects on plants and animals, morphological and physiological adaptation in organism to change in temperature</li> </ul>	15
III	<b>Threats to terrestrial environment and ecosystem</b> Population growth, Urbanization, Industrial growth, Military conflicts and Nuclear war, Natural hazard Mining, dams, land use changes	15
		45

**References:**

1. Dhaliwal GS, Sangha GS, Ralhan PK, 1996: Fundamentals of Environment Science, Kalyani Publishers New Delhi,
2. J.L Chapman and MJ Reiss, 1999: Ecology: Principles and Application, Second Edition, Cambridge University Press, UK
3. Kotpal RL, Bali NP, 1998: Concepts Of Ecology, Vishal Publication, Jalendhar
4. Purphit SS, Ranjan R, 2003: Ecology, Environment and Pollution, Agrobios (India) Publication, Jodhpur

**CORE**

**Course Code: GEG-VI.SC-8**

**Course Title: Ecology and Terrestrial Environment (PRACTICAL)**

**Marks: 25**

**Credits: 1**

**Duration: 15 sessions of 2 hours each**

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**Course Objectives:** The course aims to develop skills of field sampling, testing and analysis of water and soil and interpretation .

**Learning outcome:** After the completion of this course, students will learn water and soil testing

<b>Unit</b>	<b>Title</b>	<b>Practical sessions</b>
1	<ul style="list-style-type: none"><li>• Soil sampling (Field work)</li><li>• Soil Testing<ul style="list-style-type: none"><li>○ Grain size analysis</li><li>○ Soil chemistry – pH</li></ul></li></ul> <b>Organic matter and organic carbon:</b> Methods(Titration and Loss & ignition)	07
2	<ul style="list-style-type: none"><li>• Soil chemistry</li><li>• pH testing</li><li>• <b>organic matter and organic carbon:</b> Methods(Titration and Loss &amp; ignition)</li></ul>	08
3	Journal and Viva	
		15

**References :**

1. Handbook of Applied Hydrology, Ven Te Chow, Ed., Section 4-II, McGraw-Hill Book Company, New York
2. King, C. A. M. (1966): Techniques in Geomorphology, Edward Arnold Ltd., London
3. Miller, A. A. (1953): The Skin of the Earth, Methuen and Co. Ltd., London
4. Monkhouse, F. J. and Wilkinson, H. R. (1971): Maps and Diagrams, Methuen and Co., London
5. Strahler, A. N. (1964): Quantitative Geomorphology of Drainage Basins and Channel Networks,

**ELECTIVE**

**Course Code: GEG-VI .SE-13**

**Course Title: Remote Sensing of Forest Ecology**

**Marks: 75**

**Credits: 3**

**Duration: 45 sessions of 1 hours each**

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**Course Objectives:** The objective of this course is to introduce the fundamental application of remote sensing in the forest ecology.

**Learning outcome:** Student will be able to appreciate the use of remotely sensed data in forest applications.

<b>Unit</b>	<b>Title</b>	<b>No. of hours</b>
1	<b>Remote Sensing of Forest Environments</b> Spectral Response of Vegetation. Measuring and monitoring: General Methods of Measuring Vegetation. Selecting a Measurement Method: Indirect Measurement of Forest Canopy Structure.	15
2	Measurement of Vegetation: Biophysical Measure, Timing of Measurements, Forest Structure and Composition, Species richness and composition	15
3	Modeling Forest Productivity Using Data Acquired Through Remote Sensing, Forest Information Extraction from coarse and medium Resolution Satellite Data. Selection of Remotely Sensed Data, Understanding Forest Dynamics	15
	Total	45

**References**

1. Adrian Newton (2007) Forest Ecology and Conservation, A Handbook of Techniques Techniques in Ecology & Conservation. Oxford New York
2. Hamlyn G Jones and Robin A Vaughan (2010) Remote Sensing of Vegetation Principles, Techniques, and Applications. Oxford University Press, Oxford.
3. Michael Wulder and Steven E. Franklin (2003) Remote Sensing of Forest. Environments, Concepts and Case Studies. (Ed) Springer, US.
4. Ned Horning, Julie A. Robinson, Eleanor J. Sterling, Woody Turner, and Sacha Spector (2010 )
5. Remote Sensing for Ecology and Conservation, A Handbook of Techniques. Oxford University Press, Oxford.
6. Roger M. McCoy (2005 ) Field Methods in Remote Sensing. The Guilford Press, New York London.
7. Van Der Valk, Arnold (2009) Forest Ecology Recent Advances in Plant Ecology. Springer.



**ELECTIVE**

**Course Code: GEG-VI .SE-13**

**Course Title: Practical in Remote Sensing of Forest Ecology (PRACTICAL)**

**Marks: 25**

**Credits: 1**

**Duration: 15 sessions of 2 hours each**

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**Course Objectives:** To develop the skills of assessing forests using remotely sensed data products.

**Learning outcome:** At the end of the course student are expected to independently prepare forest map and interpret the forest dynamics.

<b>Unit</b>	<b>Title</b>	<b>Practical sessions</b>
1	<b>Measurement of Forest Canopy</b> Accuracy Assessment of forest map Per-Pixel Analysis of Forest Structure Extracting Individual Tree Information Tree Canopy structure Fragmentation metrics, Fragmentation Analysis	10
2	<b>Vegetation indices</b> <ul style="list-style-type: none"><li>• NDVI</li><li>• Principal Component Analysis (method specify)</li><li>• Mapping forest disturbances</li></ul>	5
		15

**References**

1. Adrian Newton (2007) Forest Ecology and Conservation, A Handbook of Techniques Techniques in Ecology & Conservation. Oxford New York
2. Hamlyn G Jones and Robin A Vaughan (2010) Remote Sensing of Vegetation Principles, Techniques, and Applications. Oxford University Press, Oxford.
3. Michael Wulder and Steven E. Franklin (2003) Remote Sensing of Forest. Environments, Concepts and Case Studies. (Ed) Springer, US.
4. Ned Horning, Julie A. Robinson, Eleanor J. Sterling, Woody Turner, and Sacha Spector (2010 )
5. Remote Sensing for Ecology and Conservation, A Handbook of Techniques. Oxford University Press, Oxford.
6. Roger M. McCoy (2005 ) Field Methods in Remote Sensing. The Guilford Press, New York London.
7. Van Der Valk, Arnold (2009) Forest Ecology Recent Advances in Plant Ecology. Springer.

**ELECTIVE**

**Course Code: GEG-VI.SE-14**

**Course Title: Advanced Coastal Geomorphology (THEORY)**

**Marks: 75**

**Credits: 3**

**Duration: 45 lectures of 1 hour each**

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**Course Objectives:** The basic objective of this course is to introduce the process of coastal formation and coastal geomorphology of India. It's also introduces application of geo-spatial data which will help in understanding coastal processes.

**Learning outcomes:** At the end of this course, students are expected to develop the skill of understanding coastal processes by using GIS tools and methods.

<b>Unit</b>	<b>Title</b>	<b>No. of hours</b>
I	<b>Tectonic and coast</b> <ul style="list-style-type: none"><li>• Structural factors -Tectonic Coasts, Orientation of coastal tectonic movement, rates of coastal tectonic movement</li><li>• Formation of coast</li><li>• Structurally controlled coasts- Bold and Low coast</li><li>• Coastal Process and sea-level fluctuations</li><li>• Climatic factors</li></ul>	15
II	<b>Coastal Geomorphology of India:</b> <ul style="list-style-type: none"><li>• Indian coast- Extent &amp; Topography Geology &amp; structure of coastal zone, Evidence of emergence and submergence,</li><li>• Shore features-Beach, Bar, Lagoons-lake, Delta, Estuaries, Coral reefs and islands</li><li>• Classification of Indian coast</li></ul>	15
III	<b>Application of R.S in Coastal Studies:</b> Interpretation of coastal area: <ul style="list-style-type: none"><li>• Using SOI toposheet</li><li>• Satellite images</li><li>• Study of coastal problems: A case study</li></ul>	15
		45

## References

1. Bloom. L. Arthur (2012): Geomorphology, Rawat Publication Delhi.
2. Ahamad. E (1972) Coastal geomorphology of India, Orient Longman Delhi.
3. Cooke R. U. and Doornkamp J.C. (1989): Geomorphology in Environmental Management, 2<sup>nd</sup> Edition, Oxford : Clarendon Press
4. Eric Bird (2000): Coastal Geomorphology: An Introduction, 1 edition, John Wiley & Sons
5. Gerhard Masselink , Michael Hughes : An Introduction to Coastal Processes and Geomorphology (Hodder Arnold Publication), ISBN-10: 0340764112 , ISBN-13: 978-0340764114
6. Kale, V. S. and Gupta, A. (Rep. 2011): Introduction to Geomorphology, Orient Longman, Calcutta.
7. Karlekar, S. (2009): Coastal Processes and Landforms: Diamond Publications, Pune
8. Pethick J. (1995): Introduction to Coastal Geomorphology, John Wiley & Sons Inc.
9. Richard Davis Jr. , Duncan Fitzgerald : Beaches and Coasts, Wiley-Blackwell; 1st edition (July 15, 2004), ISBN-10: 0632043083 , ISBN-13: 978-0632043088
10. Timothy Beatley , Anna K. Schwab , David Brower (2002): An Introduction to Coastal Zone Management, Island Press; REV edition

**ELECTIVE**

**Course Code: GEG-VI.SE-14**

**Course Title: Advanced Coastal Geomorphology (PRACTICAL)**

**Marks: 25**

**Credits: 1**

**Duration: 15 sessions of 2 hours each**

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**Course Objectives:** The basic objective of this course is to introduce the GIS techniques which will help in understanding and evaluating coastal processes.

**Learning outcomes:** At the end of this course, students are expected to develop the skill of understanding coastal processes by using GIS tools and methods.

<b>Unit</b>	<b>Title</b>	<b>Practical sessions</b>
1	Demarcation of shoreline and tide level and coastal features using GIS software from satellite and SOI toposheet.	05
2	Case study of any coastal problems: Field work and use of GIS software	10
3	Journal and Viva	
		15

**References:**

1. Ahamad. E (1972) Coastal Geomorphology of India, Orient Longman Delhi.
2. Bloom. L. Arthur (2012):Geomorphology,Rawat Publication Delhi.
3. Cooke R. U. and Doornkamp J.C. (1989): Geomorphology in Environmental Management, 2<sup>nd</sup> Edition, Oxford : Clarendon Press
4. Eric Bird (2000): Coastal Geomorphology: An Introduction, John Wiley & Sons; 1 edition

**ELECTIVE****Course Code: GEG-VI.SE-15****Course Title: Ecology of Estuarine Environment (THEORY)****Marks: 75****Credit: 03****Duration: 45 lectures of 1 hour each**

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**Course objectives:** This Course enables the study of estuaries and their unique ecosystems. It explores the features of estuarine ecosystem and analyzes the effects of anthropogenic activities on estuaries.

**Learning outcomes:** After the completion of this course, students will be able to understand the estuarine processes. They will be aware about anthropogenic effects on estuaries.

<b>Unit No</b>	<b>Contents</b>	<b>No. of hours</b>
1	<b>Physical attributes of Estuaries</b> <ul style="list-style-type: none"><li>• Concept and Significance.</li><li>• Physical characteristics of estuaries</li><li>• Classification of estuaries.</li><li>• Environment in estuaries: mudflats, salt marsh, mangroves, salt pans</li><li>• Sediment source, transportation and deposition in estuaries.</li></ul>	15
2	<b>Estuarine dynamics</b> <ul style="list-style-type: none"><li>• Tides and tidal currents in estuaries</li><li>• Estuarine circulation and mixing.</li><li>• Estuaries as sources of food for marine organisms and nurseries for marine organisms.</li></ul>	15
3	<b>Anthropogenic Effects on estuaries and mitigation</b> <ul style="list-style-type: none"><li>• Agricultural runoff.</li><li>• Fishing</li><li>• Urban development and Reclamation of land for development.</li><li>• Recreational activities.</li><li>• Ports and harbors</li></ul>	15
		45

**References:**

1. Dronker J and Leussen W.V ( 1988) Physical Processes In Estuaries, Springer Verlag Publishers. London
2. Dyer. K.R (1997) Estuaries- Physical Introduction, 2<sup>nd</sup> edition John Wiley and Sons, New York
3. Gade, Edward and Svendsen( 1982) Coastal Oceanography, Plenum Press London.
4. Nair N. B. and Thampy, D.M.: (1989), Textbook of Marine Ecology. Macmillan Publishers
5. Tait, R.V- (1982), Elements of Marine Ecology: An Introductory Course, 3<sup>rd</sup> Edition, Butterworth-Heinemann

**ELECTIVE****Course Code: GEG-VI.SE-15****Course Title: : Ecology of Estuarine Environment (PRACTICAL)****Marks: 25****Credit: 01****Duration: 15 sessions of 2 hours each**

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**Course objectives:** this Course helps in developing the practical skills of studying estuarine ecology.**Learning outcomes:** after the completion of this course, students will be able to independently test and analyze various parameters associated with estuarine ecology and suggest remedial measures for the protection of the same.

<b>Unit No</b>	<b>Contents</b>	<b>Practical sessions</b>
1	Mapping of estuaries from Indian coasts using SOI toposheets(any 3)	6
2	<b>Mapping of estuaries in Goa:</b> <ul style="list-style-type: none"><li>• LULC</li><li>• Drivers for change</li></ul>	9
3	Journal and Viva	

**References:**

1. Dronker J and Leussen W.V ( 1988) Physical Processes In Estuaries, Springer Verlag Publishers. London
2. Dyer. K.R (1997) Estuaries- Physical Introduction, 2<sup>nd</sup> edition John Wiley and Sons, New York
3. Gade, Edward and Svendsen( 1982) Coastal Oceanography, Plenum Press London.
4. Nair N. B. and Thampy, D.M.: (1989), Textbook of Marine Ecology. Macmillan Publishers
5. Tait, R.V- (1982), Elements of Marine Ecology: An Introductory Course, 3<sup>rd</sup> Edition, Butterworth-Heinemann

**ELECTIVE****Course Code: GEG-VI.SE-16****Course Title: Disaster Management: Urban and Coastal (THEORY)****Marks: 75****Credits: 3****Duration: 45 lectures of 1 hour each**

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**Course Objectives:** The course aims give insights of basics and applications of landscape and disaster management.

**Learning outcomes:** This course will enable the students to understand the role of landscape in Urban and Coastal disaster management.

**Prerequisite:**

Students must have completed the course of Basics of remote sensing and GIS in SEM III.

Unit	Title	No. of hours
I	<b>Introduction to Disaster Management:</b> <ul style="list-style-type: none"> <li>• Definition, Types, Concepts of Disaster Management</li> <li>• Importance of Disaster Management</li> <li>• Introduction to mitigation methods</li> <li>• Disaster Management Cycle</li> <li>• Indian Scenario</li> </ul> <b>Natural Hazards &amp; Landscapes:</b> <ul style="list-style-type: none"> <li>• Types of landscapes &amp; natural hazards</li> <li>• Distribution Pattern</li> <li>• Consequences</li> <li>• Mitigation measures</li> </ul>	15
II	<b>Urban Landscape &amp; Disaster Management:</b> <ul style="list-style-type: none"> <li>• Understanding Risk of Urban hazard</li> <li>• Case study</li> </ul>	15
III	<b>Coastal Landscape &amp; Disaster Management:</b> <ul style="list-style-type: none"> <li>• Understanding Risk of coastal hazards</li> <li>• Coastal risk, mitigation and planning.</li> <li>• Case study</li> </ul>	15
		45

**References:**

1. Asian Development Bank, (2016), Reducing Disaster Risk by managing Urban Landuse- Guidance notes for planners, Metro Manila, Philippines
2. Ban Wisner, (2005), At Risk: Natural Hazards, People's Vulnerability and Disasters, Routledge
3. Chowdhury Emdadul. Haque, (2005), Mitigation of Natural Hazards And Disasters: International Perspectives, Springer
4. FitzGerald. M. Duncan, (2003), Beaches and Coasts, Blackwell Publishing
5. Natural Hazards and Disaster Management, (2006), A Supplementary Textbook in Geography for Class XI on Unit 11: Natural Hazards and Disasters, Published by: The Secretary, Central Board of Secondary Education, 2, Community Centre, Preet Vihar, Delhi-110092
6. Vernberg. F. John, Vernberg. Winona B, (2001), The Coastal Zone: Past, Present, and Future, University of South Carolina Press

**ELECTIVE**

**Course Code: GEG-VI.SE-16**

**Course Title: Practical in Disaster Management: Urban and Coastal (PRACTICAL)**

**Marks: 25**

**Credits: 1**

**Duration: 15 sessions of 2 hours each**

=====  
**Course Objectives:** This practical course aims to equip student with the techniques of vulnerable hazard zone delineation in local and regional landscape.

**Learning outcomes:** Student will be able to demarcate the risk prone sites and potential disasters in local and regional landscape.

**Prerequisite:**

Students must have completed the course of Basics of remote sensing and GIS in SEM III.

<b>Unit</b>	<b>Title</b>	<b>Practical sessions</b>
I	1. Mapping Flood risk area 2. Mapping Landslide and Erosion prone sites 3. Mapping Rock fall prone sites	07
II	4. Mapping the urban land surface temperature (Urban Heat Islands) 5. Risk sensitive land use map 6. Calculating permissible density of hazards.	8
	Journal	
		15

**References**

1. Asian Development Bank, (2016), Reducing Disaster Risk by managing Urban Landuse- Guidance notes for planners, Metro Manila, Philippines
2. Ban Wisner, (2005), At Risk: Natural Hazards, People's Vulnerability and Disasters, Routledge
3. Chowdhury Emdadul. Haque, (2005), Mitigation of Natural Hazards And Disasters: International Perspectives, Springer
4. FitzGerald. M. Duncan, (2003), Beaches and Coasts, Blackwell Publishing
5. Natural Hazards and Disaster Management, (2006), A Supplementary Textbook in Geography for Class XI on Unit 11: Natural Hazards and Disasters, Published by: The Secretary, Central Board of Secondary Education, 2, Community Centre, Preet Vihar, Delhi-110092
6. Vernberg. F. John, Vernberg. Winona B, (2001), The Coastal Zone: Past, Present, and Future, University of South Carolina Press



# **GEOLOGY**

## DEPARTMENT OF GEOLOGY

### Approved syllabus of Semester I and Semester II in Geology under Autonomy

**Paper Title:** FUNDAMENTALS OF MINERALOGY

**Paper Code:** GEL-I. C-1

**Name of the faculty:** Meghana S Devli

**Marks:** 75

**Credits:** 3

**Course objectives:** The course deals with the study of minerals, their chemistry and identification in hand specimen. Further, it also deals with the study of crystals w.r.t their morphology, symmetry and the normal crystal classes.

**Learning outcomes:** Studying the basics of mineralogy and crystallography helps in understanding and building the overall knowledge in geology.

#### MODULE 1

Elemental and oxide composition of the earth's crust - Major elements, Minor elements and Trace elements

Types of Atomic bonds. (Ionic/Covalent/Metallic/ Van der Waal)

Atomic arrangement in crystalline matter. (HCP/CCP)

Radius Ratio, Ionic Radius, Co-ordination Number. Types of co-ordination.

Crystals and crystallization

Crystalline state and Amorphous state.

Important and abundant mineral groups: silicate, sulfides, sulfates, carbonates; oxides; halides; native metals (with three examples each)

#### MODULE 2

Space lattice. Unit cell. External morphology of a crystal. Crystal Forms with examples.

Crystallographic axes and Crystal systems.

Symmetry in crystals. (Axis, Plane, Center)

Interfacial angles and Contact Goniometer.

Parameters and Indices

Study of the Normal Class (w.r.t the crystallographic axes, crystal symmetry, crystal forms, examples) of the crystal systems

### **MODULE 3**

Mineral.Rock-forming minerals and ore minerals.

Physical properties of minerals: Colour; Streak, Luster; Diaphaneity, Habit (imitative form); Hardness; Cleavage; Fracture; Specific Gravity

Tenacity, Luminescence

Thermal, Electrical, Magnetic properties of minerals

Polymorphism, Isomorphism, Pseudomorphism, Diadochy

Classification based on silicate structures: (sorosilicate/ cyclosilicate/ nesosilicate/ inosilicate/ phyllosilicate/tectosilicate)

Introduction to rock-forming mineral groups: Olivine, Pyroxene, Amphibole, Mica, Feldspar, Silica

#### **List of recommended reference books:**

1. *Dana's Manual of Mineralogy* (2010) by Dana J. D and Ford W. E.( J. Wiley & Sons)
2. *The Manual of Mineral Science* (2007) by Klein, C. and B. Dutrow (John Wiley & Sons, Inc.)
3. *Mineralogy* (3<sup>rd</sup> edition) by Perkins, D (PHI learning Private Limited, New Delhi)
4. *An Introduction to the rock forming minerals* by Deer W A, Howie R. A and Zussman J. (John Wiley and Sons)
5. *Rutley's elements of Mineralogy* (1988) by Read, H. H (CBS Publications)

**Practical Code:** GEL-I. P -1

**Marks:** 25

**Credit:** 1

1. Identifying and determining the crystal symmetry, class, system and forms in the normal class of the six systems.
2. Identification and study of ore minerals w.r.t their physical properties, occurrence, chemical composition and use.

Paper Title: **ELEMENTARY PETROLOGY**

Paper Code: **GEL-I.C-2**

Name of Faculty: **Allan Rodrigues**

Marks: **75**

Credits: **3**

### **Learning objectives:**

Petrology is the science of rocks. The course will help the students to exhibit an improved understanding of fundamental petrologic processes and common rock types. In practicals, students learn to identify, describe and classify rocks using hand specimens.

### **Learning outcomes:**

On completion of the course the students:

- (i) Will have gained an understanding of the processes involved in the formation of a rock, their textures, structures, classifications and their importance.
- (ii) Will have learned to differentiate between the different rock types based on their properties.

## **MODULE 1**

- Rocks: Definition; Classification; The rock cycle
  - Definition of Igneous rocks
  - Magma: Definition, formation, composition,
    - Properties: temperature, density, viscosity
    - Bowen's Reaction Series
  - Mode of occurrences of Igneous rocks
    - Intrusive forms
      - Dykes (Radiating, Arcuate, Ring dykes, and cone-sheets), Sills, Laccoliths, Lopoliths, Phacoliths, Volcanic necks, Batholiths (stocks, bosses and roof - pendants), Multiple and Composite intrusions.
    - Extrusive forms
      - Central and Fissure type
  - Structures of Igneous rocks

- Textures of Igneous rocks
- Classification: Based on
  - Fabric (phaneritic, aphanitic, glassy and volcaniclastic)
  - Field relations (volcanic/extrusive, intrusive hypabyssal, and intrusive plutonic).
  - Mineralogical composition
  - Chemical composition
- Study of the following rocks: Granite, Rhyolite, Gabbro, Dolerite, Basalt, Syenite, Trachyte, Dunite, Pyroxenite, Peridotite

## **MODULE 2**

- Introduction, Scope and Significance
- Weathering (definition, types – Chemical and Physical, and products), Erosion, Transportation and Deposition
- Diagenesis (definition and processes)
- Primary Structures
- Textures
- Classification of sedimentary rocks
- Sedimentary environments
- Study of the following rock types (Structures, textures, mineral composition, origin): Shale, Sandstone, Conglomerate, Breccia, Limestone, Dolomite, Laterite

## **MODULE 3**

- Metamorphism: definition, agents of metamorphism.
- Types of metamorphism, their tectonic setting
- Metamorphic minerals; stress and anti-stress minerals
- Metamorphic textures and structures.
- Metamorphic grade, Index minerals and Isograds
- Protolith: definition, recognition and types (Ultramafic, Mafic, Quartzofeldspathic or felsic, Pelitic, Calcareous, Calc-silicate)
- Metasomatism
- Nomenclature of metamorphic rocks.
- Study of the following metamorphic rocks with reference to their parent rock type, grade and type of metamorphism, fabric and mineral composition: Slate, Phyllite, Schist, Banded Gneiss, Augen Gneiss, Mylonite, Quartzite, Marble.

## List of Recommended Reference Books

1. *Igneous Petrology* by Mihir K. Bose (The World Press Private Limited, 1997)
2. *Igneous and Metamorphic Petrology* by Myron Best (Cambridge:Blackwell science, 1995)
3. *Sedimentary Rocks* by F. J. Pettijohn ( Delhi:CBS Publishers,1984)
4. *Petrology, Igneous, Sedimentary and Metamorphic* by Ehlers, E.G. and H. Blatt (1982), (W.H Freeman, San Francisco)
5. *A textbook of Geology* by G. B. Mahapatra (CBS)
6. *A Textbook of Engineering and General Geology* (Seventh Ed) by Parbin Singh
7. *A textbook of Geology* by P. K. Mukherjee (World Press)
8. *Principles of Petrology: An Introduction to the Science of Rocks* by Tyrell G.W. (1980 ), (1st Indian Edn., B.I. Publ. India)

Practical Code: **GEL-I.P-2**

Marks: **25**

Credit: **1**

1. Identification and study of rock-forming minerals w.r.t. their physical properties, occurrence and chemical composition.
2. Megascopic study of rocks (Igneous, Sedimentary and Metamorphic) in hand specimen.

**Paper Title:** EARTH'S DYNAMICS & TECTONICS

**Paper Code:** GEL-II. C-3

**Name of the faculty:** M S Katti

**Marks:** 75

**Credits:** 3

**Course objectives:** Structural Geology is a core branch of earth science which deals with basic concepts of natural internal forces shaping the earth. Further, the course deals with geological structures resulting from the action of these forces on rocks. Also, presents an understanding of the processes in action on the earth's surface and their impact on man and his institutions.

**Learning outcomes:** the study of this paper strengthens students' knowledge w.r.t understanding the essentials of the structural dynamics of the earth.

## MODULE 1

Origin of Solar System (Nebular Concept) and formation of a layered Earth.

Structure of the Earth: Atmosphere to Core

Geologic Forces:

Internal : Epeirogenic & Orogenic movements, Volcanic activity, Isostasy ;  
Glacial Rebound.

External: Hydrological Cycle, Rock cycle.

Earth's Gravity : Acceleration due to gravity, change with latitude and altitude.

Size and shape of the Earth.

Earth's Magnetism : Earth as a magnet; lines of force, Source of Earth's Magnetic field, Declination and inclination, Geomagnetic axis & Geographic axis.

## **MODULE 2**

Introduction to Plate Tectonics: lithosphere, asthenosphere, convection currents, Plate margins & boundaries and associated seismicity and volcanism.

Lithostatic or confining pressure, Differential forces: tension, compression, couple concept of stress & strain: stages of deformation: Elastic, Plastic & Rupture.

Brittle & ductile substances.

Geological Hazards: Earthquakes & Tsunami, Volcanic activity, Landslides & avalanches.

Earthquakes: Elastic rebound theory, Seismic waves, Intensity (Richter scale) Seismogram, determination of Epicenter, Types of Earthquakes (shallow, intermediate, deep), Relation of Earthquakes to plate boundaries.

## **MODULE 3**

Map & Scales, Compass bearings, Systems of notation of bearings, Fore bearing & back bearing.

Representation of relief: Contours, Properties of contours, Contour reading, patterns & uses of contours.

Stratification, Strike & dip (true & apparent dip) strike & dip symbols.

Outcrop patterns of Horizontal, Inclined & vertical strata on various types of grounds (horizontal ground, valley & spur).

Folds: Terminology, causes, types of folds; symmetrical, asymmetrical, overturned, recumbent, isoclinal, fan, chevron, monocline, structural terrace, plunging & non-plunging; significance. Outcrop pattern of folds on horizontal ground, valley and spur.

Faults: Definition & terminology, geometric classification, significance; horst & graben.



Joints: Geometric classification, map symbols, columnar joints & sheet structure, significance.

Unconformities: Stages of development, types, significance; outliers & inliers; overlap & offlap.

**List of books recommended for reference:**

1. *Living with Earth* (2012) by Hudson Travis, Phi Learning Pvt. Ltd., New Delhi.
2. *Physical Geology* by Charles C. Plummer and David McGeary (4<sup>th</sup> edition), Wm C. Brown Publishers.
3. *Understanding the Earth* (4<sup>th</sup> edition) by Press, Siever, Grotzinger and Jordan.
4. *The Changing Earth: Exploring Geology and Evolution* (3<sup>rd</sup> edition) by Monroe and Wicanter.
5. *A Textbook of Engineering and General Geology* (7<sup>th</sup> edition) by Parbin Singh.
6. *Holmes' Principles of Physical Geology* edited by P.McL.D.Duff (ELBS).
7. *Elements of Structural Geology* by E.S. Hills (Methuen)
8. *A Textbook of Geology* by P K Mukherjee (World Press)
9. *Elements of Geology* (3<sup>rd</sup> edition) by Zumberge J.H. & Nelson C.A. John Wiley & Sons, New York.

**Practical Code:** GEL-II. P -3

**Marks:** 25

**Credit:** 1

1. Drawing cross-section and description of structural maps involving single series (Horizontal and Inclined)
2. Graphical solution to structural problems.

**Paper Title:** PRINCIPLES OF STRATIGRAPHY AND PALAEOONTOLOGY

**Paper Code:** GEL-II. C-4

**Name of the faculty:** H S S Nadkarni

**Marks:** 75

**Credits:** 3

**Course objectives:** Stratigraphy and Palaeontology, the two branches of Geology work together to unearth the secrets of age from rocks of the earth's crust. Stratigraphers study the composition and arrangement of layered, or stratified rocks. Palaeontologists study the remains of plants and animals which have been preserved in the earth's crust by natural processes. With these objectives in mind it becomes pertinent to understand the basic concepts of Stratigraphy and Palaeontology.

**Learning outcome:** The study of stratigraphy and Palaeontology encompasses the aspects of the age of the earth, chronological arrangement of rocks and appearance and evolution of life through the geologic time.

The knowledge of the concepts in stratigraphy, correlation, and palaeontology would enable the students to understand the changes that occurred in the history of the earth and relate them to their field observations and also, in understanding the framework of the stratigraphy of India.

## **Module 1**

Scope and Objectives of Stratigraphy:

Laws of: Uniformitarianism, Original horizontality, Order of superposition, Faunal succession, Cross-cutting relationship, Inclusions.

Age of the earth: Brief outline of early methods, radiometric dating; Principles.

Measurement of geologic time:

Time Units: Eon-Era-Period-Epoch-Age

Standard Stratigraphic Scale.

Lithostratigraphic/ Rock Units: Group-Formation-Member-Bed  
Indian Stratigraphic Sequence  
Chrono-/ Time stratigraphic units: Erathem-System-Series-Stage

Correlation and methods of Correlation:

Paleontological Criteria : Index/ Zone fossils  
Lithological Similarity: Marker/ Key bed  
Structural relations: Tectonic criteria  
Radiometric dating criteria

Field observations and applications.

Divisions of Geologic time: Primary-secondary-Tertiary Periods .Stratigraphical subdivisions based upon the progress of life: The Seven Ages.

Physiographic subdivisions of India and their distinctive characters.

Brief account of the Dharwar Group of rocks and their stratigraphic position.

Brief account of the Geological Formations of Goa.

## **Module 2**

Scope and importance of Palaeontology:

Fossils: Mega- Micro-Ichnofossils

Conditions for fossilization; Favourable environments for fossilization.

Modes of fossilization: Petrification, Carbonisation,  
Natural moulds and casts,  
Ichnofossils, Frozen and mummified fossils.

Uses of fossils:

Correlation: Index/ Zone fossils  
Dating, locating coal and petroleum deposits.

### **Module 3**

Binomial nomenclature of organisms and Taxonomy

Morphology of the hard parts and geological time range of the following:

Phylum: Arthropoda- Class: Trilobita

:Mollusca- Class : Pelecypoda

:Gastropoda

:Cephalopoda- Nautiloidea

Ammonoidea

Belemnoidea

: Brachiopoda

:Echinodermata- class: Echinoidea

### **Books for study and reference:**

1. *Basic concepts of Historical Geology* by Edgar, Winston, Spencer (Oxford & IBH Publishing Co.).
2. *Manual of Geology* by J.D. Dana (Anmol Publications).
3. *Fundamentals of Historical Geology and Stratigraphy of India* by Ravindra Kumar- New Age International Publishers.
4. *Fundamentals of Invertebrate Palaeontology* by M.A.Koregave-Book World Enterprises.
5. *The Changing Earth: Exploring Geology and Evolution* (3<sup>rd</sup> edition) by Monroe and Wicanter
6. *The Elements of Palaeontology* by Rhona M. Black- Cambridge University Press.
7. *A Textbook of Geology* by P.K Mukherjee (world Press).

**Practical Code:** GEL-II. P -4

**Marks:** 25

**Credit:** 1

1. Use of clinometer compass
2. Exercises on bearings
3. Study of fossils/casts/shells w.r.t their morphology and geological age.

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(Autonomous)**



DEPARTMENT OF GEOLOGY

THREE YEAR B.Sc. DEGREE  
COURSE IN GEOLOGY

(2016 onwards)

# Department of Geology, Parvatibai Chowgule College (Autonomous)

## Course Structure and List of Core, Elective and Foundation Courses

### COMPONENT A

SEMESTER	CORE COURSES		ELECTIVE COURSES			
I	<b>GEL-I.C-1</b> Fundamentals of Mineralogy	<b>GEL-I.C-2</b> Elementary Petrology	-----	-----	-----	-----
II	<b>GEL-II.C-3</b> Earth's Dynamics and Tectonics	<b>GEL-II.C-4</b> Principles of Stratigraphy and Paleontology	-----	-----	-----	-----
III	<b>GEL-III.C-5</b> Optical and Systematic Mineralogy		<b>GEL-III.E-1</b> Physical Geology	<b>GEL-III.E-2</b> Groundwater and Hydrogeology	<b>GEL-III.E-3</b> Engineering Geology.	<b>GEL-III.E-4</b> Marine Geology
IV	<b>GEL-III.C-6</b> Structural Geology		<b>GEL-IV.E-5</b> Ore Genesis	<b>GEL-IV.E-6</b> Stratigraphy of India – Part I	<b>GEL-IV.E-7</b> Natural Hazards and Management	<b>GEL-IV.E-8</b> Geotectonics
V	<b>GEL-V.C-7</b> Igneous Petrology	<b>GEL-V.CP</b> Core Project	<b>GEL-V.E-9</b> Stratigraphy of India – Part II	<b>GEL-V.E-10</b> Petroleum Geology	<b>GEL-V.E-11</b> Principles of Geophysical Exploration	<b>GEL-V.E-12</b> Remote Sensing and GIS Applications
VI	<b>GEL-VI.C-8</b> Sedimentary Petrology	<b>GEL-VI.CP</b> Core Project	<b>GEL-VI.E-13</b> Metamorphic Petrology	<b>GEL-VI.E-14</b> Mining and Mineral Exploration	<b>GEL-VI.E-15</b> Surveying and Mapping	<b>GEL-VI.E-16</b> Gemstone Testing and Evaluation

# Department of Geology, Parvatibai Chowgule College (Autonomous)

Core Course papers for students offering **Geology as the Minor Subject**

<b>SEMESTER I</b>
GEL-I.C-1: Fundamentals of Mineralogy
<b>SEMESTER II</b>
GEL-II.C-3: Earth's Dynamics and Tectonics
<b>SEMESTER III</b>
GEL-III.C-5: Optical and Systematic Mineralogy
<b>SEMESTER IV</b>
GEL-IV.C-6: Structural Geology
<b>SEMESTER V</b>
GEL-V.C-7: Igneous Petrology
<b>SEMESTER VI</b>
GEL-VI.C-8: Sedimentary Petrology

## **Component B: Foundation Course**

- **Interdisciplinary Papers**

<b>Semester V</b>
GEL-V.GC-1: Environmental and Physical Geology
<b>Semester VI</b>
GEL-VI.GC-2: Gemmology



# SEMESTER

# III

# Department of Geology, Parvatibai Chowgule College (Autonomous)

Paper Title: **OPTICAL AND SYSTEMATIC MINERALOGY**

Paper Code: **GEL-III.C-5** (Core Course)

Marks: **75**

Credits: **3 (45 Contact hours)**

## **Course Objectives:**

- The course covers the basics of geoscientific studies in Mineralogy. The knowledge of optics is applied in understanding the genesis and identification of minerals.

## **Learning Outcomes:**

- The course will enable the students not only to differentiate them based on their optical properties, but also to understand how they originate and associate with each other in a rock.

## **MODULE 1:**

**15 Lectures**

Introduction: Nature of light, Polarized light, Refractive Index, Critical angle and Total Internal reflection, Wave Surface, Double Refraction.

Parts and working of a Polarizing / Petrological microscope

Properties of minerals in Plane Polarised Light (PPL): Colour, Form, Cleavage/Cracks; Relief, Twinkling; Pleochroism, Pleochroic halos.

Optical characters of minerals: Isotropism and Anisotropism

Properties of minerals Between Crossed Polars (BXP): Interference colours: Formation, Newton's Scale, Anomalous interference colours; Extinction and Extinction types. Twinning, Zoning, Alteration, Inclusions.

Uniaxial indicatrix

Biaxial indicatrix

Optical accessories

Convergent Light: Principle

Uniaxial Interference Figure

Biaxial Interference Figure

Optic sign of Uniaxial and Biaxial Minerals

2V and 2E

**MODULE 2:**

**(15 Lectures)**

Physical and optical properties, Paragenesis, stability relations of the following group of minerals:

- Olivine group
- Pyroxene group
- Amphibole group
- Garnet group

**MODULE 3:**

**(15 Lectures)**

Physical and Optical properties, Paragenesis, Stability relations of the following group of minerals

- Mica group
- Feldspar group
- Feldspathoid group
- Silica group

## **Practicals**

Marks: **25**

Credit: **1 (15 Practicals)**

- Identification of 20 common rock forming minerals based on optical properties
- Interference figures (Demonstration)
- Determination of optic sign (demonstration)
- Determination of An-content using extinction angles (demonstration)

### **List of recommended reference books:**

- Kerr, P., 1977, Optical Mineralogy, McGraw Hill Publishers.
- Nesse, D. W., 2012, Introduction to Optical Mineralogy, Oxford University Press.
- Ford, W. E., 2006. Dana's Textbook of Mineralogy (with extended treatise Crystallography and Physical Mineralogy). CBS Publishers, New Delhi.
- Deer, W. A, Howie, R. A and Zussman. J., 2013, An Introduction to Rock-Forming Minerals, Mineralogical Society.
- Griffen, D. T, Phillips, W. R and William, R. Phillips., 2004. Optical Mineralogy: The Nonopaque Minerals. CBS Publishers, New Delhi.
- Mason and Berry., 2004. Mineralogy, CBS Publishers, New Delhi.

**Paper Title: PHYSICAL GEOLOGY**

Paper Code: GEL-III.E-1

Marks: 75

Credits: 3 (45 Contact hours)

**Prerequisites: GEL-I.C-1 and GEL-II. C-3**

**Course Objectives:**

The natural agencies like wind, rivers, glaciers have been moulding and remoulding the surface of the earth over millions of years. This paper aims at the understanding of the processes and the physical forces responsible in developing the surficial features and highlighting the role of these natural agencies in grading and degrading the land surface.

**Learning Outcomes:**

The students are expected to relate the activity of the various natural agents to the existence of different types of physical features on the earth's surface and, will be able to understand the dynamism in their creation.

**MODULE 1:**

**(15 Lectures)**

*Weathering;*

- Physical weathering: Frost wedging; Temperature fluctuations, Exfoliation, activity of organisms, attrition
- Chemical weathering: hydrolysis, leaching, oxidation, dissolution and spheroidal weathering

Processes of Erosion, Transportation and Deposition.

*Geological action of Wind* : Wind as a geological agent.

*Sediment transport by wind*: Bed load, suspended load.

*Erosional features*: Desert pavement, Ventifacts, Yardangs, Pedestal/Mushroom rocks.

*Depositional landforms*: Dunes: Formation and migration of dunes; Types of dunes; Loess.

**MODULE 2:**

**(15 Lectures)**

*Geological action of Rivers:* Stream, Stages of river, stream channels, long profile, cross-sectional shape.

*Erosion by running water:* Laminar flow, turbulent flow, hydraulic action, abrasion; Bed load; Base level of erosion.

*Erosional feature:* Waterfalls, mesas, butte, Cuesta, Hogback, Meanders and ox-bow lakes

*Depositional landforms:* Braided stream, alluvial fans; deltas.

*Geological action of Ground water:* Origin of ground water, groundwater movement, Zone of aeration, saturated zone, water table, perched water table.

*Erosion by ground water:* Dissolution, Carbonate Caverns and Sink holes, Karst topography.

*Deposition by ground water:* Cave deposits; Dripstones, Stalactites and Stalagmites

*Springs, Hot springs and Geysers.*

**MODULE 3:**

**(15 Lectures)**

*Geological work of Glaciers:* Snowline, Formation of ice; Glaciers; movement of glaciers, Valley glaciers, Piedmont glaciers, Ice-sheets; Crevasses.

*Glacial erosion:* Abrasion, Quarrying, Frost wedging;

*Erosional features;* Cirques, Arêtes, Horns, U- shaped valleys, Fjords, Hanging valleys.

*Glacial transport:* Drift, Till and Erratics

*Depositional landforms:* Moraines, Drumlins, Outwash plains, Kettles, Eskers, Varves.

*Geological action of Oceans and Sea:* Waves, Tides and currents; breaking waves, surf

*Coastal erosion and landforms:* wave-cut platform, sea cliff, sea-caves, sea-arches, sea-stack.

*Coastal deposits:* Beaches, spits, bars and tombolos.

**Practicals:**

Marks: **25**

Credit: **1(15 Practicals)**

- Calculation of length using Rotameter
- Calculation of area using Square grid, Strip method, Hero's rule (Triangle method), Planimeter (demonstration)
- Drawing of long profile and cross profile of rivers selected from S.O.I Toposheets.

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- Basin Morphometry
- Hypsometry
- Study and description of common landforms from 3D models.

### **List of books recommended for references:**

- Monroe, S. J and R. Wicander., 2014, The Changing Earth: Exploring Geology and Evolution, Brooks Cole Publishers.
- Duff, D and Holmes, A., 1993, Holmes Principles of Physical Geology, Springer.
- Skinner, J. B and S, C. Porter., 2003. The Dynamic Earth: An Introduction to Physical Geology, John Wiley and Sons.
- Mathur, S. M., 2012. Physical Geology of India, National Book Trust.

Paper Title: **GROUNDWATER AND HYDROGEOLOGY**

Paper Code: **GEL-III.E-2**

Marks: 75

Credits: **3 (45 CONTACT HOURS)**

**Prerequisites: GEL-I.C-1 and GEL-II. C-3**

**Course Objectives:** To impart knowledge about groundwater, its movement, methods of its exploration, the criteria of its quality, methods of its conservation, recharge of groundwater, monitoring of groundwater quality and quality.

**Learning Outcomes:** On completion of the course, the student will have gained an understanding of:

- Hydrogeological concepts, exploration, exploitation and recharge of groundwater
- Methods of monitoring groundwater quality and sources of pollution

**MODULE I**

**(15 LECTURES)**

- ❖ Hydrologic cycle: its components
- ❖ Infiltration: its controlling factors
- ❖ Hydrologic budget
- ❖ Vertical distribution of sub surface water
- ❖ Types of Groundwater: Juvenile, Connate, Magmatic, Meteoric water
- ❖ Rock properties affecting movement of Ground water : 1) Porosity(primary and secondary), effective porosity, controlling factors of porosity  
2) Permeability: Darcy's law, laboratory methods of measurement of permeability (constant head , falling head), specific yield , specific retention.
- ❖ Relation between grain size, porosity ,specific yield and specific retention .
- ❖ Definition of an aquifer, aquiclude, aquitard, aquifuge, and types of aquifers: Unconfined, Confined (Artesian), Perched aquifer

**MODULE II**

**(15 LECTURES)**

- ❖ Groundwater Exploration: Resistivity methods
- ❖ Aquifer parameters: 1) Transmissivity, 2) Storativity,3) Hydraulic conductivity: methods of determination (pumping test and tracer test)
- ❖ Drawdown and cone of depression
- ❖ Flow nets

- ❖ Groundwater quality:
  - Parameters :physical ,chemical and biological
  - Major, minor and trace constituents.
  - I.S.I standards for drinking water

**MODULE III**

**(15 LECTURES)**

- ❖ Effects of withdrawal, effects of waterlogging
- ❖ Artificial recharge
- ❖ Saline water intrusion in aquifer
- ❖ Ghyben-Hertzberg relation
- ❖ Pollution of ground water: Arsenic and Flourine

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**Practicals:**

Marks: **25**

Credit: **1 (15 Practicals )**

- Drawing flow nets
- Determination of depth to water table from bore hole data.
- Numerical problems on determination of porosity, bulk density, saturation percentage and void ratio of sample
- Problems based on Ghyben –Hertzberg formulae
- Graphical presentation of chemical data of water resistivity survey(demonstration)

**List of recommended reference books:**

1. Todd , D.K and Mays, L.W., 3<sup>rd</sup> edition , 2012. Groundwater Hydrology, Wiley India Pvt. Ltd.
2. Valdiya K.S., 1987, Environmental Geology: Indian Context, Tata-McGraw Hill
3. Ragunath H.M., 1983, Groundwater, Wiley Eastern Ltd, New Delhi.
4. Keller, E.A., 4<sup>th</sup> edition, 2011. Environmental Geology, CBS Publishers, NewDelhi.



Paper Title: **ENGINEERING GEOLOGY**

Paper Code: **GEL-III. E-3**

Marks: **75**

Credits: **3 (45 contact hours)**

**Prerequisites: GEL-I.C-1 and GEL-II. C-3**

**Course Objective:** To impart sufficient knowledge of engineering geology so as to be able to anticipate the technical problems related to geology of various engineering sites and suggest possible remedial measures.

**Learning Outcome:** Upon completion of the course the student will become aware of the importance of geological studies and its applicability to various engineering problems.

**MODULE I**

**(15 LECTURES)**

- ❖ Introduction to engineering geology
- ❖ Scope of engineering geology
- ❖ Engineering properties of rocks
  1. Rocks used as building stones.
  2. Rocks at foundation sites.
  3. Rocks used as aggregates.
- ❖ Factors affecting engineering properties of rocks
- ❖ Aggregates: Sources and Types.

**MODULE II**

**(15 LECTURES)**

- ❖ Soils
  1. Types of soils.
  2. Soil profile.
  3. Engineering properties of soil
- ❖ Dams
  1. Parts of a dam.
  2. Types of dams.
  3. Selection of sites.
  4. Forces acting on a dam
  5. Geological conditions at the dam site.
  6. Spillways and Types of spillways

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## ❖ Bridges

1. Geological considerations in the selection of sites for the construction of a bridge.
2. Types of bridges.

## MODULE II

(15 LECTURES)

## ❖ Tunnels

1. Types of Tunnels.
2. Geological considerations in tunneling.
3. Lining of tunnels
4. Environmental effect of tunnels

## ❖ Remedial measures for site improvement.

## ❖ Properties of important building stones..

## ❖ Case study of major dams, tunnels and bridges in India.

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## Practicals:

Marks: 25

Credit: 1 (15 Practicals)

- Site feasibility based on geological map.
- Core logging
- Computation of reservoir area, catchment area, reservoir capacity
- Numerical problems on ultimate strength of rocks

## List of recommended reference books.

1. Singh, P., 7<sup>th</sup> edition, Engineering and General Geology, S.K Kataria and Sons.
2. Blyth, F.G.H and De Freitas., 7<sup>th</sup> edition, Geology for Engineers, ELBS.
3. Kesavulu, N.C., 2<sup>nd</sup> edition, A textbook of Engineering Geology, Laxmi Publications.
4. Krynine, D. and Judd W., Indian Reprint (1998), Principles of Engineering Geology and Geotectonics, McGraw Hill.#indian reprint
5. Billings, M.P., 3<sup>rd</sup> Edition, Structural Geology, CBS Publishers, New Delhi.
6. Sathya, N S., 2<sup>nd</sup> edition, Engineering Geology, B.S, Dhanpat Rai and Co. Pvt Ltd.
7. Gupta R.B. (1992)., A Textbook of Engineering Geology., Pune Vidyarthi Griha Prakashan.

Paper Title: **MARINE GEOLOGY**

Paper Code: **GEL-III. E-4**

Marks: **75**

Credits: **3 (45 Contact hours)**

**Prerequisites: GEL-I.C-1 and GEL-II. C-3**

**Course Objectives:**

- To provide essential concepts of oceanography.
- To study the tectonics, geology, economic resources w.r.t. the oceans.

**Learning Outcomes:**

- A student will understand and learn about the basic concepts of marine science with respect to geology as to enable them to work as a marine researcher.

**MODULE 1:**

**(15 Lectures)**

- ❖ Introduction to Marine Geology
- ❖ Morphological features of the ocean floor: continental margin provinces (continental shelf, continental slope, continental rise), ocean basin provinces (sea mounts, guyots, abyssal plain), Mid Oceanic Ridges.
- ❖ Ocean basins: Shape, size of the Pacific, Atlantic and Indian Oceans

**MODULE 2:**

**(15 Lectures)**

- ❖ Classification of marine sediments (terrigenous, biogenous, chemogenous, authigenic, cosmogenous), Sediment distribution on the Ocean floor
- ❖ Sedimentation rates, sediment budget, sediment transport, accumulation of sediments in the ocean; sedimentation processes on continental shelves - physical processes, sediment response; deep-sea sediments.
- ❖ Provenance of sediments.
- ❖ Geochronology of marine sediments and rocks (dating methods).
- ❖ Seawater chemistry - salinity, components of salinity, sources of ocean's salts, processes controlling the composition of sea water, determining salinity.

**MODULE 3:**

**(15 Lectures)**

- ❖ Classification of coasts.
- ❖ Exclusive Economic Zone (EEZ); Minerals in the EEZ of India.
- ❖ Instrumentation for sea bed sampling, Sea-bed deposits,
- ❖ Marine Resources: Physical Resources - sand and gravel, polymetallic nodules, gas hydrates, metallic sulfides (black and white smokers) and muds.

**Practicals:**

Marks: **25**

Credit: **1 (15 Practicals)**

- Grain size analysis and its statistical parameters.
- Beach profiling
- Demonstration of samplers.

**List of books recommended for references:**

- Trujillo, A. P and Thurman H., 2013. Essentials of Oceanography, Eastern Economy Edition, PHI Learning Pvt. Ltd, New Delhi.
- Kennett J P., 1981. Marine Geology, Prentice Hall.
- Qasim, S.Z., 1996, India's Exclusive Economic Zone, Omega Scientific Roonwal, G.S. Publishers.
- Thurman, H V. and Trujillo A., 2003, Introductory Oceanography, Prentice Hall.

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## **SEMESTER III**

### **EVALUATION AND ASSESSMENT SCHEME**

**Each course (Core or Elective) = 4 credits of 100 marks**

**Theory: 75 marks = 3 credits**

- Continuous Assessment (CA): 30 marks.
- Semester End Examination (SEE): 45 marks.

**Practicals: 25 marks = 1 credit**

- i. Assessment in practicals will be done by continuous assessment throughout the Semester.
- ii. Practicals will be supported by appropriate field work.

# SEMESTER

# IV

Paper Title: **STRUCTURAL GEOLOGY**

Paper Code: **GEL-IV.C-6** (Core Course)

Marks: **75**

Credits: **3 (45 Contact hours)**

**Course Objectives:**

- The course is designed for the students to understand the geometry and mechanics of the various geological structures that result through the deformative processes operative within the earth.

**Learning Outcomes:**

- The student will
  - gain knowledge of the geometry of the rock structures.
  - understand the mechanism of the evolution of rock structures and its application in the field.

**MODULE I:**

**(15 Lectures)**

- ❖ Objectives of Structural Geology,
- ❖ Principles of mechanical behavior of rocks, forces, composition and resolution of forces stress, strain, stress-strain diagram. Mohr's envelope, Factors controlling mechanical behavior of rocks.
- ❖ Determination of top of beds with the help of primary and secondary features: ripple marks, graded and cross bedding, fossils.

**MODULE II:**

**(15 Lectures)**

- ❖ *Folds*: Recognition, causes of folding; tectonic and non-tectonic. Genetic classification of folds
- ❖ Drag folds and their significance
- ❖ *Unconformities*: types of unconformities, recognition and distinction from faults and intrusive contacts.

**MODULE III:**

**(15 Lectures)**

- ❖ *Joints*: Principles of failure by rupture (experimental data), relation of rupture to stress and strain (stress and strain ellipsoid), genetic classification of joints.

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- ❖ *Faults*: Terminology, separation, genetic classification, criteria for recognizing faults, types of faults ( normal, strike-slip, dip-slip, reverse, thrust, overthrust)
- ❖ *Cleavage and Schistosity*: types, origin and relation to major structures.
- ❖ *Secondary lineation*: Kinds of secondary lineation and their origin.

### **Practicals**

Marks: **25**

Credit: **1 (15 Practical)**

- Solving Geological Maps
- Completion of Outcrops
- Stereographic Projection of Structural Data
- Graphical Solution for Structural Problems

### **List of recommended reference books:**

- Twiss, R. J and Moores, E. M., 2006. Structural Geology, W H Freeman and Company.
- Davis, G. H., 1996. Structural Geology of Rocks and Regions, Wiley
- Pollard, D. D and Fletcher, R. C., 2005. Fundamentals of Structural Geology, Cambridge University Press.
- Marshak, S and G. Mitra., 1988. Basic Methods of Structural Geology, Prentice Hall.
- Billings, M., 2008. Structural Geology, PHI Learning Pvt. Ltd, New Delhi.
- Hobbs, B and Alison, O. R. D., 2014. Structural Geology: The Mechanics of Deforming Metamorphic Rocks, Elsevier Science Publishing Co. Inc
- Fossen, H., 2010. Structural Geology, Cambridge University Press



**Paper Title: ORE GENESIS**

**Paper Code: GEL-IV. E-5**

**Marks: 75**

**Credits: 3 (45 contact hours)**

**Prerequisites: GEL-I.C-1, GEL-I.C-2, GEL-II.C-3 and GEL-II. C-4**

**Course Objectives:** The course deals with the study of various processes of formation of ore deposits. It also deals with the study of various mineral deposits with respect to their mode of occurrence, geologic and geographic distribution, classification and their genesis. Furthermore, it also deals with the identification of economic minerals in hand specimens.

**Learning Outcome:** On completion of the course, the student will have gained sufficient knowledge regarding the formation of various ore deposits and also be able to differentiate between economic minerals and identify them. Furthermore, the student will gain an idea about the mineral wealth of our country.

**MODULE 1**

**(15 lectures)**

- Introduction to Ore Genesis.
- Scope and Application of Economic Geology.
- Concepts of the terms ore, gangue, grade, tenor, resources, reserves.
- Classification of Mineral deposits
  1. Lindgren's scheme.
  2. Bateman's scheme.
- Epigenetic and Syngenetic deposits.
- Process of formation of various ore deposits
  1. Magmatic Concentration
  2. Sedimentation
  3. Metamorphism
  4. Contact Metasomatism

**MODULE 2**

**(15 lectures)**

- Process of formation of various ore deposits
  5. Hydrothermal Processes ( Cavity filling and Metasomatic replacement)
  6. Oxidation and Supergene Enrichment
  7. Sublimation
  8. Residual Concentration
  9. Mechanical Concentration

**MODULE 3**

**(15 lectures)**

- Classification, mode of occurrence, genesis and geological and geographic distribution of the following metallic deposits in India.
  1. Iron
  2. Manganese
  3. Aluminium
  4. Chromium
  5. Copper
  6. Lead-Zinc
  7. Gold
- Classification, Mode of Occurrence, Genesis and Geological and Geographic distribution of the following non-metallic deposits in India .
  1. Coal
  2. Petroleum and Natural Gas
  3. Diamond
  4. Nuclear minerals
  5. Industrial minerals: (Refractory, Abrasives, Cement, Fertilizer, Electrical and Electronic industries)
- List of type deposits and leading global ore producers of the above metallic and non metallic deposits.

**Practicals:**

Marks: **25**

Credit: **1 (15 Practicals)**

1. Study of Economic minerals in hand specimen
2. Location of various ore deposits on the outline map of India

**List of recommended reference books:**

1. Jensen, M.L and Bateman A.M., 3<sup>rd</sup> Edition, (1979), Economic Mineral Deposits, John Wiley and Sons.
2. Prasad, U., 2<sup>nd</sup> edition, (2014) Economic Geology: Economic Mineral Deposits, CBS Publishers, New Delhi.
3. Krishnaswamy, S., (1979), Indian Mineral Resources, Oxford and IBH.
4. Gokhale, G.V.G.K., (1983), Ore Deposits of India, CBS Publishers, New Delhi.
5. Singh, P., 7<sup>th</sup> edition, (2008) Engineering and General Geology, SK Kataria and Sons.

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Title: **STRATIGRAPHY OF INDIA- Part I**

Paper Code: GEL-IV.E-6

Marks: 75

Credits: 3 (45 Contact hours)

Prerequisites: GEL-I.C-1, GEL-I.C-2, GEL-II.C-3 and GEL-II. C-4

**Course Objectives:**

- To understand the stratigraphic units.
- To correlate International Geological Time Scale with Indian Stratigraphic Time Scale.
- To understand the geology, stratigraphy, fossil content, economic resources of the lithounits from the Peninsular India.

**Learning Outcomes:**

- The student will gain knowledge about the stratigraphy and geology of India with emphasis on the Peninsular India which will help in understanding the different episodes on the earth during the geologic past.

**MODULE I**

**15 Lectures**

- Introduction to Stratigraphy
- Classification of Stratigraphic Units: Lithostratigraphic Units, Biostratigraphic Units, Chronostratigraphic Units, Magnetostratigraphic Units
- Indian Stratigraphic Time Scale
- Physiography, drainage, structure and tectonism of Peninsular India.

**MODULE II**

**15 Lectures**

- *Cratonic provinces of Peninsular India shield:* (Dharwar craton, Singhbhum craton, Bundelkhand craton, Aravalli craton, Bastar craton) and their economic importance, with emphasis on the Dharwar craton.
- *Mobile Belts of Peninsular India:* Eastern Ghat Mobile Belt, Satpura Mobile Belt, Pandayan Mobile Belt
- *Major Archaean Basement Complexes:* Peninsular Gneiss of Karnataka (in detail), Banded Gneissic Complex (BGC) of Rajasthan, Older Metamorphic Complex (OMC) of Eastern India
- *Greenschist/Greenstone Belts of Peninsular India:*
  - *Older Greenstones:* Sargur Supracrustals

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- *Younger Greenstones*: Dharwar Supergroup: Bababudan Group, Chitradurga Group (Goa Group of rocks)
  
- *Proterozoic Basins of Peninsular India*:
  - Vindhyan Supergroup;
  - Cuddapah Supergroup;
  - Kaladgi Supergroup (in detail).
  
- Outline of Bhīma Supergroup, Delhi Supergroup, Kurnool Supergroup

### **MODULE III**

**15 Lectures**

- Precambrian of Extra-Peninsular in the Spiti valley and Kashmir region: Salkhala Group, Vaikrita Group.
- Tectonic history of Paleozoic Era, Paleozoic life.
- Marine Paleozoic Formations of Kashmir and Spiti Valley.
- Gondwana sequence of Peninsular India: Sedimentation and Paleoclimates, Lower Gondwana succession; Upper Gondwana succession

### **Practicals:**

Marks: **25**

Credit: **1 (15 Practicals)**

- Study of rock formations of Goa in hand specimen
- Study of Fossils
- Drawing of geological cross sections using bore hole data.

### **List of books recommended for references:**

- Ramakrishnan, M and R Vaidynadhan., 1994, Geology of India, Geological Society of India Publication, Bangalore. Vol. I & II.
- Nanda, H., 2014, Indian Stratigraphy, Anmol Publications Pvt. Ltd. New Delhi.
- Kumar, R., 1998, Fundamentals of Historical Geology and Stratigraphy of India, New Age International Publisher.
- Wadia, D. N., 1975. Geology of India, McGraw-Hill Company.
- Krishnan, M. S., 2009. Geology of India and Burma, CBS Publishers, New Delhi
- Mascarenhas, A and Kalavampara, G., 2015. Natural Resources of Goa: A Geological Perspective. Geological Society of Goa.

**PAPER TITLE: NATURAL HAZARDS AND MANAGEMENT**

**Paper Code: GEL-IV.E-7**

**Marks: 75**

**Credits: 3 (45 Contact hours)**

**Prerequisites: GEL-I.C-1, GEL-I.C-2, GEL-II.C-3 and GEL-II. C-4**

**Course objectives:**

The course is designed with an aim to give the student an understanding about: various natural hazards; stages in management aimed at avoiding and / or reducing loss to life and property; and Agencies involved in mitigation and management of damage due to hazards.

**Learning outcome:**

On completion of the course, the student will become aware of the nature and effects of various natural hazards, and know about how to cope with them. The student will also come to know about different agencies and other resources available to deal with the effects of natural hazards.

**MODULE I**

**(15 LECTURES)**

- Definition of Hazard/ Disaster and Classification: Natural and man-made
- Natural Disasters:
  - Earthquakes: Definition, Causes, Magnitude and intensity, Recording, effects
  - Volcanic eruption: Types, localization, volcanic products, Hot spots and trails
  - Landslides and Avalanches: Classification of mass wasting, mechanics , causes of landslides and stabilizing methods of slopes; causes and localization of avalanches.
  - Subsidence: Causes, slow and brisk types

**MODULE II**

**(15 LECTURES)**

- Floods: causes and effects , prediction, Flashfloods
- Tsunamis and : Tsunamis, relation of Tsunamis to tectonics; Damage due to tsunamis, Co- ordinated approach to early warning of tsunamis.
- Cyclones Origin, Prediction of cyclones and pathtracking.
- CRZ act and its impact on disaster mitigation
- Causal factors of disasters
- Concept of Disaster Management: Pre disaster risk reduction and post disaster recovery
- Disaster Management Cycle: Mitigation, preparedness, response and recovery.

**MODULE III**

**(15 LECTURES)**

- Planning strategy: co-operative plan, Identifying resources, setting priorities
- Hazard coping operations and rehabilitation: .
- National Disaster Management: national and international support
- Proposed operational processes for individual Natural Disasters mentioned above.

**Practicals:**

**Marks: 25**

**Credit: 1 (15 Practicals)**

1. Hazard zonation map of India: cyclones ,earthquakes, floods, famine
2. Hazard zonation map of world: tsunamis, cyclones ,earthquakes, floods, famine
3. Land-use land cover mapping
4. Demarcating CRZ on satellite imagery

**List of recommended books:**

1. Sethi, V. K., 2009, Disaster Management, Essential Books PW, New Delhi.
2. Hess, D.,2012, Mc Knight’s Physical Geography, PHI learning, Pvt Ltd, New Delhi.
3. Krynine, D. and Judd W., 1998, Principles of Engineering Geology and Geotectonics, McGraw Hill.
4. Holmes, A., edited by Duff P.M.D., 4th edition, Physical Geology, E.L.B.S Publications.
5. Valdiya K.S., 1987, Environmental Geology: Indian Context, Tata-McGraw Hill
6. Keller, E. A., 2011, Environmental Geology, Santa Barbara Prentice Hall.
7. Joshi M.V., 2004, Environmental Disaster, Causes, Impacts and Remedies, Adhyayan Publishers.

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**Paper Title: GEOTECTONICS**

Paper Code: GEL-IV.E-8

Marks: 75

Credits: 3 (45 Contact hours)

**Prerequisites: GEL-I.C-1, GEL-II.C-3**

**Course Objectives:** Ever since the creation of the earth, there have been marked changes in the distribution of land and sea. The dynamics of these changes are stupendous. Several theories have come forth to explain and understand the mechanism of such changes. Each great mountain chain in the world was created by intense tectonic forces. The subject of Geotectonics deals with the structure of the earth and the processes responsible for the movement and redistribution of continents and seas.

**Learning Outcomes:**

The students will gain an insight into the operating processes leading to the global changes in the positioning of continents and seas, and the creation of great mountain chains.

**MODULE I**

**(15 Lectures)**

Interior of the earth:

- Clues from the study of earthquake and density;
- The earth's layers; the crust-continental crust and oceanic crust;
- Crust-mantle boundary
- Structure of the mantle
- Low Velocity Zone (LVZ)
  
- Lithosphere and the asthenosphere;
- Core-mantle boundary; P wave shadow zone,
- Nature of the core; S wave shadow zone.

Earth's Magnetic field:

- Origin and nature
- Dynamo hypothesis and Herndon's Georeactor Theory.
- Geocentric axial dipole,
- Paleomagnetism,
- Marine magnetic anomalies,
- Magnetic reversals and magnetic stripes

**MODULE II**

**(15 LECTURES)**

Continental drift:

- Wegener's hypothesis.
  - Evidences: Continental fit; similarity of rock sequences and mountain ranges; glacial evidence, fossil evidence;
- Paleomagnetism and Polar wandering.

*Plate tectonics:*

- Plate margins, plate boundaries and associated activities,
- Triple junctions;
- Divergent, Oceanic Ridges, Sea floor spreading, transform faults; hotspots.
- Convergent: oceanic–oceanic, oceanic-continental, continental-continental; oceanic trenches, subduction zones
- Transform boundaries;
- Birth, growth and decline of ocean basins: Rift valleys, the Red sea and the Gulf of Aden;

Geometrical aspects and mechanism of plate motion.

**MODULE III**

**(15 LECTURES)**

*Mountain building: Orogenesis*

Plate boundaries and orogenesis: Orogenesis at oceanic-oceanic plate boundaries, oceanic-continental plate boundaries and continental-continental plate boundaries.

Case study: Tracking the rise of Himalayas.

Case study: Frequency of Earthquakes in North India

Case Study: Occurrence of Tsunami in SE Asia

**Practicals:**

Marks: **25**

Credit: **1 (15 Practicals)**

1. Plotting of oceanic ridges, trenches, subduction zones, sea mounts, plate boundaries
2. Exercises in plate tectonics.



**List of books recommended for reference:**

- Marshak, S., 2011. Earth: Portrait of a Planet, W. W. Norton & Company.
- Duff, D and Holmes, A., 1993, Holmes Principles of Physical Geology, Springer.
- Monroe, S. J and R. Wicander., 2014. The Changing Earth: Exploring Geology and Evolution, Brooks Cole Publishers.
- Skinner, J. B and S, C. Porter., 2003. The Dynamic Earth: An Introduction to Physical Geology, John Wiley and Sons.
- Condie, K. C., 1997. Plate Tectonics and Crustal Evolution, Butterworth-Heinemann.
- Prasad, C. V. R. K., 2005. Elementary Exercises in Geology, Universities Press.

## **SEMESTER IV**

### **EVALUATION AND ASSESSMENT SCHEME**

**Each course (Core or Elective) = 4 credits of 100 marks**

**Theory: 75 marks = 3 credits**

- Continuous Assessment (CA): 30 marks.
- Semester End Examination (SEE): 45 marks.

**Practicals: 25 marks = 1 credit**

- i. Assessment in practicals will be done by continuous assessment throughout the Semester.
- ii. Practicals will be supported by appropriate field work.

**MODEL QUESTION PAPER**

**PARVATIBAI COLLEGE OF ARTS AND SCIENCE (AUTONOMOUS)  
B.Sc. SEMESTER END EXAMINATION  
GEOLOGY**

Duration: 2 hrs

Max. Mks: 45

Q.1	Answer <b><u>any three</u></b> of the following:  A. .. B. .. C. .. D. ..	Q.1 to cover all the three modules of the syllabus	(3 mks x 3 = 09 mks)
Q.2	Answer <b><u>any two</u></b> of the following:  A. .. B. .. C. ..	Each question to cover the syllabus of one module each	(6 mks x 2 = 12 mks)
Q.3	Answer <b><u>any two</u></b> of the following:  A. .. B. .. C. ..		(6 mks x 2 = 12 mks)
Q.4	Answer <b><u>any two</u></b> of the following:  A. .. B. .. C. ..		(6 mks x 2 = 12 mks)

## ANNEXURE I

### MODIFIED COURSE STRUCTURE FOR SEMESTER V

Semester	CORE COMPULSORY		CORE ELECTIVES			
	V	GEL-V.C-7  IGNEOUS PETROLOGY	GEL-V.CP  CORE PROJECT	GEL-V.E-9  STRATIGRAPHY OF INDIA-PART II	GEL-V.E-10  PETROLEUM GEOLOGY	GEL-V.E-11  PRINCIPLES OF GEOPHYSICAL EXPLORATION AND MINING

**ANNEXURE II**

**SYLLABUS OF THE**  
**UNDERGRADUATE DEGREE**  
**PROGRAMME IN GEOLOGY FOR**  
**SEMESTER V**

# **Parvatibai Chowgule College of Arts and Science, Margao- Goa Autonomous**



## **DEPARTMENT OF GEOLOGY**

### **THREE YEAR B.Sc. DEGREE PROGRAMME IN GEOLOGY (June 2017)**

**Course Structure and List of Core and Elective Courses  
COMPONENT A**

SEMESTER	CORE COURSES		ELECTIVE COURSES			
I	<b>GEL-I.C-1</b> Fundamentals of Mineralogy	<b>GEL-I.C-2</b> Elementary Petrology	----	----	----	----
II	<b>GEL-II.C-3</b> Earth's Dynamics and Tectonics	<b>GEL-II.C-4</b> Principles of Stratigraphy and Paleontology	----	----	----	----
III	<b>GEL-III.C-5</b> Optical and Systematic Mineralogy		<b>GEL-III.E-1</b> Physical Geology	<b>GEL-III.E-2</b> Groundwater and Hydrogeology	<b>GEL-III.E-3</b> Engineering Geology	<b>GEL-III.E-4</b> Marine Geology
IV	<b>GEL-IV.C-6</b> Structural Geology		<b>GEL-IV.E-5</b> Ore Genesis	<b>GEL-IV.E-6</b> Stratigraphy of India - Part I	<b>GEL-IV.E-7</b> Natural Hazards and Management	<b>GEL-IV.E-8</b> Geotectonics
V	<b>GEL-V.C-7</b> Igneous Petrology	<b>GEL-V.CP</b> Core Project	<b>GEL-V.E-9</b> Stratigraphy of India - Part II	<b>GEL-V.E-10</b> Petroleum Geology	<b>GEL-V.E-11</b> Principles of Geophysical Exploration and Mining	<b>GEL-V.E-12</b> Remote Sensing and Digital Image Processing
VI	<b>GEL-VI.C-8</b> Sedimentary Petrology	<b>GEL-VI.CP</b> Core Project	<b>GEL-VI.E-13</b> Metamorphic Petrology	<b>GEL-VI.E-14</b> Rock Deformation Microstructures	<b>GEL-VI.E-15</b> Surveying and Field Geology	<b>GEL-VI.E-16</b> Gemstone Testing and Evaluation

Core Courses for students offering **Geology as the Minor**

<b>SEMESTER I</b>
GEL-I.C-1: Fundamentals of Mineralogy
<b>SEMESTER II</b>
GEL-II.C-3: Earth's Dynamics and Tectonics
<b>SEMESTER III</b>
GEL-III.C-5: Optical and Systematic Mineralogy
<b>SEMESTER IV</b>
GEL-IV.C-6: Structural Geology
<b>SEMESTER V</b>
GEL-V.C-7: Igneous Petrology
<b>SEMESTER VI</b>
GEL-VI.C-8: Sedimentary Petrology



# SEMESTER

# V

## CORE COURSE

Paper Title: **IGNEOUS PETROLOGY**

Paper Code: **GEL-V. C-5**

Credits: **3 (45 Contact hours)**

Marks: **75**

### Learning Objectives:

The course will help the students to understand petrologic processes and common rock types. In practical's, students learn to identify, describe and classify rocks using hand specimens and rock thin sections.

### Learning Outcomes:

On completion of the course the students:

- (i) Will have gained an understanding of the processes involved in the formation of igneous rocks, their textures, structures, classifications and their importance.
- (ii) Will have learned the composition, properties and genesis of different rock types.

### MODULE I

(15 Lectures)

Origin and Evolution of Magmas:

- Composition of the earth's interior; evidences to composition of the earth
- Distribution of various elements within the different layers of the earth
- Plate tectonics and igneous activity
- Diversity of natural magma compositions (Felsic and Mafic)
- Magma Diversity:
  - Partial Melting  
Ultramafics, Basalts: Magma types, Basalt Tetrahedron,
  - Igneous layering - crystal settling  
Gabbroic rocks, Anorthosite, Layered complexes (including Indian examples)
  - Differentiation: Fractional Crystallization, liquid immiscibility, volatile transport, flowage differentiation,

### MODULE II

(15 Lectures)

- Role of volatiles in magmatic crystallization;
- Ascent and emplacement of magma
- Stages of crystallization of magma

Textures and microstructures of igneous rocks:

- a. Primary: Nucleation, Growth, Diffusion
- b. Secondary: Oswald ripening, twinning, zoning

Classification and Description of Igneous Rocks:

The International Union of Geological Sciences (IUGS) Classification System.  
Chemical Classification.

Ternary diagram: Diopside-Albite-Anorthite (Di-Ab-An)

### **MODULE III**

**(15 Lectures)**

Study of the following Rock Types (Mineralogy, petrography & Petrogenesis)

Ophiolites  
Granitoids  
Syenites & Trachytes  
Carbonatites  
Kimberlites  
Lamprophyres & Lamproites

**Practical: 1 credit (30 contact hours = 15 practical sessions)**

**Maximum Marks: 25**

1. Study of minimum 15 igneous rocks in hand specimen.
2. Study of minimum 15 igneous rocks in thin sections
3. CIPW Normative calculations

#### **List of books recommended for references:**

Bard, J P., (1986) Microtextures of Igneous and Metamorphic Rocks, D. Reidel Publishing Company.

Best, M.G., (2002) Igneous and Metamorphic Petrology, 2nd edn., Blackwell, Oxford

Bose, M.K., (1997) Igneous Petrology, The World Press, Kolkata

Cox, K G., Bell J D and Pankhurst R G., (1993) The Interpretation of Igneous rocks, Springer-Science+Business Media.

Frost B R and Frost C D., (2014) Essentials of Igneous and Metamorphic Petrology, Cambridge University Press.

Gill, R., (2010) Igneous rocks and process – A Practical Guide, Wiley-Blackwell

MacKenzie, W. S., Donaldson, C H., and Guilford, C., (1982) Atlas of Igneous Rocks and Their Textures, Wiley

Philpotts, A.R. and Ague, J.J., (2009) Principles of Igneous and Metamorphic Petrology, Cambridge University Press, Cambridge

Raymond, A. L., (1995) Petrology-The study of Igneous Sedimentary and Metamorphic rocks. Wm. C. Brown Communications, Inc.; USA.

Winter, J.D., (2009) Principles of Igneous and Metamorphic Petrology, Prentice Hall

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## ELECTIVE COURSES

Paper Title: **STRATIGRAPHY OF INDIA- Part II**

Paper Code: **GEL-V.E-9**

Credits: **3 (45 contact hours)**

Marks: **75**

Prerequisite: **GEL-IV.E-6**

### Course Objectives:

The course will help understanding the Indian stratigraphic units and to correlate International Geological Time Scale with Indian Stratigraphic Time Scale. Also to understand the geology, stratigraphy, fossil content, economic resources of the lithounits from the Phanerozoic Eon from the Indian context.

### Learning Outcomes:

The student will gain knowledge about the stratigraphy and geology of India with emphasis on the Stratigraphy of India wrt Paleozoic, Mesozoic and Cenozoic Era which will help in understanding the different episodes on the earth during the geologic past.

### MODULE I:

(15 Lectures)

- Principles of stratigraphic analysis, Facies concept in stratigraphy
- Walther's Law of Facies.
- Concept of paleogeographic reconstruction
- Important Stratigraphic boundaries in India:
  - a. Precambrian-Cambrian boundary
  - b. Permian-Triassic boundary
  - c. Cretaceous-Paleocene boundary
  - d. Pleistocene-Holocene Boundary

**MODULE II**

**(15 Lectures)**

- Triassic of Spiti
- Jurassic Formations of India
- Cretaceous Formations of India
- Deccan Flood Basalt (Age and Stratigraphy)

**MODULE III**

**(15 Lectures)**

- Tertiaries of India
- Rise and evolution of Himalayas
- Siwaliks
- Plant and animal life in relation to glacial and interglacial cycles during Quaternary.

**Practical: 1 credit (30 contact hours = 15 practical sessions)**

**Maximum Marks: 25**

1. Preparation of lithostratigraphic maps of India showing distribution of important geological formations.
2. Study of type hand specimens from their stratigraphic position and age.
3. Stratigraphic map of Goa

**List of books recommended for references:**

Doyle, P. & Bennett, M. R. (1996) Unlocking the Stratigraphic Record. John Wiley.

Kumar, R., (1998) Fundamentals of Historical Geology and Stratigraphy of India, New Age International Publisher.

Ramakrishnan, M and Vaidynadhan, R., (1994) Geology of India, Geological Society of India Publication, Bangalore. Vol. I & II.

Nanda, H., (2014) Indian Stratigraphy, Anmol Publications Pvt. Ltd. New Delhi.

Nichols, G., (2009) Sedimentology and Stratigraphy, Wiley-Blackwell and Sons Ltd.

Sharma, R S., (2009) Cratons and Fold belts of India, Springer-Verlag Berlin Heidelberg.

Valdiya, K. S., (2010) The Making of India, Macmillan India Pvt. Ltd.

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Paper Title: **PETROLEUM GEOLOGY**

Paper Code: **GEL-V.E-10**

Credits: **3 (45 Contact hours)**

Marks: **75**

**Course Objectives:**

To provide the student essential and basic concepts of Petroleum Geology and to study the process and the operations involved in Petroleum exploration

**Learning Outcomes:**

A student will understand and learn about the basic concepts of Petrology Geology with respect to geology as to enable them to work as a Petroleum Geologist.

**MODULE I**

**(15 Lectures)**

- Introduction and Aspects of Petroleum Geology, Characteristics of Hydrocarbons (Physical and Chemical properties), Petroleum System, Composition, Origin (Types of Kerogen), Occurrence, Migration and Accumulation of Petroleum; Petroleum traps (Stratigraphic and Structural); Reservoir rocks, conditions & mechanisms.
- Functions of Petroleum Geologist
- Understanding oil and gas: Exploration, Drilling and Completion, Production, Services

**MODULE II**

**(15Lectures)**

- Surface indications and direct detection of Hydrocarbons
- Surface and Subsurface exploration techniques: Concept
- Geophysical methods of exploration: Gravity and Seismic methods
- Types of rigs and its selection
- Rotary drilling system and equipment's
- Drilling sequence: Coring; Casing and Cementation and Drilling fluids;

**MODULE III**

**(15 Lectures)**

- GeoLogging and Well logs (Electric, Radioactive and Acoustic);
- Formation evaluation and Testing
- Well Completion and Stimulation
- An outline of the oil belts of the world; Global geographic and stratigraphic distributions of oil and gas;
- Important Onshore and Offshore Petroliferous basins of India.
- Recent trends in Petroleum Geology.

**Practical: 1 credit (30 contact hours = 15 Practical sessions)**

**Maximum Marks: 25**

- Plotting of Petroliferous basins on maps (World and India)
- Problems based on Well log interpretation
- Creation of carbonate isopachous maps
- Interpretation of petroliferous traps using seismic reflectance.
- Problems on mud circulation
- Observations of well cuttings and cores samples
- Demonstration/Determination of porosity

**List of books recommended for references:**

Hyne, N J., (2001) Nontechnical Guide to Petroleum Geology, Exploration, Drilling and Production, PennWell Corporation

Levorsen, A.I., (1967) Geology of Petroleum, W.H. Freeman and Company.

Morris, J., (1985) Practical Petroleum Geology, The University of Texas at Austin - Petroleum Extension Service

North, F.K., (1986) Petroleum Geology, Allen & Unwin, 607p

Selley, R.C., (1998) Elements of Petroleum Geology, W.H. Freeman & Company, New York.

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Paper Title: **PRINCIPLES OF GEOPHYSICAL EXPLORATION AND MINING**

Paper Code: **GEL-V. E-11**

Credits: **3 (45 Contact hours)**

Marks: **75**

**Course Objective:**

Mining being a key source of revenue generation for the Central as well as State governments, and an important job provider for Geologists, this course is designed to equip the undergraduate student with basic knowledge of key concepts of mining processes right from exploration to exploitation, together with an acquaintance of government regulations that control the mining and mineral conservation processes. In Geophysical exploration the student will gain first-hand knowledge dealing with the principles and their significance.

**Learning Outcome:**

By the end of this course the student will have learnt about techniques of mineral exploration and exploitation, estimation of ore reserves, environmental impact of mining, and the importance of

conservation of mineral resources, thereby partly equipping himself/herself on the way to becoming a mining geologist.

## MODULE I

(15 Lectures)

- Mining: Introduction and Mining Terminology
- Classification of mining methods
- Factors influencing choice of mining method
  - Open cast mining
  - Underground mining
    - Coal mining methods
    - Alluvial mining
- Ore Dressing or Beneficiation:
  - Principles and methods
  - Terminology of quantification of results
- Environmental Impact of Mining
- Brief outline of:
  - National Mineral Policy
  - Regulations and Acts
  - Regulating Agencies

## MODULE II

(15 Lectures)

Mineral Exploration: Sequence and phases

- Float ores and In situ ores
  - Pits, Trenches and Boreholes
    - Spacing
    - Drilling:
      - Core and non-core drilling
      - Equipment and accessories
      - Core drill sampling
      - core splitting
      - logging
      - Storage
      - Sludge
      - Combining Assay returns from sludge and core
- Categories of reserves
- Estimation of reserves
  - Cross-sectional method
  - Area of influence method
  - Triangular method
  - Weighted volume estimate method



- Estimation of stockpiles by prismoidal formula

### **MODULE III**

**(15 Lectures)**

Methods of Exploration: Geobotanical, Geochemical and Geophysical.

Geophysical Methods:

- Self-potential method: Introduction, mechanism, equipment, interpretation of anomalies.
- Gravity surveying: Introduction, basics, Gravity surveying, Interpretation
- Magnetic surveying: Introduction, concepts, Rock magnetism, Geomagnetic field, Magnetic anomalies, Instruments used, Corrections, Interpretation. Application.

**Practical: 1 credit (30hours = 15 practical sessions)**

**Maximum Marks: 25**

1. Drawing cross - and longitudinal sections using bore-hole data
2. Problems based on estimation of ore reserves
3. Interpretation of bouguer gravity anomaly maps, and magnetic data.
4. Core logging

#### **List of books recommended for references:**

Arogyaswamy, R. N. P., (1973) Courses in Mining Geology, Oxford & IBH Publishing Co.

Babu S. K. & Sinha D. K., (1988) Practical Manual of Exploration and Prospecting, CBS Publishers and Distributors, New Delhi.

Keller, E. A., (2011) Environmental Geology, Pearson Prentice Hall.

McKinstry H. E., (1948) Mining Geology, Prentice-Hill Inc.

Marjoribanks, R., (1997) Geological Methods in Mineral Exploration and Mining, Springer-Science+Business Media

Peters, W C., (1987) Exploration and Mining Geology, Wiley

Sharma J. P., (2009) Environmental Studies, Laxmi Publications (P) Ltd, New Delhi.

Sinha, R. K & Sharma N. L., (1970) Mineral Economics, Oxford & IBH Publishing Co.

Indian Bureau of Mines (IBM) Publications.

Bhimasarikaram V.L.S., (1990) Exploration Geophysics - An Outline by Association of Exploration Geophysicists, Osmania University, Hyderabad.

Dobrin, M B and Savit C H., (1988) Introduction to Geophysical Prospecting, McGraw Hill Inc.

Lowrie, W., (2007) Fundamentals of Geophysics. Cambridge University Press

Ramachandra Rao and Prasaranga, M B, (1975) Outlines of Geophysical Prospecting - A Manual for Geologists by University of Mysore, Mysore.

Telford, W. M., Geldart, L. P., and Sheriff, R. E., (1990) Applied geophysics (Vol. 1). Cambridge University Press.

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Paper Title: **REMOTE SENSING AND DIGITAL IMAGE PROCESSING**

Paper Code: **GEL-V.E-12**

Credits: **3 (45 Contact hours)**

Marks: **75**

Mandatory requirement: **Individual Laptop with MS Windows OS**

### **Learning Objectives:**

This course is designed as an introduction to the use of remote imaging in geologic applications. The basic concepts of image production, processing and interpretations are covered. This course also introduces the basic principles and techniques of Geographic Information Systems (GIS)

### **Learning Outcomes:**

Student will be able to:

- Explain remote sensing basic principles, purposes, advantages and limitations.
- Define and describe basics of electromagnetic spectrum and interactions with various types of media.
- Describe basic characteristics of remote sensing imagery
- Describe sensors and image acquisition methods.
- Understand the application of digital imagery for interpretation of lithology, structure and geomorphology.
- Develop a working knowledge of GIS software (QGIS)
- Prepared for further study in GIS

## **MODULE I**

**(15 Lectures)**

### **Concepts of Remote Sensing and Satellite Sensors and Data**

Energy Sources and Radiation Principles.

Energy interactions in the Atmosphere: Scattering, Absorption.

Energy interactions with earth surface features: Spectral Reflectance of Vegetation, Soil and Water, Spectral response patterns, Atmospheric Influences on Spectral Response Patterns.

Brief history of Remote Sensing from the advent of photography till today's aerial and space-

based remote sensing systems.

The concept of resolution: Spatial, Spectral, Temporal and Radiometric.

Space Borne Imaging Systems- The Landsat, IRS, SPOT and High resolution Land Satellites  
(the characteristics of these satellites- their orbits, their sensors, and their resolutions)

Multispectral sensing

Across track scanning.

Along track scanning.

Operating principles of Across track Multispectral Scanners.

Across track Thermal scanning.

## **MODULE II**

**(15 Lectures)**

### **Introduction to Digital Image Processing**

Introduction.

Image Rectification and Restoration.

Image Enhancement.

Contrast Manipulation.

Spatial Feature Manipulation.

Multi-Image Manipulation.

## **MODULE III**

**(15 Lectures)**

### **Digital Imaging classification**

Image Classification: Unsupervised and Supervised Classification.

Supervised Classification:

The Training Stage.

The Classification Stage: Minimum-Distance to Means Classifier, Parallelepiped

Classifier, Gaussian Maximum Likelihood Classifier.

Classification Accuracy Assessment.

**Practical: 1 credit (30 contact hours = 15 practical sessions)**

**Maximum Marks: 25**

- Interpretation of Satellite Imagery for – landforms, geological structures, rock and soil types, man-made structures.
- Data Products and Meta data
- Digital Image Processing (using number matrix): enhancement, manipulation and classification.
- Digital image processing on Computer :
  - Display of various types of image formats
  - Pallets and Display elements,
  - Georeferencing,
  - Image enhancement,
  - Image classification

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**List of books recommended for references:**

Burrough, P. A. and McDonnell, R. A., (2000) Principles of Geographical Information System, Oxford University Press.

C.P.Lo and Albert K. W. Yeung., (2002) Concepts and Techniques of Geographic Information System, Prentice –Hall, India.

Drury, S.A., (1993) Image Interpretation in Geology, 2<sup>nd</sup> ed., Chapman and Hall, London.

George Joseph., (2005) Fundamentals of Remote Sensing, University press Private Ltd, Hyderabad.

Harold, R W., (1969) Aerial Stereo Photographs, Hubbard Press, USA.

Heywood I, Sarah, Cornelius, Steve, Carver., (2011) An Introduction to Geographical Information Systems, Pearson Education Pvt. Ltd., New Delhi.

Jensen John R., (2000) Remote Sensing of the Environment – An Earth Resource perspective, Pearson Education Series, Low Price Edition.

Kang – Tsung – Chang., (2002) Introduction to Geographical Information System, , McGraw Hill.

Lillesand T.M. and Kiefer R.W., (2002) Remote Sensing and Image Interpretation, John Wiley and Sons, New Delhi.

Lillesand, T. M., Ralph W. Kiefer and Jonathan W. Chapman., (2004) Remote Sensing and Image Interpretation, 5<sup>th</sup> ed, Wiley

Mather Paul M., (2004) Computer Processing of Remotely Sensed Images- An Introduction, 3rd ed., John Wiley.

Narayan L.R.A. (1999) Remote Sensing and its Applications., Universities Press.

Ramasamy S.M., (2005) Remote Sensing in Geomorphology, New India Publishing Agency.

Schowengerdt Robert A., (2006) Remote Sensing – Models and Methods for Image Processing, 2<sup>nd</sup> ed., Elsevier (Academic Press).

**Online resources**

T. Sutton, O. Dassau, M. Sutton, A Gentle Introduction to GIS, Chief Directorate: Spatial Planning & Information, Department of Land Affairs, Eastern Cape, South Africa (ebook)  
[http://download.osgeo.org/qgis/doc/manual/qgis-1.0.0\\_a-gentle-gis-introduction\\_en.pdf](http://download.osgeo.org/qgis/doc/manual/qgis-1.0.0_a-gentle-gis-introduction_en.pdf)

QGIS Tutorials <http://www.dst-iget.in/>

## **SEMESTER V**

### **EVALUATION AND ASSESSMENT SCHEME**

**Each course (Core or Elective) = 4 credits  
75marks Theory and 25marks practical**

**Theory: 3 credits of 45 contact hours**

- i. Continuous Assessment (CA): 30 marks.
- ii. Semester End Examination (SEE): 45 marks.

**Practical: 1 credit**

**15 Practical sessions of two contact hours each**

- i. Assessment in Practical's will be done by continuous assessment throughout the Semester.
- ii. Practicals will be supported by appropriate field work.

**CORE PROJECT: 4 credits**

## ANNEXURE I

### MODIFIED COURSE STRUCTURE FOR SEMESTER VI

Semester	CORE COMPULSORY		CORE ELECTIVES			
<b>VI</b>	GEL-VI.C-7  SEDIMENTARY PETROLOGY	GEL-VI.CP  CORE PROJECT	GEL-VI.E-13  METAMORPHIC PETROLOGY	GEL-VI.E-14  ROCK DEFORMATION MICROSTRUCTURES	GEL-VI.E-15  SURVEYING AND FIELD GEOLOGY	GEL-VI.E-16  GEMSTONE TESTING AND EVALUATION

**ANNEXURE II**

**SYLLABUS OF THE**  
**UNDERGRADUATE DEGREE**  
**PROGRAMME IN GEOLOGY FOR**  
**SEMESTER VI**

**Parvatibai Chowgule College of Arts  
and Science, Margao- Goa  
Autonomous**



**DEPARTMENT OF GEOLOGY**

**THREE YEAR B.Sc. DEGREE  
PROGRAMME IN GEOLOGY  
(June 2017)**



**Course Structure and List of Core and Elective Courses**  
**COMPONENT A**

SEMESTER	CORE COURSES		ELECTIVE COURSES			
I	<b>GEL-I.C-1</b> Fundamentals of Mineralogy	<b>GEL-I.C-2</b> Elementary Petrology	----	----	----	----
II	<b>GEL-II.C-3</b> Earth's Dynamics and Tectonics	<b>GEL-II.C-4</b> Principles of Stratigraphy and Paleontology	----	----	----	----
III	<b>GEL-III.C-5</b> Optical and Systematic Mineralogy		<b>GEL-III.E-1</b> Physical Geology	<b>GEL-III.E-2</b> Groundwater and Hydrogeology	<b>GEL-III.E-3</b> Engineering Geology	<b>GEL-III.E-4</b> Marine Geology
IV	<b>GEL-IV.C-6</b> Structural Geology		<b>GEL-IV.E-5</b> Ore Genesis	<b>GEL-IV.E-6</b> Stratigraphy of India - Part I	<b>GEL-IV.E-7</b> Natural Hazards and Management	<b>GEL-IV.E-8</b> Geotectonics
V	<b>GEL-V.C-7</b> Igneous Petrology	<b>GEL-V.CP</b> Core Project	<b>GEL-V.E-9</b> Stratigraphy of India - Part II	<b>GEL-V.E-10</b> Petroleum Geology	<b>GEL-V.E-11</b> Principles of Geophysical Exploration and Mining	<b>GEL-V.E-12</b> Remote Sensing and Digital Image Processing
VI	<b>GEL-VI.C-8</b> Sedimentary Petrology	<b>GEL-VI.CP</b> Core Project	<b>GEL-VI.E-13</b> Metamorphic Petrology	<b>GEL-VI.E-14</b> Rock Deformation Microstructures	<b>GEL-VI.E-15</b> Surveying and Field Geology	<b>GEL-VI.E-16</b> Gemstone Testing and Evaluation

Core Courses for students offering **Geology as the Minor**

<b>SEMESTER I</b>
GEL-I.C-1: Fundamentals of Mineralogy
<b>SEMESTER II</b>
GEL-II.C-3: Earth's Dynamics and Tectonics
<b>SEMESTER III</b>
GEL-III.C-5: Optical and Systematic Mineralogy
<b>SEMESTER IV</b>
GEL-IV.C-6: Structural Geology
<b>SEMESTER V</b>
GEL-V.C-7: Igneous Petrology
<b>SEMESTER VI</b>
GEL-VI.C-8: Sedimentary Petrology

# SEMESTER

# VI

## CORE COURSE

Paper Title: **SEDIMENTARY PETROLOGY**

Paper Code: **GEL-VI. C-8**

Credits: **3 (45 Contact hours)**

Marks: **75**

### Course objectives:

- To provide an understanding of the origin of sedimentary rocks, the relationship of sedimentary processes to plate tectonics, and the use of sedimentary rocks in the study of the geological past.

### Learning outcomes:

- The student will gain knowledge about the concepts of sedimentary processes and the respective rock types, which will enhance their knowledge of sedimentary petrology

### MODULE I

(15 Lectures)

- The Origin of Sedimentary Rocks:
  - Erosion, transportation and deposition of sediments.
  - Hjulstrom's diagram
- Provenance
- Components of clastic sediments: Heavy, Clay, Quartz, Feldspars, other minerals
- Environment of deposition and sedimentary facies
- Basins - Plate tectonics and sedimentation
- Sedimentary Textures
  - Grain Size, Udden-Wentworth Size Scale, Phi Scale, Roundness and Sphericity. Maturity: Textural, Mineralogical and Chemical
- Classification of Sedimentary rocks (Folk's and Dunham's, Okhadas)

### MODULE II

(15 Lectures)

- Primary sedimentary structures
  - Depositional, Erosional
- Secondary sedimentary structures
  - Chemical, biogenic
- Soft sediment deformations

### MODULE III

(15 Lectures)

- Clastic Sedimentary Rocks

- Sandstones, Breccias and Conglomerates:  
Textures, Structures, Mineral composition, Textural maturity,
- Mudrocks:  
Textures, Structures, Colour, Mineral composition;
- Non-clastic Sedimentary Rocks
  - Limestones and Dolomites:  
Textures; Mineralogy; Structures; Diagenesis, Reefs and Palaeoclimate; Dolomites:  
Dolomitization.
  - Residual: (Laterite and Bauxite)  
Origin and Climate.
  - Carbonaceous sediments:  
Nature and form of organic residues; The Coal series

**Practical: 1credit (30 contact hours = 15 practical sessions)**

**Maximum Marks: 25**

1. Study and identification of minimum 15 sedimentary rocks w.r.t textures, structures, their classification.
2. Study of minimum 15 sedimentary rocks in thin sections
3. Exercises in Grain size and shape analysis

**List of books recommended for references:**

Blatt H; Tracy R. J and Owens B. E., (2006) Petrology- Igneous Sedimentary and Metamorphic 3<sup>rd</sup> edition W H Freeman and Company New York.

Boggs S., (2009) Petrology of Sedimentary rocks (2<sup>nd</sup> edition), Cambridge University Press.

Boggs, Jr., (2005) Principles of Sedimentology and Stratigraphy (4 edition), Prentice Hall.

Colinson, J D & Thompson, (1982) Sedimentary Structures, Allen & Unwin

Ehlers G.E. and Blatt H., (1987) Petrology – Igneous, Sedimentary and Metamorphic, CBS Publishers, New Delhi.

Greensmith, J. (1989) Petrology of the Sedimentary rocks (7th Edition), CBS Publishers, New Delhi.

Pettijohn F.J., (1984) Sedimentary Rocks (3rd Edition), CBS Publishers, New Delhi.

Prothero, D. R., and Schwab, F.; (2004) Sedimentary Geology. Macmillan.

Raymond A L (1995) Petrology-The study of Igneous Sedimentary and Metamorphic rocks.  
Wm. C. Brown Communications, Inc.; USA.

Tucker E.M. (2001) Sedimentary Petrology (3rd Edition), Blackwell Science Ltd.

## ELECTIVE COURSES

Paper Title: **METAMORPHIC PETROLOGY**

Paper Code: **GEL-VI. E-13**

Credits: **3 (45 Contact hours)**

Marks: **75**

### Course Objectives:

- To provide essential concepts of metamorphism and metamorphic rocks.
- To study metamorphic rocks w.r.t fabrics and types.
- To understand the concept of facies.
- Also to understand how metamorphism is related to plate tectonics

### Learning Outcomes:

- The student will gain knowledge about the concepts of metamorphism and metamorphic rocks which will strength their knowledge of metamorphic petrology

### MODULE I

(15 Lectures)

Definition and explanation of metamorphism (*upper and lower limits*) and metamorphic rocks.

Factors responsible for metamorphism:

*Heat (T)* : Geothermal gradient (in different crustal regions),

Radioactivity, magmatic intrusions, tectonics;

*Pressure (P)*: Deviatoric, Lithostatic, Hydrostatic, Fluid pressure

*Chemically active fluids (X<sub>f</sub>)*: H<sub>2</sub>O and CO<sub>2</sub>

*Composition of the parent rocks (X)*: pelites, mafites, ultramafites,  
quartzofeldspathic, carbonate rocks, sandstones and greywackes.

Time ( $\delta t$ ): Role of time in metamorphism

Phase Rule, Graphical representation of metamorphic rocks

Protoliths

Types of metamorphism: *Regional metamorphism* its characteristics and products, *burial metamorphism* its characteristics and products, *contact metamorphism* its characteristics and products

Relationship of brittle and ductile deformation with grade of metamorphism metasomatism, cataclastic metamorphism and their products, impact/shock metamorphism

Metamorphism in relation to plate tectonics:

*Divergent (constructive) boundary*

*Convergent (Destructive) boundary: subduction zone (sensu lato)*

*Continent-Continent Collision zones*

*Intra-plate environments*

## **MODULE II**

**(15 Lectures)**

Metamorphic textures: Inherited/Relict fabric, Cataclastic, lepidoblastic, Nematoblastic, granoblastic, equigranular mosaic, Porphyroblastic.

Pre-tectonic, syntectonic and post tectonic garnets

Idioblastic/Crystalloblastic Series; Riecke's Principle

Nomenclature and classification based on mineralogy and fabric

Field characters of metamorphic rocks:

Variations in mineralogy and fabric. Prograde and Retrograde metamorphism metamorphic zones and index/critical minerals, their significance in mapping and understanding tectonic history.

## **MODULE III**

**(15 Lectures)**

Facies: Concept after Goldschmidt and Eskola; Zonation in mineralogy – Buchanan (Low pressure) Barrovian (high pressure)

Facies of progressive contact metamorphism: characteristic mineral assemblages in pelites and carbonates (pure and impure) protolith

Facies of progressive regional metamorphism – characteristic mineral assemblages wrt facies (Zeolite, Prehnite-Pumpellyite, Greenschist, Amphibolite, Granulite, Blueschist, Eclogite) in pelitic, mafic and ultramafic protolith.

Paired Metamorphic Belts

**Practical: 1 credit (30 contact hours = 15 practical sessions)**

**Maximum Marks: 25**

Megascopic study and identification of minimum 15 metamorphic rocks w.r.t mineralogy, texture, type of metamorphism, facies, protolith.

Microscopic study and identification of minimum 15 metamorphic rocks wrt to mineralogy, texture type of metamorphism, facies and protolith.

Solving and plotting ACF and AFM analysis

**List of books recommended for references:**

Bard, J P., (1986) Microtextures of Igneous and Metamorphic Rocks, D. Reidel Publishing Company.

Best, M., (2003). Igneous and Metamorphic Petrology, Blackwell Publishing.

Blatt, H; Tracy R. J and Owens B. E., (2006) Petrology- Igneous Sedimentary and metamorphic 3<sup>rd</sup> edition W H Freeman and Company New York.

Bucher, K and Grapes, R., (2010) Petrogenesis of Metamorphic rocks, Springer-Heidelberg Dordrecht, London NY.

Ernst, W G and Rumble D., (2008) Metamorphic Conditions along Convergent Plate Junctions: Mineralogy, Petrology, Geochemistry and Tectonics, Geological Society of Amer.

Frost B R and Frost C D., (2014) Essentials of Igneous and Metamorphic Petrology, Cambridge University Press.

Miyashiro, A., (1994) Metamorphic Petrology, CRC Press.

Miyashiro, A, (1978) Metamorphism and Metamorphic belts, The Greshman Press Old Woking, Surrey

Philpotts, A & Ague, J (2010) Principles of Igneous and Metamorphic Petrology. Cambridge University Press, New York

Raymond, A. L., (1995) Petrology-The study of Igneous Sedimentary and Metamorphic rocks. Wm. C. Brown Communications, Inc.; USA.

Roger, M., (1990). Petrology of the Metamorphic Rocks. Unwin Hyman Ltd, UK



Turner, F., (1980) Metamorphic Petrology: Mineralogical, Field and Tectonic Aspects, CRC Press.

Vernon, R H., (2008) Principles of Metamorphic Petrology, Cambridge University Press

Winter J D., (2011) Principles of Igneous and Metamorphic Petrology. PHI Learning Pvt. Ltd.

Winkler, G. F., (1987) Petrogenesis of Metamorphic rocks 5<sup>th</sup> edition Narosa Publishing House, New Delhi.

Yardley, B W. D., (1989) An introduction to Metamorphic Petrology, Longman Group Publishers Pvt. Ltd.

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 Paper Title: **ROCK DEFORMATION MICROSTRUCTURES**

Paper Code: **GEL-VI. E-14**

Credits: **3 (45 Contact hours)**

Marks: **75**

**Prerequisite: GEL-VI. E-13**

### **Learning Objectives:**

The course will help to study deformational history of rocks. This study includes the understanding of the deformation and metamorphic processes the rock has undergone with the aim to reconstruct its structural and metamorphic history.

### **Learning Outcomes:**

On completion of the course the students:

- i. Will understand the process of deformation and its resulting features.
- ii. It will enhance their application of skills in understanding deformation history and tectonics in field and in microsections..

## **MODULE I**

**(15 Lectures)**

Introduction to microstructures and terminology; Deformation mechanisms and processes— Brittle fracturing, Dissolution, Intracrystalline deformation; Twinning and kinking; Recovery; Recrystallization; Solid state diffusion, Grain Boundary Area Reduction (GBAR), Static recrystallization.

**MODULE II****(15 Lectures)**

Foliation and its significance; Lineation and its significance; Mylonites, Shear sense indicators in mylonites; Strain shadows; Deformation of rock-forming minerals; Deformation of polymineralic rocks.

**MODULE III****(15 Lectures)**

Microstructures of – igneous rocks (porphyritic rocks, mineral intergrowth, zoning); sedimentary rocks (sandstone); metamorphic rocks (isotropic fabrics, growth of porphyroblasts, twinning, symplectite intergrowth) and deformed rocks (deformation twinning, stylolites, GBM).

**Practical: 1 credit (30 contact hours = 15 practical sessions)**

**Maximum Marks: 25**

Study of minimum 15 rock slides exhibiting various microstructures:

- Cuspate and lobate sutured boundaries,
- GBAR (Grain Boundary Area Reduction),
- Bulging (BLG), Subgrain Rotation (SGR); Grain boundary migration (GBM)
- Displaced twin lamellae (brittle deformation),
- Bending of cleavage planes, spaced and continuous cleavage
- Mineral (mica) fish,
- Porphyroclasts, asymmetric porphyroclasts depicting shear sense,
- Pressure shadows,
- Warping of foliation around porphyroclasts,
- S-C fabric.

**List of books recommended for references:**

Blenkinsop, T. (2002) Deformation microstructures and mechanisms in minerals and rocks, Kluwer Academic Publishers.

Mukherjee, S., (2013) Deformation Microstructures in rocks. Springer-Verlag Berlin Heidelberg

Passchier, C. W and Trouw, R A., (2005) Microtectonics, Springer-Verlag Berlin Heidelberg

Trouw, R A., Passchier, C W and Wiersma, D J., (2010) Atlas of Mylonites - and related microstructures, Springer-Verlag Berlin Heidelberg

Vernon, R H., (2004) A Practical Guide to Rock Microstructures, Cambridge University Press.

Winter, J D., (2014) Principles of Igneous and Metamorphic Petrology, Pearson Education Limited.

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Paper Title: **SURVEYING AND FIELD GEOLOGY**

Paper Code: **GEL-VI. E-15**

Marks: **75**

Credits: **3 (45 Contact hours)**

**Course Objectives:**

- To Provide basic knowledge of surveying techniques
- To upgrade and relate the theoretical knowledge of Geological aspects to field observations.

**Learning outcomes :**

- Students will be expected to understand how preliminary surveys are carried out specially in mining areas.
- They would be trained to work independently in the field of geology.

**MODULE I**

**(15 Lectures)**

Definitions of Surveying and Levelling, Objectives of Survey;

Primary divisions of Surveying – Geodetic and Plane Surveys uses and Principles of Surveying.

Methods of locating a point

Plane Table Survey: Instruments, Procedures of Plane table surveys; Methods (Demonstrative):

Radiation and Intersections, advantages and disadvantages of Plane Tabling.

**MODULE II**

**(15 Lectures)**

**Levelling:** Definitions of Terms used in Levelling, characteristics of land surveying instruments, Bench Marks, Change Points.

Levelling operations and steps in Levelling: Demonstration with exercises in the field.

Principles of Levelling: Simple and Differential,

Reduction of Levels: The Collimation, and Rise and Fall systems of Computation.

Theodolite survey: Principles and working, Procedures

### **MODULE III**

**(15 Lectures)**

#### **Field Geology:**

General basis of Field Geology.

SOI Toposheet Indexing scheme, Map symbol reading and Scale,

Geological map reading: Geological symbols for lithology and structure

Understanding map reliability

Geological mapping and preparation of lithological maps

GPS surveys

Basic field gear

Planning a field Project: Preparations for the field, Taking geologic notes in the field: Basic procedures at outcrops – noting characters of igneous, sedimentary and metamorphic rocks, Measuring strike and dip (attitude) of planar and linear features using a clinometer compass, a Brunton Compass.

**Practical: 1 credit (30 contact hours = 15 practical sessions)**

**Maximum Marks: 25**

- The evaluation is to be based on preparation of portfolio that should include plans drawn using Plane table, a Levelling Exercise.
- Assessment to be based on presentation of Field diary, Field report, and field based viva voce on the localities visited for field work.

#### **List of books recommended for references:**

Arora, K R., (2015) Surveying Vol-2 (13<sup>th</sup> edition). Standard Book House Unit of Rajsons Publication Pvt. Ltd.

Barnes, J W and Lisle, R J., (2004) Basic Geological Mapping, John Wiley and Sons

Basak, N N., (2014) Surveying and Levelling, McGraw Hill Education.

Coe, A, L., Argles, T W., Rothery, D A and Spicer, R A., (2010) Wiley-Blackwell, The Open University.

Compton, R R., (1985) Geology in the Field, John Wiley & Sons, Inc.

Compton, R R., (1962) Manual of Field Geology, John Wiley & Sons, Inc.

Gokhale, N W., (2001) A Guide to Field Geology, CBS Publishers & Distributors.

Kanetkar, T P & Kulkarni, S V., (1988) Surveying & Levelling (Part I), Pune Vidyarthi Griha Prakashan.

Lahee, F H. (1962) Field Geology, McGraw – Hill Book Company, Inc.

Lambert, D A., (1998) Field Guide to Geology, Facts on File Inc.

Lisle R., Brabham P and Barnes J., (2011) Basic Geological Mapping (Geological Field Guide), Wiley Blackwell.

McClay, K R., (2007) The Mapping of Geological Structures, John Wiley and Sons.

Penning, W H. and Jukes-Browne., (2011) A Textbook of Field Geology, Nabu Press.

Robinson W F and Tallack., (2016) Surveying and Levelling Instruments Theoretically and Practically Described for construction, Qualities, Selection, Preservation, Adjustments and Uses: With other apparatus and Appliances used by Civil Engineers and Surveyors in the Field, Wentworth Press.

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 Paper Title: **GEM TESTING AND EVALUATION**

Paper Code: **GEL-VI. E-16**

Credits: **3 (45 Contact hours)**

Marks: **75**

**Course Objectives:**

- The course covers the various aspects of gem testing using both theoretical as well as practical by dealing with basics to the advanced techniques of gemstone identification.
- Further it deals with the methods employed by diamond industry in cutting a rough diamond into a sparkling gem and how diamonds are graded internationally.
- Why synthetic gemstones have flooded the market and how they are manufactured is then next topic, including their detection.

**Learning Outcomes:**

- The students will get a direction which will be useful to them in the gem industry.
- The basic idea thus, is to make students well versed with the different terminologies used in the gem sector to become a successful gemmologist.

## **MODULE I**

**(15 Lectures)**

Introduction; Formation of gemstones: Igneous rocks, Sedimentary rocks, Metamorphic rocks; Crystalline, Amorphous and Metamict gemstones, Formation of natural diamond.

Essential qualities in a gemstone: Beauty – Colours, Cut, Clarity, Carat; Rarity; Durability

Causes of colour: Transition metal elements; Idiochromatic gemstones, Allochromatic gemstones, Pseudochromatic gemstones – Colour changing gemstones, lattice defects, dispersion, scattering of light, interference of light

## **MODULE II**

**(15 Lectures)**

Specific Gravity: Definition, Heavy Liquid method, Floatation method, Hydrostatic weighing method, Pycnometer

Cleavage, fracture, parting; Hardness: Significance of hardness test in gem testing, Hardness pencils, Hardness plates

Properties based on reflection of light in gemstones: Reflection of light; Lustre; Chatoyancy; Asterism; Averagescence; Labradoresence

Use of 10X/hand loupe

Need and objective of faceting and polishing; steps in diamond cutting; Styles of cut.

## **MODULE III**

**(15 Lectures)**

Synthesis of gemstones: Flame fusion method, Hydrothermal process, Flux fusion process, Synthesis of diamond

Grading of Diamonds

Enhancement and Treatments and its detection: Bleaching, Coating, spraying, foiling, Coloured impregnation, Colourless impregnation, Heat treatment, Irradiation, Diffusion treatment, Laser drilling, Surface modifications

Composites: Types of composites and Detection

**Practical: 1 credit (30 contact hours = 15 Practical sessions)**

**Maximum Marks: 25**

- Visual observation of gemstones
- Identification of natural crystals
- Use of Dichroscope in gem testing

- Use of Polariscope in gem testing
- Use of Refractometer in gem testing
- Use of Spectroscope in gem testing
- Use of Ultra violet lamp in gem testing
- Determination of Specific Gravity
- Identification of different types of cuts

**List of books recommended for references:**

Read, P G; (1991) Gemmology, Butterworth-Heinemann Ltd.

Sinkankas, J; (1969) Mineralogy: A First Course, Van Nostrand Reinhold Company.

Webster, R and edited by Anderson, B, W; (1983) Gems: Their Sources, Descriptions and Identification, Butterworth-Heinemann Ltd.

Fernandes S. and Choudhary G., (2010) Understanding Rough Gemstones, Indian Institute of Jewellery.

Karant, R V; (2000) Gem and Gem deposits of India, Geological Society of India.

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## **SEMESTER VI**

### **EVALUATION AND ASSESSMENT SCHEME**

**Each course (Core or Elective) = 4 credits**  
**75marks Theory and 25marks Practical**

**Theory: 3 credits of 45 contact hours each**

- i. Continuous Assessment (CA): 30 marks.
- ii. Semester End Examination (SEE): 45 marks.

**Practical: 1 credit**

**15 practical sessions of two contact hours each**

- i. Assessment in Practical's will be done by continuous assessment throughout the Semester.
- ii. Practicals will be supported by appropriate field work.

**CORE PROJECT : 4 credits**



**Parvatibai Chowgule College of Arts and  
Science, Margao- Goa  
(Autonomous)**



**DEPARTMENT OF GEOLOGY**

**THREE YEAR B.Sc. DEGREE  
PROGRAMME IN GEOLOGY**

**(Revised & Implemented June, 2018)**

**ANNEXURE I**

**MODIFIED COURSE STRUCTURE FOR SEMESTER I, III & V**

Semester	CORE COMPULSORY		CORE ELECTIVES			
	<b>I</b>	<b>GEL-I.C-1</b> Fundamentals of Mineralogy	<b>GEL-I.C-2A</b> Earth's Dynamics and Tectonics			
<b>III</b>	<b>GEL-III.C-5A</b> Advanced Mineralogy and Geochemistry		<b>GEL-III.E-1</b> Physical Geology	<b>GEL-III.E-2</b> Groundwater and Hydrogeology	<b>GEL-III.E-3A</b> Ore Genesis	<b>GEL-III.E-4</b> Marine Geology
<b>V</b>	<b>GEL-V.C-7A</b> Sedimentary Petrology		<b>GEL-V.E-9A</b> Stratigraphy of India – Part I	<b>GEL-V.E-10</b> Petroleum Geology	<b>GEL-V.E-11A</b> Metamorphic Petrology	<b>GEL-V.E-12</b> Remote Sensing and Digital Image Processing

**Revised Course Structure and List of Core and Elective Courses**

**COMPONENT A**

<b>SEMESTER</b>	<b>CORE COURSES</b>		<b>ELECTIVE COURSES</b>			
I	<b>GEL-I.C-1</b> Fundamentals of Mineralogy	<b>GEL-I.C-2A</b> Earth's Dynamics and Tectonics	----	----	----	----
II	<b>GEL-II.C-3A</b> Elementary Petrology	<b>GEL-II.C-4</b> Principles of Stratigraphy and Paleontology	----	----	----	----
III	<b>GEL-III.C-5A</b> Advanced Mineralogy and Geochemistry		<b>GEL-III.E-1</b> Physical Geology	<b>GEL-III.E-2</b> Groundwater and Hydrogeology	<b>GEL-III.E-3A</b> Ore Genesis	<b>GEL-III.E-4</b> Marine Geology
IV	<b>GEL-IV.C-6A</b> Structural Geology		<b>GEL-IV.E-5A</b> Engineering Geology	<b>GEL-IV.E-6A</b> Optical Mineralogy	<b>GEL-IV.E-7</b> Natural Hazards and Management	<b>GEL-IV.E-8</b> Geotectonics
V	<b>GEL-V.C-7A</b> Sedimentary Petrology	<b>GEL-V.CP</b> Core Project	<b>GEL-V.E-9A</b> Stratigraphy of India – Part I	<b>GEL-V.E-10</b> Petroleum Geology	<b>GEL-V.E-11A</b> Metamorphic Petrology	<b>GEL-V.E-12</b> Remote Sensing and Digital Image Processing
VI	<b>GEL-VI.C-8A</b> Igneous Petrology	<b>GEL-VI.CP</b> Core Project	<b>GEL-VI.E-13A</b> Stratigraphy of India – Part II	<b>GEL-VI.E-14A</b> Rock Structures and Deformation Microstructures	<b>GEL-VI.E-15</b> Surveying and Field Geology	<b>GEL-VI.E-16A</b> Principles of Geophysical Exploration and Mining

Core Courses for students offering **Geology as the Minor**

<b>SEMESTER I</b> GEL-I. C-1: FUNDAMENTALS OF MINERALOGY
<b>SEMESTER II</b> GEL-II. C-3A: ELEMENTARY PETROLOGY
<b>SEMESTER III</b> GEL-III.C-5A: ADVANCED MINERALOGY AND GEOCHEMISTRY
<b>SEMESTER IV</b> GEL-IV.C-6A: STRUCTURAL GEOLOGY
<b>SEMESTER V</b> GEL-V.C-7A: SEDIMENTARY PETROLOGY
<b>SEMESTER VI</b> GEL-VI.C-8A: IGNEOUS PETROLOGY

## **ANNEXURE II**

# **REVISED SYLLABUS OF THE UNDERGRADUATE DEGREE PROGRAMME IN GEOLOGY FOR SEMESTERS I, III AND V (IMPLEMENTED FROM JUNE 2018 ONWARDS)**

# SEMESTER

# I

Course Title: **FUNDAMENTALS OF MINERALOGY**

Course Code: **GEL-I. C-1**

Credits: **3 (45 Contact hours)**

Marks: **75**

### **Course Objectives**

The course deals with the study of minerals, their chemistry and identification in hand specimen. Further, it also deals with the study of crystals w.r.t their morphology, symmetry and the normal crystal classes.

### **Learning Outcomes**

Studying the basics of mineralogy and crystallography helps in understanding and building the overall knowledge in Geology.

### **Module I**

**(15 hours)**

Minerals: Rock-forming minerals and ore minerals.

Common physical properties of minerals including electrical and magnetic properties.

Isomorphism, Polymorphism, Pseudomorphism

silicate structures: (sorosilicate/ cyclosilicate/ nesosilicate/ inosilicate/  
phyllosilicate/tectosilicate)

Introduction to rock-forming mineral Olivine, Pyroxene, Amphibole, Mica, Feldspar,  
Quartz and its varieties

Important and abundant mineral groups: aluminosilicates, sulfides, sulfates, carbonates;  
oxides; halides; native metals (with three examples each)

### **Module II**

**(15 hours)**

Elemental and major oxide composition of the earth's crust -

Types of Atomic bonds (Ionic/Covalent/Metallic/ Van der Waal).

Radius Ratio, Ionic Radius,

Co-ordination Number. Types of co-ordination.

Atomic arrangement (HCP/CCP)

### **Module III**

**(15 hours)**

Space lattice. Unit cell. External morphology of a crystal. Crystal Forms with examples.

Crystallographic axes and Crystal systems.

Symmetry in crystals. (Axis, Plane, Center)

Interfacial angles and Contact Goniometer.

Parameters and Indices

### **Practical: 1 credit**

**Maximum Marks: 25**

1. Identifying and determining the crystal symmetry, class, system and forms in the normal class of the six systems.
2. Identification and study of minerals w.r.t their physical properties, occurrence, chemical composition and use.

**List of books recommended for reference**

**Mandatory Reading**

Dana's Manual of Mineralogy (2010), Dana J. D and Ford W. E. (J. Wiley & Sons)  
The Manual of Mineral Science (2007), Klein, C. and B. Dutrow (John Wiley & Sons, Inc.)  
Mineralogy (3<sup>rd</sup> edition), Perkins, D (PHI learning Private Limited, New Delhi)  
Rutley's elements of Mineralogy (1988), Read, H. H (CBS Publications)  
Battey, M H. Mineralogy for students.

**Supplementary Reading**

An Introduction to the rock forming minerals, Deer W A, Howie R. A and Zussman J.  
(John Wiley and Sons).



Course Title: **EARTH'S DYNAMICS AND TECTONICS**

Course Code: **GEL-II. C-2A**

Credits: **3 (45 contact hours)**

Marks: **75**

### **Course Objectives**

Structural Geology is a core branch of earth science which deals with basic concepts of natural internal forces shaping the earth. Further, the course deals with geological structures resulting from the action of these forces on rocks. Also, presents an understanding of the processes in action on the earth's surface and their impact on man and his institutions.

### **Learning Outcomes**

The study of this paper strengthens students' knowledge w.r.t understanding the essentials of the structural dynamics of the earth.

### **Module I**

**(15 hours)**

Origin of Solar System (Nebular Concept) and formation of a layered Earth.

Size and shape of the Earth.

Internal structure of the Earth: Geosphere asthenosphere, lithosphere, hydrosphere, biosphere, atmosphere (anoxic to oxic conditions) wrt to earth dynamic

Earth's Gravity : Acceleration due to gravity, change with latitude and altitude.

Earth's Magnetism: Earth as a magnet; lines of force, Source of Earth's Magnetic field, Declination and inclination, Geomagnetic axis and Geographic axis.

### **Module II**

**(15 hours)**

Introduction to Plate Tectonics:

Concept of isostasy

Lithostatic or confining pressure, Differential forces: tension, compression, couple.

Concept of stress and strain: stages of deformation: Elastic, Plastic and Rupture.

Brittle and ductile substances.

Introduction to geological hazards: exogenous (floods, drought and cyclones) and endogenous (volcanic hazards, earthquakes and tsunamis, mass wasting)

### **Module III**

**(15 hours)**

Map and Scales

Stratification, Strike and dip (true and apparent dip) strike and dip symbols.

Outcrop patterns of Horizontal, Inclined & vertical strata on various types of grounds (horizontal ground, valley and spur).

Folds: Terminology, causes, types of folds; symmetrical, asymmetrical, overturned, recumbent, isoclinal, fan, chevron, monocline, structural terrace, plunging and non-plunging; significance. Outcrop pattern of folds on horizontal ground, valley and spur.

Faults: Definition & terminology, geometric classification, significance; horst and graben.

Joints: Geometric classification, map symbols, columnar joints and sheet structure, significance.

Unconformities: Stages of development, types, significance; outliers and inliers; overlap and offlap.

**Practical: 1 credit**

**Maximum Marks: 25**

1. Drawing cross-section and description of structural maps involving single series (Horizontal and Inclined)
2. Graphical solution to structural problems.

**List of books recommended for reference**

**Mandatory reading**

Living with Earth (2012), Hudson Travis, Phi Learning Pvt. Ltd., New Delhi.

Physical Geology, Charles C. Plummer and David McGeary (4<sup>th</sup> edition), Wm C. Brown Publishers.

Understanding the Earth (4<sup>th</sup> edition), Press, Siever, Grotzinger and Jordan.

The Changing Earth: Exploring Geology and Evolution (3<sup>rd</sup> edition), Monroe and Wicander.

Jain, A k structural geology, GSI

Holmes' Principles of Physical Geology edited by P.McL.D.Duff (ELBS).

Elements of Structural Geology, E.S. Hills (Methuen)

A Textbook of Geology, P K Mukherjee (World Press)

**Supplementary Reading**

Elements of Geology (3<sup>rd</sup> edition), Zumberge J.H. & Nelson C.A. John Wiley & Sons, New York.

# SEMESTER

# III

Course Title: **ADVANCED MINERALOGY AND GEOCHEMISTRY**

Course Code: **GEL-III.C-5A**

Credits: **3 (45 Contact hours)**

Marks: **75**

### **Course Objectives**

- The course covers geoscientific studies of mineralogy. The knowledge of mineralogy will be applied in understanding the genesis of minerals.

### **Learning Outcomes**

- The course will enable the students to understand how minerals originate and associate with each other in a rock.

### **Module I**

**(15 hours)**

Introduction to mineral chemistry, Gibbs Phase Rule, Phase diagram.

Structure, mineral chemistry, paragenesis, and Phase diagrams of the following silicate group of minerals:

Olivine group (Forsterite-Fayalite System)

Pyroxene group (Diopside-Anorthite System)

Feldspar group (Albite-Anorthite System; Orthoclase-Albite System)

### **MODULE II**

**(15 hours)**

Structure, mineral chemistry, paragenesis, and stability relations of the following silicate group of minerals:

- Feldspathoid group (Leucite-Silica System)
- Silica
- Amphibole
- Mica

### **MODULE III**

**(15 hours)**

- Whole rock analysis (major, trace REE)
- Concept of compatible and incompatible elements,
- Use of geochemistry in deducing tectonics.
- Primitive mantle normalized diagram and their significance in petrogenesis.

### **Practical: 1 credit**

**Maximum Marks: 25**

1. Calculation of end-members for olivine, pyroxene and feldspar group of minerals.
2. Plotting of major oxides in tectonic discriminant diagrams

### **List of books recommended for reference**

Mandatory Reading

- Ford, W. E., 2006. Dana's Textbook of Mineralogy (with extended treatise Crystallography and Physical Mineralogy). CBS Publishers, New Delhi.

- Deer, W. A, Howie, R. A and Zussman. J., 2013, An Introduction to Rock-Forming Minerals, Mineralogical Society.
- Griffen, D. T, Phillips, W. R and William, R. Phillips., 2004. Optical Mineralogy: The Nonopaque Minerals. CBS Publishers, New Delhi.
- Mason and Berry, 2004. Mineralogy, CBS Publishers, New Delhi.
- Mason and Moore
- White, W M (1997) Geochemistry.
- Pearce 1976.

#### Supplementary Reading

- Krauskopf, K B and Bird, D K (1995) Introduction to Geochemistry. McGraw-Hill
- Faure, G (1998) Principles and Applications of Geochemistry. Prentice Hall

Course Title: **PHYSICAL GEOLOGY**

Course Code: **GEL-III.E-1**

Credits: **3 (45 Contact hours)**

Marks: **75**

**Course Objectives:** The natural agencies like wind, rivers, glaciers have been moulding and remoulding the surface of the earth over millions of years. This paper aims at the understanding of the processes and the physical forces responsible in developing the surficial features and highlighting the role of these natural agencies in grading and degrading the land surface.

**Learning Outcomes:** The students are expected to relate the activity of the various natural agents to the existence of different types of physical features on the earth's surface and, will be able to understand the dynamism in their creation.

### **Module I**

**(15 Hours)**

Weathering and erosion

Earth Systems Affecting Weathering

Mechanical Weathering – Pressure Release, Frost Action, Thermal Expansion and Contraction, Salt Growth, Impact of Organism

Chemical Weathering – Organisms Role, Oxidation, Acid Action, Dissolution/Leaching, Hydrolysis, Spheroidal Weathering

Factors Affecting rate of Weathering.

Rate of Weathering versus Stability of Minerals

Weathering versus Erosion

Transportation and deposition

Laminar and Turbulent Flow

Agents of Transportation – Wind, Water, Glaciers, Gravity

Modes of transportation – Bed Load (sliding, rolling, saltation), Suspension, dissolved load

Factors Affecting Depositions

Action of Wind

Generation of Winds,

Characteristics of Desert.

Problems Associated with Desertification.

Sediment Transport – Lifting Mechanism, Bed Load and Suspended Load

Desert Landforms:

Depositional: sand dunes, Sand Seas/Ergs, Playa, sabkha

Erosional: Grooves, Ventifacts & Yardangs mushroom rock, Inselbergs, Mesas and Buttes,

Deflation Basin, Desert Pavement and Lag Gravel

## **Module II**

**(15 Hours)**

Drainage Basin and River System –, Drainage Patterns –  
Dynamics of Stream Flow – Discharge, Gradient, Velocity, Sediment Load, Base Level

Concept of Graded Stream

River System and Plate Tectonics

Geological Action of Rivers

Erosion by River

Process of Stream Erosion – Removal of Regolith, Downcutting, Headward Erosion.

Bradshaw Model

Erosional Feature in Upper Course - Steep Valleys, Gorges, Interlocking Spurs, Potholes, Waterfall and Rapid

Erosional Features in Middle and Lower Course – Meander, Ox Bow Lake, Hogbacks, Cuestas

Depositional Landforms by River

Floodplains – Meanders, Point Bars, Natural Levees, Backswamps, Braided Stream

Alluvial Valleys – Step Terraces

Deltas – Formation and Types

Alluvial Fans

Erosion by Groundwater

Karst Topography – Caves, Sinkholes, Solution Valleys, Disappearing Streams, Tower Karst

Deposition by Groundwater

Speleothems – Stalactites, Stalagmites

## **Module III**

**(15 Hours)**

Types of glaciers and Glacial Budget

Glacier Flow – Surging Glacier, Crevasses

Ablation – Melting, Evaporation, Calving

Geological Work of Glaciers

Erosional Features of Glaciers

Erosion Process– and erosional landforms related to valley and continental glaciation.

Depositional Features of Glaciers

Glacial Drift – Till and Stratified Drift

Action of Sea Waves

Erosional and depositional features of the coast.

## **PRACTICAL MODULE: 1 Credit**

- Basin Morphometry Perimeter Calculation using rotameter
- Area Calculation – Square Grid/Strip Method

- Stream Ordering (Strahler's Method)
- Drainage Network Morphology – Bifurcation and Length ratio
- Basin Geometry – Basin Circularity Intensity of Dissection – Drainage Density, Stream Frequency Hypsometric Curve
- Draw Inference for the Basin based on the result
- Long Profile and Cross Profile of River – Upper Course, Middle Course, Lower Course of river from SOI Toposheet Field visit to nearby area to understand and describe the various physical geology features.

**REFERENCE BOOKS:**

- Monroe, S. J and R. Wicander., 2014. The Changing Earth: Exploring Geology and Evolution. Brooks Cole Publishers.
- Monroe, J.S., Wicander, R., Hazlett, R., 2007. Physical geology – Exploring the Earth (6<sup>th</sup> Ed.) Thomson Brooks/Cole.
- Carlson, D.H., Plummer, C.C., McGeary, D., 2008. Physical Geology: Earth revealed. Higher Education.
- McConnell, D., Steer, D., Knight, C., Owens, K., Park, L., 2008. The Good Earth – Introduction to Earth Science. Higher Education.
- Mathur, S. M., 2012. Physical Geology of India. National Book Trust
- Thornbury Principles of geomorphology John Wiley and Sons, Inc. and Chapman & Hall, ltd.



Course Title: **GROUNDWATER AND HYDROGEOLOGY**

Course Code: **GEL-III.E-2**

Credits: **3(45 contact hours)**

Marks: **75**

### **Course Objectives**

To impart knowledge about groundwater, its movement, methods of its exploration, the criteria of its quality, methods of its conservation, recharge of groundwater, monitoring of groundwater quality and quantity.

### **Learning Outcomes**

On completion of the course, the student will have gained an understanding of:

- Hydrogeological concepts, exploration, exploitation and recharge of groundwater
- Methods of monitoring groundwater quality and sources of pollution

### **Module I**

**(15 hours)**

Hydrologic cycle and its components

Factors controlling all the components: Evaporation, precipitation, runoff, Infiltration

Hydrologic budget

Vertical distribution of ground water

Types of Groundwater: soil water, vadose, capillary water, Meteoric water

Rock properties affecting movement of ground water:

1) Porosity(primary and secondary), effective porosity, specific retention, controlling factors of porosity

2) Permeability: Darcy's law, laboratory methods of measurement of permeability (constant head, falling head), specific yield, Relation between grain size, porosity, specific yield and specific retention.

Definition of an aquifer, aquiclude, aquitard, aquifuge, and types of aquifers:

Unconfined, Confined (Artesian), Perched aquifer.

### **Module II**

**(15 hours)**

Groundwater Exploration: Resistivity methods

Groundwater levels and Flow nets

Aquifer parameters: 1) Transmissivity, 2) Storativity, 3) Hydraulic conductivity: methods of determination (pumping test and tracer test)

Drawdown and cone of depression

Groundwater quality:

- Parameters :physical ,chemical and biological
- Major, minor and trace constituents.
- I.S.I standards for drinking water

**Module III**

**(15 hours)**

Effects of withdrawal, effects of waterlogging  
Artificial recharge  
Saline water intrusion in aquifer  
Ghyben-Hertzberg relation  
Pollution of ground water: Arsenic and Fluoride

**Practical: 1 credit**

**Maximum Marks: 25**

- Drawing flow nets
- Determination of depth to water table from bore hole data.
- Numerical problems on determination of porosity, bulk density, saturation percentage and void ratio of sample
- Problems based on Ghyben –Hertzberg formulae
- Graphical presentation of chemical data of water
- Resistivity survey (demonstration)

**List of books recommended for reference**

**Mandatory Reading**

- Todd , D.K and Mays, L.W., 3<sup>rd</sup> edition , 2012. Groundwater Hydrology, Wiley India Pvt. Ltd.
- Hiscock, K and Bense, V F. Hydrogeology: Principles and Practice.
- Valdiya K.S., 1987, Environmental Geology: Indian Context, Tata-McGraw Hill
- Rangunath H.M., 1983, Groundwater, Wiley Eastern Ltd, New Delhi.
- Keller, E.A., 4<sup>th</sup> edition, 2011. Environmental Geology, CBS Publishers, New Delhi.

Course Title: **ORE GENESIS**  
Course Code: **GEL-III.E-3A**  
Credits: **3 (45 contact hours)**  
Marks: **75**

**Course Objectives:** The course deals with the study of various processes of formation of ore deposits. It also deals with the study of various mineral deposits with respect to their mode of occurrence, geologic and geographic distribution, classification and their genesis. Furthermore, it also deals with the identification of economic minerals in hand specimens.

**Learning Outcome:** On completion of the course, the student will have gained sufficient knowledge regarding the formation of various ore deposits and also be able to differentiate between economic minerals and identify them. Furthermore, the student will gain an idea about the mineral wealth of our country.

**Module I (15 hours)**

Goldsmith geochemical Classification

Tenor, Prospects, Resource & Reserves of ore minerals

Classification of Ore Deposits:

Modified Lindgren's Scheme; Bateman Scheme; Based on Tectonic Setting

Processes Forming Mineral Deposits

Requirements for Ore deposit formation

Syngenetic & Epigenetic deposits

Magmatic Ore Forming Processes

Orthomagmatic ore formation (Bushveld; Sudbury)

Ore deposits at mid-ocean ridges (Black & White Smokers) and in ophiolites (podiform chromites)

Ore formation related to alkaline magmatic rocks, carbonatites and kimberlites

Ore deposits in pegmatites

**Module II (15 hours)**

Magmatic-Hydrothermal Ore Forming Systems

Hydrothermal ore formation (Source of Hydrothermal Solutions; Textures & Structures; Host rock alteration)

Volcanogenic ore deposits (VMS; Terrestrial epithermal gold, silver and base metal)

Porphyry copper (Mo-Au-Sn-W) deposits

Hydrothermal-metasomatic ore deposits

Skarn, Greisen

Supergene Ore Formation Systems

Residual (eluvial) ore deposits

Supergene enrichment by descending (vadose) solutions

Sedimentary Ore Formation Systems

Black shales in metallogenesis (European Copper Shale)

Autochthonous iron and manganese Deposits  
Sediment-hosted & submarine-exhalative (sedex) base metal deposits  
Mississippi Valley type (MVT) Lead-Zinc deposits  
Placer deposits  
Metamorphic Ore Forming System  
Orogenic Cu-Zn-Au deposits  
Ore Deposits in Space and time  
Metallogenic Epochs  
Plate Tectonic Setting of Ore Deposits

### Module III

(15 hours)

Indian occurrences of

Metallic Deposits:

Iron

Manganese

Chromium

Copper-Lead-Zinc

Gold

Non metallic Deposits:

Diamond, Baryte, Bauxite,

Nuclear Minerals

Industrial Minerals (Refractory, Abrasives, Cement, Fertilizer, Electrical and Electronics).

### PRACTICAL MODULE = 1 Credit

- Descriptive evaluation of ore minerals in hand sample
- Introduction to reflected light microscopy of ore minerals (demonstration) Site visits to local mineralized geology

### REFERENCE BOOKS

For Ore Forming Process: (E-books Available of All)

1. Pohl, L.W., 2011. Economic Geology – Principles and Practice. Wiley-Blackwell
2. Robb, L., 2005. Introduction to Ore-Forming Processes. Blackwell Publishing
3. Evans, A.M., 1993. Ore Geology and Industrial Minerals – An Introduction (3<sup>rd</sup> Ed.) Blackwell Publishing
4. Edwards, R. & Atkinson, K., 1986. Ore Deposit Geology and its influence on Mineral Exploration. Chapman and Hall Ltd.
5. Hutchison, C., Economic Deposits and their Tectonic Setting.

For Ore Deposits in Indian Context:

1. Prasad, U., 2014. Economic Geology: Economic Mineral Deposits (2<sup>nd</sup> Ed.), CBS Publishers, New Delhi

2. Srivastav, J.P., 2012. Introduction to Ore Microscopy. Prentice Hall India Learning Private Limited
3. Tiwari, A.K., 2010. Ore Geology, Economic Minerals and Mineral Economics. Atlantic
4. Gokhale, G.V.G.K., 1983. Ore Deposits of India. CBS Publishers, New Delhi

**Mandatory Reading**

Principle Reference books used for course preparation will be Economic Geology by Walter Pohl and Economic Geology by Umeshwar Prasad.

Course Title: **MARINE GEOLOGY**

Course Code: **GEL-III.E-4**

Credits: **3 (45 Contact hours)**

Marks: **75**

**Course Objectives:**

To provide essential concepts of oceanography.

To study the tectonics, geology, economic resources w.r.t. the oceans.

**Learning Outcomes:**

A student will understand and learn about the basic concepts of marine science with respect to geology as to enable them to work as a marine researcher.

**Module I**

**(15 hours)**

Ocean basins: Shape, size of the Pacific, Atlantic and Indian Oceans

Coriolis Effect

Ocean circulation

Ocean salinity

Techniques used to study ocean bathymetry

Concept of Plate Tectonics and ocean floor spreading,

Magneto stratigraphy

**Module II**

**(15 hours)**

Marine Provinces

Morphological features of the ocean floor;

Mid Oceanic Ridges and its features;

Abyssal plains and its features

Ocean trench and its features

Continental slope and shelf and their features

Ocean islands: Hot spot, Atolls

**Module III**

**(15 hours)**

Clastic Sedimentation in different marine environments:

Biogenic sedimentation

Chemogenic sedimentation

Near coastal geological processes

Coastal Zone Regulations (CRZ), Exclusive Economic Zone (EEZ); Minerals in the EEZ of India.

Mineral deposits

**Practicals = 1 credit**

- Preparation of salinity and ocean current map.
- Drawing and labeling of ocean profile.
- Preparation of ocean resource distribution maps
- Visits to National Laboratories engaged in Ocean Research such as NIO and NCAOR.

**List of books recommended for references:**

- Trujillo, A. P and Thurman H., 2013. Essentials of Oceanography, Eastern Economy Edition, PHI Learning Pvt. Ltd, New Delhi.
- Kennett J P., 1981. Marine Geology, Prentice Hall.
- Pinet Invitation to Oceanography
- Qasim, S.Z., 1996, India's Exclusive Economic Zone, Omega Scientific Roonwal, G.S. Publishers.
- Thurman, H V. and Trujillo A., 2003, Introductory Oceanography, Prentice Hall.

# SEMESTER

# V



Course Title: **SEDIMENTARY PETROLOGY**

Course Code: **GEL-V. C-7A**

Credits: **3 (45 Contact hours)**

Marks: **75**

### **Course Objectives**

To provide an understanding of the origin of sedimentary rocks, the relationship of sedimentary processes to plate tectonics, and the use of sedimentary rocks in the study of the geological past.

### **Learning Outcomes**

The student will gain knowledge about the concepts of sedimentary processes and the respective rock types, which will enhance their knowledge of sedimentary petrology.

### **Module I**

**(15 hours)**

The Origin of Sedimentary Rocks:

Erosion, transportation and deposition of sediments.

Hjulstrom's diagram

Provenance

Components of clastic sediments: Heavy, Clay, Quartz, Feldspars, other minerals

Environment of deposition and sedimentary facies

Basins - Plate tectonics and sedimentation

Sedimentary Textures

Grain Size, Udden-Wentworth Size Scale, Phi Scale, Roundness and Sphericity.

Maturity: Textural, Mineralogical and Chemical

Classification of Sedimentary rocks (Folk's and Dunham's, Okhadas)

### **Module II**

**(15 hours)**

Primary sedimentary structures

Depositional, Erosional

Secondary sedimentary structures

Chemical, biogenic

Soft sediment deformations

### **Module III**

**(15 hours)**

Clastic Sedimentary Rocks

Sandstones, Breccias and Conglomerates:

Textures, Structures, Mineral composition, Textural maturity,

Mudrocks:

Structures, Colour, Mineral composition;

Non-clastic Sedimentary Rocks

Limestones and Dolomites:

Textures; Mineralogy; Structures; Diagenesis, Reefs and Palaeoclimate; Dolomites: Dolomitization.

Residual: (Laterite and Bauxite)

Origin and Climate.

Carbonaceous sediments:

Nature and form of organic residues; The Coal series

**Practical Course: 1credit**

**Maximum Marks: 25**

- Study and identification of sedimentary rocks w.r.t textures, structures, their classification.
- Study of sedimentary rocks in thin sections
- Exercises in grain size and shape analysis.

**List of books recommended for reference**

- Blatt H; Tracy R. J and Owens B. E., (2006) Petrology- Igneous Sedimentary and Metamorphic 3<sup>rd</sup> edition W H Freeman and Company New York.
- Boggs S., (2009) Petrology of Sedimentary rocks (2<sup>nd</sup> edition), Cambridge University Press.
- Boggs, Jr., (2005) Principles of Sedimentology and Stratigraphy (4 edition), Prentice Hall.
- Colinson, J D & Thompson, (1982) Sedimentary Structures, Allen & Unwin.
- Ehlers G.E. and Blatt H., (1987) Petrology - Igneous, Sedimentary and Metamorphic, CBS Publishers, New Delhi.
- Greensmith, J. (1989) Petrology of the Sedimentary rocks (7th Edition), CBS Publishers, New Delhi.
- Pettijohn F.J., (1984) Sedimentary Rocks (3rd Edition), CBS Publishers, New Delhi.
- Prothero, D. R., and Schwab, F.; (2004) Sedimentary Geology. Macmillan.
- Raymond A L (1995) Petrology-The study of Igneous Sedimentary and Metamorphic rocks.Wm. C. Brown Communications, Inc.; USA.
- Tucker E.M. (2001) Sedimentary Petrology (3rd Edition), Blackwell Science Ltd.

Course Title: **STRATIGRAPHY OF INDIA- Part I**

Course Code: **GEL-V.E-9A**

Credits: **3 (45 Contact hours)**

Marks: **75**

### **Course Objectives**

To understand the stratigraphic units.

To correlate International Geological Time Scale with Indian Stratigraphic Time Scale.

To understand the geology, stratigraphy, fossil content, economic resources of the lithounits from the Peninsular India.

### **Learning Outcomes**

The student will gain knowledge about the stratigraphy and geology of India with emphasis on the Peninsular India which will help in understanding the different episodes on the earth during the geologic past.

### **Module I (15 hours)**

Physiographic subdivisions of India and their distinctive characters.

Geology of India

Cratonic provinces of Peninsular India shield: (Dharwar craton/ Singhbhum craton,/Bundelkhand craton/, Aravalli craton,/ Bastar craton) and their economic importance, with emphasis on the Dharwar craton.

Mobile Belts of Peninsular India: Eastern Ghat Mobile Belt, Satpura Mobile Belt, Pandayan Mobile Belt

### **Module II (15 hours)**

Gorur Gneiss

Sargur Supracrustals

Dharwar craton: Eastern Dharwar Craton (Deccan Batholith) and Western Dharwar Craton (Peninsular Gneiss)

Greenschist/Greenstone Belts of Peninsular India:

Dharwar type Greenstone Belt: Dharwar Supergroup: Bababudan Group, Chitradurga Group

Goa Group of rocks

Kolar type greenstone Belt: Kolar

### **Module III (15 hours)**

Proterozoic Basins of Peninsular India:

Vindhyan Supergroup;

Cuddapah Supergroup;

Kaladgi Supergroup.

Outline of Bhīma Supergroup, Delhi Supergroup, Kurnool Supergroup

**Practical: 1 credit**

**Maximum Marks: 25**

- Study of specimens representing rock formations of Goa.
- Assigning stratigraphy Formations based on fossils.
- Maps related to Indian Geology/ Problems in stratigraphic correlation.

**List of books recommended for reference**

**Mandatory Reading**

- Ramakrishnan, M and R Vaidynadhan. 1994, Geology of India, Geological Society of India Publication, Bangalore. Vol. I and II.
- Mascarenhas, A and Kalavampara, G., 2015. Natural Resources of Goa: A Geological Perspective. Geological Society of Goa.
- Dessai, A G 2018. Geology and Mineral resources of goa. New Delhi Publishers

**Supplementary Reading**

- Nanda, H., 2014, Indian Stratigraphy, Anmol Publications Pvt. Ltd. New Delhi.
- Valdiya. The making of India: Geodynamic evolution. 2010
- Cratons and fold belts of India. R S Sharma. 2009. Springer

Course Title: **PETROLEUM GEOLOGY**

Course Code: **GEL-V.E-10**

Credits: **3 (45 Contact hours)**

Marks: **75**

### **Course Objectives**

To provide the student essential and basic concepts of Petroleum Geology and to study the process and the operations involved in Petroleum exploration

### **Learning Outcomes**

A student will understand and learn about the basic concepts of Petrology Geology with respect to geology as to enable them to work as a Petroleum Geologist.

### **Module I**

**(15 hours)**

Introduction and Aspects of Petroleum Geology, Characteristics of Hydrocarbons (Physical and Chemical properties), Petroleum System, Composition, Origin (Types of Kerogen), Occurrence, Migration and Accumulation of Petroleum; Petroleum traps (Stratigraphic and Structural); Reservoir rocks, conditions & mechanisms.

Functions of Petroleum Geologist

Understanding oil and gas: Exploration, Drilling and Completion, Production, Services

### **Module II**

**(15 hours)**

Surface indications and direct detection of Hydrocarbons

Surface and Subsurface exploration techniques: Concept

Geophysical methods of exploration: Gravity and Seismic methods

Types of rigs and its selection

Rotary drilling system and equipment's

Drilling sequence: Coring; Casing and Cementation and Drilling fluids;

### **Module III**

**(15 hours)**

GeoLogging and Well logs (Electric, Radioactive and Acoustic);

Formation evaluation and Testing

Well Completion and Stimulation

An outline of the oil belts of the world; Global geographic and stratigraphic distributions of oil and gas;

Important Onshore and Offshore Petroliferous basins of India.

Recent trends in Petroleum Geology.

**Practical Course: 1 credit**

**Maximum Marks: 25**

- Plotting of Petroliferous basins on maps (World and India)
- Problems based on Well log interpretation
- Creation of carbonate isopachous maps
- Interpretation of petroliferous traps using seismic reflectance.
- Problems on mud circulation
- Observations of well cuttings and cores samples
- Demonstration/Determination of porosity

**List of books recommended for reference**

- Hyne, N J., (2001) Nontechnical Guide to Petroleum Geology, Exploration, Drilling and Production, PennWell Corporation.
- Levorsen, A.I., (1967) Geology of Petroleum, W.H. Freeman and Company.
- Morris, J., (1985) Practical Petroleum Geology, The University of Texas at Austin - Petroleum Extension Service.
- North, F.K., 1(986) Petroleum Geology, Allen &UnWin, 607p
- Selley, R.C., (1998) Elements of Petroleum Geology, W.H. Freeman & Company, New York.

Course Title: **METAMORPHIC PETROLOGY**

Course Code: **GEL-V. E-11A**

Credits: **3 (45 Contact hours)**

Marks: **75**

### **Course Objectives**

To provide essential concepts of metamorphism and metamorphic rocks.

To study metamorphic rocks w.r.t fabrics and types.

To understand the concept of facies.

Also to understand how metamorphism is related to plate tectonics

### **Learning Outcomes**

The student will gain knowledge about the concepts of metamorphism and metamorphic rocks which will strength their knowledge of metamorphic petrology

### **Module I**

**(15 hours)**

Definition and explanation of metamorphism (upper and lower limits) and metamorphic rocks.

Factors controlling metamorphism:

Heat (T): Geothermal gradient (in different crustal regions), Radioactivity, magmatic intrusions, tectonics;

Pressure (P): Deviatoric, Lithostatic, Hydrostatic, Fluid pressure

Chemically active fluids ( $X_f$ ):  $H_2O$  and  $CO_2$

Composition of the parent rocks (X): pelites, mafites, ultramafites, quartzofeldspathic, carbonate rocks, sandstones and greywackes.

Time ( $\delta t$ ): Role of time in metamorphism.

Phase Rule and Phase diagrams Graphical representation of metamorphic rocks.

Protoliths.

Types of metamorphism: Regional metamorphism its characteristics and products, burial metamorphism its characteristics and products, contact metamorphism its characteristics and products.

Relationship of brittle and ductile deformation with grade of metamorphism metasomatism, cataclastic metamorphism and their products, impact/shock metamorphism.

Metamorphism in relation to plate tectonics:

Divergent(constructive) boundary

Convergent (Destructive) boundary: subduction zone (sensu lato)

Continent-Continent Collision zones

Intra-plate environments

### **Module II**

**(15 hours)**

Metamorphic textures: Inherited/Relict fabric lepidoblastic, nematoblastic, granoblastic, equigranular mosaic, Porphyroblastic; cataclastic and mylonitic textures.

Kinematic stress indicators and their role in interpreting tectonic history

Nomenclature and classification based on mineralogy and fabric

Field characters of metamorphic rocks:

Variations in mineralogy and fabric. Prograde and Retrograde metamorphism  
metamorphic zones and index/critical minerals, their significance in mapping  
and understanding tectonic history.

### **Module III**

**(15 hours)**

Facies: Concept after Goldschmidt and Eskola; Zonation in mineralogy – Buchanan (Low pressure) Barrovian (high pressure).

Facies of progressive contact metamorphism: characteristic mineral assemblages in pelites and carbonates (pure and impure) protolith

Facies of progressive regional metamorphism – characteristic mineral assemblages wrt facies (Zeolite, Prehnite-Pumpellyite, Greenschist, Amphibolite, Granulite,) in pelitic, mafic protolith.

Facies of burial metamorphism: Blueschist, Eclogite

Paired Metamorphic Belts

### **Practical Course: 1 credit**

**Maximum Marks: 25**

- Megascopic study and identification of metamorphic rocks w.r.t mineralogy, texture, type of metamorphism, facies, protolith.
- Microscopic study and identification of metamorphic rocks wrt to mineralogy, texture type of metamorphism, facies and protolith.
- Plotting ACF diagrams and commenting on the protolith.

### **List of books recommended for reference**

#### **Mandatory Reading**

- Winter J D., (2011) Principles of Igneous and Metamorphic Petrology. PHI Learning Pvt. Ltd.
- Winkler, G. F., (1987) Petrogenesis of Metamorphic rocks 5<sup>th</sup> edition Narosa Publishing House, New Delhi.
- Yardley, B W. D., (1989) An introduction to Metamorphic Petrology, Longman Group Publishers Pvt. Ltd.
- Turner, F., (1980) Metamorphic Petrology: Mineralogical, Field and Tectonic Aspects, CRC Press.
- Vernon, R H. and Clarke, G.L., (2008) Principles of Metamorphic Petrology, Cambridge University Press
- Best, M., (2003). Igneous and Metamorphic Petrology, Blackwell Publishing.
- Raymond, A. L., (1995) Petrology-The study of Igneous Sedimentary and Metamorphic rocks. Wm. C. Brown Communications, Inc.; USA.



Supplementary Reading

- Ernst, W G and Rumble D., (2008) Metamorphic Conditions along Convergent Plate Junctions: Mineralogy, Petrology, Geochemistry and Tectonics, Geological Society of Amer.
- Frost B R and Frost C D., (2014) Essentials of Igneous and Metamorphic Petrology, Cambridge University Press.
- Miyashiro, A., (1994) Metamorphic Petrology, CRC Press.
- Miyashiro, A, (1978) Metamorphism and Metamorphic belts, The Greshman Press Old Woking, Surrey
- Philpotts, A & Ague, J (2010) Principles of Igneous and Metamorphic Petrology. Cambridge University Press, New York
- Roger, M., (1990). Petrology of the Metamorphic Rocks. Unwin Hyman Ltd, UK
- Blatt, H; Tracy R. J and Owens B. E., (2006) Petrology- Igneous Sedimentary and metamorphic 3<sup>rd</sup> edition W H Freeman and Company New York.
- Bucher, K and Grapes, R., (2010) Petrogenesis of Metamorphic rocks, Springer - Heidelberg Dordrecht, London NY.

Course Title: **REMOTE SENSING AND DIGITAL IMAGE PROCESSING**

Course Code: **GEL-V.E-12**

Credits: **3 (45 Contact hours)**

Marks: **75**

Mandatory requirement: **Individual Laptop with MS Windows OS**

### **Learning Objectives**

This course is designed as an introduction to the use of remote imaging in geologic applications. The basic concepts of image production, processing and interpretations are covered. This course also introduces the basic principles and techniques of Geographic information Systems (GIS)

### **Learning Outcomes**

Student will be able to:

- Explain remote sensing basic principles, purposes, advantages and limitations.
- Define and describe basics of electromagnetic spectrum and interactions with various types of media.
- Describe basic characteristics of remote sensing imagery
- Describe sensors and image acquisition methods.
- Understand the application of digital imagery for interpretation of lithology, structure and geomorphology.
- Develop a working knowledge of GIS software (QGIS)
- Prepared for further study in GIS

### **Module I**

**(15 hours)**

Energy Sources and Radiation Principles.

Electromagnetic Spectrum

Energy interactions in the Atmosphere: Scattering, Absorption.

Atmospheric windows

Energy interactions with earth surface features: Spectral Reflectance of rock, Soil water, and vegetation.

Photo recognition elements

The concept of resolution: Spatial, Spectral, Temporal and Radiometric.

Space Borne Imaging Systems- The Landsat, IRS, SPOT and High resolution Land Satellites (the characteristics of these satellites- orbits, sensors, and their resolutions)

Multispectral remote sensing and hyper spectral remote sensing

### **Module II**

**(15 hours)**

Concept of Digital numbers

Georeferencing

Image Rectification and Restoration.

Image Enhancement.: Low and high pass filter, directional filters

Contrast Manipulation.

Spatial Feature Manipulation.

Multi-Image Manipulation.

**Module III**

**(15 hours)**

Image Classification: Unsupervised and Supervised Classification.

Supervised Classification:

The Training Stage.

The Classification Stage: Minimum-Distance to Means Classifier, Gaussian Maximum Likelihood Classifier.

Classification Accuracy Assessment and ground truth verification

Raster to vector conversions

Elements of GIS, Point, line, polygon, layers

Integration with Remote Sensing and GIS

**Practical Course: 1 credit**

**Maximum Marks: 25**

- Interpretation of Satellite Imagery for – landforms, geological structures, rock and soil types, man-made structures.
- Data Products and Meta data
- Digital Image Processing (using number matrix): enhancement, manipulation and classification.
- Digital image processing on Computer (demonstration)

**List of books recommended for reference**

- Burrough, P. A. and McDonnell, R. A., (2000) Principles of Geographical Information System, Oxford University Press.
- Gupta, R P., (2003) Remote Sensing Geology. Springer-Verlag
- C.P.Lo and Albert K. W. Yeung., (2002) Concepts and Techniques of Geographic Information System, Prentice –Hall, India.
- Drury, S.A., (1993) Image Interpretation in Geology, 2<sup>nd</sup> ed., Chapman and Hall, London.
- George Joseph., (2005) Fundamentals of Remote Sensing, University press Private Ltd, Hyderabad.
- Harold, R W., (1969) Aerial Stereo Photographs, Hubbard Press, USA.
- Heywood I, Sarah, Cornelius, Steve, Carver.,(2011) An Introduction to Geographical Information Systems, Pearson Education Pvt. Ltd., New Delhi.
- Jensen John R., (2000) Remote Sensing of the Environment – An Earth Resource perspective, Pearson Education Series, Low Price Edition.
- Kang – Tsung – Chang., (2002) Introduction to Geographical Information System, , McGraw Hill.
- Lillesand T.M. and Kiefer R.W., (2002) Remote Sensing and Image Interpretation, John Wiley and Sons, New Delhi.
- Lillesand, T. M., Ralph W. Kiefer and Jonathan W. Chapman., (2004) Remote Sensing and Image Interpretation, 5<sup>th</sup>ed, Wiley.
- Mather Paul M., (2004) Computer Processing of Remotely Sensed Images- An Introduction, 3<sup>rd</sup> ed., John Wiley.
- Narayan L.R.A. (1999) Remote Sensing and its Applications., Universities Press.
- Ramasamy S.M., (2005) Remote Sensing in Geomorphology, New India Publishing Agency.
- Schowengerdt Robert A., (2006) Remote Sensing – Models and Methods for Image Processing, 2<sup>nd</sup> ed., Elsevier (Academic Press).

**Online resources**

- T. Sutton, O. Dassau, M. Sutton, A Gentle Introduction to GIS, Chief Directorate: Spatial Planning & Information, Department of Land Affairs, Eastern Cape, South Africa (ebook)

[http://download.osgeo.org/qgis/doc/manual/qgis-1.0.0\\_a-gentle-gis-introduction\\_en.pdf](http://download.osgeo.org/qgis/doc/manual/qgis-1.0.0_a-gentle-gis-introduction_en.pdf)

- QGIS Tutorials <http://www.dst-iget.in/>

**Parvatibai Chowgule College of Arts and  
Science, Margao- Goa  
(Autonomous)**



**DEPARTMENT OF GEOLOGY**

**THREE YEAR B.Sc. DEGREE  
PROGRAMME IN GEOLOGY**

**(Revised & implemented June, 2018)**

## ANNEXURE I

### MODIFIED COURSE STRUCTURE FOR SEMESTER II, IV & VI

Semester	CORE COMPULSORY		CORE ELECTIVES			
II	<b>GEL-II.C-3A</b> Elementary Petrology	<b>GEL-II.C-4</b> Principles of Stratigraphy and Paleontology				
IV	<b>GEL-IV.C-6</b> Structural Geology		<b>GEL-IV.E-5A</b> Engineering Geology	<b>GEL-IV.E-6A</b> Optical Mineralogy	<b>GEL-IV.E-7</b> Natural Hazards and Management	<b>GEL-IV.E-8</b> Geotectonics
VI	<b>GEL-VI.C-8A</b> Igneous Petrology		<b>GEL-VI.E-13A</b> Stratigraphy of India - Part II	<b>GEL-VI.E-14A</b> Rock Structures and Deformation Microstructures	<b>GEL-VI.E-15</b> Surveying and Field Geology	<b>GEL-VI.E-16A</b> Principles of Geophysical Exploration and Mining

## Revised Course Structure and List of Core and Elective Courses

### COMPONENT A

SEMESTER	CORE COURSES		ELECTIVE COURSES			
I	<b>GEL-I.C-1</b> Fundamentals of Mineralogy	<b>GEL-I.C-2A</b> Earth's Dynamics and Tectonics	----	----	----	----
II	<b>GEL-II.C-3A</b> Elementary Petrology	<b>GEL-II.C-4</b> Principles of Stratigraphy and Paleontology	----	----	----	----
III	<b>GEL-III.C-5A</b> Advanced Mineralogy and Geochemistry		<b>GEL-III.E-1</b> Physical Geology	<b>GEL-III.E-2</b> Groundwater and Hydrogeology	<b>GEL-III.E-3A</b> Ore Genesis	<b>GEL-III.E-4</b> Marine Geology
IV	<b>GEL-IV.C-6</b> Structural Geology		<b>GEL-IV.E-5A</b> Engineering Geology	<b>GEL-IV.E-6A</b> Optical Mineralogy	<b>GEL-IV.E-7</b> Natural Hazards and Management	<b>GEL-IV.E-8</b> Geotectonics
V	<b>GEL-V.C-7</b> Sedimentary Petrology	<b>GEL-V.CP</b> Core Project	<b>GEL-V.E-9A</b> Stratigraphy of India – Part I	<b>GEL-V.E-10</b> Petroleum Geology	<b>GEL-V.E-11A</b> Metamorphic Petrology	<b>GEL-V.E-12</b> Remote Sensing and Digital Image Processing
VI	<b>GEL-VI.C-8A</b> Igneous Petrology	<b>GEL-VI.CP</b> Core Project	<b>GEL-VI.E-13A</b> Stratigraphy of India – Part II	<b>GEL-VI.E-14A</b> Rock Structures and Deformation Microstructures	<b>GEL-VI.E-15</b> Surveying and Field Geology	<b>GEL-VI.E-16A</b> Principles of Geophysical Exploration and Mining

Core Courses for students offering **Geology as the Minor**

<b>SEMESTER I</b> GEL-I.C-1: FUNDAMENTALS OF MINERALOGY
<b>SEMESTER II</b> GEL-II.C-3A: ELEMENTARY PETROLOGY
<b>SEMESTER III</b> GEL-III.C-5A: GEOCHEMISTRY AND SYSTEMATIC MINERALOGY
<b>SEMESTER IV</b> GEL-IV.C-6: STRUCTURAL GEOLOGY
<b>SEMESTER V</b> GEL-V.C-7A: SEDIMENTARY PETROLOGY
<b>SEMESTER VI</b> GEL-VI.C-8A: IGNEOUS PETROLOGY



# **ANNEXURE II**

## **REVISED SYLLABUS OF THE UNDERGRADUATE DEGREE PROGRAMME IN GEOLOGY FOR SEMESTERS II, IV AND VI (IMPLEMENTED FROM JUNE 2018 ONWARDS)**

# SEMESTER

# II

Course Title: **ELEMENTARY PETROLOGY**

Course Code: **GEL-I.C-3A**

Marks: **75**

Credits: **3 (45 contact hours)**

### **Course Objectives**

Petrology is the science of rocks. The course will help the students to exhibit an improved understanding of fundamental petrologic processes and common rock types. In practical's, students learn to identify, describe and classify rocks using hand specimens.

### **Learning Outcomes**

On completion of the course the students:

- (i) Will have gained an understanding of the processes involved in the formation of a rock, their textures, structures, classifications and their importance.
- (ii) Will have learned to differentiate between the different rock types based on their properties.

### **Module I**

**(15hours)**

- Rocks and rock cycle
  - Magma: Definition, formation, composition,
    - Properties: temperature, density, viscosity
    - Bowen's Reaction Series
  - Mode of occurrences of Igneous rocks
  - Plutonic: Batholiths (stocks, bosses and roof - pendants), Multiple and Composite intrusions.
  - Hypabyssal: Dykes (Radiating, Arcuate, Ring dykes,), Sills, Laccoliths, Lopoliths
  - Extrusive forms: pyroclastics, lava flows and Volcanic necks,
  - Central and Fissure type of eruptions
  - Structures of Igneous rocks : layering, flow banding
  - Textures of Igneous rocks aphanitic (glassy), : phaneritic: porphyritic, poikilitic, ophitic, sub ophitic; holocrystalline
    - Classification: Based on chemical composition (TAS diagram)

### **Module II**

**(15 hours)**

Weathering (, types – Chemical and Physical, and products), Erosion, Transportation and Deposition

Diagenesis

Udden-Wentworth classification based on grain size

Sedimentary structures: Primary (stratification), chemogenic and biogenic

Textures: clastic and non clastic

Sedimentary environments: aeolian, fluvial, glacial and marine

### **Module III**

**(15 hours)**

Factors controlling metamorphism.

Types of metamorphism: burial, regional and contact,

Metamorphic grade

Metamorphic textures and structures: Foliated and non-foliated.  
Index minerals and Isograds  
Nomenclature of metamorphic rocks  
Protolith: recognition and types (Mafic, Quartzofeldspathic, Pelitic, Calcareous,)  
Metasomatism

**Practical: 1 credit**

**Maximum Marks: 25**

- Megascopic study of Igneous, Sedimentary and Metamorphic rocks.

**List of books recommended for reference**

**Mandatory Reading**

- Winter, J D., (2014) Principles of Igneous and Metamorphic Petrology, Pearson Education Limited.
- Best, M., (2003). Igneous and Metamorphic Petrology, Blackwell Publishing.
- Tucker E.M. (2001) Sedimentary Petrology (3rd Edition), Blackwell Science Ltd.
- Pettijohn F.J., (1984) Sedimentary Rocks (3rd Edition), CBS Publishers, New Delhi.
- Prothero, D. R., and Schwab, F.; (2004) Sedimentary Geology. Macmillan.
- Boggs S., (2009) Petrology of Sedimentary rocks (2<sup>nd</sup> edition), Cambridge University Press.
- Gill, R., (2010) Igneous rocks and process – A Practical Guide, Wiley-Blackwell

**Supplementary Reading**

- Ehlers, E.G. and H. Blatt (1982), Petrology, Igneous, Sedimentary and Metamorphic, W.H Freeman, San Francisco.
- Mahapatra G B. A Textbook of Geology, CBS
- Parbin Singh. A Textbook of Engineering and General Geology (Seventh Ed),
- Mukerjee, P K. A Textbook of Geology, World Press.
- Gill, R., (2010) Igneous rocks and process – A Practical Guide, Wiley-Blackwell

Course Title: **PRINCIPLES OF STRATIGRAPHY AND PALEONTOLOGY**

Course Code: **GEL-II. C-4**

Marks: **75**

Credits: **3 (45 Contact hours)**

### **Course Objectives**

Stratigraphy and Paleontology, the two branches of Geology work together to unearth the secrets of age from rocks of the earth's crust. Stratigraphers study the composition and arrangement of layered or stratified rocks. Paleontologists study the remains of plants and animals which have been preserved in the earth's crust by natural processes. With these objectives in mind it becomes pertinent to understand the basic concepts of Stratigraphy and Palaeontology.

### **Learning Outcomes**

The study of stratigraphy and Paleontology encompasses the aspects of the age of the earth, chronological arrangement of rocks and appearance and evolution of life through the geologic time.

The knowledge of the concepts in stratigraphy, correlation, and paleontology would enable the students to understand the changes that occurred in the history of the earth and relate them to their field observations and also, in understanding the framework of the stratigraphy of India.

### **Module I**

**(15 hours)**

Principles of stratigraphy: Uniformitarianism, Original horizontality, Order of superposition, Faunal succession, Cross-cutting relationship, Inclusions.

Principles of stratigraphic analysis, Facies concept in stratigraphy

Walther's Law of Facies.

Age of the earth:, radiometric dating; Principles.

Measurement of geologic time:

Time Units: Eon-Era-Period-Epoch-Age

Lithostratigraphic/ Rock Units: Group-Formation-Member-Bed

Chrono-/ Time stratigraphic units: Erathem-System-Series-Stage

Standard Stratigraphic Scale.

Correlation and methods of Correlation:

Paleontological Criteria : Index/ Zone fossils

Lithological Similarity: Marker/ Key bed

Structural relations: Tectonic criteria

Brief account of the Geological Formations of Goa.

### **Module II**

**(15 hours)**

Fossils: Mega- Micro-Ichnofossils

Conditions for fossilization; Favourable environments for fossilization.

Modes of fossilization: Petrification, Carbonization, Natural moulds and casts

Frozen and mummified fossils.

Uses of fossils in locating coal and petroleum deposits.

### **Module III**

**(15 hours)**

Binomial Nomenclature of Organisms and Taxonomy

Morphology of the hard parts and geological time range of the following:

*Phylum*: Arthropoda- Class: Trilobita

*Phylum*: Mollusca- Class : Pelecypoda

:Gastropoda

:Cephalopoda- Nautiloidea

Ammonoidea

Belemnoidea

*Phylum*: Brachiopoda

*Phylum*: Echinodermata- Class: Echinoidea

#### **Practical: 1 credit**

**Maximum Marks: 25**

- Map reading
- Use of clinometer compass and exercises on Bearings
- Study of fossils/casts/shells w.r.t their morphology and geological age.

#### **List of books recommended for reference**

Mandatory Reading

- Spencer, E, W, Basic concepts of Historical Geology, Oxford & IBH Publishing Co.
- Dana, J.D., Manual of Geology, Anmol Publications.
- Koregave, M A., Fundamentals of Invertebrate Palaeontology, Book World Enterprises.
- Monroe and Wicander, The Changing Earth: Exploring Geology and Evolution (3<sup>rd</sup> edition.
- Black. R M., The Elements of Palaeontology, Cambridge University Press.

Supplementary Reading

- A Textbook of Geology, P.K Mukherjee (World Press).

# SEMESTER

# IV

Course Title: **STRUCTURAL GEOLOGY**

Course Code: **GEL-IV.C-6**

Marks: 75

Credits: 3 (45 Contact hours)

### **Course Objectives**

The course is designed for the students to understand the geometry and mechanics of the various geological structures that result through the deformative processes operative within the earth.

### **Learning Outcomes**

The student will

- Gain knowledge of the geometry of the rock structures.
- Understand the mechanism of the evolution of rock structures and its application in the field.

### **Module I**

**15 hours**

Primary and secondary structures.

Concept of rock deformation.

Stress and Strain in rocks, 2-D stress and strain analysis;

Strain ellipses of different types and their geological significance.

### **Module II**

**15 hours**

Unconformities.

Joints: Joints and fracture mechanics, classification of joints.

Faults: Terminology, classification, criteria for faulting.

Diapirs (salt domes)

### **Module III**

**15 hours**

Cleavage and foliation: types, origin and relation to major structures.

Lineations- Description and origin of lineation.

Folds- morphology; Geometric and genetic classification; Mechanics and causes of folding

Lineation and relationship with folds

### **Practicals : Credit 1**

Maximum Marks: 25

Solving Geological Maps

Completion of Outcrops

Stereographic Projection of Structural Data

Graphical Solution for Structural Problems

### **List of recommended reference books:**

Mandatory Reading

- Twiss, R. J and Moores, E. M., 2006. Structural Geology, W H Freeman and Company.
- Davis, G. H., 1996. Structural Geology of Rocks and Regions, Wiley



- Pollard, D. D and Fletcher, R. C., 2005. Fundamentals of Structural Geology, Cambridge University Press.
- Marshak, S and G. Mitra., 1988. Basic Methods of Structural Geology, Prentice Hall.
- Hobbs, B and Alison, O. R. D., 2014. Structural Geology: The Mechanics of Deforming Metamorphic Rocks, Elsevier Science Publishing Co. Inc
- Fossen, H., 2010. Structural Geology, Cambridge University Press.
- Robert D hatcher, Structural geology: Principles, concepts and problems. Pearson (1995)
- Ramsays Techniques of Modern Structural geology

Course Title: **ENGINEERING GEOLOGY**

Course Code: **GEL-IV.E-5A**

Marks: **75**

Credits: **3 (45 contact hours)**

### **Course Objective**

To impart sufficient knowledge of engineering geology so as to be able to anticipate the technical problems related to geology of various engineering sites and suggest possible remedial measures.

### **Learning Outcome**

Upon completion of the course the student will become aware of the importance of geological studies and its applicability to various engineering problems.

### **Module I**

**(15 hours )**

Aim of engineering geology

Porosity and permeability of rocks

Principles of mechanical behaviour of rock materials

Engineering properties of rocks; specific gravity, compressive strength, hardness, toughness,

Soil profile and Engineering properties of soil;

Role of structures (joints, fractures, folds, faults) and water/fluids in engineering geology

Use of rocks / aggregates in construction

### **Module II**

**(15 hours )**

Role of engineering geologists in planning, design and construction of major man-made civil structural features.

Methods of site investigation

Introduction to core logging

Geological investigations/geotechnical problems related to groundwater occurrence,

### **Module III**

**(15 hours )**

Geological investigations for landslides, bridges and tunnels -design and construction.

Geological investigations in dams and reservoirs.

Case studies of dam failures

Site improvement methods

### **Practical: 1 credit**

**Maximum Marks: 25**

- Site feasibility based on geological map.
- Physical and mineralogical descriptions of cores,
- Relationship of core log to RQD values

- Computation of reservoir area, catchment area, reservoir capacity
- Numerical problems on ultimate strength of rocks

#### **List of recommended reference books.**

- Bell, .F.G, 2007. Engineering Geology, Butterworth-Heineman
- Blyth, F.G.H and De Freitas., 7th edition, Geology for Engineers, ELBS.
- Billings, M.P., 3rd Edition, Structural Geology, CBS Publishers, New Delhi.
- Sathya, N S., 2nd edition, Engineering Geology, B.S, Dhanpat Rai and Co. Pvt Ltd.
- Gupte R.B. (1992)., A Textbook of Engineering Geology., Pune Vidyarthi Griha Prakashan.
- Narayanswami S.B.S. (2000), Engineering Geology, Dhanpat Rai & Co, India.
- Price, D.G.,(2009), Engineering Geology Principles and Practice, Springer.

Course Title: **OPTICAL MINERALOGY**

Course Code: **GEL-IV.E-6A**

Marks: **75**

Credits: **3 (45 Contact hours)**

#### **Course Objectives**

- The course covers the basics of geoscientific studies in Mineralogy. The knowledge of optics is applied in understanding and identification of minerals.

#### **Learning Outcomes**

The course will enable the students to gain knowledge in identifying minerals based on their optical properties and optical methods using a petrological microscope.

#### **Module I**

**(15 hours)**

Introduction: Nature of light, Polarized light, Refractive Index, Critical angle and Total Internal reflection, Wave Surface, Double Refraction.

Parts and working of a Polarizing / Petrological microscope

Properties of minerals in Plane Polarised Light (PPL): Colour, Form, Cleavage/Cracks; Relief, Twinkling; Pleochroism,

Pleochroic halos.

#### **Module II**

**(15 hours)**

Optical characters of minerals: Isotropism and Anisotropism

Properties of minerals Between Crossed Polars (BXP): Interference colours: Formation, Newton's Scale, Anomalous interference colours;

Extinction and Extinction types.

Twinning and Zoning

Alteration, Inclusions.

### **Module III**

**(15 hours)**

Optical accessories

Uniaxial indicatrix

Biaxial indicatrix

Convergent Light: Principle

Uniaxial Interference Figure

Biaxial Interference Figure

Optic sign of Uniaxial and Biaxial Minerals

2V and 2E

#### **Practical: 1 credit**

#### **Maximum Marks: 25**

- Identification of common rock forming minerals based on optical properties
- Interference figures (Demonstration)
- Determination of optic sign (demonstration)
- Determination of An-content using extinction angles (demonstration)

#### **List of books recommended for reference**

##### Mandatory Reading

- Kerr, P., 1977, Optical Mineralogy, McGraw Hill Publishers.
- Nesse, D. W., 2012, Introduction to Optical Mineralogy, Oxford University Press.
- Perkins, Dexter. Mineralogy. Pearson New International Edition

##### Supplementary reading

- Klein, Cornelis and Hurlbut, Cornelis. Manual of Mineralogy

Course Title: **NATURAL HAZARDS AND MANAGEMENT**

Course Code: GEL-IV.E-7

Marks: 75

Credits: 3 (45 Contact hours)

Prerequisites: GEL-III.E-1

### Course Objectives

The course is designed with an aim to give the student an understanding about: various natural hazards; stages in management aimed at avoiding and /or reducing loss to life and property; and Agencies involved in mitigation and management of damage due to hazards.

### Learning Outcomes

On completion of the course, the student will become aware of the nature and effects of various natural hazards, and know about how to cope with them. The student will also come to know about different agencies and other resources available to deal with the effects of natural hazards.

### Module I

(15 hours)

Natural and man-made disasters

Natural Disasters:

Exogenous

*Droughts:* types, causes, mitigation

*Floods:* causes and effects, prediction, Cloud burst/Flashfloods, remedial measures

*Cyclones:* Structures, origin, effects, prediction, path tracking and early warning systems.

### Module II

(15 hours)

Endogenous:

*Volcanic eruption:* Types, localization, volcanic hazards and mitigation

*Earthquakes:* Causes, Magnitude and intensity, Recording, effects and preparedness, Earthquake Zonation Map.

*Tsunamis:* relation of Tsunamis to tectonics; Damage due to tsunamis, Co-ordinated approach to early warning of tsunamis.

*Landslides and Avalanches:* Classification of mass wasting, mechanics, causes of landslides and stabilizing methods of slopes; civil engineering measures.

*Subsidence:* Causes, slow and brisk types

### Module III

(15 hours)

Salinity hazards: Inland and coastal

Coastal erosion and mitigatory measures

CRZ act and its impact on disaster mitigation

National Disaster Management: national and international support

Planning strategy: co-operative plan, identifying resources, setting priorities.

Hazard coping operations and rehabilitation

Proposed operational processes for individual Natural Disasters mentioned above.  
Case study of Parvatibai Chowgule College Disaster Plan

**Practical: 1 credit**

**Maximum Marks: 25**

- Hazard zonation map of India: ,earthquakes, floods droughts, landslides and Cyclone
- Discussing disaster management plan for Parvatibai Chowgule College
- Land-use land cover mapping

**List of books recommended for reference**

**Mandatory reading**

- Paul, K. B., 2011, Environmental Hazards and Disasters: Context, Perspectives and Management, Wiley-Blackwell, West Sussex.
- National policy on disaster management 2009, Government of India, Ministry of Earth science  
<http://ndma.gov.in/images/guidelines/national-dm-policy2009.pdf>
- Sethi, V. K., 2009, Disaster Management, Essential Books PW, New Delhi.
- Hess, D., 2012, Mc Knight's Physical Geography, PHI learning, Pvt Ltd, New Delhi.
- Krynine, D. and Judd W., 1998, Principles of Engineering Geology and Geotectonics, McGraw Hill.
- Holmes, A., edited by Duff P.M.D., 4th edition, Physical Geology, E.L.B.S Publications.
- Valdiya K.S., 1987, Environmental Geology: Indian Context, Tata-McGraw Hill
- Keller, E. A., 2011, Environmental Geology, Santa Barbara Prentice Hall.
- Joshi M.V., 2004, Environmental Disaster, Causes, Impacts and Remedies, Adhyayan Publishers.

Course Title: **GEOTECTONICS**

Course Code: **GEL-IV.E-8**

Marks: **75**

Credits: **3 (45 Contact hours)**

### **Course Objectives**

Ever since the creation of the earth, there have been marked changes in the distribution of land and sea. The dynamics of these changes are stupendous. Several theories have come forth to explain and understand the mechanism of such changes. Each great mountain chain in the world was created by intense tectonic forces. The subject of Geotectonics deals with the structure of the earth and the processes responsible for the movement and redistribution of continents and seas.

### **Learning Outcomes**

The students will gain an insight into the operating processes leading to the global changes in the positioning of continents and seas, and the creation of great mountain chains.

### **Module I**

**(15 hours)**

Interior of the earth:

Clues from the study of earthquake and density;  
The earth's layers; the crust-continental crust and oceanic crust;  
Crust-mantle boundary  
Structure of the mantle  
Low Velocity Zone (LVZ)  
Core-mantle boundary; P wave shadow zone,  
Nature of the core; S wave shadow zone.

Earth's Magnetic field:

Origin and nature  
Dynamo hypothesis and Herndon's Georeactor Theory.  
Geocentric axial dipole,  
Paleomagnetism,  
Marine magnetic anomalies,  
Magnetic reversals and magnetic stripes

### **Module II**

**(15 hours)**

Continental drift:

Wegener's hypothesis.  
○ Evidences: Continental fit; similarity of rock sequences and mountain ranges; glacial evidence, fossil evidence;  
Paleomagnetism and Polar wandering.

*Plate tectonics:*

Plate margins, plate boundaries and associated activities,

Triple junctions;  
Divergent, Oceanic Ridges, Sea floor spreading, transform faults; hotspots.  
Convergent: oceanic–oceanic, oceanic-continental, continental-continental;  
oceanic trenches, subduction zones  
Transform boundaries;  
Wilson Cycle (Rift valleys, the Red sea and the Gulf of Aden)  
Geometrical aspects and mechanism of plate motion.

### **Module III**

**(15 hours)**

*Mountain building*: Orogenesis

Plate boundaries and orogenesis: Orogenesis at oceanic-oceanic plate boundaries, oceanic-continental plate boundaries and continental-continental plate boundaries.

Case study: Tracking the rise of Himalayas.

Case study: Frequency of Earthquakes in North India

Case Study: Occurrence of Tsunami in SE Asia

### **Practical: 1 credit**

**Maximum Marks: 25**

- Plotting of oceanic ridges, trenches, subduction zones, sea mounts, plate boundaries
- Exercises in plate tectonics.

### **List of books recommended for reference**

Mandatory reading

- Marshak, S., 2011. Earth: Portrait of a Planet, W. W. Norton & Company.
- Duff, D and Holmes, A., 1993, Holmes Principles of Physical Geology, Springer.
- Monroe, S. J and R. Wicander., 2014. The Changing Earth: Exploring Geology and Evolution, Brooks Cole Publishers.
- Skinner, J. B and S. C. Porter., 2003. The Dynamic Earth: An Introduction to Physical Geology, John Wiley and Sons.
- Condie, K. C., 1997. Plate Tectonics and Crustal Evolution, Butterworth-Heinemann.
- Prasad, C. V. R. K., 2005. Elementary Exercises in Geology, Universities Press.



# SEMESTER

# VI

Course Title: **IGNEOUS PETROLOGY**

Course Code: **GEL-VI.C-8A**

Credits: **3 (45 Contact hours)**

Marks: **75**

### **Learning Objectives**

The course will help the students to understand petrologic processes and common rock types. In practical's, students learn to identify, describe and classify rocks using hand specimens and rock thin sections.

### **Learning Outcomes**

On completion of the course the students:

Will have gained an understanding of the processes involved in the formation of igneous rocks, their textures, structures, classifications and their importance.

Will have learned the composition, properties and genesis of different rock types.

### **Module I**

**(15 hours)**

Meteorites: Mineralogy and whole rock chemistry

Composition of the earth's interior = Primitive mantle Plate tectonics and igneous activity

Partial Melting and Generation of magma.

Magma Diversity:

- Partial Melting: Mafic  
Ultramafics, Basalts: Magma types, Basalt Tetrahedron.  
Anatexis: Felsic  
Granites/Pegmatites: Mingling, Mixing and Crustal contamination
- Igneous layering - crystal settling  
Gabbroic rocks, Anorthosite, Layered complexes  
Differentiation: Fractional Crystallization, liquid immiscibility, flowage differentiation

### **Module II**

**(15 hours)**

Ascent and emplacement of magma

Textures and microstructures of igneous rocks:

- a. Primary: Nucleation, Growth, Diffusion
- b. Secondary: Oswald ripening, twinning, zoning

Classification and Description of Igneous Rocks:

The International Union of Geological Sciences (IUGS) Classification System:

Gabbros, Granites (QAPF diagram).

Ternary diagram: Diopside-Albite-Anorthite (Di-Ab-An)

### **Module III**

**(15hours)**

Study of the following rock types (mineralogy, petrography and petrogenesis)

Ophiolites

Granitoids  
Carbonatites  
Kimberlites

**Practical: 1 credit**

**Maximum Marks: 25**

- Study of igneous rocks in hand specimen.
- Study of igneous rocks in thin sections
- CIPW Normative calculations

**List of books recommended for reference**

Mandatory reading

- Winter, J.D., (2009) Principles of Igneous and Metamorphic Petrology, Prentice Hall
- Gill, R., (2010) Igneous rocks and process – A Practical Guide, Wiley-Blackwell
- Frost B R and Frost C D., (2014) Essentials of Igneous and Metamorphic Petrology, Cambridge University Press.

Supplementary reading

- Best, M.G., (2002) Igneous and Metamorphic Petrology, 2nd edn., Blackwell, Oxford.
- Bose, M.K., (1997) Igneous Petrology, The World Press, Kolkata.
- MacKenzie, W. S., Donaldson, C H., and Guilford, C., (1982) Atlas of Igneous Rocks and Their Textures, Wiley
- Raymond, A. L., (1995) Petrology-The study of Igneous Sedimentary and Metamorphic rocks. Wm. C. Brown Communications, Inc.; USA.

Course Title: **STRATIGRAPHY OF INDIA- Part II**

Course Code: **GEL-VI.E-13A**

Credits: **3 (45 contact hours)**

Marks: **75**

Prerequisite: **GEL-V.E-9A**

### **Course Objectives**

The course will help understanding the Indian stratigraphic units and to correlate International Geological Time Scale with Indian Stratigraphic Time Scale. Also to understand the geology, stratigraphy, fossil content, economic resources of the lithounits from the Phanerozoic Eon from the Indian context.

### **Learning Outcomes**

The student will gain knowledge about the stratigraphy and geology of India with emphasis on the Stratigraphy of India wrt Paleozoic, Mesozoic and Cenozoic Era which will help in understanding the different episodes on the earth during the geologic past.

#### **Module I**

**(15 hours)**

Precambrian-Cambrian boundary

Cambrian Tal

Muth Quartzites

Gondwana sedimentation: Peninsular, Extra-Peninsular

Permian-Triassic boundary

#### **Module II**

**(15 hours)**

Jurassic of Kutch

Cretaceous of Trichinopoly

Deccan Flood Basalt (Age and Stratigraphy)

Cretaceous-Paleocene boundary

#### **Module III**

**(15 hours)**

Tertiaries of Assam

Rise and evolution of Himalayas

Siwaliks

Pleistocene-Holocene Boundary

Plant and animal life in relation to glacial and interglacial cycles during Quaternary.

Recent: Laterite Formations of Goa

Practical Course: **1 credit**

Maximum Marks: **25**

1. Preparation of lithostratigraphic maps of India showing distribution of important geological formations.
2. Study of type hand specimens from their stratigraphic position and age.
3. Stratigraphic map of Goa

**List of books recommended for reference**

- Doyle, P. & Bennett, M. R. (1996) Unlocking the Stratigraphic Record. John Wiley.
- Ramakrishnan, M and Vaidynadhan, R., (1994) Geology of India, Geological Society of India Publication, Bangalore. Vol. I and II.
- Nanda, H., (2014) Indian Stratigraphy, Anmol Publications Pvt. Ltd. New Delhi.
- Nichols, G., (2009) Sedimentology and Stratigraphy, Wiley-Blackwell and Sons Ltd.
- Sharma, R S., (2009) Cratons and Fold belts of India, Springer-Verlag Berlin Heidelberg.
- Valdiya, K. S., (2010). The Making of India, Macmillan India Pvt. Ltd.

Course Title: **ROCK STRUCTURES AND DEFORMATION MICROSTRUCTURES**

Course Code: **GEL-VI. E-14A**

Credits: **3 (45 Contact hours)**

Marks: **75**

Prerequisite: **GEL-V.E-11A**

### **Learning Objectives**

The course will help to study deformational history of rocks. This study includes the understanding of the deformation and metamorphic processes the rock has undergone with the aim to reconstruct its structural and metamorphic history.

### **Learning Outcomes**

On completion of the course the students:

Will understand the process of deformation and its resulting features.

It will enhance their application of skills in understanding deformation history and tectonics in field and in microsections..

### **Module I**

**(15 hours)**

Introduction to microstructures and terminology; Deformation mechanisms and processes– Brittle fracturing, Dissolution, Intracrystalline deformation; Twinning and kinking; Recovery; Recrystallization; Solid state diffusion, Grain Boundary Area Reduction (GBAR), Static recrystallization.

### **Module II**

**(15 hours)**

Foliation and its significance; Lineation and its significance; Mylonites, Shear sense indicators in mylonites; Strain shadows; Deformation of rock-forming minerals; Deformation of polymineralic rocks.

### **Module III**

**(15 hours)**

Microstructures of – igneous rocks (porphyritic rocks, mineral intergrowth, zoning); sedimentary rocks (sandstone); metamorphic rocks (isotropic fabrics, growth of porphyroblasts, twinning, symplectite intergrowth) and deformed rocks (deformation twinning, stylolites, GBM), fossils as strain markers

### **Practical Course:1 credit**

#### **Maximum Marks: 25**

Study of rock slides exhibiting various microstructures:

- Cusped and lobate sutured boundaries,
- GBAR (Grain Boundary Area Reduction),
- Bulging (BLG), Subgrain Rotation (SGR); Grain boundary migration (GBM)
- Deformation twins and Displaced twin lamellae
- Bending of cleavage planes, spaced and continuous cleavage
- Mineral (mica) fish,

- Porphyroclasts, asymmetric porphyroclasts depicting shear sense,
- Pressure shadows,
- Warping of foliation around porphyroclasts,
- S-C fabric.

### **List of books recommended for reference**

#### Mandatory reading

- Vernon, R H., (2004) A Practical Guide to Rock Microstructures, Cambridge University Press.
- Winter, J D., (2014) Principles of Igneous and Metamorphic Petrology, Pearson Education Limited.
- Blenkinsop, T. (2002) Deformation microstructures and mechanisms in minerals and rocks, Kluwer Academic Publishers.
- Passchier, C. W and Trouw, R A., (2005) Microtectonics, Springer-Verlag Berlin Heidelberg
- Trouw, R A., Passchier, C W and Wiersma, D J., (2010) Atlas of Mylonites - and related microstructures, Springer-Verlag Berlin Heidelberg

#### Supplementary Reading

- Mukherjee, S., (2013) Deformation Microstructures in rocks. Springer-Verlag Berlin Heidelberg.

Course Title: **SURVEYING AND FIELD GEOLOGY**

Course Code: **GELVIE-15**

Marks: **75**

Credits: **3 (45 Contact hours)**

### **Course Objectives**

To Provide basic knowledge of surveying techniques  
To upgrade and relate the theoretical knowledge of Geological aspects to field observations.

### **Learning Outcomes**

Students will be expected to understand how preliminary surveys are carried out especially in mining areas.

They would be trained to work independently in the field of geology.

### **Module I (15 hours)**

Surveying, Objectives of Survey;

Primary divisions of Surveying – Geodetic and Plane Surveys uses and Principles of Surveying.

Methods of locating a point

Plane Table Survey: Instruments, Procedures of Plane table surveys; Methods (Demonstrative): Radiation and Intersections, advantages and disadvantages of Plane Tabling.

### **Module II (15 hours)**

Levelling, characteristics of land surveying instruments, Bench Marks, Change Points.

Levelling operations and steps in Levelling: Demonstration with exercises in the field.

Principles of Levelling: Simple and Differential,

Reduction of Levels: The Collimation, and Rise and Fall systems of Computation.

Theodolite survey: Principles and working,

### **Module III (15 hours)**

SOI Toposheet Indexing scheme, Map symbol reading SOI toposheet map reading

Standard Symbols/colour for lithology and symbols related to structures

Munsell colour chart

Understanding map reliability

GPS surveys

Geological mapping

Basic field gear

Planning a field Project: Preparations for the field, Taking geologic notes in the field:

Basic procedures at outcrops – noting characters of igneous, sedimentary and metamorphic rocks, Measuring strike and dip (attitude) of planar and linear features using a clinometer compass, a Brunton Compass.

### **Practical course: 1 credit**

#### **Maximum Marks: 25**

- The evaluation is to be based on preparation of portfolio that should include plans drawn using Plane table, a Levelling Exercise.



- Assessment to be based on presentation of Field diary, Field report, and field based viva voce on the localities visited for field work.

### **List of books recommended for reference**

#### Mandatory reading

- Compton, R R., (1985) Geology in the Field, John Wiley & Sons, Inc.
- Compton, R R., (1962) Manual of Field Geology, John Wiley & Sons, Inc.
- Gokhale, N W., (2001) A Guide to Field Geology, CBS Publishers & Distributors.
- Kanetkar, T P & Kulkarni, S V., (1988) Surveying & Levelling (Part I), Pune VidyarthiGrihaPrakashan.
- Lahee, F H. (1962) Field Geology, McGraw – Hill Book Company, Inc.
- Lambert, D A., (1998) Field Guide to Geology, Facts on File Inc.
- Lisle R., Brabham P and Barnes J., (2011) Basic Geological Mapping (Geological Field Guide), Wiley Blackwell.
- Basak, N N., (2014) Surveying and Levelling, McGraw Hill Education.

#### Supplementary reading

- Arora, K R., (2015) Surveying Vol-2 (13<sup>th</sup> edition). Standard Book House Unit of Rajsons Publication Pvt. Ltd.
- Barnes, J W and Lisle, R J., (2004) Basic Geological Mapping, John Wiley and Sons
- Coe, A, L., Argles, T W., Rothery, D A and Spicer, R A., (2010) Wiley-Blackwell, The Open University.
- McClay, K R., (2007) The Mapping of Geological Structures, John Wiley and Sons.
- Penning, W H. and Jukes-Browne., (2011) A Textbook of Field Geology, Nabu Press.
- Robinson W F and Tallack., (2016) Surveying and Levelling Instruments Theoretically and Practically Described for construction, Qualities, Selection, Preservation, Adjustments and Uses: With other apparatus and Appliances used by Civil Engineers and Surveyors in the Field, Wentworth Press.

Course Title: **PRINCIPLES OF GEOPHYSICAL EXPLORATION AND MINING**

Course Code: **GEL-VI.E-16A**

Credits: **3 (45 Contact hours)**

Marks: **75**

### **Course Objectives**

Mining being a key source of revenue generation for the Central as well as State governments, and an important job provider for Geologists, this course is designed to equip the undergraduate student with basic knowledge of key concepts of mining processes right from exploration to exploitation, together with an acquaintance of government regulations that control the mining and mineral conservation processes. In Geophysical exploration the student will gain first-hand knowledge dealing with the principles and their significance.

### **Learning Outcomes**

By the end of this course the student will have learnt about techniques of mineral exploration and exploitation, estimation of ore reserves, environmental impact of mining, and the importance of conservation of mineral resources, thereby partly equipping himself/herself on the way to becoming a mining geologist.

### **Module I**

**(15 hours)**

Mining Terminology

Classification of mining methods.

Factors influencing choice of mining method

- Open cast mining
- Underground mining
  - Coal mining methods
  - Alluvial mining

Ore Dressing or Beneficiation:

- Principles and methods
- Terminology of quantification of results

Environmental Impact of Mining

Brief outline of:

National Mineral Policy  
Regulations and Acts  
Regulating Agencies

### **Module II**

**(15 hours)**

Mineral Exploration: Sequence and phases

- Float ores and In situ ores
  - Pits, Trenches and Boreholes
    - Spacing
    - Drilling:
      - Core and non-core drilling
      - Equipment and accessories

- Core drill sampling
- core splitting
- logging
- Storage
- Sludge
- Combining Assay returns from sludge and core

Categories of reserves

Estimation of reserves

- Cross-sectional method
- Area of influence method
- Triangular method
- Weighted volume estimate method
- Estimation of stockpiles by prismoidal formula

### Module III

**(15 hours)**

Methods of Exploration: Geobotanical, Geochemical and Geophysical.

Geophysical Methods:

*Self-potential method*:, mechanism, equipment, interpretation of anomalies.

*Gravity surveying*:, , Gravity surveying, Interpretation

*Magnetic surveying*:, concepts, Rock magnetism, Geomagnetic field, Magnetic anomalies, Instruments used, Corrections, Interpretation, Application.

Practical Course: **1 credit**

Maximum Marks: **25**

- Drawing cross - and longitudinal sections using bore-hole data
- Problems based on estimation of ore reserves
- Interpretation of bouguer gravity anomaly maps, and magnetic data.
- Core logging

### List of books recommended for references

- Arogyaswamy, R. N. P., (1973) Courses in Mining Geology, Oxford & IBH Publishing Co.
- Babu S. K. & Sinha D. K., (1988) Practical Manual of Exploration and Prospecting, CBS Publishers and Distributors, New Delhi.
- Keller, E. A., (2011) Environmental Geology, Pearson Prentice Hall.
- McKinstry H. E., (1948) Mining Geology, Prentice-Hill Inc.
- Marjoribanks, R., (1997) Geological Methods in Mineral Exploration and Mining, Springer-Science+Business Media
- Peters, W C., (1987) Exploration and Mining Geology, Wiley
- Sharma J. P., (2009) Environmental Studies, Laxmi Publications (P) Ltd, New Delhi.
- Sinha, R. K & Sharma N. L., (1970) Mineral Economics, Oxford & IBH Publishing Co.
- Indian Bureau of Mines (IBM) Publications.

- Bhimasarikaram V.L.S., (1990) Exploration Geophysics - An Outline by Association of Exploration Geophysicists, Osmania University, Hyderabad.
- Dobrin, M B and Savit C H., (1988) Introduction to Geophysical Prospecting, McGraw Hill Inc.
- Lowrie, W., (2007) Fundamentals of Geophysics. Cambridge University Press.
- Ramachandra Rao and Prasaranga, M B, (1975) Outlines of Geophysical Prospecting - A Manual for Geologists by University of Mysore, Mysore.
- Telford, W. M., Geldart, L. P., and Sheriff, R. E., (1990) Applied geophysics (Vol. I) Cambridge University Press.

**ANNEXURE I**

**Parvatibai Chowgule College of Arts and  
Science, Margao- Goa  
(Autonomous)**



**DEPARTMENT OF GEOLOGY**

**THREE YEAR B.Sc. DEGREE  
PROGRAMME IN GEOLOGY  
(Revised & implemented June, 2019)**

## ANNEXURE II

### COURSE STRUCTURE FOR SEMESTER I, III & V

Semester	CORE COMPULSORY		CORE ELECTIVES			
I	<b>GEL-I.C-1</b> Fundamentals of Mineralogy	<b>GEL-I.C-2A</b> Earth's Dynamics and Tectonics				
III	<b>GEL-III.C-5A</b> Advanced Mineralogy and Geochemistry		<b>GEL-III.E-1</b> Physical Geology	<b>GEL-III.E-2</b> Groundwater and Hydrogeology	<b>GEL-III.E-3A</b> Ore Genesis	<b>GEL-III.E-4</b> Marine Geology
V	<b>GEL-V.C-7</b> Sedimentary Petrology		<b>GEL-V.E-9B</b> <i>Precambrian Stratigraphy of India</i>	<b>GEL-V.E-10</b> Petroleum Geology	<b>GEL-V.E-11A</b> Metamorphic Petrology	<b>GEL-V.E-12</b> Remote Sensing and Digital Image Processing

### COURSE STRUCTURE FOR SEMESTER II, IV & VI

Semester	CORE COMPULSORY		CORE ELECTIVES			
II	<b>GEL-II.C-3A</b> Elementary Petrology	<b>GEL-II.C-4</b> Principles of Stratigraphy & Palaeontology				
IV	<b>GEL-IV.C-6</b> Structural Geology		<b>GEL-IV.E-5A</b> Engineering Geology	<b>GEL-IV.E-6A</b> Optical Mineralogy	<b>GEL-IV.E-7</b> Natural Hazards and Management	<b>GEL-IV.E-8</b> Geotectonics
VI	<b>GEL-VI.C-8A</b> Igneous Petrology		<b>GEL-VI.E-13B</b> <i>Phanerozoic Stratigraphy of India</i>	<b>GEL-VI.E-14A</b> Rock Structures and Deformation Microstructures	<b>GEL-VI.E-15A</b> <i>Surveying, Mapping and Field Geology</i>	<b>GEL-VI.E-16A</b> Principles of Geophysical Exploration and Mining

Course Structure and List of Core and Elective Courses

COMPONENT A

SEMESTER	CORE COURSES		ELECTIVE COURSES			
I	<b>GEL-I.C-1</b> Fundamentals of Mineralogy	<b>GEL-I.C-2A</b> Earth's Dynamics and Tectonics	----	----	----	----
II	<b>GEL-II.C-3A</b> Elementary Petrology	<b>GEL-II.C-4</b> Principles of Stratigraphy and Paleontology	----	----	----	----
III	<b>GEL-III.C-5A</b> Advanced Mineralogy and Geochemistry		<b>GEL-III.E-1</b> Physical Geology	<b>GEL-III.E-2</b> Groundwater and Hydrogeology	<b>GEL-III.E-3A</b> Ore Genesis	<b>GEL-III.E-4</b> Marine Geology
IV	<b>GEL-IV.C-6</b> Structural Geology		<b>GEL-IV.E-5A</b> Engineering Geology	<b>GEL-IV.E-6A</b> Optical Mineralogy	<b>GEL-IV.E-7</b> Natural Hazards and Management	<b>GEL-IV.E-8</b> Geotectonics
V	<b>GEL-V.C-7</b> Sedimentary Petrology	<b>GEL-V.CP</b> Core Project	<b>GEL-V.E-9B</b> Precambrian Stratigraphy of India	<b>GEL-V.E-10</b> Petroleum Geology	<b>GEL-V.E-11A</b> Metamorphic Petrology	<b>GEL-V.E-12</b> Remote Sensing and Digital Image Processing
VI	<b>GEL-VI.C-8A</b> Igneous Petrology	<b>GEL-VI.CP</b> Core Project	<b>GEL-VI.E-13B</b> Phanerozoic Stratigraphy of India	<b>GEL-VI.E-14A</b> Rock Structures and Deformation Microstructures	<b>GEL-VI.E-15A</b> Surveying, Mapping and Field Geology	<b>GEL-VI.E-16A</b> Principles of Geophysical Exploration and Mining

Core Courses for students offering **Geology as the Minor**

<b>SEMESTER I</b> GEL-I.C-1: FUNDAMENTALS OF MINERALOGY
<b>SEMESTER II</b> GEL-II.C-3A: ELEMENTARY PETROLOGY
<b>SEMESTER III</b> GEL-III.C-5A: GEOCHEMISTRY AND SYSTEMATIC MINERALOGY
<b>SEMESTER IV</b> GEL-IV.C-6: STRUCTURAL GEOLOGY
<b>SEMESTER V</b> GEL-V.C-7A: SEDIMENTARY PETROLOGY
<b>SEMESTER VI</b> GEL-VI.C-8A: IGNEOUS PETROLOGY



**ANNEXURE I**

**REVISED SYLLABUS OF THE  
UNDERGRADUATE DEGREE  
PROGRAMME IN GEOLOGY FOR  
SEMESTERS I, II, III, IV, V AND VI  
(IMPLEMENTED FROM JUNE 2019 ONWARDS)**

## **B.Sc. in Geology**

### **PROGRAMME OUTCOMES**

<b>Programme Outcomes (PO)</b>	<b>Short Title of the POs</b>	<b>Description of the Programme Outcomes</b>
		<b>Graduates will be able to :</b>
PO-1	Problem Analysis and Solutions	Think critically, identify, analyze problems/ situations and further attempt to design/ develop solutions that meet the specified goals.
PO-2	Use of Technology	Apply appropriate IT tools efficiently in their daily life-professional and personal.
PO-3	Environment and Sustainability	Be aware of environmental issues and commit towards sustainable development at local/ national and global context.
PO-4	Ethics	Recognize and understand professional ethics /human values and be responsible.
PO-5	Individual and Team work	Function effectively at various levels, capacities and situations.
PO-6	Communication	Communicate proficiently (oral and written) as a responsible member of society.
PO-7	Research Aptitude	Understand general research methods and be able to analyse, interpret and derive rational conclusions.
PO-8	Life Skills	Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of domain specific change.

#### **PROGRAMME SPECIFIC OUTCOMES (PSO)**

After successful completion of a Bachelor's degree in Geology, the students will be able to :

PSO-1	Explain the theoretical concepts involved in courses like Mineralogy, Petrology and Structural Geology.
PSO-2	Apply theoretical concepts involved in mineral forming to confidently identify them in hand as well as in thin sections.
PSO-3	Analyse the theoretical concepts and apply them in interpreting the various petrographic features in rocks exhibited in hand specimens and in thin sections.
PSO-4	Create, analyse and interpret structural geological maps.
PSO-5	Make good field observations during field excursions and relate their understanding of various structural and petrological features learnt in classroom for correct interpretation.
PSO-6	Communicate confidently and write geological reports.
PSO-7	Demonstrate content knowledge appropriate to professional career goals

# SEMESTER

# I

Course Title: **FUNDAMENTALS OF MINERALOGY**

Course Code: **GEL-I. C-1**

Credits: **3 (45 Contact hours)**

Marks: **75**

### **Course Objectives**

As minerals are building blocks of earth's material, the course is designed to understand the basic concepts in mineralogy, their chemistry and identification of minerals in hand specimens. Further, the students will study crystallography in understanding the morphology, symmetry and the normal crystal classes.

### **Course Outcomes**

Upon completion of the course, the student will be able to,

**CO1** Understand what is a mineral and its formation.

**CO2** Explain mineralogical properties like polymorphism, isomorphism, Pseudomorphism.

**CO3** Describe the physical properties of minerals.

**CO4** Relate crystal chemistry and chemical bonding to the formation of minerals like crystal structure, chemistry, chemical composition.

**CO5** Compare and contrast the elemental and major oxide composition of the crust with the entire earth.

**CO6** Link how the internal atomic structure of minerals affects the external development of a crystal in terms of crystal symmetry, crystal system and crystal forms.

**CO7** Identify rock- forming minerals in hand specimen using their physical properties.

**CO8** Classify minerals into crystal systems based on crystal symmetry.

### **Module I**

**(15 hours)**

Minerals: Rock-forming minerals and ore minerals.

Common physical properties of minerals including electrical and magnetic properties.

Isomorphism, Polymorphism, Pseudomorphism

silicate structures: (sorosilicate/ cyclosilicates/ nesosilicates/ inosilicate/ phyllosilicates/ tectosilicate)

Introduction to rock-forming mineral Olivine, Pyroxene, Amphibole, Mica, Feldspar, Quartz and its varieties

Important and abundant mineral groups: aluminosilicates, sulfides, sulfates, carbonates; oxides; halides; native metals (with three examples each)

**Module II**

**(15 hours)**

Elemental and major oxide composition of the earth's crust -  
Types of Atomic bonds (Ionic/Covalent/Metallic/ Van der Waal).  
Radius Ratio, Ionic Radius,  
Co-ordination Number. Types of co-ordination.  
Atomic arrangement (HCP/CCP)

**Module III**

**(15 hours)**

Space lattice. Unit cell. External morphology of a crystal. Crystal Forms with examples.  
Crystallographic axes and Crystal systems.  
Symmetry in crystals. (Axis, Plane, Center)  
Interfacial angles and Contact Goniometer.  
Parameters and Indices

**Practical: 1 credit**

**Maximum Marks: 25**

1. Identifying and determining the crystal symmetry, class, system and forms in the normal class of the six systems.
2. Identification and study of minerals w.r.t their physical properties, occurrence, chemical composition and use.

**List of books recommended for reference**

**Mandatory Reading**

- Perkins, D., (2015), Mineralogy, Pearson Education Limited.
- Dana, J.D & Ford, W. E., (2010). Dana's Manual of Mineralogy. J. Wiley & Sons.
- Klein, C. and Dutrow, B., (2007). The Manual of Mineral Science, John Wiley & Sons, Inc.
- Read, H. H., (1988). Rutley's elements of Mineralogy, CBS Publications.
- Battey, M H. (1971), Mineralogy for students, Oliver & Boyd

**Supplementary Reading**

- Deer, W. A., Howie, R. A & Zussman, J., (2013). An Introduction to the rock forming minerals, John Wiley and Sons.

Course Title: **EARTH'S DYNAMICS AND TECTONICS**

Course Code: **GEL-II. C-2A**

Credits: **3 (45 contact hours)**

Marks: **75**

### **Course Objectives**

This is a core branch of earth science which deals with basic concepts of natural internal forces shaping the earth. Earth's Dynamics and Tectonics aims at acquainting the student with these forces as well as the geological structures resulting from the action of these forces on rocks. The course also aims at providing an understanding of the processes in action on the earth's surface and their impact on man and his institutions.

### **Course Outcomes**

Upon completion of the course, the student will be able to:

**CO1** Understand the origin and nature of the earth and its layered structure.

**CO2** Gain insights into the spheres of the earth and their inter-relationship, the earth's Gravity, and magnetic field.

**CO3** Relate the concept of Isostasy with plate tectonics.

**CO4** Differentiate between the different types of forces acting in the lithosphere and link the different types of responses of brittle and ductile substances to stress.

**CO5** Understand the exogenous and endogenous geological hazards.

**CO6** Read and interpret geological maps and draw geological cross – sections.

**CO7** Recognize different types of folds, faults and joints.

### **Module I**

**(15 hours)**

Origin of Solar System (Nebular Concept) and formation of a layered Earth.

Size and shape of the Earth.

Internal structure of the Earth: Geosphere asthenosphere, lithosphere, hydrosphere, biosphere, atmosphere (anoxic to oxic conditions) wrt to earth dynamic

Earth's Gravity : Acceleration due to gravity, change with latitude and altitude.

Earth's Magnetism: Earth as a magnet; lines of force, Source of Earth's Magnetic field,

Declination and inclination, Geomagnetic axis and Geographic axis.

### **Module II**

**(15 hours)**

Introduction to Plate Tectonics:

Concept of isostasy

Lithostatic or confining pressure, Differential forces: tension, compression, couple.

Concept of stress and strain: stages of deformation: Elastic, Plastic and Rupture.

Brittle and ductile substances.

Introduction to geological hazards: exogenous (floods, drought and cyclones) and endogenous (volcanic hazards, earthquakes and tsunamis, mass wasting)

### **Module III**

**(15 hours)**

Map and Scales

Stratification, Strike and dip (true and apparent dip) strike and dip symbols.

Outcrop patterns of Horizontal, Inclined & vertical strata on various types of grounds (horizontal ground, valley and spur).

Folds: Terminology, causes, types of folds; symmetrical, asymmetrical, overturned, recumbent, isoclinal, fan, chevron, monocline, structural terrace, plunging and non-plunging; significance. Outcrop pattern of folds on horizontal ground, valley and spur.

Faults: Definition & terminology, geometric classification, significance; horst and graben.

Joints: Geometric classification, map symbols, columnar joints and sheet structure, significance.

Unconformities: Stages of development, types, significance; outliers and inliers; overlap and offlap.

**Practical: 1 credit**

**Maximum Marks: 25**

1. Drawing cross-section and description of structural maps involving single series (Horizontal and Inclined)
2. Graphical solution to structural problems.

### **List of books recommended for reference**

Mandatory reading

- Travis, H., 2012. Living with Earth, Phi Learning Pvt. Ltd., New Delhi.
- Press, Siever, Grotzinger and Jordan., 2003. Understanding the Earth (4<sup>th</sup> edition).
- Charles C. Plummer and David McGeary., 2001. Physical Geology, (4<sup>th</sup> edition), Wm C. Brown Publishers.
- Monroe and Wicander., 2001. The Changing Earth: Exploring Geology and Evolution (3<sup>rd</sup> edition).
- Jain, A K ., Structural geology, , Geological Society of India.
- Holmes' Principles of Physical Geology edited by P.McL.D.Duff (ELBS).
- Hils, E. S., Elements of Structural Geology, Methuen.
- Mukerjee. P. K., A Textbook of Geology, World Press.

Supplementary Reading

- Zumberge J.H. & Nelson C.A., Elements of Geology (3<sup>rd</sup> edition), John Wiley & Sons, New York.

# SEMESTER

# II



Course Title: **ELEMENTARY PETROLOGY**

Course Code: **GEL-I.C-3A**

Marks: **75**

Credits: **3 (45 contact hours)**

### **Course Objectives**

Petrology is the science of rocks. The course will help the students to exhibit an improved understanding of fundamental petrologic processes and common rock types. In practicals, students learn to identify, describe and classify rocks using hand specimens.

### **Course Outcomes**

On completion of the course the students will be able to:

- CO1** Understand the processes involved in the formation of rocks, their textures and structures.
- CO2** Classify rocks into their various types – Igneous, Sedimentary or Metamorphic.
- CO3** Understand the importance of rocks.
- CO4** Differentiate between the different rock types based on their textures, structures and mineralogy.
- CO5** Identify the different textures and structures of rocks.
- CO6** Describe the mineralogy and properties of, and identify common rock types.

### **Module I**

**(15hours)**

- Rocks and rock cycle
  - Magma: Definition, formation, composition,
    - Properties: temperature, density, viscosity
    - Bowen's Reaction Series
  - Mode of occurrences of Igneous rocks
  - Plutonic: Batholiths (stocks, bosses and roof - pendants), Multiple and Composite intrusions.
  - Hypabyssal: Dykes (Radiating, Arcuate, Ring dykes,), Sills, Laccoliths, Lopoliths
  - Extrusive forms: pyroclastics, lava flows and Volcanic necks,
  - Central and Fissure type of eruptions
  - Structures of Igneous rocks : layering, flow banding
  - Textures of Igneous rocks aphanitic (glassy), : phaneritic: porphyritic, poikilitic, ophitic, sub ophitic; holocrystalline
    - Classification: Based on chemical composition (TAS diagram)

**Module II**

**(15 hours)**

Weathering (, types – Chemical and Physical, and products), Erosion, Transportation and Deposition

Diagenesis

Udden-Wentworth classification based on grain size

Sedimentary structures: Primary (stratification), chemogenic and biogenic

Textures: clastic and non clastic

Sedimentary environments: aeolian, fluvial, glacial and marine

**Module III**

**(15 hours)**

Factors controlling metamorphism.

Types of metamorphism: burial, regional and contact,

Metamorphic grade

Metamorphic textures and structures: Foliated and non-foliated.

Index minerals and Isograds

Nomenclature of metamorphic rocks

Protolith: recognition and types (Mafic, Quartzofeldspathic, Pelitic, Calcareous,)

Metasomatism

**Practical: 1 credit**

**Maximum Marks: 25**

- Megascope study of Igneous, Sedimentary and Metamorphic rocks.

**List of books recommended for reference**

**Mandatory Reading**

- Winter, J D., (2014). Principles of Igneous and Metamorphic Petrology, Pearson Education Limited.
- Gill, R., (2010) Igneous rocks and process – A Practical Guide, Wiley-Blackwell
- Boggs S., (2009) Petrology of Sedimentary rocks (2<sup>nd</sup> edition), Cambridge University Press.
- Prothero, D. R., and Schwab, F.; (2004) Sedimentary Geology. Macmillan.
- Best, M., (2003). Igneous and Metamorphic Petrology, Blackwell Publishing.
- Tucker E.M. (2001) Sedimentary Petrology (3rd Edition), Blackwell Science Ltd.
- Pettijohn F.J., (1984) Sedimentary Rocks (3rd Edition), CBS Publishers, New Delhi.

**Supplementary Reading**

- Ehlers, E.G. and H. Blatt., 1982. Petrology, Igneous, Sedimentary and Metamorphic, W.H Freeman, San Francisco.
- Mahapatra G B. A Textbook of Geology, CBS
- Parbin Singh. A Textbook of Engineering and General Geology (Seventh Ed),
- Mukerjee, P K. A Textbook of Geology, World Press.

Course Title: **PRINCIPLES OF STRATIGRAPHY AND PALEONTOLOGY**

Course Code: **GEL-II. C-4**

Marks: **75**

Credits: **3 (45 Contact hours)**

### **Course Objectives**

Stratigraphy and Paleontology, the two branches of Geology work together to unearth the secrets of age from rocks of the earth's crust. Stratigraphers study the composition and arrangement of layered or stratified rocks. Paleontologists study the remains of plants and animals which have been preserved in the earth's crust by natural processes. With these objectives in mind it becomes pertinent to understand the basic concepts of Stratigraphy and Palaeontology.

### **Course Outcomes**

Upon completion of the course, the student will be able to,

**CO1** Understand principles of Stratigraphy and concept of Facies.

**CO2** Differentiate between absolute and relative age of the earth.

**CO3** Explain measurements of geologic time.

**CO4** Describe how rocks are correlated.

**CO5** Describe types of fossils, conditions and modes for fossilisation, how fossils can be used to locate economic deposits.

**CO6** Describe and explain morphology of the hard parts of different phylum's and geological time range.

**CO7** Understand map reading and handle clinometer compass.

**CO8** Solve problems on bearings.

**CO9** Describe and identify fossils/casts/shells w.r.t their morphology and geological age

**CO10** Apply classroom teaching to field observations and preparing a geological report.

### **Module I**

**(15 hours)**

Principles of stratigraphy: Uniformitarianism, Original horizontality, Order of superposition, Faunal succession, Cross-cutting relationship, Inclusions.

Principles of stratigraphic analysis, Facies concept in stratigraphy

Walther's Law of Facies.

Age of the earth:, radiometric dating; Principles.

Measurement of geologic time:

Time Units: Eon-Era-Period-Epoch-Age

Lithostratigraphic/ Rock Units: Group-Formation-Member-Bed  
Chrono-/ Time stratigraphic units: Erathem-System-Series-Stage  
Standard Stratigraphic Scale.

Correlation and methods of Correlation:

Paleontological Criteria : Index/ Zone fossils

Lithological Similarity: Marker/ Key bed

Structural relations: Tectonic criteria

Brief account of the Geological Formations of Goa.

## **Module II**

**(15 hours)**

Fossils: Mega- Micro-Ichnofossils

Conditions for fossilization; Favourable environments for fossilization.

Modes of fossilization: Petrification, Carbonization, Natural moulds and casts

Frozen and mummified fossils.

Uses of fossils in locating coal and petroleum deposits.

## **Module III**

**(15 hours)**

Binomial Nomenclature of Organisms and Taxonomy

Morphology of the hard parts and geological time range of the following:

*Phylum*: Arthropoda- Class: Trilobita

*Phylum*: Mollusca- Class : Pelecypoda

:Gastropoda

:Cephalopoda- Nautiloidea

Ammonoidea

Belemnoidea

*Phylum*: Brachiopoda

*Phylum*: Echinodermata- Class: Echinoidea

### **Practical: 1 credit**

**Maximum Marks: 25**

- Map reading
- Use of clinometer compass and exercises on Bearings
- Study of fossils/casts/shells w.r.t their morphology and geological age.

### **List of books recommended for reference**

Mandatory Reading

- Dana, J.D., (2010), Manual of Geology, Anmol Publications.
- Monroe, J and Wicander, R., (1994). The Changing Earth: Exploring Geology and Evolution, Brooks/Cole
- Black. R M., (1989). The Elements of Palaeontology, Cambridge University Press.

- Spencer, E, W, Basic concepts of Historical Geology, Oxford & IBH Publishing Co.
- Koregave, M A., Fundamentals of Invertebrate Palaeontology, Book World Enterprises.

Supplementary Reading

- A Textbook of Geology, P.K Mukherjee (World Press).

# SEMESTER

# III

Course Title: **ADVANCED MINERALOGY AND GEOCHEMISTRY**

Course Code: **GEL-III.C-5A**

Credits: **3 (45 Contact hours)**

Marks: **75**

### **Course Objectives**

- The course provides geoscientific study of mineralogy in understanding the structure, chemistry, optical & physical properties, stability relations and genesis of minerals. With respect to geochemistry the student will understand the distribution of various elements and their abundances in the earth's crust.

### **Course Outcomes**

Upon completion of the course, the student will be able to,

**CO1** Understand the concept of Gibbs Phase Rule.

**CO2** Correlate structure, chemical composition with physical and optical properties of minerals of major silicate group of minerals.

**CO3** Interpret stability relations of minerals using Phase diagrams.

**CO4** Understand how minerals originate and associate with each other in a rock

**CO5** Understand the geochemical composition of the earth.

**CO6** Describe how compatible elements are involved in the various geochemical processes.

**CO7** Explain how incompatible elements are involved in the various geochemical processes.

**CO8** Evaluate and interpret how geochemistry can be used to interpret tectonic setting.

**CO9** Solve applied quantitative problems.

**CO10** Plot major oxides in tectonic discriminant diagrams

### **Module I**

**(15 hours)**

Introduction to mineral chemistry, Gibbs Phase Rule, Phase diagram.

Structure, mineral chemistry, paragenesis, and Phase diagrams of the following silicate group of minerals:

Olivine group (Forsterite-Fayalite System)

Pyroxene group (Diopside-Anorthite System)

Feldspar group (Albite-Anorthite System; Orthoclase-Albite System)

## MODULE II

(15 hours)

Structure, mineral chemistry, paragenesis, and stability relations of the following silicate group of minerals:

- Feldspathoid group (Leucite-Silica System)
- Silica
- Amphibole
- Mica

## MODULE III

(15 hours)

- Whole rock analysis (major, trace REE)
- Concept of compatible and incompatible elements,
- Use of geochemistry in deducing tectonics.
- Primitive mantle normalized diagram and their significance in petrogenesis.

### Practical: 1 credit

#### Maximum Marks: 25

1. Calculation of end-members for olivine, pyroxene and feldspar group of minerals.
2. Plotting of major oxides in tectonic discriminant diagrams

#### List of books recommended for reference

- Deer, W. A, Howie, R. A and Zussman. J., (2013). An Introduction to Rock-Forming Minerals, Mineralogical Society.
- Ford, W. E., (2006). Dana's Textbook of Mineralogy (with extended treatise Crystallography and Physical Mineralogy). CBS Publishers, New Delhi.
- Griffen, D. T, Phillips, W. R and William, R. Phillips., (2004). Optical Mineralogy: The Nonopaque Minerals. CBS Publishers, New Delhi.
- Mason and Berry, (2004). Mineralogy, CBS Publishers, New Delhi.
- Faure, G (1998) Principles and Applications of Geochemistry. Prentice Hall
- White, W M (1997) Geochemistry, Wiley-Blackwell
- Krauskopf, K B and Bird, D K (1995) Introduction to Geochemistry. McGraw-Hill
- Mason, B and Moore, C., (1982). Principles of Geochemistry, John Wiley & Sons.



Course Title: **PHYSICAL GEOLOGY**

Course Code: **GEL-III.E-1**

Credits: **3 (45 Contact hours)**

Marks: **75**

**Course Objectives:** The natural agencies like wind, rivers, glaciers have been moulding and remoulding the surface of the earth over millions of years. This course aims at the understanding of the processes and the physical forces responsible in developing the surficial features and highlighting the role of these natural agencies in grading and degrading the land surface.

**Course Outcomes:**

Upon completion of the course, the student will be able to,

- CO1** Identify the dominant medium of erosion, transportation and deposition in a given area and explain the mechanisms for those processes.
- CO2** Identify various desert landforms and explain the processes involved in their formation.
- CO3** Identify various fluvial landforms and explain the processes involved in their formation.
- CO4** Identify various Karst topography and features and explain the processes involved in their formation.
- CO5** Identify various glacial and coastal landforms and explain the processes involved in their formation.
- CO6** Assign stream order as per Strahler's Method, Analyze various attributes of basin morphometry and drainage.
- CO7** Prepare and analyze long and cross sections of river profiles from SOI Toposheet.
- CO8** Deduct the processes involved in shaping the geomorphology of a local area by an integrated approach of applying theoretical knowledge and field based observations.

**Module I**

**(15 Hours)**

Weathering and erosion

Earth Systems Affecting Weathering

Mechanical Weathering – Pressure Release, Frost Action, Thermal Expansion and Contraction, Salt Growth, Impact of Organism

Chemical Weathering – Organisms Role, Oxidation, Acid Action, Dissolution/Leaching, Hydrolysis, Spheroidal Weathering

Factors Affecting rate of Weathering.  
Rate of Weathering versus Stability of Minerals  
Weathering versus Erosion  
Transportation and deposition  
Laminar and Turbulent Flow  
Agents of Transportation – Wind, Water, Glaciers, Gravity  
Modes of transportation – Bed Load (sliding, rolling, saltation), Suspension, dissolved load  
Factors Affecting Depositions  
Action of Wind  
Generation of Winds,  
Characteristics of Desert.  
Problems Associated with Desertification.  
Sediment Transport – Lifting Mechanism, Bed Load and Suspended Load  
Desert Landforms:  
Depositional: sand dunes, Sand Seas/Ergs, Playa, sabkha  
Erosional: Grooves, Ventifacts & Yardangs mushroom rock, Inselbergs, Mesas and Buttes,  
Deflation Basin, Desert Pavement and Lag Gravel

## **Module II**

**(15 Hours)**

Drainage Basin and River System –, Drainage Patterns –  
Dynamics of Stream Flow – Discharge, Gradient, Velocity, Sediment Load, Base Level  
Concept of Graded Stream  
River System and Plate Tectonics  
Geological Action of Rivers  
Erosion by River  
Process of Stream Erosion – Removal of Regolith, Downcutting, Headward Erosion.  
Bradshaw Model  
Erosional Feature in Upper Course - Steep Valleys, Gorges, Interlocking Spurs, Potholes,  
Waterfall and Rapid  
Erosional Features in Middle and Lower Course – Meander, Ox Bow Lake, Hogbacks,  
Cuestas  
Depositional Landforms by River  
Floodplains – Meanders, Point Bars, Natural Levees, Backswamps, Braided Stream  
Alluvial Valleys – Step Terraces  
Deltas – Formation and Types  
Alluvial Fans  
Erosion by Groundwater  
Karst Topography – Caves, Sinkholes, Solution Valleys, Disappearing Streams, Tower  
Karst

Deposition by Groundwater

Speleothems – Stalactites, Stalagmites

### **Module III**

**(15 Hours)**

Types of glaciers and Glacial Budget

Glacier Flow – Surging Glacier, Crevasses

Ablation – Melting, Evaporation, Calving

Geological Work of Glaciers

Erosional Features of Glaciers

Erosion Process– and erosional landforms related to valley and continental glaciation.

Depositional Features of Glaciers

Glacial Drift – Till and Stratified Drift

Action of Sea Waves

Erosional and depositional features of the coast.

### **PRACTICAL MODULE: 1 Credit**

- Basin Morphometry Perimeter Calculation using rotameter
- Area Calculation – Square Grid/Planimeter/Area using triangles
- Stream Ordering (Strahler's Method)
- Drainage Network Morphology – Bifurcation and Length ratio
- Basin Geometry – Basin Circularity, Intensity of Dissection – Drainage Density, Stream Frequency, Hypsometric Curve
- Draw Inference for the Basin based on the result
- Long Profile and Cross Profile of River – Upper Course, Middle Course, Lower Course of river from SOI Toposheet. Field visit to nearby area to understand and describe the various physical geology features.

### **REFERENCE BOOKS:**

- Monroe, S. J and R. Wicander., 2014. The Changing Earth: Exploring Geology and Evolution. Brooks Cole Publishers.
- Mathur, S. M., 2012. Physical Geology of India. National Book Trust
- Carlson, D.H., Plummer, C.C., McGeary, D., 2008. Physical Geology: Earth revealed. Higher Education.
- McConnell, D., Steer, D., Knight, C., Owens, K., Park, L., 2008. The Good Earth – Introduction to Earth Science. Higher Education.
- Monroe, J.S., Wicander, R., Hazlett, R., 2007. Physical geology – Exploring the Earth (6<sup>th</sup> Ed.) Thomson Brooks/Cole.
- King, C.A.M., 2006: Techniques in Geomorphology, Edward Arnold, London

Course Title: **GROUNDWATER AND HYDROGEOLOGY**

Course Code: **GEL-III.E-2**

Credits: **3(45 contact hours)**

Marks: **75**

### **Course Objectives**

To impart knowledge about groundwater, its movement, methods of its exploration, the criteria of its quality, methods of its conservation, recharge of groundwater, monitoring of groundwater quality and quantity.

### **Course Outcomes**

Upon completion of the course, the student will be able to,

- CO1** Understand the concept of Groundwater, its sub- surface distribution and sources.
- CO2** Explain the rock properties of porosity and permeability affecting the movement of groundwater.
- CO3** Differentiate between the various types of aquifers.
- CO4** Carry out groundwater exploration by resistivity method.
- CO5** Draw flow-nets from groundwater levels.
- CO6** Determine water quality based on various parameters.
- CO7** Understand the effects of over withdrawal of groundwater and waterlogging, and suggest mitigation measures.

### **Module I**

**(15 hours)**

Hydrologic cycle and its components

Factors controlling all the components: Evaporation, precipitation, runoff, Infiltration Hydrologic budget

Vertical distribution of ground water

Types of Groundwater: soil water, vadose, capillary water, Meteoric water

Rock properties affecting movement of ground water:

- 1) Porosity(primary and secondary), effective porosity, specific retention, controlling factors of porosity
- 2) Permeability: Darcy's law, laboratory methods of measurement of permeability (constant head, falling head), specific yield, Relation between grain size, porosity, specific yield and specific retention.

Definition of an aquifer, aquiclude, aquitard, aquifuge, and types of aquifers: Unconfined, Confined (Artesian), Perched aquifer.

## **Module II**

**(15 hours)**

Groundwater Exploration: Resistivity methods

Groundwater levels and Flow nets

Aquifer parameters: 1) Transmissivity, 2) Storativity, 3) Hydraulic conductivity: methods of determination (pumping test and tracer test)

Drawdown and cone of depression

Groundwater quality:

- Parameters :physical ,chemical and biological
- Major, minor and trace constituents.
- I.S.I standards for drinking water

## **Module III**

**(15 hours)**

Effects of withdrawal, effects of waterlogging

Artificial recharge

Saline water intrusion in aquifer

Ghyben-Hertzberg relation

Pollution of ground water: Arsenic and Fluoride

### **Practical: 1 credit**

#### **Maximum Marks: 25**

- Drawing flow nets
- Determination of depth to water table from bore hole data.
- Numerical problems on determination of porosity, bulk density, saturation percentage and void ratio of sample
- Problems based on Ghyben –Hertzberg formulae
- Graphical presentation of chemical data of water
- Resistivity survey (demonstration)

List of books recommended for reference

#### **Mandatory Reading**

- Todd , D.K and Mays, L.W., 3<sup>rd</sup> edition , 2012. Groundwater Hydrology, Wiley India Pvt. Ltd.
- Keller, E.A., 4<sup>th</sup> edition, 2011. Environmental Geology, CBS Publishers, New Delhi.
- Hiscock, K and Bense, V F. Hydrogeology: Principles and Practice.
- Valdiya K.S., 1987, Environmental Geology: Indian Context, Tata-McGraw Hill
- Ragunath H.M., 1983, Groundwater, Wiley Eastern Ltd, New Delhi.

Course Title: **ORE GENESIS**

Course Code: **GEL-III.E-3A**

Credits: **3 (45 contact hours)**

Marks: **75**

**Course Objectives:** The course aims at understanding the various types of mineral deposits, classification, their mode of occurrence, geologic & geographical distribution and genesis. It primarily focuses on the processes of formation of ore deposits. Furthermore, it also aims at identification of economic minerals in hand specimens.

### **Course Outcomes**

Upon completion of the course, the student will be able to,

**CO1** Differentiate between rock-forming minerals and ore minerals.

**CO2** Understand the basis of classifying ore minerals.

**CO3** Understand the origin and stages of ore formation.

**CO4** Classify the various ore minerals under categories such as magmatic, hydrothermal, volcanogenic etc.

**CO5** Explain the processes involved in the formation of ore deposits.

**CO6** Understand the genesis and occurrence of various ore deposits in India.

**CO7** Evaluate ore minerals in hand specimen using their physical properties.

### **Module I**

**(15 hours)**

Goldsmith geochemical Classification

Tenor, Prospects, Resource & Reserves of ore minerals

Classification of Ore Deposits:

Modified Lindgren's Scheme; Bateman Scheme; Based on Tectonic Setting

Processes Forming Mineral Deposits

Requirements for Ore deposit formation

Syngenetic & Epigenetic deposits

Magmatic Ore Forming Processes

Orthomagmatic ore formation (Bushveld; Sudbury)

Ore deposits at mid-ocean ridges (Black & White Smokers) and in ophiolites (podiform chromites)

Ore formation related to alkaline magmatic rocks, carbonatites and kimberlites

Ore deposits in pegmatites

**Module II**

**(15 hours)**

Magmatic-Hydrothermal Ore Forming Systems

Hydrothermal ore formation (Source of Hydrothermal Solutions; Textures & Structures; Host rock alteration)

Volcanogenic ore deposits (VMS; Terrestrial epithermal gold, silver and base metal)

Porphyry copper (Mo-Au-Sn-W) deposits

Hydrothermal-metasomatic ore deposits

Skarn, Greisen

Supergene Ore Formation Systems

Residual (eluvial) ore deposits

Supergene enrichment by descending (vadose) solutions

Sedimentary Ore Formation Systems

Black shales in metallogenesis (European Copper Shale)

Autochthonous iron and manganese Deposits

Sediment-hosted & submarine-exhalative (sedex) base metal deposits

Mississippi Valley type (MVT) Lead-Zinc deposits

Placer deposits

Metamorphic Ore Forming System

Orogenic Cu-Zn-Au deposits

Ore Deposits in Space and time

Metallogenic Epochs

Plate Tectonic Setting of Ore Deposits

**Module III**

**(15 hours)**

Indian occurrences of

Metallic Deposits:

Iron

Manganese

Chromium

Copper-Lead-Zinc

Gold

Non metallic Deposits:

Diamond, Baryte, Bauxite,

Nuclear Minerals

Industrial Minerals (Refractory, Abrasives, Cement, Fertilizer, Electrical and Electronics).

**PRACTICAL MODULE = 1 Credit**

- Descriptive evaluation of ore minerals in hand sample
- Introduction to reflected light microscopy of ore minerals (demonstration) Site visits to local mineralized geology

**REFERENCE BOOKS**

For Ore Forming Process: (E-books Available of All)

1. Pohl, L.W., 2011. Economic Geology – Principles and Practice. Wiley-Blackwell
2. Robb, L., 2005. Introduction to Ore-Forming Processes. Blackwell Publishing
3. Evans, A.M., 1993. Ore Geology and Industrial Minerals – An Introduction (3<sup>rd</sup> Ed.) Blackwell Publishing
4. Edwards, R. & Atkinson, K., 1986. Ore Deposit Geology and its influence on Mineral Exploration. Chapman and Hall Ltd.
5. Hutchison, C., Economic Deposits and their Tectonic Setting.

For Ore Deposits in Indian Context:

1. Prasad, U., 2014. Economic Geology: Economic Mineral Deposits (2<sup>nd</sup> Ed.), CBS Publishers, New Delhi
2. Srivastav, J.P., 2012. Introduction to Ore Microscopy. Prentice Hall India Learning Private Limited
3. Tiwari, A.K., 2010. Ore Geology, Economic Minerals and Mineral Economics. Atlantic
4. Gokhale, G.V.G.K., 1983. Ore Deposits of India. CBS Publishers, New Delhi

**Mandatory Reading**

Principle Reference books used for course preparation will be Economic Geology by Walter Pohl and Economic Geology by Umeshwar Prasad.



Course Title: **MARINE GEOLOGY**

Course Code: **GEL-III.E-4**

Credits: **3 (45 Contact hours)**

Marks: **75**

**Course Objectives:**

To provide knowledge on essential concepts of oceanography.

To study the tectonics, geology, economic resources w.r.t. the oceans.

**Course Outcomes:**

Upon completion of the course, the student will be able to,

**CO1** Understand ocean bathymetry and learn to identify features of the ocean floor such as mid ocean ridges, seamounts, guyots, hydrothermal vents, pillow basalts, trenches.

**CO2** Relate the ocean features to its tectonic origin.

**CO3** Understand the various processes which generate ocean currents.

**CO4** Classify marine sediments into four broad categories based on their origin i.e lithogenous , hydrogeneous, biogenous, cosmogenous.

**CO5** Identify the characteristics of important marine resources for the future such as polymetallic nodules and gas hydrates.

**CO6** Recognise how near shore geological processes shape coastlines over time

**Module I**

**(15 hours)**

Ocean basins: Shape, size of the Pacific, Atlantic and Indian Oceans

Coriolis Effect

Ocean circulation

Ocean salinity

Techniques used to study ocean bathymetry

Concept of Plate Tectonics and ocean floor spreading,

Magneto stratigraphy

**Module II**

**(15 hours)**

Marine Provinces

Morphological features of the ocean floor;

Mid Oceanic Ridges and its features;

Abyssal plains and its features

Ocean trench and its features

Continental slope and shelf and their features  
Ocean islands: Hot spot, Atolls

### **Module III**

**(15 hours)**

Clastic Sedimentation in different marine environments:

Biogenic sedimentation  
Chemogenic sedimentation

Near coastal geological processes

Coastal Zone Regulations (CRZ), Exclusive Economic Zone (EEZ); Minerals in the EEZ of India.

Mineral deposits

### **Practicals = 1 credit**

- Preparation of salinity and ocean current map.
- Drawing and labeling of ocean profile.
- Preparation of ocean resource distribution maps
- Visits to National Laboratories engaged in Ocean Research such as NIO and NCAOR.

### **List of books recommended for references:**

- Trujillo, A. P and Thurman H., 2013. Essentials of Oceanography, Eastern Economy Edition, PHI Learning Pvt. Ltd, New Delhi.
- Pinet, R. P., 2009. Invitation to Oceanography,(5<sup>TH</sup> Edition), Jones and Bartlett Publishers, London.
- Thurman, H V. and Trujillo A., 2003, Introductory Oceanography, Prentice Hall.
- Qasim, S.Z., 1996, India's Exclusive Economic Zone, Omega Scientific Roonwal, G.S. Publishers.
- Kennett J P., 1981. Marine Geology, Prentice Hall.

### **Online resources**

- <https://oceanexplorer.noaa.gov/edu/learning/welcome.html> , Date: 15/3/19
- [http://www.nio.org/index/option/com\\_nomenu/task/show/id/134](http://www.nio.org/index/option/com_nomenu/task/show/id/134) , Date: 15/3/19

<https://pubs.usgs.gov/gip/dynamic/dynamic.html> ,

# SEMESTER IV

Course Title: **STRUCTURAL GEOLOGY**

Course Code: **GEL-IV.C-6**

Marks: 75

Credits: 3 (45 Contact hours)

### **Course Objectives**

The course is designed for the students to understand the geometry and mechanics of the various geological structures that result through the deformative processes operative within the earth.

### **Course Outcomes**

Upon completion of the course, the student will be able to,

**CO1** Gather knowledge about the geometry of various structures acquired by rocks at primary and secondary stages.

**CO2** Understand the concepts of stress and strain.

**CO3** Understand the application of stress and strain in rock deformation.

**CO4** Identify rock structures and deformities like joints, folds and faults.

**CO5** Understand a structural separation in geological context based on unconformities.

**CO6** Identify secondary structures developing in rocks.

**CO7** Interpret geological maps

**CO8** Solve structural problems based on provided data.

### **Module I**

**15 hours**

Primary and secondary structures.

Concept of rock deformation.

Stress and Strain in rocks, 2-D stress and strain analysis;

Strain ellipses of different types and their geological significance.

### **Module II**

**15 hours**

Unconformities.

Joints: Joints and fracture mechanics, classification of joints.

Faults: Terminology, classification, criteria for faulting.

Diapirs (salt domes)

**Module III**

**15 hours**

Cleavage and foliation: types, origin and relation to major structures.

Lineations- Description and origin of lineation.

Folds- morphology; Geometric and genetic classification; Mechanics and causes of folding

Lineation and relationship with folds

**Practicals : Credit 1**

Maximum Marks: 25

Solving Geological Maps

Completion of Outcrops

Stereographic Projection of Structural Data

Graphical Solution for Structural Problems

**List of recommended reference books:**

**Mandatory Reading**

- Hobbs, B and Alison, O. R. D., 2014. Structural Geology: The Mechanics of Deforming Metamorphic Rocks, Elsevier Science Publishing Co. Inc
- Fossen, H., 2010. Structural Geology, Cambridge University Press.
- Twiss, R. J and Moores, E. M., (2006). Structural Geology, W H Freeman and Company.
- Pollard, D. D and Fletcher, R. C., (2005). Fundamentals of Structural Geology, Cambridge University Press.
- Davis, G. H., (1996). Structural Geology of Rocks and Regions, Wiley
- Hatcher, R., (1995). Structural Geology: Principles, Concepts and Problems. Pearson.

Course Title: **ENGINEERING GEOLOGY**

Course Code: **GEL-IV.E-5A**

Marks: **75**

Credits: **3 (45 contact hours)**

### **Course Objective**

To impart sufficient knowledge of engineering geology so as to be able to anticipate the technical problems related to geology of various engineering sites and suggest possible remedial measures.

### **Course Outcomes**

Upon completion of the course, the student will be able to,

**CO1** Understand issues related to geological basement and structure of a region.

**CO2** Identify the characteristics of basement rock formations and problems associated with them.

**CO3** Describe and interpret geological structures in geological maps and drawing cross sections.

**CO4** Assess the area appropriately suggested for a geotechnical project and apply the geological knowledge for a safe and secure construction and operation of a geotechnical project.

**CO5** Suggest remedial measures to encounter the problems detected.

**CO6** Interpret core logs and suggest suitable remedial measures.

**CO7** Collect data interpret and analyse it to solve problems associated with the engineering project as well as the environment.

**CO8** Explore and suggest novel ideas using geological background for the geotechnical project.

**CO9** Suggest Site feasibility based on geological maps.

**CO10** Carry out physical and mineralogical descriptions of cores.

**CO11** Draw relationship of core log to RQD values

**CO12** Compute reservoir area, catchment area, reservoir capacity.

**CO13** Solve numerical problems on ultimate strength of rocks

### **Module I**

**(15 hours )**

Aim of engineering geology

Porosity and permeability of rocks

Principles of mechanical behaviour of rock materials

Engineering properties of rocks; specific gravity, compressive strength, hardness, toughness.

Soil profile and Engineering properties of soil;  
Role of structures (joints, fractures, folds, faults) and water/fluids in engineering geology  
Use of rocks / aggregates in construction

**Module II** **(15 hours )**

Role of engineering geologists in planning, design and construction of major man-made civil structural features.

Methods of site investigation

Introduction to core logging

Geological investigations/geotechnical problems related to groundwater occurrence,

**Module III** **(15 hours )**

Geological investigations for landslides, bridges and tunnels -design and construction.

Geological investigations in dams and reservoirs.

Case studies of dam failures

Site improvement methods

**Practical: 1 credit**

**Maximum Marks: 25**

- Site feasibility based on geological map.
- Physical and mineralogical descriptions of cores,
- Relationship of core log to RQD values
  
- Computation of reservoir area, catchment area, reservoir capacity
- Numerical problems on ultimate strength of rocks

**List of recommended reference books.**

- Parthsarthy, A, Panchapakesan, V., Nagarajan, R., (2013) Engineering Geology, Wiley.
- Price, D.G., (2009), Engineering Geology Principles and Practice, Springer.
- Bell, .F.G, (2007). Engineering Geology, Butterworth-Heineman
- Narayanswami S.B.S. (2000), Engineering Geology, Dhanpat Rai & Co, India.
- Sathya, N S., (1992). Engineering Geology, B.S, Dhanpat Rai and Co. Pvt Ltd.
- Gupte R.B. (1992). A Textbook of Engineering Geology., Pune Vidyarthi Griha Prakashan.

Course Title: **OPTICAL MINERALOGY**

Course Code: **GEL-IV.E-6A**

Marks: **75**

Credits: **3 (45 Contact hours)**

### **Course Objectives**

- The objective of the course is to provide the basics of geoscientific studies in Optical Mineralogy involving optical properties of minerals in plane polarized light, in between crossed polars and convergent light. Further, it will strengthen their knowledge in understanding of optical indicatrices and determination of optic sign of minerals. The knowledge of optics is applied in understanding and identification of minerals.

### **Course Outcomes**

Upon completion of the course, the student will be able to,

**CO1** Understand basic concepts in optical mineralogy wrt relief, pleochroism, character between crossed polars, extinction and their types, interference colours, zoning and twinning.

**CO2** Correlate elementary principles of optics to crystal optics.

**CO3** Distinguish Uniaxial and Biaxial Indicatrix

**CO4** Understand the concept of formation of Interference colours and determine their orders as per Newton's Scale.

**CO5** Handle Petrological Microscopes.

**CO6** Identify major rock-forming minerals in microsections.

**CO7** Detect Optic Sign for Uniaxial and Biaxial Minerals using Interference Figures.

**CO8** Determine Anorthite content of Plagioclase.

**CO9** Calculate Optic Axial Angle.

### **Module I**

**(15 hours)**

Introduction: Nature of light, Polarized light, Refractive Index, Critical angle and Total Internal reflection, Wave Surface, Double Refraction.

Parts and working of a Polarizing / Petrological microscope

Properties of minerals in Plane Polarised Light (PPL): Colour, Form, Cleavage/Cracks; Relief, Twinkling; Pleochroism,

Pleochroic halos.



**Module II**

**(15 hours)**

Optical characters of minerals: Isotropism and Anisotropism

Properties of minerals Between Crossed Polars (BXP): Interference colours: Formation, Newton's Scale, Anomalous interference colours;

Extinction and Extinction types.

Twinning and Zoning

Alteration, Inclusions.

**Module III**

**(15 hours)**

Optical accessories

Uniaxial indicatrix

Biaxial indicatrix

Convergent Light: Principle

Uniaxial Interference Figure

Biaxial Interference Figure

Optic sign of Uniaxial and Biaxial Minerals

2V and 2E

**Practical: 1 credit**

**Maximum Marks: 25**

- Identification of common rock forming minerals based on optical properties
- Interference figures (Demonstration)
- Determination of optic sign (demonstration)
- Determination of An-content using extinction angles (demonstration)

**List of books recommended for reference**

**Mandatory Reading**

- Perkins, D., (2015). Mineralogy. Pearson New International Edition
- Nesse, D. W., (2012), Introduction to Optical Mineralogy, Oxford University Press.
- Kerr, P., (1977), Optical Mineralogy, McGraw Hill Publishers.
- MacKenzie, W. S and Guilford, C., Atlas of Rock forming minerals in thin section\_

**Supplementary reading**

- Cornelis, K and Cornelis, H. (1993). Manual of Mineralogy, John Wiley and Sons Ltd.

Course Title: **NATURAL HAZARDS AND MANAGEMENT**

Course Code: **GEL-IV.E-7**

Marks: **75**

Credits: **3 (45 Contact hours)**

Prerequisites: **GEL-III.E-1**

### **Course Objectives**

The course is designed with an aim to give the student an understanding about: various natural hazards; stages in management aimed at avoiding and /or reducing loss to life and property; and Agencies involved in mitigation and management of damage due to hazards.

### **Course Outcomes**

Upon completion of the course, the student will be able to,

**CO1** Understand the causes, effects and mitigation measures for natural hazards such as droughts, floods, cyclones, volcanic eruptions, tsunami, landslides & subsidence, salinity hazards, coastal erosion.

**CO2** Appreciate the CRZ act and its impact on disaster mitigation.

**CO3** Understand the framework and roles of various bodies under the National disaster management plan of India.

**CO4** Prepare a simple disaster management plan for a building/unit.

### **Module I**

**(15 hours)**

Classification of hazards: Natural and man-made disasters

Droughts: types, causes, mitigation

Floods: causes and effects, prediction, Cloud burst/Flashfloods, remedial measures

Cyclones: Structures, origin, effects, prediction, path tracking and early warning systems.

### **Module II**

**(15 hours)**

Volcanic eruption: Types, localization, volcanic hazards and mitigation

Earthquakes: Causes, Magnitude and intensity, Recording, effects and preparedness, Earthquake Zonation Map.

Tsunamis: relation of Tsunamis to tectonics; Damage due to tsunamis, Co-ordinated approach to early warning of tsunamis.

Landslides and Avalanches: Classification of mass wasting, mechanics, causes of landslides and stabilizing methods of slopes; civil engineering measures.

Subsidence: Causes, slow and brisk types

### Module III

(15 hours)

Salinity hazards: Inland and coastal  
Coastal erosion and mitigatory measures  
CRZ act and its impact on disaster mitigation  
National Disaster Management: national and international support  
Planning strategy: co-operative plan, identifying resources, setting priorities.  
Hazard coping operations and rehabilitation  
Proposed operational processes for individual Natural Disasters mentioned above.  
Case study of Parvatibai Chowgule College Disaster Plan

### Practical: 1 credit

#### Maximum Marks: 25

- Hazard zonation map of India: ,earthquakes, floods droughts, landslides and Cyclone
- Discussing disaster management plan for Parvatibai Chowgule College
- Land-use land cover mapping

### List of books recommended for reference

#### Mandatory reading

- Paul, K, B., 2011, Environmental Hazards and Disasters: Context, Perspectives and Management, Wiley-Blackwell, West Sussex.
- Keller, E. A., 2011, Environmental Geology, Santa Barbara Prentice Hall.
- Hess, D., 2012, Mc Knight's Physical Geography, PHI learning, Pvt Ltd, New Delhi.
- Sethi, V. K., 2009, Disaster Management, Essential Books PW, New Delhi.
- Joshi M.V., 2004, Environmental Disaster, Causes, Impacts and Remedies, Adhyayan Publishers.
- Krynine, D. and Judd W., 1998, Principles of Engineering Geology and Geotectonics, McGraw Hill.
- Holmes, A., edited by Duff P.M.D.,1993, 4th edition, Physical Geology, E.L.B.S Publications.
- Valdiya K.S., 1987, Environmental Geology: Indian Context, Tata-McGraw Hill

#### Online resources

- <https://ndma.gov.in/en/national-policy.html> Date:19/3/19
- The Gazette of India : extraordinary [part ii—sec. 3(i)] ministry of environment, forest and climate change notification New Delhi, the 18th January, 2019 G.S.R. 37(e).— [18/01/2019]- coastal regulation zone notification.

[http://www.moef.nic.in/sites/default/files/GSR%2037\(E\)%20DATED%2018.01.2019.pdf](http://www.moef.nic.in/sites/default/files/GSR%2037(E)%20DATED%2018.01.2019.pdf),

Course Title: **GEOTECTONICS**

Course Code: **GEL-IV.E-8**

Marks: **75**

Credits: **3 (45 Contact hours)**

### **Course Objectives**

Ever since the creation of the earth, there have been marked changes in the distribution of land and sea. The dynamics of these changes are stupendous. The subject of Geotectonics aims at understanding the mechanism of such changes and explaining the structure of the earth and the processes responsible for the movement and redistribution of continents and seas.

### **Course Outcomes**

Upon completion of the course, the student will be able to,

- CO1** Gain an insight into the study of the earth's interior using seismic data.
- CO2** Understand the various layers of the earth's interior and the mechanism of plate tectonics.
- CO3** Explain the origin and nature of the earth's magnetic field and palaeomagnetism.
- CO4** Understand the theory of Continental Drift along with supporting evidences.
- CO5** Explain mountain building (orogenesis) and its relation with plate tectonics.
- CO6** Identify and plot various tectonic features on the earth's surface.

### **Module I**

**(15 hours)**

Interior of the earth:

- Clues from the study of earthquake and density;
- The earth's layers; the crust-continental crust and oceanic crust;
- Crust-mantle boundary
- Structure of the mantle
- Low Velocity Zone (LVZ)
- Core-mantle boundary; P wave shadow zone,
- Nature of the core; S wave shadow zone.

Earth's Magnetic field:

- Origin and nature
- Dynamo hypothesis and Herndon's Georeactor Theory.
- Geocentric axial dipole,
- Paleomagnetism,
- Marine magnetic anomalies,
- Magnetic reversals and magnetic stripes

## Module II

(15 hours)

Continental drift:

Wegener's hypothesis.

- Evidences: Continental fit; similarity of rock sequences and mountain ranges; glacial evidence, fossil evidence;

Paleomagnetism and Polar wandering.

*Plate tectonics:*

Plate margins, plate boundaries and associated activities,

Triple junctions;

Divergent, Oceanic Ridges, Sea floor spreading, transform faults; hotspots.

Convergent: oceanic-oceanic, oceanic-continental, continental-continental; oceanic trenches, subduction zones

Transform boundaries;

Wilson Cycle (Rift valleys, the Red sea and the Gulf of Aden)

Geometrical aspects and mechanism of plate motion.

## Module III

(15 hours)

*Mountain building:* Orogenesis

Plate boundaries and orogenesis: Orogenesis at oceanic-oceanic plate boundaries, oceanic-continental plate boundaries and continental-continental plate boundaries.

Case study: Tracking the rise of Himalayas.

Case study: Frequency of Earthquakes in North India

Case Study: Occurrence of Tsunami in SE Asia

### Practical: 1 credit

Maximum Marks: 25

- Plotting of oceanic ridges, trenches, subduction zones, sea mounts, plate boundaries
- Exercises in plate tectonics.

### List of books recommended for reference

Mandatory reading

- Monroe, S. J and R. Wicander., 2014. The Changing Earth: Exploring Geology and Evolution, Brooks Cole Publishers.
- Marshak, S., 2011. Earth: Portrait of a Planet, W. W. Norton & Company.
- Prasad, C. V. R. K., 2005. Elementary Exercises in Geology, Universities Press.
- Skinner, J. B and S. C. Porter., 2003. The Dynamic Earth: An Introduction to Physical Geology, John Wiley and Sons.
- Condie, K. C., 1997. Plate Tectonics and Crustal Evolution, Butterworth-Heinemann.
- Duff, D and Holmes, A., 1993, *Holmes Principles of Physical Geology*, Springer.

# SEMESTER

# V

Course Title: **SEDIMENTARY PETROLOGY**

Course Code: **GEL-V. C-7A**

Credits: **3 (45 Contact hours)**

Marks: **75**

### **Course Objectives**

To provide an understanding of the origin of sedimentary rocks, the relationship of sedimentary processes to plate tectonics, and the use of sedimentary rocks in the study of the geological past.

### **Course Outcomes**

Upon completion of the course, the student will be able to,

**CO1** Understand the processes leading to the formation of sedimentary rocks.

**CO2** Identify and explain the various textures and structures of sedimentary rocks.

**CO3** Relate different sedimentary facies with the environment of deposition.

**CO4** Describe and identify the textures, structures and mineral composition and origin of various clastic and non-clastic sedimentary rocks.

### **Module I**

**(15 hours)**

The Origin of Sedimentary Rocks:

Erosion, transportation and deposition of sediments.

Hjulstrom's diagram

Provenance

Components of clastic sediments: Heavy, Clay, Quartz, Feldspars, other minerals

Environment of deposition and sedimentary facies

Basins - Plate tectonics and sedimentation

Sedimentary Textures

Grain Size, Udden-Wentworth Size Scale, Phi Scale, Roundness and Sphericity.

Maturity: Textural, Mineralogical and Chemical

Classification of Sedimentary rocks (Folk's and Dunham's, Okhadas)

### **Module II**

**(15 hours)**

Primary sedimentary structures

Depositional, Erosional

Secondary sedimentary structures

Chemical, biogenic

Soft sediment deformations

**Module III**

**(15 hours)**

Clastic Sedimentary Rocks

Sandstones, Breccias and Conglomerates:

Textures, Structures, Mineral composition, Textural maturity,

Mudrocks:

Structures, Colour, Mineral composition;

Non-clastic Sedimentary Rocks

Limestones and Dolomites:

Textures; Mineralogy; Structures; Diagenesis, Reefs and Palaeoclimate; Dolomites: Dolomitization.

Residual: (Laterite and Bauxite)

Origin and Climate.

Carbonaceous sediments:

Nature and form of organic residues; The Coal series

**Practical Course: 1credit**

**Maximum Marks: 25**

- Study and identification of sedimentary rocks w.r.t textures, structures, their classification.
- Study of sedimentary rocks in thin sections
- Exercises in grain size and shape analysis.

**List of books recommended for reference**

- Boggs S., (2009) Petrology of Sedimentary rocks (2<sup>nd</sup> edition), Cambridge University Press.
- Blatt H; Tracy R. J and Owens B. E., (2006) Petrology- Igneous Sedimentary and Metamorphic 3<sup>rd</sup> edition W H Freeman and Company New York.
- Boggs, Jr., (2005) Principles of Sedimentology and Stratigraphy (4 edition), Prentice Hall.
- Prothero, D. R., and Schwab, F.; (2004) Sedimentary Geology. Macmillan.
- Tucker E.M. (2001) Sedimentary Petrology (3rd Edition), Blackwell Science Ltd.
- Raymond A L (1995) Petrology-The study of Igneous Sedimentary and Metamorphic rocks. Wm. C. Brown Communications, Inc.; USA.
- Greensmith, J. (1989) Petrology of the Sedimentary rocks (7th Edition), CBS Publishers, New Delhi.
- Ehlers G.E. and Blatt H., (1987) Petrology – Igneous, Sedimentary and Metamorphic, CBS Publishers, New Delhi.
- Pettijohn F.J., (1984) Sedimentary Rocks (3rd Edition), CBS Publishers, New Delhi.
- Colinson, J D & Thompson, (1982) Sedimentary Structures, Allen & Unwin.



Course Title: **PRECAMBRIAN STRATIGRAPHY OF INDIA**

Course Code: **GEL-V.E-9B**

Credits: **3 (45 Contact hours)**

Marks: **75**

### **Course Objectives**

The Peninsular India is a shield comprising of composite crustal blocks of Archean antiquity and therefore it preserves record of the various tectonic events that this land has witnessed. This course aims at providing a basic understanding of the various stratigraphic units and the correlation of International Geological Time Scale with Indian Stratigraphic Time Scale. It aims to provide understanding of the Precambrian geology, stratigraphy, fossil content and the economic resources of the lithounits from the Peninsular India.

### **Course Outcomes**

Upon completion of the course, the student will be able to,

**CO1** Understand evolution and stabilisation of the Archean cratons in India with special emphasis on Dharwar craton.

**CO2** Understand the tectonics behind Mobile Belts of India

**CO3** Differentiate between western Dharwar Craton and Eastern Dharwar Craton.

**CO4** Interpret geological and geochemical differences of the basement rocks for Sargur (Gorur Gneiss) and Dharwarian (Peninsular Gneissic Complex)

**CO5** Relate the lithostratigraphy of Sargur and Dharwar Schist Belt and correlate it with the Goa Group of rocks.

**CO6** Understand the Purana basins in India with emphasis on Cuddapah Vindhyan and Kaladgis.

**CO7** Identify specimens representing rock Formations in Goa

**CO8** Assigning stratigraphy Formations based on fossils.

**CO9** Solve problems in stratigraphic correlation

### **Module I**

**(15 hours)**

Physiographic subdivisions of India and their distinctive characters.

Geology of India

Cratonic provinces of Peninsular India shield: (Dharwar craton/ Singhbhum craton,/Bundelkhand craton/, Aravalli craton,/ Bastar craton) and their economic importance, with emphasis on the Dharwar craton.

Mobile Belts of Peninsular India: Eastern Ghat Mobile Belt, Satpura Mobile Belt, Pandayan Mobile Belt

**Module II**

**(15 hours)**

Gorur Gneiss

Sargur Supracrustals

Dharwar craton: Eastern Dharwar Craton (Deccan Batholith) and Western Dharwar Craton (Peninsular Gneiss)

Greenschist/Greenstone Belts of Peninsular India:

Dharwar type Greenstone Belt: Dharwar Supergroup: Bababudan Group, Chitradurga Group

Goa Group of rocks

Kolar type greenstone Belt: Kolar

**Module III**

**(15 hours)**

Proterozoic Basins of Peninsular India:

Vindhyan Supergroup;

Cuddapah Supergroup;

Kaladgi Supergroup.

Outline of Bhīma Supergroup, Delhi Supergroup, Kurnool Supergroup

**Practical: 1 credit**

**Maximum Marks: 25**

- Study of specimens representing rock formations of Goa.
- Assigning stratigraphy Formations based on fossils.
- Maps related to Indian Geology/ Problems in stratigraphic correlation.

**List of books recommended for reference**

**Mandatory Reading**

- Dessai, A G (2018). Geology and Mineral resources of Goa. New Delhi Publishers
- Mascarenhas, A and Kalavampara, G., (2015). Natural Resources of Goa: A Geological Perspective. Geological Society of Goa.
- Ramakrishnan, M and Vaidynadhan, R., (1994), Geology of India, Geological Society of India Publication, Bangalore. Vol. I and II.

**Supplementary Reading**

- Valdiya, K. S., (2015). The making of India: Geodynamic evolution, Springer
- Nanda, H., (2014), Indian Stratigraphy, Anmol Publications Pvt. Ltd. New Delhi.
- Sharma, R. S., (2009). Cratons and fold belts of India, Springer

Course Title: **PETROLEUM GEOLOGY**

Course Code: **GEL-V.E-10**

Credits: **3 (45 Contact hours)**

Marks: **75**

### **Course Objectives**

The course aims to provide the students an understanding of essential and basic concepts of Petroleum Geology, the process and the operations involved in Petroleum exploration & extraction and to provide knowledge on the petroliferous basins of India.

### **Course Outcomes**

Upon completion of the course, the student will be able to,

- CO1** Describe the Physical & chemical properties of Hydrocarbons.
- CO2** Compare various exploration techniques involved in hydrocarbon detection.
- CO3** Understand the process of drilling & completion of a Petroleum well.
- CO4** Prepare isopach maps.
- CO5** Delineate and describe the petroliferous domains in India.
- CO6** Analyse well logs.

### **Module I**

**(15 hours)**

Introduction and Aspects of Petroleum Geology, Characteristics of Hydrocarbons (Physical and Chemical properties), Petroleum System, Composition, Origin (Types of Kerogen), Occurrence, Migration and Accumulation of Petroleum; Petroleum traps (Stratigraphic and Structural); Reservoir rocks, conditions & mechanisms.

Functions of Petroleum Geologist

Understanding oil and gas: Exploration, Drilling and Completion, Production, Services

### **Module II**

**(15 hours)**

Surface indications and direct detection of Hydrocarbons

Surface and Subsurface exploration techniques: Concept

Geophysical methods of exploration: Gravity and Seismic methods

Types of rigs and its selection

Rotary drilling system and equipment's

Drilling sequence: Coring; Casing and Cementation and Drilling fluids;

### **Module III**

**(15 hours)**

GeoLogging and Well logs (Electric, Radioactive and Acoustic);

Formation evaluation and Testing

### Well Completion and Stimulation

An outline of the oil belts of the world; Global geographic and stratigraphic distributions of oil and gas;

Important Onshore and Offshore Petroliferous basins of India.

Recent trends in Petroleum Geology.

### Practical Course: **1 credit**

Maximum Marks: **25**

- Plotting of Petroliferous basins on maps (World and India)
- Problems based on Well log interpretation
- Creation of carbonate isopachous maps
- Problems on mud circulation
- Observations of well cuttings and cores samples
- Demonstration/Determination of porosity

### List of books recommended for reference

- Hyne, N J., (2001) Nontechnical Guide to Petroleum Geology, Exploration, Drilling and Production, PennWell Corporation.
- Selley, R.C., (1998) Elements of Petroleum Geology, W.H. Freeman & Company, New York.
- North, F.K., (1986) Petroleum Geology, Allen & Unwin, 607p
- Morris, J., (1985) Practical Petroleum Geology, The University of Texas at Austin - Petroleum Extension Service.
- Levorsen, A.I., (1967) Geology of Petroleum, W.H. Freeman and Company.

Course Title: **METAMORPHIC PETROLOGY**

Course Code: **GEL-V. E-11A**

Credits: **3 (45 Contact hours)**

Marks: **75**

### **Course Objectives**

To provide essential concepts of metamorphism and metamorphic rocks.

To study metamorphic rocks w.r.t fabrics and types.

To understand the concept of facies.

Also to understand how metamorphism is related to plate tectonics

### **Course Outcomes**

Upon completion of the course, the student will be able to,

**CO1** Understand metamorphism and their upper and lower limits and study metamorphic concepts like factors, types of metamorphism and facies.

**CO2** Apply fundamental principles of metamorphism to development of textures.

**CO3** Classify metamorphic rocks based on mineral assemblage and fabric.

**CO4** Relate the types of metamorphism with the product.

**CO5** Represent metamorphic rocks graphically using Phase Diagrams.

**CO6** Correlate deformation with grade of metamorphism.

**CO7** Evaluate how the different factors like temperature, pressure, protolith, chemically active fluids and time control metamorphism.

**CO8** Interpret tectonic setting of Metamorphic Belts based on field characters and kinematic stress indicators.

**CO9** Interpret the metamorphic processes combining the evidences derived from hand specimens, microsections and protolith.

**CO10** Differentiate between Barrovian and Buchan Zones

**CO11** Apply the facies concept to progressive contact and regional including burial metamorphism.

**CO12** Identify textures of metamorphic rocks in hand specimens.

**CO13** Identify textures, structures, mineralogy of metamorphic rocks in thin sections

### **Module I**

**(15 hours)**

Definition and explanation of metamorphism (upper and lower limits) and metamorphic rocks.

Factors controlling metamorphism:

Heat (T): Geothermal gradient (in different crustal regions), Radioactivity, magmatic intrusions, tectonics;

Pressure (P): Deviatoric, Lithostatic, Hydrostatic, Fluid pressure

Chemically active fluids ( $X_f$ ):  $H_2O$  and  $CO_2$

Composition of the parent rocks (X): pelites, mafites, ultramafites, quartzofeldspathic, carbonate rocks, sandstones and greywackes.

Time ( $\delta t$ ): Role of time in metamorphism.

Phase Rule and Phase diagrams Graphical representation of metamorphic rocks.

Protoliths.

Types of metamorphism: Regional metamorphism its characteristics and products, burial metamorphism its characteristics and products, contact metamorphism its characteristics and products.

Relationship of brittle and ductile deformation with grade of metamorphism metasomatism, cataclastic metamorphism and their products, impact/shock metamorphism.

Metamorphism in relation to plate tectonics:

Divergent(constructive) boundary

Convergent (Destructive) boundary: subduction zone (sensu lato)

Continent-Continent Collision zones

Intra-plate environments

### **Module II**

**(15 hours)**

Metamorphic textures: Inherited/Relict fabric lepidoblastic, nematoblastic, granoblastic, equigranular mosaic, Porphyroblastic; cataclastic and mylonitic textures.

Kinematic stress indicators and their role in interpreting tectonic history

Nomenclature and classification based on mineralogy and fabric

Field characters of metamorphic rocks:

Variations in mineralogy and fabric. Prograde and Retrograde metamorphism

metamorphic zones and index/critical minerals, their significance in mapping and understanding tectonic history.

### **Module III**

**(15 hours)**

Facies: Concept after Goldschmidt and Eskola; Zonation in mineralogy – Buchanan (Low pressure) Barrovian (high pressure).

Facies of progressive contact metamorphism: characteristic mineral assemblages in pelites and carbonates (pure and impure) protolith

Facies of progressive regional metamorphism – characteristic mineral assemblages wrt facies (Zeolite, Prehnite-Pumpellyite, Greenschist, Amphibolite, Granulite,) in pelitic, mafic protolith.

Facies of burial metamorphism: Blueschist, Eclogite

Paired Metamorphic Belts

**Practical Course: 1 credit**

**Maximum Marks: 25**

- Megascopic study and identification of metamorphic rocks w.r.t mineralogy, texture, type of metamorphism, facies, protolith.
- Microscopic study and identification of metamorphic rocks wrt to mineralogy, texture type of metamorphism, facies and protolith.
- Plotting ACF diagrams and commenting on the protolith.

**List of books recommended for reference**

**Mandatory Reading**

- Winter J D., (2011) Principles of Igneous and Metamorphic Petrology. PHI Learning Pvt. Ltd.
- Philpotts, A & Ague, J (2010) Principles of Igneous and Metamorphic Petrology. Cambridge University Press, New York
- Vernon, R H. and Clarke, G.L., (2008) Principles of Metamorphic Petrology, Cambridge University Press
- Best, M., (2003). Igneous and Metamorphic Petrology, Blackwell Publishing.
- Raymond, A. L., (1995) Petrology-The study of Igneous Sedimentary and Metamorphic rocks. Wm. C. Brown Communications, Inc.; USA.
- Yardley, B W. D., (1989) An introduction to Metamorphic Petrology, Longman Group Publishers Pvt. Ltd.
- Winkler, G. F., (1987) Petrogenesis of Metamorphic rocks 5<sup>th</sup> edition Narosa Publishing House, New Delhi.
- Turner, F., (1980) Metamorphic Petrology: Mineralogical, Field and Tectonic Aspects, CRC Press.

**Supplementary Reading**

- Frost B R and Frost C D., (2014) Essentials of Igneous and Metamorphic Petrology, Cambridge University Press.
- Bucher, K and Grapes, R., (2010) Petrogenesis of Metamorphic rocks, Springer-Heidelberg Dordrecht, London NY.

- Ernst, W G and Rumble D., (2008) Metamorphic Conditions along Convergent Plate Junctions: Mineralogy, Petrology, Geochemistry and Tectonics, Geological Society of Amer.
- Blatt, H; Tracy R. J and Owens B. E., (2006) Petrology- Igneous Sedimentary and metamorphic 3<sup>rd</sup> edition W H Freeman and Company New York.
- Miyashiro, A., (1994) Metamorphic Petrology, CRC Press.
- Roger, M., (1990). Petrology of the Metamorphic Rocks. Unwin Hyman Ltd, UK
- Miyashiro, A, (1978) Metamorphism and Metamorphic belts, The Greshman Press Old Woking, Surrey



Course Title: **REMOTE SENSING AND DIGITAL IMAGE PROCESSING**

Course Code: **GEL-V.E-12**

Credits: **3 (45 Contact hours)**

Marks: **75**

Mandatory requirement: **Individual Laptop with MS Windows OS**

### **Learning Objectives**

This course is designed as an introduction to the use of remote imaging in geologic applications. The basic concepts of image production, processing and interpretations are covered.

### **Course Outcomes**

Upon completion of the course, the student will be able to,

**CO1** Explain remote sensing principles, purposes, advantages and limitations.

**CO2** Define and describe electromagnetic spectrum and interactions with various types of media.

**CO3** Describe characteristics of remote sensing imagery.

**CO4** Describe sensors and image acquisition methods.

**CO5** Search and download satellite imagery from online portals such as Bhuvan, USGS Earth explorer.

**CO6** Understand the application of digital imagery for interpretation of lithology, Structure and geomorphology

**CO7** Prepare various maps using Quantum GIS and Google Earth.

### **Module I**

**(15 hours)**

Energy Sources and Radiation Principles.

Electromagnetic Spectrum

Energy interactions in the Atmosphere: Scattering, Absorption.

Atmospheric windows

Energy interactions with earth surface features: Spectral Reflectance of rock, Soil water, and vegetation.

Photo recognition elements

The concept of resolution: Spatial, Spectral, Temporal and Radiometric.

Space Borne Imaging Systems- The Landsat, IRS, SPOT and High resolution Land Satellites  
(the characteristics of these satellites- orbits, sensors, and their resolutions)

Multispectral remote sensing and hyper spectral remote sensing

**Module II**

**(15 hours)**

Concept of Digital numbers

Georeferencing

Image Rectification and Restoration.

Image Enhancement.: Low and high pass filter, directional filters

Contrast Manipulation.

Spatial Feature Manipulation.

Multi-Image Manipulation.

**Module III**

**(15 hours)**

Image Classification: Unsupervised and Supervised Classification.

Supervised Classification:

    The Training Stage.

    The Classification Stage: Minimum-Distance to Means Classifier, Gaussian Maximum Likelihood Classifier.

Classification Accuracy Assessment and ground truth verification

**Practical Course: 1 credit**

**Maximum Marks: 25**

- Interpretation of Satellite Imagery for – landforms, geological structures, rock and soil types, man-made structures.
- Data Products and Meta data
- Digital Image Processing (using number matrix): enhancement, manipulation and classification.
- Digital image processing on Computer (demonstration)

**List of books recommended for reference**

- Heywood I, Sarah, Cornelius, Steve, Carver., (2011) An Introduction to Geographical Information Systems, Pearson Education Pvt. Ltd., New Delhi.
- Schowengerdt Robert A., (2006) Remote Sensing – Models and Methods for Image Processing, 2<sup>nd</sup> ed., Elsevier (Academic Press).
- George Joseph., (2005) Fundamentals of Remote Sensing, University press Private Ltd, Hyderabad.
- Lillesand, T. M., Ralph W. Kiefer and Jonathan W. Chapman., (2004) Remote Sensing and Image Interpretation, 5<sup>th</sup>ed, Wiley.
- Mather Paul M., (2004) Computer Processing of Remotely Sensed Images- An Introduction, 3rd ed., John Wiley.
- Gupta, R P., (2003) Remote Sensing Geology. Springer-Verlag
- Lillesand T.M. and Kiefer R.W., (2002) Remote Sensing and Image Interpretation, John Wiley and Sons, New Delhi.

- Jensen John R., (2000) Remote Sensing of the Environment – An Earth Resource perspective, Pearson Education Series, Low Price Edition.
- Drury, S.A., (1993) Image Interpretation in Geology, 2<sup>nd</sup> ed., Chapman and Hall, London.
- Harold, R W., (1969) Aerial Stereo Photographs, Hubbard Press, USA.

**Online resources**

- Fundamental of remote sensing, Canada Centre for Mapping and Earth Observation , Natural Resources Canada. <https://www.nrcan.gc.ca/node/9309>
- DST-IGET, Remote Sensing Tutorials <http://dst-iget.in/index.php/tutorialdetails/2/2>

# SEMESTER

# VI

Course Title: **IGNEOUS PETROLOGY**

Course Code: **GEL-VI.C-8A**

Credits: **3 (45 Contact hours)**

Marks: **75**

### **Learning Objectives**

The course will help the students to understand petrologic processes and common rock types. In practical's, students learn to identify, describe and classify rocks using hand specimens and rock thin sections.

### **Course Outcomes**

Upon completion of the course, the student will be able to,

**CO1** Understand conceptual techniques wrt nucleation and growth of minerals thereby understanding the formation of a rock.

**CO2** Identify igneous rocks in hand specimen.

**CO3** Identify igneous rocks in thin sections

**CO4** Classify igneous rocks

**CO5** Evaluate a rock wrt its environment of formation (PT) conditions thereby assign a name.

**CO6** Identify key textural and microstructures and their application related to geological processes.

**CO7** Interpret ternary phase diagrams.

**CO8** Classify rocks based on their chemical analysis.

### **Module I**

**(15 hours)**

Meteorites: Mineralogy and whole rock chemistry

Composition of the earth's interior = Primitive mantle Plate tectonics and igneous activity

Partial Melting and Generation of magma.

Magma Diversity:

Partial Melting: Mafic, Ultramafics

Basalts: Magma types, Basalt Tetrahedron.

Anatexis in Felsic rocks

Granites/Pegmatites: Mingling, Mixing and Crustal contamination

Igneous layering - crystal settling

Gabbroic rocks, Anorthosite

Layered complexes Differentiation: Fractional Crystallization, liquid immiscibility, flowage differentiation

## **Module II**

**(15 hours)**

Ascent and emplacement of magma

Textures and microstructures of igneous rocks:

- a. Primary: Nucleation, Growth, Diffusion
- b. Secondary: Oswald ripening, twinning, zoning

Classification and Description of Igneous Rocks:

The International Union of Geological Sciences (IUGS) Classification System:  
Gabbros, Granites (QAPF diagram).

Ternary System: Diopside-Albite-Anorthite (Di-Ab-An)

## **Module III**

**(15hours)**

Study of the following rock types (mineralogy, petrography and petrogenesis)

Ophiolites  
Granitoids  
Carbonatites  
Kimberlites

### **Practical: 1 credit**

#### **Maximum Marks: 25**

- Study of igneous rocks in hand specimen.
- Study of igneous rocks in thin sections
- CIPW Normative calculations

### **List of books recommended for reference**

#### **Mandatory reading**

- Frost B R and Frost C D., (2014) Essentials of Igneous and Metamorphic Petrology, Cambridge University Press.
- Gill, R., (2010). Igneous rocks and process – A Practical Guide, Wiley-Blackwell
- Winter, J.D., (2009) Principles of Igneous and Metamorphic Petrology, Prentice Hall

#### **Supplementary reading**

- Best, M.G., (2002). Igneous and Metamorphic Petrology, 2nd edn., Blackwell, Oxford.
- Bose, M.K., (1997). Igneous Petrology, The World Press, Kolkata.
- Raymond, A. L., (1995). Petrology-The study of Igneous Sedimentary and Metamorphic rocks. Wm. C. Brown Communications, Inc.; USA.
- MacKenzie, W. S., Donaldson, C H., and Guilford, C., (1982). Atlas of Igneous Rocks and Their Textures, Wiley

Course Title: **PHANEROZOIC STRATIGRAPHY OF INDIA**

Course Code: **GEL-VLE-13B**

Credits: **3 (45 contact hours)**

Marks: **75**

Prerequisite: **GEL-V.E-9A**

### **Course Objectives**

The course will help understanding the Indian stratigraphic units and to correlate International Geological Time Scale with Indian Stratigraphic Time Scale. Also to understand the geology, stratigraphy, fossil content, economic resources of the lithounits from the Phanerozoic Eon from the Indian context.

### **Course Outcomes**

Upon completion of the course, the student will be able to,

**CO1** Understand the Gondwana sedimentation and its economic significance.

**CO2** Understand the geology and geotectonics of Triassic of Spiti.

**CO3** Understand the geology and geotectonics of Jurassic of Kutch.

**CO4** Understand the geology and geotectonics of Cretaceous of Trichinopoly.

**CO5** Understand Deccan Flood Volcanism.

**CO6** Analyse and interpret the Gondwana breakup.

**CO7** Understand the geology and geotectonics of Tertiaries of Assam and its economic significance.

**CO8** Understand the upheaval and evolution of Himalayas.

**CO9** Relate boundary problems associated with Precambrian-Cambrian, Permian-Triassic, Cretaceous-Tertiary and Pleistocene-Holocene boundaries in India and their relation to mass extinctions.

**CO10** Prepare lithostratigraphic maps.

### **Module I**

**(15 hours)**

Precambrian-Cambrian boundary

Cambrian Tal

Muth Quartzites

Gondwana sedimentation: Peninsular, Extra-Peninsular

Permian-Triassic boundary

**Module II**

**(15 hours)**

Jurassic of Kutch  
Cretaceous of Trichinopoly  
Deccan Flood Basalt (Age and Stratigraphy)  
Cretaceous-Paleocene boundary

**Module III**

**(15 hours)**

Tertiaries of Assam  
Rise and evolution of Himalayas  
Siwaliks  
Pleistocene-Holocene Boundary  
Plant and animal life in relation to glacial and interglacial cycles during Quaternary.  
Recent: Laterite Formations of Goa

**Practical Course: 1 credit**

**Maximum Marks: 25**

1. Preparation of lithostratigraphic maps of India showing distribution of important geological formations.
2. Study of type hand specimens from their stratigraphic position and age.
3. Stratigraphic map of Goa

**List of books recommended for reference**

- Nanda, H., (2014) Indian Stratigraphy, Anmol Publications Pvt. Ltd. New Delhi.
- Valdiya, K. S., (2010). The Making of India, Macmillan India Pvt. Ltd.
- Nichols, G., (2009) Sedimentology and Stratigraphy, Wiley-Blackwell and Sons Ltd.
- Sharma, R S., (2009) Cratons and Fold belts of India, Springer-Verlag Berlin Heidelberg.
- Doyle, P. & Bennett, M. R. (1996) Unlocking the Stratigraphic Record. John Wiley.
- Ramakrishnan, M and Vaidynadhan, R., (1994) Geology of India, Geological Society of India Publication, Bangalore. Vol. I and II.



Course Title: **ROCK STRUCTURES AND DEFORMATION MICROSTRUCTURES**

Course Code: **GEL-VI. E-14A**

Credits: **3 (45 Contact hours)**

Marks: **75**

Prerequisite: **GEL-V.E-11A**

### **Learning Objectives**

The course will help to study deformational history of rocks. This study includes the understanding of the deformation and metamorphic processes the rock has undergone with the aim to reconstruct its structural and metamorphic history.

### **Course Outcomes**

Upon completion of the course, the student will be able to,

**CO1** Understand the process and mechanisms of rock structures and rock deformation microstructures.

**CO2** Interpret the significance of microstructures in Igneous, Sedimentary and Metamorphic rocks.

**CO3** Apply the significance of features like foliation and lineation in field as well as in microsections in understanding microstructures and rock deformation.

**CO4** Interpret Shear Sense Indicators in Mylonites.

**CO5** Enhance application skills in relating deformation history to tectonism.

**CO6** Interpret deformation features in field and in microsections.

**CO7** Identify and Interpret the significance of rock structures in thin sections.

**CO8** Identify and Interpret the significance of rock deformation microstructures in thin sections.

### **Module I**

**(15 hours)**

Introduction to microstructures and terminology; Deformation mechanisms and processes– Brittle fracturing, Dissolution, Intracrystalline deformation; Twinning and kinking; Recovery; Recrystallization; Solid state diffusion, Grain Boundary Area Reduction (GBAR), Static recrystallization.

### **Module II**

**(15 hours)**

Foliation and its significance; Lineation and its significance; Mylonites, Shear sense indicators in mylonites; Strain shadows; Deformation of rock-forming minerals; Deformation of polymineralic rocks.

### Module III

(15 hours)

Microstructures of – igneous rocks (porphyritic rocks, mineral intergrowth, zoning); sedimentary rocks (sandstone); metamorphic rocks (isotropic fabrics, growth of porphyroblasts, twinning, symplectite intergrowth) and deformed rocks (deformation twinning, stylolites, GBM), fossils as strain markers

### Practical Course:1 credit

#### Maximum Marks: 25

Study of rock slides exhibiting various microstructures:

- Cuspate and lobate sutured boundaries,
- GBAR (Grain Boundary Area Reduction),
- Bulging (BLG), Subgrain Rotation (SGR); Grain boundary migration (GBM)
- Deformation twins and Displaced twin lamellae
- Bending of cleavage planes, spaced and continuous cleavage
- Mineral (mica) fish,
- Porphyroclasts, asymmetric porphyroclasts depicting shear sense,
- Pressure shadows,
- Warping of foliation around porphyroclasts,
- S-C fabric.

### List of books recommended for reference

#### Mandatory reading

- Winter, J D., (2014) Principles of Igneous and Metamorphic Petrology, Pearson Education Limited.
- Trouw, R A., Passchier, C W and Wiersma, D J., (2010) Atlas of Mylonites - and related microstructures, Springer-Verlag Berlin Heidelberg
- Passchier, C. W and Trouw, R A., (2005) Microtectonics, Springer-Verlag Berlin Heidelberg
- Vernon, R H., (2004) A Practical Guide to Rock Microstructures, Cambridge University Press.
- Blenkinsop, T. (2002) Deformation microstructures and mechanisms in minerals and rocks, Kluwer Academic Publishers.

#### Supplementary Reading

- Mukherjee, S., (2013) Deformation Microstructures in rocks. Springer-Verlag Berlin Heidelberg.

Course Title: **SURVEYING, MAPPING AND FIELD GEOLOGY**

Course Code: **GELVLE-15A**

Marks: **75**

Credits: **3 (45 Contact hours)**

Mandatory requirement: **Individual Laptop with MS Windows OS**

### **Course Objectives**

To Provide basic knowledge of surveying techniques

To upgrade and relate the theoretical knowledge of Geological aspects to field observations.

This course also introduces the basic principles and techniques of Geographic information Systems (GIS)

### **Course Outcomes**

Upon completion of the course, the student will be able to,

**CO1** Carry out dumpy level survey.

**CO2** Carry out plane table survey.

**CO3** Understand SOI Toposheet catalogue.

**CO4** Learn to plan for a geology field trip.

**CO5** Record detailed field observations systematically in their field diary and subsequently prepare a geologic field report of the same.

### **Module I**

**(15 hours)**

Surveying, Objectives of Survey;

Primary divisions of Surveying – Geodetic and Plane Surveys uses and Principles of Surveying.

Methods of locating a point

Plane Table Survey: Instruments, Procedures of Plane table surveys; Methods (Demonstrative):

Radiation and Intersections, advantages and disadvantages of Plane Tabling.

Levelling, characteristics of land surveying instruments, Bench Marks, Change Points.

Levelling operations and steps in Levelling: Demonstration with exercises in the field.

Principles of Levelling: Simple and Differential,

Reduction of Levels: The Collimation, and Rise and Fall systems of Computation.

Theodolite survey: Principles and working,

### **Module II**

**(15 hours)**

SOI Toposheet Indexing scheme, Map symbol reading SOI toposheet map reading

Standard Symbols/colour for lithology and symbols related to structures

Munsell colour chart

Understanding map reliability

GPS surveys

Geological mapping

Basic field gear

Planning a field Project: Preparations for the field, Taking geologic notes in the field: Basic procedures at outcrops – noting characters of igneous, sedimentary and metamorphic rocks, Measuring strike and dip (attitude) of planar and linear features using a clinometer compass, a Brunton Compass.

### **Module III**

**(15 hours)**

Introduction to GIS

Components of GIS

Georeferencing

Digitizing: Point, line, polygon

Attribute data

Map layout and cartographic output

### **Practical course: 1 credit**

#### **Maximum Marks: 25**

- The evaluation is to be based on preparation of portfolio that should include plans drawn using Plane table, a Levelling Exercise.
- Assessment to be based on presentation of Field diary, Field report, and field based viva voce on the localities visited for field work.
- Hands-on exercises in QGIS and Google Earth.

### **List of books recommended for reference**

#### **Mandatory reading**

- Basak, N N., (2014) Surveying and Levelling, McGraw Hill Education.
- Lisle R., Brabham P and Barnes J., (2011) Basic Geological Mapping (Geological Field Guide), Wiley Blackwell.
- C.P.Lo and Albert K. W. Yeung., (2002) Concepts and Techniques of Geographic Information System, Prentice –Hall, India.
- Kang – Tsung – Chang., (2002) Introduction to Geographical Information System, , McGraw Hill.
- Gokhale, N W., (2001) A Guide to Field Geology, CBS Publishers & Distributors.
- Lambert, D A., (1998) Field Guide to Geology, Facts on File Inc.
- Burrough, P. A. and McDonnell, R. A., (2000) Principles of Geographical Information System, Oxford University Press.

- Kanetkar, T P & Kulkarni, S V., (1988) Surveying & Levelling (Part I), Pune VidyarthiGrihaPrakashan.
- Compton, R R., (1985) Geology in the Field, John Wiley & Sons, Inc.
- Compton, R R., (1962) Manual of Field Geology, John Wiley & Sons, Inc.
- Lahee, F H. (1962) Field Geology, McGraw – Hill Book Company, Inc.

#### Supplementary reading

- Robinson W F and Tallack., (2016) Surveying and Levelling Instruments Theoretically and Practically Described for construction, Qualities, Selection, Preservation, Adjustments and Uses: With other apparatus and Appliances used by Civil Engineers and Surveyors in the Field, Wentworth Press.
- Arora, K R., (2015) Surveying Vol-2 (13<sup>th</sup> edition). Standard Book House Unit of Rajsons Publication Pvt. Ltd.
- Penning, W H. and Jukes-Browne., (2011) A Textbook of Field Geology, Nabu Press.
- Coe, A, L., Argles, T W., Rothery, D A and Spicer, R A., (2010) Wiley-Blackwell, The Open University.
- McClay, K R., (2007) The Mapping of Geological Structures, John Wiley and Sons.
- Barnes, J W and Lisle, R J., (2004) Basic Geological Mapping, John Wiley and Sons

#### Online resources

- T. Sutton, O. Dassau, M. Sutton, A Gentle Introduction to GIS, Chief Directorate: Spatial Planning & Information, Department of Land Affairs, Eastern Cape, South Africa (ebook), [http://download.osgeo.org/qgis/doc/manual/qgis-1.0.0\\_a-gentle-gis-introduction\\_en.pdf](http://download.osgeo.org/qgis/doc/manual/qgis-1.0.0_a-gentle-gis-introduction_en.pdf)
- DST-IGET, QGIS Tutorials <http://dst-iget.in/index.php/tutorialdetails/1/1>

Course Title: **PRINCIPLES OF GEOPHYSICAL EXPLORATION AND MINING**

Course Code: **GEL-VI.E-16A**

Credits: **3 (45 Contact hours)**

Marks: **75**

### **Course Objectives**

Mining being a key source of revenue generation for the Central as well as State governments, and an important job provider for Geologists, this course is designed to equip the undergraduate student with basic knowledge of key concepts of mining processes right from exploration to exploitation, together with an acquaintance of government regulations that control the mining and mineral conservation processes. In Geophysical exploration the student will gain first-hand knowledge dealing with the principles and their significance.

### **Course Outcomes**

Upon completion of the course, the student will be able to,

- CO1** Gain knowledge of key concepts of mining processes right from exploration to exploitation
- CO2** Understand the difference between the nature of, and factors leading to the choice between, Open-cast and Underground mining methods.
- CO3** Explain the different techniques of ore beneficiation.
- CO4** Get acquainted with government agencies and regulations that control the mining and mineral conservation processes.
- CO5** Explain the principles behind, and methods of Geophysical, Geochemical and Geobotanical exploration.
- CO6** Draw cross - and longitudinal sections using bore-hole Data.
- CO7** Estimate ore reserves using different methods.
- CO8** Get a first-hand experience in core-logging

### **Module I**

**(15 hours)**

Mining Terminology

Classification of mining methods.

Factors influencing choice of mining method

- Open cast mining
- Underground mining
  - Coal mining methods
  - Alluvial mining

Ore Dressing or Beneficiation:

- Principles and methods
- Terminology of quantification of results

Environmental Impact of Mining

Brief outline of:

National Mineral Policy  
Regulations and Acts  
Regulating Agencies

## **Module II**

**(15 hours)**

Mineral Exploration: Sequence and phases

- Float ores and In situ ores
  - Pits, Trenches and Boreholes
    - Spacing
    - Drilling:
      - Core and non-core drilling
      - Equipment and accessories
      - Core drill sampling
      - core splitting
      - logging
      - Storage
      - Sludge
      - Combining Assay returns from sludge and core

Categories of reserves

Estimation of reserves

- Cross-sectional method
- Area of influence method
- Triangular method
- Weighted volume estimate method
- Estimation of stockpiles by prismatic formula

## **Module III**

**(15 hours)**

Methods of Exploration: Geobotanical, Geochemical and Geophysical.

Geophysical Methods:

*Self-potential method*:, mechanism, equipment, interpretation of anomalies.

*Gravity surveying*:, , Gravity surveying, Interpretation

*Magnetic surveying*:, concepts, Rock magnetism, Geomagnetic field, Magnetic anomalies, Instruments used, Corrections, Interpretation, Application.

Practical Course: **1 credit**

Maximum Marks: **25**

1. Drawing cross - and longitudinal sections using bore-hole data
2. Problems based on estimation of ore reserves
3. Interpretation of bouguer gravity anomaly maps, and magnetic data.
4. Core logging

**List of books recommended for references**

- Keller, E. A., (2011) Environmental Geology, Pearson Prentice Hall.
- Sharma J. P., (2009) Environmental Studies, Laxmi Publications (P) Ltd, New Delhi.
- Lowrie, W., (2007) Fundamentals of Geophysics. Cambridge University Press.
- Marjoribanks, R., (1997) Geological Methods in Mineral Exploration and Mining, Springer-Science+Business Media
- Telford, W. M., Geldart, L. P., and Sheriff, R. E., (1990) Applied geophysics (Vol. I) Cambridge University Press.
- Bhimasarikaram V.L.S., (1990) Exploration Geophysics - An Outline by Association of Exploration Geophysicists, Osmania University, Hyderabad.
- Dobrin, M B and Savit C H., (1988) Introduction to Geophysical Prospecting, McGraw Hill Inc.
- Babu S. K. & Sinha D. K., (1988) Practical Manual of Exploration and Prospecting, CBS Publishers and Distributors, New Delhi.
- Peters, W C., (1987) Exploration and Mining Geology, Wiley
- Ramachandra Rao and Prasaranga, M B, (1975) Outlines of Geophysical Prospecting - A Manual for Geologists by University of Mysore, Mysore.
- Arogyaswamy, R. N. P., (1973) Courses in Mining Geology, Oxford & IBH Publishing Co.
- Sinha, R. K & Sharma N. L., (1970) Mineral Economics, Oxford & IBH Publishing Co.
- McKinstry H. E., (1948) Mining Geology, Prentice-Hill Inc.
- Indian Bureau of Mines (IBM) Publications.



**HINDI**

PARVATIBAI CHOWGULE COLLEGE OF ARTS AND SCIENCE  
AUTONOMOUS

DEPARTMENT OF HINDI  
SYLLABUS OF B.A

SYLLABI OF SEMESTER I AND SEMESTER II FOR THE ACADEMIC YEAR 2015-16

F.Y.B.A - (Semester – I)

Core Paper

Paper Title: हिन्दी कहानी एवं शब्द साधन

Paper Code: HIN -I.C-1

Name of the Faculty: Mr. Pradeep Jatal

Marks: 100

Credits: 04 (60 Lectures)

**Course Objective:**

प्रारंभिक कहानियों से लेकर वर्तमान समय तक लिखी जाने वाली कहानियों की विद्यार्थियों को जानकारी देना। ये कहानियाँ वर्तमान एवं सामाजिक सरोकारों से जुड़ी होने के साथ ही मूल्यनिष्ठ कहानियाँ हैं। साथ ही विद्यार्थियों को व्याकरण का ज्ञान कराना है।

**Syllabus: कहानी संग्रह:** हिन्दी विभाग-पार्वतीबाई चौगुले कॉलेज मडगांव,गोवा

(बी.ओ.एस की सहमति के अनुसार संकलित कहानी संग्रह )

**अध्याय एक :** बड़े भाई साहब (प्रेमचंद),ममता( जयशंकर प्रसाद),परदा( यशपाल),मलबे का मालिक (मोहन राकेश),गोपाल को किसने मारा ( मन्नू भण्डारी),सितंबर की एक शाम( निर्मल वर्मा),कील (महीप सिंह),अपनी वापसी(चित्रा मुदगल (45 Lectures)

**अध्याय दो :** शब्द साधन-(शब्द के भेद,वर्तनी एवं शुद्धलेखन,शब्दयुग्म,मुहावरे,पर्यायवाची शब्द,वाक्यांश के लिए एक शब्द,कारक आदि का सामान्य परिचय) (15 Lectures)

**Learning Outcome:**

इस पाठ्यक्रम को पढ़ने के बाद छात्रों को अब तक की कहानियों एवं कहानीकारों की जानकारी तो प्राप्त होगी ही, साथ ही छात्र हिन्दी लेखन में भी प्रवीण होंगे।

## संदर्भ ग्रंथ

1. कथा कुसुम – संतोष कुमार चतुर्वेदी, लोकभारती प्रकाशन, इलाहाबाद, वर्ष 2012
2. मानक कहानियाँ – सं. मार्कण्डेय, लोकभारती प्रकाशन, इलाहाबाद, वर्ष 2014
3. कथा - रश्मि – सं. चक्रधर, सुमित्र प्रकाशन, इलाहाबाद, वर्ष 2013
4. अभिनव कथा संचय – सं. चक्रधर, लोकभारती प्रकाशन, इलाहाबाद, वर्ष 2013
5. प्रतिनिधि कथामाला – सं. मार्कण्डेय, लोकभारती प्रकाशन, इलाहाबाद, वर्ष 2013
6. हिन्दी व्याकरण – कामताप्रसाद गुरु, हिन्दी – मराठी प्रकाशन, नागपुर, वर्ष 2011

F.Y.B.A - (Semester – I)

**Core Paper**

**Paper Title:** हिन्दी कविता एवं काव्य सौंदर्य

**Paper Code:** HIN-I.C-2

**Name of the Faculty:** Dr. Omprakash Tripathi (H.O.D)

**Marks:** 100

**Credits:** 04 (60 Lectures)

**Course Objective:**

मध्ययुगीन एवं आधुनिक कवियों एवं कविताओं की विद्यार्थियों को जानकारी देना। साथ ही काव्य सौंदर्य के अंतर्गत अलंकार, छंद एवं समास की जानकारी देना।

**Syllabus: कविता संग्रह:** हिन्दी विभाग-पार्वतीबाई चौगुले कॉलेज मडगांव, गोवा

(बी.ओ.एस की सहमति के अनुसार संकलित कविता संग्रह)

**अध्याय एक :** कबीर, सूरदास, तुलसीदास, रहीम, निराला, अज्ञेय, धूमिल, कीर्ति चौधरी (45 Lectures)

**अध्याय दो :** काव्यसौंदर्य-शब्दालंकार(अनुप्रास, यमक, श्लेष) (15 Lectures)

अर्थालंकार(उपमा, रूपक, उत्प्रेक्षा)

मात्रिक छंद (दोहा, सोरठा, चोपाई)

वर्णिक छंद (इंद्रवज्रा, उपेन्द्रवज्रा, सवैया)

समास(सभी समास)

**Learning Outcome:**

इस पाठ्यक्रम के माध्यम से विद्यार्थी अब तक की कविताओं एवं कवियों की जानकारी प्राप्त करेंगे। साथ ही विद्यार्थी अलंकार, छंद और समास से भी परिचित होंगे।

**संदर्भ ग्रंथ**

1. काव्य सरगम – सन्तोष कुमार चतुर्वेदी, लोकभारती प्रकाशन, इलाहाबाद, वर्ष 2013
2. काव्य मंजूषा – सं. डॉ. सत्यप्रकाश मिश्र, लोकभारती प्रकाशन, इलाहाबाद, वर्ष 2003
3. काव्य –वैभव – सं. दूधनाथ सिंह, लोकभारती प्रकाशन, इलाहाबाद, वर्ष 2014
4. काव्य – वाटिका – सं. डॉ. मत्स्येन्द्र नाथ शुक्ल, लोकभारती प्रकाशन, इलाहाबाद, वर्ष 2005
5. काव्यशास्त्र - भगीरथ मिश्र, विश्वविद्यालय प्रकाशन, वाराणसी, वर्ष 1999
6. हिन्दी व्याकरण-डॉ. ब्रजकिशोर प्रसाद सिंह, नमन प्रकाशन, नई दिल्ली, वर्ष 2009

**F.Y.B.A - (Semester – II)**

**Core Paper**

**Paper Title:** हिन्दी नाटक: वृत्तचित्र एवं फीचर फिल्म (सैद्धांतिक पक्ष)

**Paper Code:** HIN-II.C-3

**Name of Faculty:** Dr. Omprakash Tripathi (H.O.D)

**Marks:** 100

**Credit:** 4 (60 Lectures)

**Course Objective**

शंकर शेष का नाटक 'एक और द्रोणाचार्य' के माध्यम से नाटक का परिचय कराते हुए विद्यार्थियों को आज की शिक्षा व्यवस्था की वास्तविकता का परिचय कराना। साथ ही वृत्तचित्र एवं फीचर फिल्म लेखन के सैद्धांतिक पक्ष की जानकारी देना।

**Syllabus:** एक और द्रोणाचार्य-शंकर शेष

**अध्याय एक:** 'एक और द्रोणाचार्य' की पृष्ठभूमि, लेखक परिचय, नाटक का उद्देश्य, देशकाल वातावरण, पात्र, संवाद, भाषा-शैली आदि पर विचार। (45 Lectures)

**अध्याय दो:** वृत्तचित्र लेखन एवं फीचर लेखन का सैद्धांतिक पक्ष (15 Lectures)

**Learning Outcome:**

'एक और द्रोणाचार्य' पढ़ने के बाद विद्यार्थियों को अभिनय कौशल के प्रति अभिरुचि पैदा होगी। अभिनय के माध्यम से वे समाज का रूप ज्यादा अच्छी तरह समझेंगे। साथ ही वे वृत्तचित्र लेखन एवं फीचर लेखन के सैद्धांतिक पक्ष से परिचित होंगे।

**संदर्भ ग्रंथ**

1. एक और द्रोणाचार्य – डॉ. शंकर शेष, पराग प्रकाशन, दिल्ली
2. हिन्दी साहित्य : युग और प्रवृत्तियाँ – डॉ. शिवकुमार शर्मा, अशोक प्रकाशन, वर्ष 1970
3. साठोत्तर हिन्दी नाटक-के. वी. नारायण कुरूप लोकभरती प्रकाशन, इलाहाबाद, वर्ष 2007
4. समकालीन फिल्मों के आईने में समाज-सत्यदेव त्रिपाठी शिल्पायन प्रकाशन, दिल्ली, वर्ष 2013
5. साहित्य और सिनेमा -सं.डॉ.शैलजा भारद्वाज, चिंतन प्रकाशन, कानपुर वर्ष 2013

6. सिनेमा और साहित्य- हरीश कुमार संजय प्रकाशन,दिल्ली,वर्ष 2010

**F.Y.B.A - (Semester – II)**

**Core Paper**

**Paper Title:** हास्य - व्यंग्य निबंध एवं पत्रकारिता

**Paper Code:** HIN-II.C-4

**Name of Faculty:** Mr.Pradeep jatal

**Marks:** 100

**Credit:** 4 (60 Lectures)

**Course Objectives:**

भारतेन्दु युग से लेकर अब तक के हास्य- व्यंग्य निबंधों से विद्यार्थियों का परिचय कराना, ताकि वे हास्य-व्यंग्य निबंधों की गंभीरता एवं वैचारिकता को समझ सकें। साथ ही पत्रकारिता की जानकारी से विद्यार्थी रोजगार से जुड़ सकेंगे।

**Syllabus:** निबंध संग्रह हिन्दी विभाग-पार्वतीबाई चौगुले कॉलेज मडगांव,गोवा

(बी.ओ.एस की सहमति के अनुसार संकलित निबंध संग्रह)

**अध्याय एक:** स्वर्ग में विचार सभा आयोजन (भारतेन्दु हरिश्चंद्र) नया साल (अमृतराय), अपना मकान (इंद्रनाथ मदान), पगडंडियों का जमाना (हरिशंकर परसाई), अध्यक्ष महोदय (शरद जोशी), अंगद का पाँव (श्रीलाल शुक्ल) घूस एक चिकनाई है (रवींद्र कालिया), धमाका (अभिमन्यु अनंत)

(45 Lectures)

**अध्याय दो:** पत्रकारिता(सामान्य परिचय, भेद, उपयोगिता एवं महत्व) (15 Lectures)

**Learning Outcome:**

इस पाठ्यक्रम को पढ़ने के बाद विद्यार्थी यह समझ जाएंगे कि गद्य की अन्य विधाओं की तुलना में हास्य-व्यंग्य किस प्रकार अलग और चुटीला है। पत्रकारिता की जानकारी से उनके लिए रोजगार के अनेक रास्ते खुलेंगे।

**संदर्भ ग्रंथ**

1. नवीन हास्य –व्यंग्य –सं. सुरेश आचार्य, लोकभारती प्रकाशन, इलाहाबाद, वर्ष 2009
2. मेरे श्रेष्ठ दलित व्यंग्य –रामअवतार यादव, अमन प्रकाशन, कानपुर, वर्ष 2010
3. प्रयोजनमूलक हिन्दी – विनोद गोदरे, वाणी प्रकाशन, नई दिल्ली, वर्ष 2007

4. निबंधकार आचार्य हजारी प्रसाद द्विवेदी – डॉ. विजयबहादुर सिंह, संजय बुक सेंटर, वाराणसी, वर्ष 1985
5. हिन्दी हास्य व्यंग निबंध :रूप यात्रा -डॉ. संसार चन्द्र,किताब महल,इलाहाबाद ,वर्ष 1986
6. पत्रकारिता और पत्रकारिता-डॉ. अरुण जैन हिन्दी बूक सेंटर, दिल्ली
7. पत्रकारिता: विविध विधाएँ -डॉ. राजकूमारी रानी,जय भारती प्रकाशन,इलाहाबाद



**F.Y.B.A - (Semester – I)**

**Optional Paper**

**Paper Title:** व्यावहारिक हिन्दी

**Paper Code:**

**Name of the Faculty:** Mr. Pradeep Jatal

**Marks: 100**

**Credits: 04** (60 Lectures)

**Course Objective:**

आज साहित्यिक हिन्दी के साथ – साथ उसका व्यावहारिक रूप उभरकर सामने आ रहा है। उदाहरण के रूप में बैंक के क्षेत्र में, रेल विभाग में, रेडियो, दूरदर्शन तथा विभिन्न जनसंचार माध्यमों में हिन्दी के व्यावहारिक रूप से विद्यार्थियों को परिचित कराना।

**Syllabus:**

**अध्याय एक :** व्यावहारिक हिन्दी का सामान्य परिचय, स्वरूप एवं व्याप्ति (16 Lectures)

**अध्याय दो :** व्यावहारिक हिन्दी के विविध क्षेत्र (28 Lectures)

**अध्याय तीन :** व्यावहारिक एवं साहित्यिक हिन्दी में अंतर (16 Lectures)

**Learning Outcome:**

इस पाठ्यक्रम के पूरा होने के बाद विद्यार्थी इस स्थिति में पहुँचेंगे कि वे पारंपारिक शिक्षा से आगे बढ़कर व्यावहारिक हिन्दी के माध्यम से नये एवं तकनीकी क्षेत्रों में रोजगार प्राप्त कर सकें।

**संदर्भ ग्रंथ**

1. प्रयोजनमूलक हिन्दी अधुनातन आयाम – डॉ. अंबादास देशमुख, शैलजा प्रकाशन, कानपुर, वर्ष 2006
2. प्रयोजनमूलक हिन्दी – विनोद गोदरे, वाणी प्रकाशन, नई दिल्ली, वर्ष 2007
3. प्रयोगात्मक और प्रयोजनमूलक हिन्दी – डॉ. रामप्रकाश, डॉ. दिनेश गुप्त, राधाकृष्ण प्रकाशन, नई दिल्ली, वर्ष 1994

**F.Y.B.A - (Semester – II)**

**Optional Paper**

**Paper Title:** वाचन – लेखन कौशल

**Paper Code:**

**Name of the Faculty:** Dr. Omprakash Tripathi (H.O.D)

**Marks:** 100

**Credits:** 04 (60 Lectures)

**Course Objective:**

इस पाठ्यक्रम के माध्यम से विद्यार्थियों में वाचन एवं लेखन कौशल की वृद्धि कराना है। संगणक युग में भी वाचन – लेखन कौशल बना रहें, इस दिशा में प्रयत्न कराना है। उन्हें क्रमशः इन दो कौशलों के माध्यम से उस सोपान तक ले जाना है, जहाँ वे हिन्दी भाषा का प्रयोग एवं लेखन सही ढंग से कर सकें।

**Syllabus:**

**अध्याय एक :** भाषा – कौशल और उसका क्रमिक विकास (28 Lectures)

**अध्याय दो :** वाचन एवं लेखन –कौशल का स्वरूप (16 Lectures)

**अध्याय तीन :** वाचन – लेखन में योग्यता प्राप्ति के विविध सोपान (16 Lectures)

**Learning Outcome:**

इस पाठ्यक्रम के पूरा होने के बाद विद्यार्थी निश्चित रूप से हिन्दी भाषा पर अधिकार प्राप्त कर सकेंगे। विशेष रूप से विद्यार्थियों का वाचन – लेखन कौशल पुष्ट होगा। वे भाषण की कला में और सर्जनात्मक कला में निपुण होंगे।

**संदर्भ ग्रंथ**

1. हिन्दी का सही प्रयोग – नीलम मान, तक्षशिला प्रकाशन, नई दिल्ली, वर्ष 2005
2. हिंदी भाषाशिक्षण के आयाम – मनोरमा गुप्त
3. भाषाशिक्षण – रवीन्द्रनाथ श्रीवास्तव

नोट : इस प्रश्न पत्र पर विद्यार्थियों से प्रैक्टिकल कराया जाएगा।

**S.Y.B.A - (Semester – III)**

**Core Course**

**Course Title:** प्रयोजनमूलक हिन्दी: अनुवाद एवं पत्रलेखन

**Course Code:** HIN-III C-5

**Name of the Faculty:** Pradeep Rangrao Jatal

**Marks:** 100

**Credits:** 04 (60 Lectures)

**Course Objective:**

आज का युग आधुनिकीकरण, निजीकरण और भूमंडलीकरण की प्रक्रिया से गुजर रहा है। ऐसी स्थिति में हिन्दी की भूमिका केवल साहित्यिक हिन्दी तक सीमित न रहकर नए ज्ञान विज्ञान एवं तकनीकी क्षेत्रों से गुजर रही है। इन क्षेत्रों में प्रयोजनमूलक हिन्दी की अहम भूमिका है। अनुवाद और पत्रलेखन का महत्व तथा उसकी आवश्यकता को ध्यान में रखकर इन क्षेत्रों में बढ़ते अवसरों से विद्यार्थियों को परिचित कराना।

**Learning Outcome:**

इस पाठ्यक्रम के पूरा होने के बाद विद्यार्थी इस स्थिति में पहुँचेंगे कि वे पारंपरिक शिक्षा से आगे बढ़कर प्रयोजनमूलक हिन्दी के माध्यम से अनुवाद के क्षेत्रों में रोजगार प्राप्त करने तथा पत्र लेखन में सक्षम होंगे।

**Syllabus:**

अध्याय एक : प्रयोजनमूलक हिन्दी का सामान्य परिचय (24 Lectures)

प्रयोजनमूलक हिन्दी के विविध क्षेत्र

राष्ट्रभाषा, राजभाषा के रूप में हिंदी का विकास

राजभाषा संबंधी प्रमुख प्रावधान

अध्याय दो : अनुवाद: अवधारणा एवं स्वरूप (18 Lectures)

कार्यालयीन अनुवाद

व्यावसायिक अनुवाद

व्यावहारिक अनुवाद का अभ्यास

अध्याय तीन : पत्रलेखन : औपचारिक पत्रलेखन

(18 Lectures)

अनौपचारिक पत्रलेखन

व्यावसायिक पत्रलेखन

कार्यालयीन पत्रलेखन

### संदर्भ ग्रंथ

1. डॉ. रामप्रकाश, डॉ. दिनेश गुप्त, *प्रयोगात्मक और प्रयोजनमूलक हिन्दी* - राधाकृष्ण प्रकाशन, नई दिल्ली
2. डॉ. अंबादास देशमुख, *प्रयोजनमूलक हिन्दी: अधुनातन आयाम* - शैलजा प्रकाशन, कानपुर
3. विनोद गोदरे, *प्रयोजनमूलक हिन्दी* - वाणी प्रकाशन, नई दिल्ली
4. डॉ. कैलाश नाथ पाण्डेय *प्रयोजनमूलक हिन्दी की नई भूमिका* - लोकभारती प्रकाशन, इलाहाबाद-  
नई दिल्ली

**S.Y.B.A - (Semester – III)**

**Elective Course**

**Course Title:** हिन्दी साहित्य का इतिहास (आदिकाल, भक्तिकाल एवं रीतिकाल)

**Course Code:** HIN-III E-1

**Name of the Faculty:** Dr. O. P. Tripathi

**Marks:** 100

**Credits:** 04 (60 Lectures)

**Course Objective:**

प्रारंभ से लेकर रीतिकाल तक हिन्दी साहित्य के इतिहास की विद्यार्थियों को जानकारी देना। इससे विद्यार्थियों को ज्ञात होगा कि आज हिन्दी का जो स्वरूप है, उसका प्रारंभिक रूप किस प्रकार का था। वे प्राचीन हिन्दी भाषा और विशेष रूप से प्राचीन एवं मध्यकालीन साहित्य से परिचित होंगे।

**Learning Outcome :**

इस पाठ्यक्रम को पढ़ने के बाद विद्यार्थी हिन्दी साहित्य के आदिकाल, भक्तिकाल और रीतिकाल के साहित्य से परिचित होंगे। साथ ही इनसे संबन्धित प्रमुख कवियों का संक्षेप में उन्हें परिचय भी प्राप्त होगा।

**Syllabus:**

अध्याय एक: आदिकालीन साहित्य की पृष्ठभूमि और रासो, सिद्ध, जैन, नाथ काव्य परंपरा का सामान्य परिचय एवं प्रमुख कवि परिचय। (चंदबरदाई और विद्यापति) (20 Lectures)

अध्याय दो: भक्तिकालीन साहित्य की पृष्ठभूमि और संत, सूफी, राम, कृष्ण काव्य धाराओं का सामान्य परिचय एवं प्रमुख कवि परिचय । (कबीर और मीराबाई) (20 Lectures)

अध्याय तीन : रीतिकालीन साहित्य की पृष्ठभूमि और रीतिबद्ध, रीतिसिद्ध एवं रीतिमुक्त काव्य धाराओं का सामान्य परिचय एवं प्रमुख कवि परिचय। (20 Lectures)  
(बिहारी और घनानन्द )

संदर्भ ग्रंथ:

- 1) डॉ. बच्चन सिंह, *हिन्दी साहित्य का दूसरा इतिहास*, राधाकृष्ण प्रकाशन, नयी दिल्ली
- 2) डॉ. वासुदेव सिंह, *हिन्दी साहित्य का समीक्षात्मक इतिहास*, संजय बूक सेंटर वाराणसी
- 3) डॉ. रामकुमार वर्मा, *हिन्दी साहित्य का आलोचनात्मक इतिहास*, रामनारायण लाल प्रकाशन, इलाहाबाद-उ.प्र.
- 4) डॉ. फणीश सिंह, *हिन्दी साहित्य: एक परिचय*, राजकमल प्रकाशन, नयी दिल्ली
- 5) डॉ. रामस्वरूप चतुर्वेदी, *हिन्दी साहित्य और संवेदना*, लोकभारती प्रकाशन, इलाहाबाद
- 6) डॉ. शिवकुमार शर्मा, *हिन्दी साहित्य: युग और प्रवृत्तियाँ*, अशोक प्रकाशन, नई सड़क, दिल्ली

S.Y.B.A - (Semester – III)

**Elective Course**

**Course Title:** मध्यकालीन काव्य (चयनित कविताएँ)

**Course Code:** HIN-III E-2

**Name of the Faculty:** Pradeep Rangrao Jatal

**Marks:** 100

**Credits:** 04 (60 Lectures)

**Course Objective:**

विद्यार्थियों को मध्यकालीन परिस्थितियों से अवगत कराते हुए तत्कालीन कविताओं से परिचित कराना। साथ ही रीतिकाल की कुछ प्रमुख शृंगारिक रचनाओं के माध्यम से यह बताना कि रीतिकालीन कविताएँ किस प्रकार दरबारी संस्कृति से जुड़ गई।

**Learning Outcome:**

इस पाठ्यक्रम को पढ़ने के बाद विद्यार्थी मध्यकालीन कवि तथा कविताओं की जानकारी प्राप्त करेंगे। इससे उन्हें ज्ञात होगा कि आदिकालीन कविता किस प्रकार मध्यकाल से होती हुई रीतिकाल की दरबारी संस्कृति से जुड़ गई।

**Syllabus:**

अध्याय एक: कबीर, रविदास, और जायसी (20 Lectures)

अध्याय दो: सूरदास, तुलसीदास और मीराबाई (20 Lectures)

अध्याय तीन: बिहारी, देव और घनानन्द (20 Lectures)

(प्रत्येक का 10 दोहे एवं 6 पदों की व्याख्या)

**संदर्भ ग्रंथ-**

- 1) विश्वंभर 'मानव', प्राचीन कवि- लोकभारती प्रकाशन, इलाहाबाद नयी दिल्ली पटना
- 2) सं. आचार्य रामचन्द्र शुक्ल, जायसी ग्रंथावली- विनय प्रकाशन, कानपुर-2
- 3) विश्वनाथ त्रिपाठी, मीरा का काव्य- वाणी प्रकाशन-21-ए, दरियागंज, नयी दिल्ली
- 4) श्री. जगन्नाथदास 'रत्नाकर', बिहारी रत्नाकर- लोकभारती प्रकाशन, इलाहाबाद नयी दिल्ली पटना
- 5) डॉ. शिवकुमार शर्मा, हिन्दी साहित्य: युग और प्रवृत्तियाँ- अशोक प्रकाशन, नयी सड़क, दिल्ली-6

**S.Y.B.A - (Semester – III)**

**Elective Course**

**Course Title:** हिन्दी महिला लेखन

**Course Code:** HIN-III E-3

**Name of the Faculty:** Dr.O.P. Tripathi

**Marks:** 100

**Credits:** 04 (60 Lectures)

**Course Objective:**

हिन्दी में महिला लेखन अपने से पूर्व के साहित्य से किस प्रकार अलग है, इसकी जानकारी विद्यार्थियों को देना। साथ ही इस लेखन का उद्देश्य क्या है, इसका भी विद्यार्थियों को जान कराना।

**Learning Outcome:**

इस पाठ्यक्रम को पढ़ने के बाद विद्यार्थी हिन्दी के अधुनातन साहित्य से परिचित होंगे। विद्यार्थियों को ज्ञात होगा कि प्राचीन एवं परंपरागत साहित्य से महिला लेखन किस अर्थ में अलग एवं विशिष्ट है।

**Syllabus :**

अध्याय एक: महिला लेखन की अवधारणा, पृष्ठभूमि, स्वरूप एवं विकास (08 Lects.)

अध्याय दो: महिलाओं द्वारा लिखित प्रमुख कहानियाँ (आठ कहानियाँ ) (32 Lects.)

(मन्नू भण्डारी, सुधा अरोड़ा, उषा प्रियंवदा, चित्रा मुद्गल, मैत्रेयी पुष्पा, जया जाधवानी,  
ममता कालिया, सूर्यबाला )

अध्याय तीन: महिलाओं द्वारा लिखित प्रमुख कविताएँ (आठ कविताएँ ) (20 Lects.)

(अनामिका, निलेश रघुवंशी, सुशीला टाकभोरे, कात्यायनी, सविता सिंह, रमा सिंह,  
प्रभा खेतान, जयश्री राय)

(चयनित प्रमुख महिला कहानियाँ एवं कविताएँ )



संदर्भ ग्रंथ:

- 1) सरला माहेश्वरी, *नारी प्रश्न*, राधाकृष्ण प्रकाशन, नयी दिल्ली
- 2) क्षमा शर्मा, *स्त्री विमर्श: समाज और साहित्य*, राजकमल प्रकाशन, नयी दिल्ली
- 3) वीरेंद्र मोहन, *कविता और मानवीय मुक्ति*, शिल्पायन, शाहदरा, दिल्ली

**S.Y.B.A - (Semester – III)**

**Elective Course**

**Course Title:** हिंदी दलित लेखन

**Course Code:** HIN-III E-4

**Name of the Faculty:** Dr. O. P. Tripathi

**Marks:** 100

**Credits:** 04 (60 Lectures)

**Course Objective:**

हिन्दी में दलित लेखन साहित्य की मुख्य धारा से किस प्रकार अलग है, इसकी जानकारी विद्यार्थियों को देना। साथ ही इस लेखन का उद्देश्य क्या है, इसका भी विद्यार्थियों को ज्ञान कराना।

**Course Outcome :**

विद्यार्थियों को ज्ञात होगा कि प्राचीन एवं परंपरागत साहित्य से दलित लेखन किस अर्थ में अलग एवं विशिष्ट है और यह लेखन अपने यथार्थ को किस बेबाकी और सच्चाई के साथ स्वानुभूति को व्यक्त कर रहा है।

**Syllabus:**

अध्याय एक: दलित लेखन की अवधारणा एवं उसका विकास	(08 Lects.)
अध्याय दो: दलित कहानियाँ (आठ कहानियाँ )	(32 Lects.)
अध्याय तीन: दलित कविताएँ (आठ कविताएँ)	(20 Lects.)
(चयनित दलित कहानियाँ एवं कविताएँ )	

**संदर्भ ग्रंथ-**

- 1) तेज सिंह, *आज का दलित साहित्य*, अप्रतिम प्रकाशन, हरि नगर, नयी दिल्ली
- 2) तेज सिंह, *दलित समाज और संस्कृति*, आधार प्रकाशन, पंचकुला, हरियाणा
- 3) तेज सिंह, *अंबेडकरवादी साहित्य का समाजशास्त्र*, किताबघर, दरियागंज, नयी दिल्ली

S.Y.B.A - (Semester – IV)

**Core Course**

**Course Title:** हिन्दी पत्रकारिता: मुद्रित एवं इलेक्ट्रॉनिक

**Course Code:** HIN-IV.C-6

**Name of the Faculty:** P. R. Jatal

**Marks:** 100

**Credits:** 04 (60 Lectures)

**Course Objective:**

- 1) हिन्दी पत्रकारिता के इतिहास से विद्यार्थियों को अवगत कराना।
- 2) मुद्रित माध्यमों में रोजगार के अवसरों की विद्यार्थियों को जानकारी देना।
- 3) इलेक्ट्रॉनिक माध्यमों की बढ़ती व्याप्ति को समझते हुए उसमें प्राप्त रोजगार संबंधी जानकारी विद्यार्थियों को देना।

**Learning Outcome:**

- 1) इस पाठ्यक्रम के पूरा होने के बाद विद्यार्थी हिन्दी पत्रकारिता के इतिहास से अवगत होंगे।
- 2) पारंपरिक शिक्षा से आगे बढ़कर पत्रकारिता के क्षेत्र में रोजगार प्राप्त करने में सक्षम होंगे।

**Syllabus:**

- अध्याय एक -** i. पत्रकारिता का सामान्य परिचय, स्वरूप एवं विकासक्रम (20 Lectures)  
ii. पत्रकारिता के विविध प्रकार (खेल पत्रकारिता, मनोरंजन पत्रकारिता, खोजी पत्रकारिता, आर्थिक पत्रकारिता, बाल पत्रकारिता, महिला पत्रकारिता)  
iii. पत्रकारिता का महत्त्व  
iv. पत्रकारिता संबंधी कानून

- अध्याय दो-** हिन्दी मुद्रित पत्रकारिता का उद्भव और विकास (20 Lectures)  
i. स्वतंत्रता पूर्व हिन्दी पत्रकारिता  
ii. स्वातंत्र्योत्तर हिन्दी पत्रकारिता  
iii. प्रमुख साहित्यिक पत्र-पत्रिकाएँ  
(साप्ताहिक, मासिक, त्रैमासिक पत्रिकाएँ)

अध्याय तीन -हिन्दी की इलेक्ट्रॉनिक पत्रकारिता: संक्षिप्त विकास क्रम

(20 Lectures)

- क) रेडियो पत्रकारिता
- ख) टी. वी. पत्रकारिता
- घ) इंटरनेट पत्रकारिता

**संदर्भ ग्रंथ-**

1. कैलाशनाथ पाण्डेय, 'प्रयोजनमूलक हिन्दी की नयी भूमिका', लोकभारती प्रकाशन, इलाहाबाद, 2007
2. डॉ.अंबादास देशमुख, 'प्रयोजनमूलक हिन्दी के अधुनातन आयाम', शैलजा प्रकाशन, कानपुर, 2006
3. डॉ.रामप्रकाश, डॉ. दिनेशगुप्त, 'प्रयोगात्मक और प्रयोजनमूलक हिन्दी', राधाकृष्ण प्रकाशन, नई दिल्ली, 2014
3. एन. सी. पंत, 'पत्रकारिता का इतिहास' तक्षशिला प्रकाशन, अंसारी रोड, दरियागंज, नई दिल्ली, 2002
4. सविता चड्ढा, 'हिन्दी पत्रकारिता: सिद्धान्त और स्वरूप' तक्षशिला प्रकाशन, अंसारी रोड, दरियागंज, नई दिल्ली, 1995
5. डॉ. अजय प्रकाश, डॉ. रमेश वर्मा, 'प्रयोजनमूलक हिन्दी' समवेत प्रकाशन, रामबाग ,कानपुर, 2005

S.Y.B.A - (Semester – IV)

**Elective Course**

**Course Title:** आधुनिक हिन्दी कविता (इतिहास एवं काव्य संग्रह)

**Course Code:** HIN-IV.E-5

**Name of the Faculty:** Dr. Omprakash Tripathi

**Marks:** 100

**Credits:** 04 (60 Lectures)

**Course Objective:**

विद्यार्थियों को आधुनिक हिन्दी कविता के इतिहास से परिचित कराना। उन्हें यह बताना कि अपनी किन विशिष्टताओं के कारण आधुनिक काल की कविता और उसके कवि सीधे समाज और राष्ट्र प्रेम से जुड़े।

**Learning Outcome:**

इस पाठ्यक्रम के अध्ययन के बाद विद्यार्थी आधुनिक काल की कविताओं से और उनके कवियों से परिचित होंगे। उन्हें आधुनिक कालीन कविताओं की विभिन्न प्रवृत्तियों को भी जानने का अवसर मिलेगा।

**Syllabus:**

**अध्याय एक:**

भारतेन्दुयुगीन कविता, द्विवेदी युगीन कविता, छायावादी कविता, प्रगतिवादी कविता, प्रयोगवादी कविता: सामान्य प्रवृत्तियाँ एवं प्रतिनिधि कवियों का सामान्य परिचय।

(भारतेन्दु हरिश्चंद्र, मैथिलीशरण गुप्त, जयशंकर प्रसाद, नागार्जुन, अज्ञेय ) (20 Lectures)

**अध्याय दो:**

राष्ट्रीय सांस्कृतिक काव्यधारा, नई कविता, नवगीत, हिन्दी गजल एवं समकालीन कविता:

सामान्य परिचय एवं प्रतिनिधि कवियों का सामान्य परिचय।

(माखनलाल चतुर्वेदी, मुक्तिबोध, शंभुनाथ सिंह, दुष्यंतकुमार, राजेश जोशी) (20 Lectures)

**अध्याय तीन:**

द्रौपदी (नरेन्द्र शर्मा) खण्ड काव्य का अध्ययन।

(व्याख्या के लिए निर्धारित अंश) (20 Lectures)

## संदर्भ ग्रंथ

1. डॉ.शिवकुमार शर्मा, 'हिन्दी साहित्य: युग और प्रवृत्तियाँ', अशोक प्रकाशन, नयी सड़क, दिल्ली, 1970
2. आचार्य रामचन्द्र शुक्ल, 'हिन्दी साहित्य का इतिहास' प्रकाशन संस्थान, नई दिल्ली, 2003
3. डॉ. रमेश चंद्र शर्मा, 'हिन्दी साहित्य का इतिहास' विद्या प्रकाशन, गुजैनी, कानपुर, 2002
4. डॉ. गणपति चन्द्र गुप्त, 'हिन्दी साहित्येतिहास' अटलांटिक प्रकाशन एंड डिस्ट्रीब्यूटर्स, दिल्ली, 1989
5. राजनाथ शर्मा, 'हिन्दी साहित्य का विवेचनात्मक इतिहास' विनोद पुस्तक मंदिर, आग्रा, 1978
6. डॉ. नगेन्द्र, 'हिन्दी साहित्यका इतिहास', नेशनल पब्लिशिंग हाउस, दरियागंज, दिल्ली, 1973

S.Y.B.A - (Semester – IV)  
**Elective Course**

**Course Title:** विशेष अध्ययन: सूर्यकांत त्रिपाठी निराला

**Course Code:** HIN-IV.E-6

**Name of the Faculty:** Dr. Omprakash Tripathi

**Marks:** 100

**Credits:** 04 (60 Lectures)

**Course Objective:**

विद्यार्थियों को सूर्यकांत त्रिपाठी निराला के समग्र जीवनवृत्त एवं साहित्य से परिचित कराना। विद्यार्थियों को यह बताना कि निराला किस प्रकार छायावादी अन्य कवियों से अलग और महत्वपूर्ण थे।

**Learning Outcome:**

इस पाठ्यक्रम के अध्ययन के पश्चात विद्यार्थी निराला के समग्र साहित्य से परिचित होंगे। विद्यार्थियों को ज्ञात होगा कि अपनी किन विशिष्टताओं के कारण छायावादी कवियों में निराला आज सबसे अधिक प्रासंगिक हैं।

**Syllabus:**

**अध्याय एक:** निराला का जीवन वृत्त, निराला की काव्य दृष्टि, निराला का गद्य साहित्य।

(20 Lectures)

**अध्याय दो:** वह तोड़ती पत्थर, स्नेह निर्झर बह गया है, कुकुरमुत्ता, दान, जागो फिर एक बार, विधवा, वसंत आया, बादल राग, मरा हूँ हजार मरण, सरोज स्मृति(दस कविताओं का अध्ययन) (20 Lectures)

**अध्याय तीन:** बिल्लेसुर बकरिहा रेखाचित्र का अध्ययन।

(20 Lectures)

**संदर्भ ग्रंथ**

1. नंदकिशोर नवल, 'निराला रचनावली-1' राजकमल प्रकाशन, नेताजी सुभाष मार्ग, नई दिल्ली, 1983
2. नंदकिशोर नवल, 'निराला रचनावली-2' राजकमल प्रकाशन, नेताजी सुभाष मार्ग, नई दिल्ली, 1983
3. बच्चन सिंह, 'आधुनिक हिन्दी साहित्य का इतिहास', लोकभारती प्रकाशन, इलाहाबाद, 2007
4. प्रो. सूर्यप्रसाद दीक्षित, 'निराला समग्र', उत्तरप्रदेश हिन्दी संस्थान, लखनऊ, 2015
5. डॉ. फणीश सिंह, 'हिन्दी साहित्य - एक परिचय', राजकमल प्रकाशन, नयी दिल्ली, 2006

S.Y.B.A - (Semester – IV)

**Elective Course**

**Course Title:** विशेष अध्ययन: हिन्दी कहानी

**Course Code:** HIN-IV.E-7

**Name of the Faculty:** P. R. Jatal

**Marks:** 100

**Credits:** 04 (60 Lectures)

**Course Objective:**

- 1) आधुनिक हिन्दी कहानी साहित्य से विद्यार्थियों को अवगत कराना।
- 2) विद्यार्थियों को कहानी एवं उसके इतिहास से परिचित कराना।
- 3) विद्यार्थियों को हिन्दी के प्रमुख कहानिकारों का परिचय कराना।

**Learning Outcomes:**

- 1) इस पाठ्यक्रम को पढ़ने के बाद विद्यार्थी हिन्दी के कहानी साहित्य से अवगत होंगे।
- 2) विद्यार्थी कहानी विधा से परिचित होंगे।
- 3) छात्र हिन्दी के प्रमुख कहानीकारों से परिचय प्राप्त करेंगे।

**Syllabus:**

**अध्याय एक** - कहानी: स्वरूप एवं तत्व (10 Lectures)

**अध्याय दो-** हिन्दी कहानी का उद्भव और विकास (20 Lectures)

i. प्रेमचंद पूर्व कहानी

ii. प्रेमचंद युगीन कहानी

iii. प्रेमचंदोत्तर कहानी

iv. नई कहानी एवं प्रमुख आंदोलन

(समांतर कहानी, सचेतन कहानी एवं जनवादी कहानी)

**अध्याय तीन-** हिन्दी कहानी संग्रह - पार्टिशन तथा अन्य कहानियाँ - स्वयंप्रकाश (30 Lectures)



### संदर्भ ग्रंथ-

1. गोपाल राय, 'हिन्दी कहानी का इतिहास,' राजकमल प्रकाशन, इलाहाबाद, 2008
2. बच्चन सिंह, 'हिन्दी साहित्य का दूसरा इतिहास' , राजकमल प्रकाशन, नयी दिल्ली, 2004
3. रामस्वरूप चतुर्वेदी , 'हिन्दी साहित्य और संवेदना का विकास', लोकभारती प्रकाशन, इलाहाबाद, 2005
4. डॉ. फणीश सिंह, 'हिन्दी साहित्य: एक परिचय', राजकमल प्रकाशन, इलाहाबाद, 2006
5. डॉ. नगेन्द्र, 'हिन्दी साहित्य का इतिहास', नेशनल पब्लिशिंग हाउस, दरियागंज, दिल्ली, 1973

S.Y.B.A - (Semester - IV)

**Elective Course**

**Paper Title:** हिन्दी साहित्य का आस्वादन एवं समीक्षा (कविता, कहानी एवं उपन्यास)

**Paper Code:** HIN-IV.E-8

**Name of the Faculty:** Dr.O. P. Tripathi

**Marks:** 100

**Credits:** 04 (60 Lectures)

**Course Objective:**

- 1) चयनित हिन्दी साहित्यका संकलन एवं विश्लेषण कराना।
- 2) हिन्दी साहित्यिक परंपरा का अभ्यास कराना।
- 3) हिन्दी साहित्य पर प्रपत्र बनाने का अभ्यास कराना।
- 4) हिन्दी साहित्य का आस्वादन, समीक्षा और शोध कार्य हेतु प्रवृत्त कराना।

**Learning Outcomes:**

- 1) इस पाठ्यक्रम के माध्यम से विद्यार्थी शोधकार्य की प्रक्रिया को समझेंगे और उसमें प्रवृत्त होंगे, जिससे विद्यार्थियों को भविष्य में शोध कार्य करने में सुविधा और मदद मिलेगी।
- 2) इससे नए समीक्षक और शोधार्थी तैयार होंगे।

**Syllabus:**

**अध्याय एक** - समीक्षा का अर्थ, स्वरूप एवं आधार (20 Lectures)

**अध्याय दो** - काव्य आस्वादन और समीक्षा (निर्धारित कृति का आस्वादन एवं समीक्षा) (20 Lectures)

**अध्याय तीन** - कथा आस्वादन और समीक्षा (निर्धारित कृति का आस्वादन एवं समीक्षा) (20 Lectures)

**संदर्भ ग्रंथ:**

1. डॉ. ओमप्रकाश त्रिपाठी, 'समीक्षा के विविध रंग', विद्या प्रकाशन, कानपुर, 2014
2. डॉ. मधु खराटे, डॉ. शिवाजी देवरे, 'अनुसंधान प्रविधि और प्रक्रिया' विद्या प्रकाशन, कानपुर, 2013
3. अभिलाषा दिवाकर, 'शोध कैसे करें', मार्क पब्लिशर, जयपुर, 2014

S.Y.B.A - (Semester – IV)  
Inter Disciplinary Course

Course Title: एकांकी और पथनाट्य: प्रस्तुतीकरण

Course Code: HIN-IV.ID-2

Name of the Faculty: P. R. Jatal

Marks: 100

Credits: 04 (60 Lectures)

**Course Objective:**

- 1) इस पाठ्यक्रम के माध्यम से विद्यार्थियों को एकांकी और पथनाट्य लेखन हेतु प्रवृत्त करना।
- 2) एकांकी और पथनाट्य के माध्यम से विद्यार्थियों के अभिनय कौशल को विकसित करना।
- 3) विद्यार्थी एकांकी तथा पथनाट्य को प्रस्तुत करने का तंत्र समझेंगे।

**Learning Outcomes:**

- 1) विद्यार्थी एकांकी एवं पथनाट्य लेखन में दक्ष प्राप्त करेंगे।
- 2) एकांकी वाचन कला में निपुण होंगे।
- 3) एकांकी और पथनाट्य के प्रस्तुतीकरण सेछात्रों में अभिनय कौशल विकसित होगा।
- 4) विद्यार्थियों में अभिनय के साथ-साथ अन्य कौशलों का भी विकास होगा।

**Syllabus:**

अध्याय एक - एकांकी : प्राथमिक लेखन, प्रकट वाचन, समूह चर्चा, पुनर्लेखन	(15 Lectures)
अध्याय दो - पथनाट्य : प्राथमिक लेखन, प्रकट वाचन, समूह चर्चा, पुनर्लेखन	(15 Lectures)
अध्याय तीन - एकांकी : समूह में प्रस्तुतीकरण एवं मूल्यांकन	(15 Lectures)
अध्याय चार - पथनाट्य: समूह में प्रस्तुतीकरण एवं मूल्यांकन	(15 Lectures)

**संदर्भ ग्रंथ-**

1. डॉ. रामशरण महेंद्र, 'एकांकी और एकांकीकार', वाणी प्रकाशन, नई दिल्ली, 2001
2. सं. अखिलेश कुमार मिश्र, 'अंधेर-नगरी, भारत दुर्दशा', प्रयाग प्रकाशन, इलाहाबाद, 1985
3. ममता कालिया, 'आप न बदलेंगे', लोकभारती प्रकाशन, इलाहाबाद, 2013
4. दया प्रकाश सिन्हा, 'हास्य एकांकी', वाणी प्रकाशन, दिल्ली, 2015

**PARVATIBAI CHOWGULE COLLEGE OF  
ARTS AND SCIENCE  
(AUTONOMOUS)**

**UNDERGRADUATE DEPARTMENT OF HINDI**

**SYLLABUS**

**SEMESTER V & VI FOR THE ACADEMIC  
YEAR 2017-2018**

T.Y.B.A - (Semester – V)

**Core Course**

**Course Title:** मीडिया लेखन: रेडियो एवं टेलीविजन

**Course Code:** HIN-V.C-7

**Marks:** 100

**Credits:** 04 (60 Lectures)

**Course Objective:**

इस पाठ्यक्रम के माध्यम से विद्यार्थियों को मीडिया लेखन की जानकारी देना। विशेष रूप से रेडियो एवं टेलीविजन से संबंधित लेखन से उन्हें अवगत कराना, क्योंकि आज रेडियो एवं टेलीविजन मीडिया का सशक्त माध्यम बन गए हैं।

**Learning Outcome**

इस पाठ्यक्रम के माध्यम से विद्यार्थी मीडिया लेखन से अच्छी तरह परिचित होंगे। रेडियो एवं दूरदर्शन से संबंधित लेखन में प्रवृत्त होंगे। साथ ही रोजगार की दिशा में विद्यार्थियों का मार्ग प्रशस्त होगा।

**Syllabus:**

**अध्याय एक-** रेडियो लेखन के सिद्धान्त, रेडियो लेखन के प्रकार- समाचार लेखन, रेडियो वार्ता, भेंट वार्ता, चर्चा - परिचर्चा, रेडियो नाटक, रेडियो की भाषा। 20 Lects.

**अध्याय दो-** टेलीविजन लेखन के सिद्धान्त, टेलीविजन लेखन के प्रकार- समाचार लेखन, साक्षात्कार, धारावाहिक लेखन, टेलीविजन की भाषा। 20 Lects.

**अध्याय तीन-** रेडियो और टेलीविजन लेखन के व्यावहारिक रूप का अध्ययन: रेडियो वार्ता लेखन, संवाद लेखन, दृश्य रूपान्तरण, भेंट वार्ता, रेडियो-समाचार लेखन, रेडियो विज्ञापन लेखन, टेलीविजन विज्ञापन लेखन 20 Lects.

**संदर्भ ग्रंथ-**

1. सं. डॉ. सुभाष तलेकर, 'रोजगाराभिमुख हिन्दी :दिशाएँ एवं संभावनाएँ', नंदादीप प्रकाशन, पुणे, 2010
2. डॉ. सुजाता वर्मा, 'पत्रकारिता और मीडिया,' विकास प्रकाशन, कानपुर, 2016
3. रामशरन जोशी, 'मीडिया विमर्श', सामयिक प्रकाशन, दरियागंज, नई दिल्ली, 2002
4. डॉ. अजय प्रकाश, डॉ.रमेश वर्मा, 'प्रयोजनमूलक हिन्दी', समवेत प्रकाशन, रामबाग, कानपुर, 2005
5. डॉ. अंबादास देशमुख, 'प्रयोजनमूलक हिन्दी:अधुनातन आयाम' , शैलजा प्रकाशन, कानपुर, 2006

**T.Y.B.A - (Semester – V)**

**Core Course**

**Course Title:** कथेतर गद्य साहित्य: संस्मरण, यात्रा वृतांत, आत्मकथा एवं जीवनी  
(किसी विधा की एक पाठ्य पुस्तक)

**Course Code:** HIN-V.E-9

**Marks:** 100

**Credits:** 04 (60 Lectures)

**Course Objective:**

इस पाठ्यक्रम से हिन्दी गद्य की मुख्य विधा के अलावा विद्यार्थियों को अन्य विधाओं की जानकारी देना। इनमें मुख्य विधाएँ हैं- संस्मरण साहित्य, यात्रा वृतांत, आत्मकथा साहित्य एवं जीवनी साहित्य। इन विधाओं में आज काफी लेखन कार्य हो रहा है, इनकी उन्हें जानकारी देना।

**Learning Outcome:**

इस पाठ्यक्रम के द्वारा विद्यार्थी हिन्दी गद्य की मुख्य विधा के अलावा अन्य विधाओं से परिचित होंगे। वे संस्मरण, यात्रा, आत्मकथा एवं जीवनी साहित्य के उद्भव एवं विकास की जानकारी प्राप्त करेंगे। साथ ही इन विधाओं के लेखकों का साहित्य में क्या योगदान है, इसकी जानकारी प्राप्त करेंगे।

**Syllabus:**

- अध्याय एक** - संस्मरण, यात्रा वृतांत, आत्मकथा एवं जीवनी साहित्य: अवधारणा  
एवं स्वरूप 20 Lects.
- अध्याय दो** - संस्मरण, यात्रा वृतांत, आत्मकथा एवं जीवनी साहित्य: उद्भव एवं विकास  
20 Lects.
- अध्याय तीन** - किसी विधा की एक पाठ्यपुस्तक: याद हो कि न याद हो- काशीनाथ सिंह  
(चयनित) 20Lects.

**संदर्भ ग्रंथ-**

1. डॉ. शांति खन्ना, 'आधुनिक हिन्दी का जीवनीपरक साहित्य', सन्मार्ग प्रकाशन, बेंगलोर रोड, दिल्ली, 1973
2. डॉ. संजय नवले, 'साहित्यशास्त्र', दिव्य डिस्ट्रीब्यूटर्स, कानपुर, 2009
3. डॉ. रमेशचन्द्र शर्मा, 'हिन्दी साहित्य का इतिहास', विद्या प्रकाशन, कानपुर, 2002
4. डॉ. लक्ष्मीसागर वाष्ण्य, 'हिन्दी साहित्य का इतिहास', लोकभारती प्रकाशन, इलाहाबाद, 1981
5. डॉ. सुधाकर कलवडे, 'साहित्यशास्त्र परिचय', पुस्तक संस्थान नेहरू नगर, कानपुर, 1985

T.Y.B.A - (Semester – V)

**Core Course**

**Course Title:** विशेष अध्ययन: हिन्दी उपन्यास

**Course Code:** HIN-V.E-10

**Marks:** 100

**Credits:** 04 (60 Lectures)

**Course Objective:**

इस पाठ्यक्रम के माध्यम से विद्यार्थियों को हिन्दी उपन्यास का स्वरूप एवं तत्व की जानकारी देना। उन्हें हिन्दी उपन्यास के विकासक्रम की जानकारी देना। साथ ही उपन्यासकारों के उद्देश्य को उन तक पहुँचाना।

**Learning Outcome:**

इस पाठ्यक्रम के माध्यम से विद्यार्थियों को हिन्दी उपन्यास का स्वरूप एवं तत्व की जानकारी प्राप्त होगी। साथ ही वे हिन्दी उपन्यास के विकासक्रम से परिचित होंगे। उपन्यासों का समाज से क्या संबंध है, इसकी जानकारी उन्हें प्राप्त होगी।

**Syllabus:**

अध्याय एक- उपन्यास: स्वरूप एवं तत्व, हिन्दी उपन्यास का उद्भव (प्रेमचंद पूर्व, प्रेमचंद युग)	20 Lects.
अध्याय दो- हिन्दी उपन्यास का विकास (प्रेमचंदोत्तर युग, साठोत्तरी युग, विमर्श केन्द्रित )	20 Lects.
अध्याय तीन- एक उपन्यास का अध्ययन: मोहनदास - उदयप्रकाश	20 Lects.

**संदर्भ ग्रंथ-**

1. डॉ. रामलखन शुक्ल, 'हिन्दी उपन्यास कला', सन्मार्ग प्रकाशन, बेंगलौ रोड, दिल्ली, 1972
2. डॉ. शांतिस्वरूप गुप्त, 'हिन्दी साहित्य: प्रकीर्ण विचार', शोक प्रकाशन, नई सड़क, दिल्ली, 1967
3. डॉ. रामनारायण सिंह, 'मधुर हिन्दी के ऐतिहासिक उपन्यास', ग्रंथम, रामबाग, कानपुर, 1971
4. डॉ. ज्ञान अस्थाना, 'हिन्दी उपन्यासों में ग्राम समस्याएँ', जवाहर पुस्तकालय, मथुरा, 1979
5. पदुमलाल पुन्नलाल बखशी, 'हिन्दी कथा साहित्य', हिन्दी ग्रंथ-रत्नाकर कार्यालय, बंबई, 1954

T.Y.B.A - (Semester – V)

**Core Course**

**Course Title:** भारतीय काव्यशास्त्र

**Course Code:** HIN-V.E-11

**Marks:** 100

**Credits:** 04 (60 Lectures)

**Course Objective:**

इस पाठ्यक्रम के माध्यम से विद्यार्थियों को भारतीय काव्यशास्त्र की जानकारी देना। भारतीय आचार्यों के चिंतन का ज्ञान प्राप्त कराना। साथ ही हिन्दी के आधुनिक आचार्यों के काव्यशास्त्रीय चिंतन की जानकारी देना।

**Learning Outcome:**

इस पाठ्यक्रम को पढ़ने के बाद विद्यार्थी भारतीय काव्यशास्त्र से परिचित होंगे। वे भारतीय आचार्यों के काव्यशास्त्रीय सिद्धांतों को समझेंगे और इसके साथ ही आधुनिक हिन्दी आचार्यों ने काव्यशास्त्र के विषय में क्या कहा है, इससे भी विद्यार्थी परिचित होंगे।

**Syllabus:**

- अध्याय एक** - काव्य की परिभाषा स्वरूप एवं भेद 20 Lects.  
- काव्य के तत्त्व, हेतु एवं प्रयोजन
- अध्याय दो** - रस सिद्धान्त- स्वरूप, अवयव और उसके भेद 20 Lects.  
- अलंकार सिद्धान्त- सामान्य परिचय  
- ध्वनि सिद्धान्त- सामान्य परिचय (शब्दशक्ति)
- अध्याय तीन** -- रीति सिद्धान्त- सामान्य परिचय 20 Lects.  
- वक्रोक्ति सिद्धान्त- सामान्य परिचय  
- औचित्य सिद्धान्त- सामान्य परिचय  
- शुक्ल एवं द्विवेदी का काव्य चिंतन

**संदर्भ ग्रंथ-**

1. डॉ. कन्हैयालाल अवस्थी, 'काव्यशास्त्र भारतीय एवं पाश्चात्य', आशीष प्रकाशन, कानपुर, 2012
2. जयचंद्र राय, 'आचार्य रामचन्द्र शुक्ल: सिद्धान्त और साहित्य', भारती साहित्य मंदिर, दिल्ली, 1963
3. डॉ. आनंद प्रकाश दीक्षित, 'रस सिद्धान्त: स्वरूप-विश्लेषण', राजकमल प्रकाशन, दिल्ली, 1972
4. डॉ. संजय नवले, 'साहित्यशास्त्र', दिव्य डिस्ट्रीब्यूटर्स, कानपुर, 2009
5. बलदेव उपाध्याय, 'भारतीय साहित्यशास्त्र', प्रसाद परिषद, काशी, 1955



T.Y.B.A - (Semester – V)

**Core Course**

**Course Title:** हिंदी नाटक

**Course Code:** HIN-V.E-12

**Marks:** 100

**Credits:** 04 (60 Lectures)

**Course Objective:**

इस पाठ्यक्रम के माध्यम से विद्यार्थियों को हिन्दी नाटक, स्वरूप एवं तत्व से परिचित कराना। उन्हें नाटक के उद्भव एवं विकास की जानकारी देना। साथ ही एक नाटक का अध्ययन कराना।

**Learning Outcome**

इस पाठ्यक्रम के माध्यम से विद्यार्थी हिन्दी नाटक स्वरूप एवं तत्व से परिचित होंगे। उन्हें नाटक के उद्भव एवं विकास की जानकारी प्राप्त होगी। साथ ही एक नाट्य रचना का अध्ययन करके नाट्य विधा को समझेंगे।

**Syllabus:**

**अध्याय एक** - नाटक: स्वरूप एवं तत्व, भारतीय नाट्य परंपरा (शास्त्रीय एवं लोक नाट्य) 20 Lects.

**अध्याय दो** - हिन्दी नाटक: उद्भव एवं विकास 20 Lects.

**अध्याय तीन** - किसी एक नाटक का अध्ययन-  
आषाढ का एक दिन- मोहन राकेश 20 Lects.

**संदर्भ ग्रंथ-**

1. डॉ. पशुपतिनाथ उपाध्याय, 'हिन्दी नाटक एवं रंगमंच', जवाहर पुस्तकालय, मथुरा, 2009
2. डॉ. सविता चौधरी, 'साठोत्तरी हिन्दी नाटक', विद्या प्रकाशन गुजैनी, कानपुर, 2012
3. नेमिचन्द्र जैन, 'रंगदर्शन', राधाकृष्ण प्रकाशन, नई दिल्ली, 2008
4. डॉ. बच्चन सिंह, 'हिन्दी नाटक', साहित्य भवन प्रा.लि., इलाहाबाद, 1958
5. डॉ. भोलानाथ, 'हिन्दी साहित्य', हिन्दी परिषद, प्रयाग, 1971

T.Y.B.A - (Semester – VI)

**Core Course**

**Course Title:** हिंदी भाषा, लिपि एवं व्याकरण

**Course Code:** HIN-VI.C-8

**Marks:** 100

**Credits:** 04 (60 Lectures)

**Course Objective:**

इस पाठ्यक्रम के माध्यम से विद्यार्थियों को हिन्दी भाषा की जानकारी देना। भाषा परिवर्तन के कारणों का पता लगाना। देवनागरी लिपि से परिचित कराना एवं उसकी वैज्ञानिकता पर प्रकाश डालना और साथ ही विद्यार्थियों को हिन्दी व्याकरण से अवगत कराना।

**Learning Outcome**

इस पाठ्यक्रम के माध्यम से विद्यार्थी हिन्दी भाषा की जानकारी प्राप्त करेंगे। उसमें आनेवाले परिवर्तन को समझेंगे। विद्यार्थियों को देवनागरी लिपि का ज्ञान प्राप्त होगा। इसके साथ ही हिन्दी व्याकरण से पूर्णतया परिचित होंगे।

**Syllabus:**

**अध्याय एक – हिन्दी भाषा-प्राचीन एवं मध्यकालीन आर्यभाषा**

हिन्दी भाषा का उद्भव और विकास

20 Lects.

**अध्याय दो - लिपि- देवनागरी लिपि का उद्भव एवं विकास, देवनागरी लिपि की विशेषताएँ**

देवनागरी लिपि का मानकीकरण

20 Lects.

**अध्याय तीन - व्याकरण: वर्ण विचार- स्वर, व्यंजन, वर्तनी की समस्या।**

20 Lects.

शब्दसाधन- विकारी एवं अविकारी शब्दों का सामान्य परिचय।

हिन्दी की रूप रचना- उपसर्ग, प्रत्यय एवं समास के आधार पर।

संज्ञा, सर्वनाम, विशेषण, क्रिया का रूपान्तरण ।

संदर्भ ग्रंथ-

1. डॉ. ब्रज किशोर प्रसाद सिंह, 'हिन्दी व्याकरण', नमन प्रकाशन, दरियागंज, दिल्ली, 2009
2. कामताप्रसाद गुरु, 'हिन्दी व्याकरण', हिन्दी-मराठी प्रकाशन, नागपुर, 2011
3. डॉ. हरदेव बाहरी, 'व्यावहारिक हिन्दी व्याकरण', लोकभारती प्रकाशन, इलाहाबाद, 1997
4. श्री शरण, 'हिन्दी-अशुद्धियाँ संदर्भ शोधन', प्रेम प्रकाशन मंदिर, दिल्ली, 1997
5. डॉ. विजय लक्ष्मण वर्धे, अत्यावश्यक हिन्दी व्याकरण, फडके बुकसेलर्स, कोल्हापुर, 1993

T.Y.B.A - (Semester – VI)

**Core Course**

**Course Title:** हिंदी निबंध

**Course Code:** HIN-VI.E-13

**Marks:** 100

**Credits:** 04 (60 Lectures)

**Course Objective:**

इस पाठ्यक्रम के माध्यम से विद्यार्थियों को हिन्दी निबंध के स्वरूप एवं तत्व की जानकारी देना। उन्हें हिन्दी निबंध के क्रमिक विकास से परिचित कराना। साथ ही एक निबंध संग्रह के अध्ययन के माध्यम से निबंध विधा की जानकारी देना।

**Learning Outcome**

इस पाठ्यक्रम के माध्यम से विद्यार्थी हिन्दी निबंध के स्वरूप एवं तत्व से परिचित होंगे। उन्हें हिन्दी निबंध के उद्भव एवं विकास की जानकारी प्राप्त होगी। एक निबंध संग्रह के अध्ययन के बाद निबंध विधा को अच्छी तरह से समझेंगे।

**Syllabus:**

अध्याय एक - निबंध: स्वरूप, तत्व एवं भेद	20 Lects.
अध्याय दो - हिन्दी निबंध: उद्भव एवं विकास	20 Lects.
अध्याय तीन - किसी एक निबंध संग्रह का अध्ययन जिंदगी मुस्कराई- कन्हैयालाल मिश्र 'प्रभाकर'	20 Lects.

**संदर्भ ग्रंथ-**

1. डॉ. गणपतिचन्द्र गुप्त, 'साहित्यिक निबंध', लोकभारती प्रकाशन, इलाहाबाद, 1981
2. डॉ. भोलानाथ, 'हिन्दी साहित्य' हिन्दी परिषद, प्रकाशन प्रयाग, 1971
3. रामचन्द्र शुक्ल, 'हिन्दी साहित्य का इतिहास', नागरी प्रचारिणी सभा, काशी, 1961
4. बच्चन सिंह, 'आधुनिक हिन्दी साहित्य का इतिहास', लोकभारती प्रकाशन, इलाहाबाद, 2005
5. डॉ. नगेन्द्र, डॉ. हरदयाल, 'हिन्दी साहित्य का इतिहास', मयूर पेपरबैक्स, 2014

T.Y.B.A - (Semester – VI)

**Core Course**

**Course Title:** भाषाविज्ञान

**Course Code:** HIN-VI.E-14

**Marks:** 100

**Credits:** 04 (60 Lectures)

**Course Objective:**

इस पाठ्यक्रम के माध्यम से विद्यार्थियों को भाषाविज्ञान की जानकारी देना। उसके अध्ययन क्षेत्र एवं दिशाओं का ज्ञान प्राप्त कराना। साथ ही ध्वनि विज्ञान, रूप विज्ञान, वाक्य विज्ञान एवं अर्थ विज्ञान की जानकारी देना।

**Learning Outcome**

इस पाठ्यक्रम के माध्यम से विद्यार्थी भाषाविज्ञान की जानकारी प्राप्त करेंगे। उसके अध्ययन के विभिन्न क्षेत्रों एवं दिशाओं का ज्ञान प्राप्त करेंगे। इसके आलावा ध्वनि विज्ञान, रूप विज्ञान, वाक्य विज्ञान एवं अर्थ विज्ञान से भी भली भांति परिचित होंगे।

**Syllabus:**

**अध्याय एक-** भाषा: परिभाषा, भाषा की विशेषताएँ एवं भाषा परिवर्तन के कारण

भाषाविज्ञान: परिभाषा और अध्ययन की दिशाएँ।

20 Lects.

**अध्याय दो-** ध्वनि विज्ञान: ध्वनि का स्वरूप, ध्वनियों का वर्गीकरण, ध्वनि परिवर्तन के कारण।

- रूप विज्ञान: स्वरूप, अर्थतत्त्व एवं संबंध तत्त्व, रूप परिवर्तन के कारण एवं

दिशाएँ।

20 Lects.

**अध्याय तीन -** वाक्य विज्ञान : वाक्य की परिभाषा, स्वरूप एवं वाक्य के भेद।

- अर्थ विज्ञान: स्वरूप, अर्थ बोध के साधन, अर्थ परिवर्तन के कारण एवं दिशाएँ। 20 Lects.

संदर्भ ग्रंथ-

1. डॉ. भोलानाथ तिवारी, 'भाषाविज्ञान', किताबमहल इलाहाबाद, 1991
2. डॉ. हनुमंतराव पाटील, 'भाषा विज्ञान एवं हिन्दी भाषा', विद्या प्रकाशन, गुजैनी, कानपुर, 2009
3. डॉ. राजमणि शर्मा, 'आधुनिक भाषाविज्ञान', महाशक्ति साहित्य मंदिर, वाराणसी, 1983
4. डॉ. भोलानाथ तिवारी, 'शब्द विज्ञान', शब्दकार, तुर्कमार गेट, दिल्ली, 1982
5. डॉ. जितेंद्र वत्स, डॉ. देवेन्द्र प्रसाद सिंह, 'भाषाविज्ञान एवं हिन्दी भाषा', निर्मल पब्लिकेशन, दिल्ली, 2009

T.Y.B.A - (Semester – VI)

**Core Course**

**Course Title:** पाश्चात्य काव्यशास्त्र

**Course Code:** HIN-VI.E-15

**Marks:** 100

**Credits:** 04 (60 Lectures)

**Course Objective:**

इस पाठ्यक्रम से विद्यार्थियों को प्रमुख पाश्चात्य विचारकों से परिचित कराना। विद्यार्थियों को पाश्चात्य विचारकों के सिद्धांतों और वादों की जानकारी देना और साथ ही उन्हें आधुनिक समीक्षा की प्रवृत्तियों से परिचित कराना।

**Learning Outcome:**

इस पाठ्यक्रम के माध्यम से विद्यार्थी प्रमुख पाश्चात्य विचारकों से परिचित होंगे। उनके सिद्धांतों और वादों की जानकारी प्राप्त करेंगे। विद्यार्थी आधुनिक समीक्षा की प्रवृत्ति को भी समझेंगे।

**Syllabus:**

**अध्याय एक** - प्रमुख पाश्चात्य विचारक- प्लेटो, अरस्तू, मैथ्यू आरनाल्ड, टी.एस. इलियट का परिचय।  
20 Lects.

**अध्याय दो** – प्रमुख पाश्चात्य सिद्धान्त : अभिजात्यवाद, स्वच्छंदतावाद, मार्क्सवाद का परिचय।  
20 Lects.

**अध्याय तीन** – आधुनिक समीक्षा सिद्धान्त: संरचनावाद, उत्तर संरचनावाद, उत्तर आधुनिकतावाद।  
20 Lects.

**संदर्भ सूची-**

1. सं. डॉ.नगेन्द्र, डॉ.सावित्री सिन्हा, 'पाश्चात्य काव्यशास्त्र की परंपरा', दिल्ली विश्वविद्यालय, दिल्ली, 1966
2. डॉ. शिव कुमार मिश्र, 'नया हिन्दी-काव्य', अनुसंधान प्रकाशन, आचार्यनगर, कानपुर, 1962
3. डॉ. कन्हैयालाल अवस्थी, 'काव्यशास्त्र भारतीय एवं पाश्चात्य', आशीष प्रकाशन, कानपुर, 2012
4. नन्ददुलारे वाजपेयी, 'नया साहित्य नए प्रश्न' विद्यामन्दिर प्रेस, मानमंदिर, वाराणसी, 1959
5. मुद्गरक्षस, 'साहित्य समीक्षा', नेशनल पब्लिशिंग हाउस, दिल्ली, 1963

T.Y.B.A - (Semester – VI)

**Core Course**

**Course Title:** साहित्य का अंतरानुशासनात्मक अध्ययन

**Course Code:** HIN-VI.E-16

**Marks:** 100

**Credits:** 04 (60 Lectures)

**Course Objective:**

इस पाठ्यक्रम के माध्यम से विद्यार्थियों को साहित्य तथा साहित्येतर विद्या शाखाओं की जानकारी देना। उनके अंतःसंबंध का ज्ञान प्राप्त कराना। साथ ही साहित्येतर विद्या शाखाओं का हिन्दी साहित्य पर प्रभाव बताना।

**Learning Outcome:**

इस पाठ्यक्रम के माध्यम से विद्यार्थी साहित्य तथा साहित्येतर विद्या शाखाओं की जानकारी प्राप्त करेंगे। उनके अंतःसंबंध से परिचित होंगे। साथ ही साहित्येतर विद्या शाखाओं का प्रभाव हिन्दी साहित्य पर किस प्रकार पड़ा, इससे परिचित होंगे।

**Syllabus:**

- अध्याय एक** - साहित्य एवं अन्य विद्या शाखाओं का संबंध : साहित्य एवं इतिहास, साहित्य एवं दर्शन, साहित्य एवं मनोविज्ञान 20 Lects
- अध्याय दो** – साहित्य का समाजशास्त्रीय अध्ययन - लिंग, वर्ण, वर्ग एवं संप्रदाय के आधार पर 20 Lects.
- अध्याय तीन** – व्यावहारिक अध्ययन के लिए निर्धारित कृति : ग्लोबल गाँव का देवता - रणेन्द्र (समाजशास्त्र, अर्थशास्त्र, इतिहास, वैश्वीकरण के संदर्भ में) 20Lects.

**संदर्भ ग्रंथ-**

1. डॉ. राधाकृष्णन, 'भारतीय दर्शन-भाग एक', राजपाल एण्ड सन्स, दिल्ली, 2012
2. डॉ. राधाकृष्णन, 'भारतीय दर्शन भाग दो', राजपाल एण्ड सन्स, दिल्ली, 2013
3. श्रीनलिन विलोचन शर्मा, 'साहित्य का इतिहास-दर्शन', बिहार राष्ट्रभाषा परिषद, पटना. 1959
4. डॉ. सुरिंदरकौर गौड़, 'सौंदर्यशास्त्र' अभय प्रकाशन, कानपुर, 2015
5. डॉ. धीरेन्द्र वर्मा, 'हिन्दी साहित्य कोश, भाग-1', ज्ञान मंडल, लिमिटेड, वाराणसी, 2007



**KONKANI**

**F.Y.B.A. (Semester – I)**

**Core Course**

**Course Title: कोंकणी भास आनी साहित्याचो इतिहास – एक वळख**

**(आरंभा साकून 1858 वर्स मेरेनचो काळ)**

**(Outline History of Konkani Language and Literature)**

**(From beginning till 1858)**

**Course Code: KON-I.C-1**

**Marks: 100**

**Credits: 04**

**Course Objectives:**

1. संस्कृत-प्राकृत-अपभ्रंश हे प्रक्रियेंत कोंकणीची भाशीक आनी संस्कृतीक स्थित्यंतरां सोदप.
2. कोंकणी भाशेचो उगम सोदून तिचे मौखीक परंपरेचो अभ्यास करप.
3. 16 व्या शेंकड्या मेरेन मेळपी कोंकणीचे लिखित परंपरेचो नियाळ घेवप.
4. 1858 आदल्या कोंकणी साहित्याच्या एकंदर इतिहासाची अभ्यासणी करप.

**Learning Outcomes:**

1. कोंकणीची भाशीक आनी संस्कृतीक स्थित्यंतरां विद्यार्थ्यांक कळटलीं.
2. कोंकणी भाशेचो उगम, तशेंच तिची जडण-घडण कशी जाली हाचें गिन्यान विद्यार्थ्यांक मेळटलें.
3. 16 व्या शेंकड्या मेरेनची कोंकणीची लिखित परंपरा विद्यार्थ्यांक समजतली.
4. 1858 आदलें कोंकणी साहित्याचें इतिहासीक दायज विद्यार्थ्यांक कळटलें.

**No. of Hours: 4 Hours per week**

**अभ्यासक्रम :**

1. भारतीय आर्यकुळांतल्या भासांची व्युत्पत्ती आनी कोंकणीची स्थित्यंतरां.

(10व्या शेंकड्या मेरेनची) (14 तासिका)

- हेर समकालीन भारतीय भासांची व्युत्पत्ती
- कोंकणीची व्युत्पत्ती आनी उगम
- कोंकणीचीं भाशीक आनी संस्कृतीक स्थित्यंतरां
- कोंकणी भाशेची जडण-घडण

2. कोंकणी भाशेचे मौखीक परंपरेचो इतिहास (14 तासिका)

- भारतीय आर्य कुळांतल्या भासांची मौखीक परंपरा
- कोंकणीचे मौखीक परंपरेंत कोंकणी उतरावळ
- कोंकणी म्हणी-ओंपारी, वाक्प्रचार
- मौखीक परंपरेंत कोंकणीचें लोकसाहित्य

3. 16 व्या शेंकड्या मेरेनची कोंकणीची लिखीत परंपरा (14 तासिका)

- शिलालेख आनी संबंदीत लिखीत पुरावे
- कोंकणी भाशे संदर्भात मेळपी ग्रंथीक संदर्भ:
  - अ. केरळांतल्या *हॉर्ट्स इंडिकस मलबारिकस* ग्रंथांतल्या कोंकणी बरपावळीचो अभ्यास
  - आ. कृष्णदास शामा आनी समकालिनांचो लिखीत स्वरुपाचो वावर
  - इ. कोंकणीच्या लिखीत साहित्या संदर्भात विद्वानांचीं मतां

4. 17 व्या शेंकड्यांत निर्माण जाल्लें कोंकणीतलें धर्मीक साहित्य (9 तासिका)

अ. जेजुईत पाद्री:

1. फा. थॉमस स्टिफन्स
2. फा. दियोग रिबैरू
3. फा. आंतोनियू साल्दान्य
4. फा. मिंगेल द आल्मेदा
5. फा. जुआंव द पेद्रोज

आ. फ्रांसिस्कन पाद्री: (9 तासिका)

1. गाशपार द सा मिंगेल
2. जुआंव द सा मातियश
3. आमादोर द सांत आना
4. इनाझियो आर्कांमोनी

## 5. सिमांव आल्वारीस

### संदर्भ ग्रंथ :

1. कुळकर्णी, सु. बा. *कोंकणी भाषा : प्रकृती आणि परंपरा*. पणजी गोंय : गोवा कोंकणी अकादेमी, 2007.
2. देसाय, श्रीपाद. *कोंकणी भाशेची कुळकथा*. पुणे : सौंदर्यलहरी प्रकाशन, 1990.
3. पेरेरा, जुझे. *कोंकणी मंदाकिनी*. पणजी गोंय : गोवा कोंकणी अकादेमी, 1996.
4. पै घुंगट मनोहर. *म्हणी सागर*, कोंकणी अकादेमी. 2016
5. मोरास, पाव्लु. *कोंकणी चळवळ*. मंगळूर : कोंकणी इन्स्टिट्यूट, सां. लुविस कॉलेज, 2003.
6. लिमा द एडवर्ड. *कोंकणी ओपारींचो कोश*. विक्रम प्रकाशन. 2017
7. वेरेंकार, श्याम., सरदेसाय, माधवी., कमलाकार, म्हाळशी. (संपादक) *कोंकणी भास, साहित्य आनी संस्कृताय*. मडगांव गोंय : कोंकणी भाशा मंडळ, 2003.
8. सं नायक जयंती. *अखिल भारतीय कोंकणी परिशदेच्या अध्यक्षांची भाशणां*, अखिल भारतीय कोंकणी परिशद, 2016
9. सं अखिल भारतीय. *कोंकणी साहित्य संमेलनाचीं अध्यक्षीय भाशणां*. अखिल भारतीय कोंकणी परिशद. 2016
10. Bhave, Bhushan (Editor). *Contribution of Konkani to 'Hortus Indicus Malabaricus' (Seminar Papers)*. Panaji, Goa: Goa Konkani Akademi, 2014.
11. Gomes, Olivinho J.F. *Old Konkani Language and Literature – A Portuguese Role*. Chandor Goa: Konkani Sorospat Publication, 1999.
12. Loba. Theophilus. J. H. Cunha Rivara. *An Historical Essay on the Konkani Language*. V M Salgaokar Foundation. 2006
13. Katre, S. M. *The Formation of Konkani*. Pune: Deccan College Publication, 1966 (S.E.).
14. Pereira José. *LITRARY KONKNAI A BRIEF HISTORY*. Goa Konkani Akademi. 1992
15. Pereira Antonio. *The Makers Of Konkani Literature*. Antonio Pereira. 1982
16. Sardesai Manoharrai. *A History of Konkani literature*. Sahitya Akademi. 2000

### पुरवणी वाचन :

1. प्रभुदेसाई, वि. बा. *सतराव्या शतकातील गोमन्तकीय बोली*. मुंबई : मुंबई विश्वविद्यालय, 1963.  
सरदेसाय, माधवी. *मंथन*. मडगांव गोंय : जाग प्रकाशन, 2012.
2. सातोस्कर, बा. द. *गोमन्तक : प्रकृती आणि संस्कृती*. खंड- 1. पुणे : शरद गोगटे, शुभदा-सारस्वत प्रकाशन, 1979, 1988.

3. सॉदे, नागेश. *कोंकणी भाशेचो इतिहास*. सांताक्रूज मुंबय 54: वासंतिक प्रकाशन, 1981.
4. हळर्णकार, तानाजी. (संपादक) *कोंकणी विश्वकोश – खंड – 1,2,3*, ताळगांव गोंय: गोंय विद्यापीठ, 1999.
4. Grierson, George A. *Linguistic Survey of India. Vol. VII. Indo-Aryan Family. Southern Group. Specimens of the Marathi Language*. Calcutta: Office of the Superintendent of Government Printing, India. 1905.

**F.Y.B.A. (Semester – I)**

**Core Course**

**Course Title:** शणै गौयबाबांचें कोंकणी अस्मिताये खातीर योगदान

(Contribution of Shennoy Goembab towards Konkani Identity)

**Course Code:** KON-I.C-2

**Marks:** 100

**Credits:** 4

**Course Objectives:**

1. कोंकणी विभागांत शिकपी विद्यार्थ्यांक गोंयच्या समाजीक जिणेची आनी विचारांची वळख घडोवंक मदत करप.
2. शणै गोंयबाबांनी केल्ल्या साहित्याची वळख घडोवन गोंयकारांची विचारीक जडण घडण करपाक तांचें साहित्य कशेतरेन उपेगाक पडलें ताची वळख घडोवप.
3. गोंयकारांची संस्कृतीक आनी अस्मिताये विशींची संकल्पना कशेतरेन विकसीत जावपाक लागली ताची म्हायती करून दिवप.
4. शणै गोंयबाबांच्या वेंचीक साहित्याचो अभ्यास करून तातूंतल्यान अस्मिताये पासत दिल्ल्या योगदानाचो अभ्यास करप.

**Learning Outcomes:**

1. शणै गोंयबाबांच्या वेंचीक साहित्याच्या अभ्यासांतल्यान विद्यार्थ्यांक गोंयची समाजीक जडण घडण हांचे विशीं म्हायती मेळिल्ल्यान तांकां गोंय आनी गोंयकारपण समजून घेवपाक आधार जातलो.
2. आपली निजाची संस्कृताय आनी ताची वळख विद्यार्थ्यांक जातली.
3. आपले खाशेले संस्कृतायेचो अभ्यास बरेतरेन केल्ल्यान हेर समाजांतल्या लोकां कडेन पळेवपाच्या आनी हेर वेव्हारांत विशालतायेची नदर विद्यार्थ्यांक येतली.
4. शणै गोंयबाबांच्या वेंचीक साहित्याच्या अभ्यासांतल्यान अस्मिताये पासत दिल्ल्या योगदानाची म्हायती मेळटली.

**No. of Hours: 4 Hours per week**

### अभ्यासक्रम :

1. संकल्पनांची सिद्धांतीक म्हायती (15 तासिका)
  - अ. समाज
  - आ. संस्कृताय
  - इ. व्यक्ती आनी व्यक्तितमत्व
  - ई. अस्मिताय
2. शणै गोंयबाबांचो जल्म, भुरगेंपण आनी शिक्षण (15 तासिका)
  - अ. जल्म
  - आ. भुरगेंपण
  - इ. शिक्षण
3. भाशीक, इतिहासीक आनी संशोधनात्मक साहित्यीक वावराची वळख (15 तासिका)
4. तेदेवेळची समाजीक आनी राजकी परिस्थिती (15 तासिका)

### संदर्भ ग्रंथ -

1. नायक, भिकू बोमी. (संपादक) *युगपुरुश शणै गोंयबाब: एक परिचर्चा*. खोर्ली गोंय : जैत प्रकाशन, 2005.
2. दुबे, श्यामचरण, *भारतीय समाज*. अणकार केणी चंद्रकांत, नॅशनल बुक ट्रस्ट, इंडिया, नवी दिल्ली 1999.
3. वर्दे वालावलीकार, शांताराम. (संपादक) *समग्र शणै गोंयबाब खंड- 1*. पणजी गोंय: गोवा कोंकणी अकादेमी, 2003.
4. वर्दे वालावलीकार, शांताराम. (संपादक) *समग्र शणै गोंयबाब खंड- 2*. पणजी गोंय: गोवा कोंकणी अकादेमी, 2003.
5. वर्दे वालावलीकार, शांताराम. (संपादक) *समग्र शणै गोंयबाब खंड- 3*. पणजी गोंय: गोवा कोंकणी अकादेमी, 2006.

6. वर्दे वालावलीकार, शांताराम. (संपादक) *समग्र शणै गोंयबाब खंड- 4*. पणजी गोंय: गोवा कोंकणी अकादेमी, 2006.
7. वेरेंकार, श्याम., सरदेसाय, माधवी., कमलाकार, म्हाळशी. (संपादक) *कोंकणी भास, साहित्य आनी संस्कृताय*. मडगांव गोंय : कोंकणी भाशा मंडळ, 2003.
8. सुखटणकर ज. स. *आजचा व कालचा गोमंतक*. धि गोवा हिंदू एसोसिएशन रौप्यमहोत्सव स्मारक ग्रंथ. 1954.

### पुरवणी वाचन

1. सोद. कोंकणी रिसर्च बुलेटीन -7. तॉमास स्टीवन्स कोंकणी केंद्र, पर्वरी, गोंय-2004, 46-56 page.
2. खेडेकर, विनायक: *लोकसरीता – गोमंतकीय जीवनाचा समग्र अभ्यास*, कला अकादमी, पणजी गोवा, 1993.
3. सावित्री चन्द्र शोभा: *समाज और संस्कृती*. नॅशनल पब्लिशिंग हावस, नई दिल्ली, 1976.



**F.Y.B.A. (Semester – I)**  
**Optional Course**

**Course Title:** कोंकणी भाशेचो वेव्हारीक अभ्यास  
(Functional Study of Konkani Language)

**Course Code:** Foundation Course

**Marks:** 100

**Credits:** 4

**Objectives:**

1. कोंकणी व्याकरण आनी शुद्धलेखनाचो अभ्यास करप.
2. कोंकणी भाशेचीं खाशेलपणां शिकोवप.
3. कोंकणी भाशेंतल्यान वेव्हारीक लेखनाचो अभ्यास करप.
4. अनुवाद कोंकणींतल्यान इंग्लीशींत आनी इंग्लीशींतल्यान कोंकणींत.

**Learning Outcomes:**

1. विद्यार्थी कोंकणी व्याकरण आनी शुद्धलेखन शिकतले.
2. कोंकणी भाशेचीं खाशेलपणां विद्यार्थी शिकतले.
3. विद्यार्थी कोंकणी भाशेंतल्यान वेव्हारीक लेखनाचो अभ्यास करतले.
4. विद्यार्थी कोंकणी आनी इंग्लीशींतल्यान अनुवाद करपाक शिकतले.

**No. of Hours:** 4 Hours per week

**अभ्यासक्रम:**

**1. कोंकणी भाशेचीं खाशेलपणां आनी व्याकरणीक अभ्यास (10 तासिका)**

- अ) कोंकणी भाशीची वळख
- आ) कोंकणी व्याकरणाची वळख
- इ) कोंकणी शुद्धलेखनाचे नेम

**2. कोंकणीचो वेव्हारीक अभ्यास (पयलो वांटो) (20 तासिका)**

- अ. घरगुती पत्रवेव्हार
- आ. आमंत्रण पत्रिकांचें लेखन
- इ. प्रशासकीय पत्रवेव्हार (थळाव्यो स्वराज्य आनी भाशीक संस्था)
- ई. अनुवाद करप (कोंकणींतल्यान इंग्लीशींत, मराठीत आनी हिंदींत)

तशेंच संबंदीत भासांतल्यान कोंकणींत)

3. कोंकणीचो वेव्हारीक अभ्यास (दुसरो वांटो) (20 तासिका)

- अ. जायरात लेखन (वृत्तपत्रां खातीर)
- आ. जायरात लेखन (टि.वी. आनी रेडिओ खातीर)
- इ. सुचोवणी फलक (भौशीक आनी शासकीय)

4. परिभाशीक उतरावळ आनी अनुवाद (05 तासिका)

5. विंगड विंगड कोंकणी कार्यावळींनी वांटेकार जावन नियाळ बरोवप / सादर करप (05 तासिका)

टीप - सी. ए. खातीर साबार भौशीक आनी शासकीय आस्थापनांक पत्रां बरोवंक लावंचीं  
- सुचोवणी फलकांक धरून स्वाध्याय बरोवंक लावंचो.

संदर्भ ग्रंथ

1. श्रीवास्तव, मदन मोहन. *शिक्षा के दार्शनिक परिपेक्ष.* वंदना प्रकाशन, 2007.
2. *कोंकणी शुद्धलेखनाचे नेम.* गोवा कोंकणी अकादेमी, पणजी गोंय, 2015.
3. कुळकर्णी, बि. बि. *संभाषण कला.* मुंबई : मॅजिस्टिक बुक स्टॉल, 1983.
4. घाणेकार दामोदर. *अभ्यास कोश.* राजहंस वितरण, 2009.
5. तडकोडकार प्रियदर्शिनी. *कोंकणी परिचय.* गोवा कोंकणी अकादेमी, 2006.
6. देसाई स. शं. *लेखनकला परिचय एक इतिहासीक दृष्टिकोण.* औरंगाबाद, परिमल प्रकाशन, 1998.
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8. बोरकार जयवंत सुरेश. *कोंकणी व्याकरण.* कोंकणी भाशा मंडळ, 2012.
9. भावे भूषण आनी हेर. *कारबारी कोंकणी.* राजहंस वितरण, 2013.

पुरवणी वाचन

1. Seely John. *Writing and Speaking.* Orient Blackswan Private Limited, 2011.
2. वाळके मो रा. *सुगम मराठी व्याकरण लेखन.* नितीन प्रकाशन, 2010.

**F.Y.B.A. (Semester – II)**

**Core Course**

**Course Title: कोंकणी चळवळीचो इतिहास - एक वळख**

**(1858 वर्स ते 1992 वर्स मेरेनचो काळ)**

**(Outline History of Konkani Movement)**

**(Period from 1858 till 1992)**

**Course Code: KON-II.C-3**

**Marks: 100**

**Credits: 04**

**Course Objectives:**

1. कोंकणी-मराठी चळवळीच्या वा भाशावादाच्या मुळाचो अभ्यास करप.
2. कोंकणी चळवळींतल्या गोंय मुक्ती आदल्या साबार स्थित्यंतरांचो नियाळ करप.
3. कोंकणी चळवळींतल्या गोंय मुक्ती उपरांतच्या साबार आंदोलनांचो अभ्यास करप.
4. कोंकणी चळवळींतल्या संस्थात्मक आनी वैयक्तीक योगदानाचो अभ्यास करप.

**Learning Outcomes:**

1. कोंकणी-मराठी संघर्शाच्या साबार कारणांची वळख विद्यार्थ्यांक जातली.
2. गोंय मुक्ती आदल्या आनी उपरांतच्या कोंकणी चळवळीचें गिन्यान विद्यार्थ्यांक मेळटलें.
3. 1961 ते 1992 मेरेनच्या कोंकणी चळवळींतलीं साबार तासां विद्यार्थ्यांक कळटलीं.
4. कोंकणी चळवळींत संस्थांनी आनी व्यक्तींनी दिल्लें योगदान कळटलें.

**अभ्यासक्रम :**

**1. कोंकणीचे संघटनात्मक चळवळीचो इतिहास (15 तासिका)**

- अखिल भारतीय कोंकणी परिशदेची स्थापणूक आनी कार्य
- कोंकणी भाशा मंडळ मुंबय : स्थापणूक आनी वावर
- 1950 च्या दशकांत मुंबय शारांत चलिल्ली कोंकणी चळवळ  
(गोंय, महाराष्ट्र, कर्नाटकांतल्या कोंकणी भाशिकांच्या संदर्भांत)
- कोंकणीची संस्कृतीक चळवळ (संगीत, नाटक, तियात्र मळांवेल्या सेवा संस्थाचें योगदान)

**2. जनमत कौल : कोंकणी अस्मितायेचें इतिहासीक आंदोलन (15 तासिका)**

- जनमत कौलाची फाटभूंय, संकल्पना आनी स्वरूप

- जनमत कौलाचे मुखेल घटनाक्रम आनी राजकारण
- कौलांतलें संस्थात्मक आनी व्यक्तीगत योगदान

### 3. साहित्य अकादेमीची मान्यताय (15 तासिका)

- साहित्य अकादेमी- वळख आनी कार्य
- साहित्य अकादेमींत कोंकणीचे मान्यतायेची मागणी आनी प्रक्रिया
- साहित्य अकादेमीचे मान्यतायेंत कोंकणी संस्थांचें आनी व्यक्तींचें योगदान
- साहित्य अकादेमीचे मान्यतायेंत मराठीचो विरोध आनी राजकारण

### 4. गोंयचें राजभास आंदोलन: निर्णायक पर्व (15 तासिका)

- राजभास आंदोलनांत के. पी. ए. विरुद्ध म. रा. प्र. स.
- राजभास आंदोलनांत पत्रकारितेची भुमिका आनी कार्य
- राजभास आंदोलनांत राजकी पक्षांची भुमिका आनी कार्य
- राजभास आंदोलनांत संस्थात्मक आनी वैयक्तीक योगदान

### संदर्भ ग्रंथ :

1. केळेकर, रवीन्द्र. (संपादिका – डॉ. अरुणा दुभाषी) *भाषिक संघर्शाचे समाजशास्त्र*. पणजी.
2. कालेलकर, काकासाहेब. *पुण्यभूमि गोमंतक*. मंबई 07 : गोमंत भारती प्रकाशन, 1958.
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7. मोरास, पाव्लु. *कोंकणी चळवळ*. मंगळूर : कोंकणी इन्स्टिट्यूट, सां. लुविस कॉलेज, 2003.
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### पुरवणी वाचन :

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2. नागवेंकार, हरिश्चंद्र. *पुरुषोत्तम काकोडकार जिवीत आनी कार्य*. पणजी गोंय : गोवा

कोंकणी अकादेमी, 2014.

3. सौंदे, नागेश. *कोंकणी भाशेचो इतिहास*. सांताक्रूज मुंबय 54: वासंतिक प्रकाशन, 1981.
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5. शहा, घनश्याम. *सामाजिक चळवळी आणि सरकार*. पुणे : डायमंड पब्लिकेशन्स, 2009.
6. हळर्णकार, तानाजी. (मुखेल संपादक) *विश्व कोंकणी परिचय कोश- खंड- 1*. मंगळूर : कोंकणी भास आनी संस्कृती प्रतिष्ठान, 2011.

**F.Y.B.A. (Semester – II)**

**Core Course**

**Course Title: कोंकणी बोलींचो अभ्यास**

**(Study of Konkani Dialects)**

**Course Code: KON-II.C-4**

**Marks: 100**

**Credits: 4**

**Course Objectives:**

1. कोंकणी विभागांत शिकपी विद्यार्थ्यांक कोंकणी भाशेच्या वेगवेगळ्या बोलींचो अभ्यास करपाक मदत करप.
2. वेगवेगळ्या बोलींची वळख घडोवन तांचे विशीं जाणविकाय करून घेवपाक आदार करप.
3. बोली ही संकल्पना कशे तरेन विकसीत जावपाक लागली ताची म्हायती करून दिवप.
4. बोली निर्माण जावपा फाटल्या कारणांचो अभ्यास करप.
5. विद्यार्थ्यांक वेगवेगळ्या वाठारांनी वापरांत आशिल्ल्या बोलींची लागींच्यान वळख घडोवप.
6. वेगवेगळ्या बोलींचो ध्वनीशास्त्राचे नदरेन अभ्यास करप.

**Learning Outcomes:**

1. कोंकणी भाशेच्या वेगवेगळ्या बोलींचो अभ्यास केल्ल्यान विद्यार्थ्यांक त्यो समजुपाक मदत जातली.
2. आपले निजाचे भाशेच्या बोलींची वळख जाल्ल्यान विद्यार्थ्यांक हेर बोलयो उलोवपी लोकांनी उलयल्ली भास समजून घेवपाक आदार जातलो.
3. बोलींचो आनी त्यो उलोवपी लोकांचें खाशेलेपण कळटलें.

**No. of Hours: 4 Hours per week**

**अभ्यासक्रम :**

**सिध्दांतीक माहिती (20 तासिका)**

- बोली संकल्पना स्पश्ट करप
- भास आनी ताचीं खाशेलेपणां

### प्रत्यक्ष वावर (40 तासिका)

1. वेगवेगळ्या बोलींचो वापर करपी भाशीक पंगडांची माहिती मेळोवप.
2. बोलींचें ऑडियो-विडियो रिकॉर्डिंग करप.
3. नमुने एकठांय करप आनी तांची उलोवपाची खेरीत रीत समजून घेवप.
4. प्रादेशीक वाठारांतल्या वेंचीक बोलींचो अभ्यास करपाक भोंवडेचें आयोजन.

### संदर्भ ग्रंथ

1. केळेकार, रवीन्द्र. *भौभाशीक भारतांत भाशेचें समाजशास्त्र*. मडगांव गोंय : कोंकणी भाशा मंडळ, 1974.
2. प्रभुदेसाई, डॉ. वि. बा. *सतराव्या शतकातील गोमन्तकीय बोली*. मुंबई : मुंबई विश्वविद्यालय, 1963.
3. कालेलकर, ना. गो. *भाषा इतिहास आणि भुगोल*. खटाववाडी, मुंबई 4 : मौज प्रकाशन, 1964.
4. काळे, कल्याण., सोमण, अंजली., (सं) *आधुनीक भाषाविज्ञान*. पुणे : प्रतिमा प्रकाशन, 2003.
5. कुळकर्णी, सु. बा. *कोंकणी भाषा प्रकृती आणि परंपरा*. पणजी गोंय : गोवा कोंकणी अकादेमी, 2007.
6. केळकर, अशोक. *वैखरी भाषा आणि भाषा व्यवहार*. मुंबई : मॅजिस्टिक बुक स्टॉल, 1983.

### पुरवणी वाचन

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2. श्रीवास्तव, रवीन्द्रनाथ. *हिंदी भाषा का समाजशास्त्र*. नई दिल्ली : राधाकृष्ण प्रकाशन, 1986.
3. नायक, भिकू. बोमी. (संपा.) *युगपुरुश शणै गोंयबाब : एक परिचर्चा*. खोर्ली गोंय : जैत प्रकाशन, 2005.
4. देसाई, स.शं. *लेखन कला परिचय*. औरंगाबाद, परिमल प्रकाशन, 1988.
5. मालशे. स. गं. *साहित्य सिद्धांत*. मुंबई, महाराष्ट्र राज्य साहित्य आणि संस्कृती मंडळ, 2002.

**F.Y.B.A. (Semester –II)**

**Optional Course**

**Course Title: कोंकणी भाशेचीं मौखीक आनी लेखन कौशल्यां**

**(Spoken and Written Skills of Konkani Language)**

**Course Code:** Foundation Course

**Marks:** 100

**Credits:** 04

**Course Objectives:**

1. कोंकणी भाशेची मुळावी आनी व्याकरणीक वळख विद्यार्थ्यांक करून दिवप.
2. कोंकणी भाशेचीं मौखीक कौशल्यां विद्यार्थ्यांक शिकोवप.
3. कोंकणी भाशेचीं लिखीत कौशल्यां विद्यार्थ्यांक शिकोवप.
4. वेवसायीक मळांचेर मुखार सरपाक गरजेचें अशें मुळावें गिन्यान विद्यार्थ्यांक दिवप.

**Learning Outcome:**

1. कोंकणी विद्यार्थी कोंकणी भाशेंत मौखीक कौशल्यां शिकतलो.
2. कोंकणी विद्यार्थी कोंकणीचीं लिखीत कौशल्यां अभ्यासतलो.
3. ह्या अभ्यासक्रमांतल्यान छापील आनी इलॅक्ट्रॉनिक प्रसार माध्यमां खातीर बातम्यो सांगपी, निवेदक आनी संपादक तयार जातले.
4. साबार कार्यावळींचें सुत्रसंचालक वा संयोजक तयार जातले.

**No. of Hours: 4 Hours per week**

**अभ्यासक्रम :**

**1. कोंकणी भाशेच्या मौखीक कौशल्यांचो अभ्यास (15 तासिका)**

- कोंकणी भाशेच्या मौखीक कौशल्यांची गरज आनी उपयोजन
- विचार आनी मतां अभिव्यक्त करप : एक कला (विचार शुद्धी, भाशाशुद्धी, मुद्दे, मांडावळ)
- सराव आनी उजळणी (विद्यार्थ्यांची प्रत्यक्ष तयारी)
- प्रत्यक्षिकां आनी प्रयोग (विद्यार्थ्यांचें प्रत्यक्ष सादरीकरण)

**2. कोंकणी भाशेच्या लिखीत कौशल्यांचो अभ्यास (15 तासिका)**

- कोंकणी भाशेच्या लिखीत कौशल्यांची गरज आनी उपयोजन
- विचार आनी मतां शब्दबद्ध करप : एक कला (व्याकरण, शुद्धलेखन, लेखन, कलात्मकता)



- सराव आनी उजळणी (विद्यार्थ्यांची प्रत्यक्ष तयारी)
- प्रत्यक्षिकां आनी प्रयोग (विद्यार्थ्यांचें प्रत्यक्ष सादरीकरण)

### 3. कोंकणी भाशेचीं कौशल्यां : रेडिओ आनी टि.वी. माध्यमां खातीर (15 तासिका)

- निवेदनाच्या तरेकवार कौशल्यांचो अभ्यास आनी सराव
- वृत्तनिवेदकाच्या तरेकवार कौशल्यांचो अभ्यास आनी सराव
- रेडिओ आनी टि. वी. पासत खाशेले कार्यावळीची निर्मिती करप
- वक्तृत्व आनी नाट्यवाचन

### 4. कोंकणी भाशेचीं कौशल्यां आनी संगणकीय तंत्रज्ञान (15 तासिका)

- कोंकणी टायपसेटींग कौशल्य
- कोंकणी न्यूज लॅटर तयार करपाचें कौशल्य
- पावर पॉयंट सादरीकरणाचें कौशल्य
- प्रत्यक्षिकां आनी सादरीकरण

टीप - रेडियो/ टिव्ही पासत कार्यावळ तयार करची.

### संदर्भ ग्रंथ :

1. कालेलकर, ना. गो. *भाषा, इतिहास आणि भूगोल*. खटाववाडी, मुंबई 4 : मौज प्रकाशन, 1964.
2. केळकर, अशोक. *वैखरी भाषा आणि भाषा व्यवहार*. मुंबई: मॅजिस्टिक बुक स्टॉल, 1983.
3. गांवकार भालचंद्र. *कोंकणी भासविज्ञान*. किटोलें: मित्र प्रकाशन, 1996.
4. घाणेकार दामोदर. *अभ्यास कोश*. राजहंस, 2009
5. बोरकार जयवंत सुरेश. *कोंकणी व्याकरण*. कोंकणी भाशा मंडळ, 2012
6. Borkar S. J. *Let's Learn Konkani*. Rajhauns Vitran, 2005.
7. Lima, Edward de. *Spoken Konkani (A Self – Learning Guide)*. Vikram Publication, 2001.
8. Rodrigues Antonio F. X. *Sarki Amchi Bhasha Sonpi*. Dasya Holistic, Counseling Center, Porvorim, 2003.

### पुरवणी वाचन :

1. पाटील आनंद. *सृजनात्मक लेखन*. अरुण जाखडे, 2005.

**S.Y.B.A. (Semester III)**

**Core Course**

**Course Title:** कोंकणी भाशेचो व्याकरणीक आनी भासशास्त्रीय अभ्यास  
(Grammatical and Linguistic Study of Konkani)

**Course Code:** KON-III.C-5

**Marks:** 100

**Credits:** 04

**Course Objectives:**

1. स्वर आनी व्यंजन हांची म्हायती दिवन वाक्य बांदावळीची वळख घडोवप.
2. विद्यार्थ्यांक भास, व्याकरण आनी भासविज्ञानाचें भाशेंतलें म्हत्व समजावन सांगप.
3. भास आनी व्याकरण हांचो संबंद शिकपाक मदत करप.
4. भासविज्ञान आनी ताच्या वेगवेगळ्या आंगांची वळख घडोवप.
5. भासविज्ञान अभ्यासाच्या वेगवेगळ्या रितींची वळख घडोवप.

**Learning Outcomes:**

1. स्वर आनी व्यंजन हांची म्हायती तशेंच वाक्य बांदावळीची वळख जातली.
2. विद्यार्थ्यांक भास, व्याकरण आनी भासविज्ञानाचें भाशेंतलें म्हत्व समजतलें.
3. भास आनी व्याकरण हांचो संबंद समजतलो.
4. भासविज्ञान आनी ताच्या वेगवेगळ्या आंगांची वळख जातली.
5. भासविज्ञान अभ्यासाच्या वेगवेगळ्या रितींची वळख जातली.

**अभ्यासक्रम:**

**व्याकरण**

1. भास, व्याकरण - संकल्पना आनी गरज (10 तासिका)
2. शब्दाच्यो जाती (05 तासिका)
3. लिंग, वचन, विभक्ती आनी काळ (05 तासिका)
4. वाक्य विचार (05 तासिका)
5. संधी आनी समास (05 तासिका)

**भासविज्ञान**

1. भासविज्ञान – संकल्पना आनी गरज (10 तासिका)

2. भासविज्ञान - अभ्यासाच्यो तरा (08 तासिका)
3. भासविज्ञानाचीं आंगां आनी तांचो अभ्यास (08 तासिका)
4. भासविज्ञान आनी भाशेचें अध्यापन (04 तासिका)

**संदर्भ ग्रंथ :**

1. कालेलकर, ना. गो. *भाषा, इतिहास आणि भूगोल*. खटाववाडी, मुंबई 4 : मौज प्रकाशन, 1964.
2. काळे, कल्याण., सोमण, अंजली. (संपादक) *आधुनिक भाषाविज्ञान. पुणे* : प्रतिमा प्रकाशन, 2003.
3. कुळकर्णी, सु. बा. *कोंकणी भाषा : प्रकृती आणि परंपरा*. पणजी गोंय : गोवा कोंकणी अकादेमी, 2007.
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6. चोपडेकार हनुमंत. *समाजभासविज्ञान: भाशीक अध्ययनाचें आर्विल्लें शासत्र*. गोवा कोंकणी अकादेमी. 2020
7. दीक्षित, सुर्यप्रकाश. *भाषा प्रद्योगिकी एवं भाषा प्रबंधन*. अंसारी रोड, दरयागंज, नई दिल्ली किताबघर प्रकाशन : 2005.
8. बोरकार, सुरेश. *कोंकणी व्याकरण*. मडगांव गोंय : कोंकणी भाशा मंडळ, 1992.
9. वर्दे वालावलीकार, शांताराम. (संपादक) *समग्र शणै गोंयबाब खंड- 1*. पणजी गोंय : गोवा कोंकणी अकादेमी, 2003.
10. वाळिंबे, मो. रा. *सुगम मराठी व्याकरण*. बुधवार पेठ पुणे 411002 : नितीन प्रकाशन, 2009
11. वेरेंकार, श्याम., सरदेसाय, माधवी., म्हाळशी कमलाकार. (संपादक) *कोंकणी भास, साहित्य आनी संस्कृताय*. मडगांव गोंय : कोंकणी भाशा मंडळ, 2003.
12. सरदेसाय, माधवी. *भासाभास. प्रियोळ फोंडें गोंय*: जाग प्रकाशन, 1993.
13. सौंदे, नागेश. *कोंकणी भाशेचो इतिहास*. सांताक्रूज मुंबय 54 : वासंतिक प्रकाशन, 1981.
14. Chomsky, Noam. *Aspects of the theory of Syntax*. Cambridge Mass: M. I. T. Press, 1965.
15. Lyons John. *Language and Linguistics an Introduction*. Cambridge University Press, 2003.
16. Kelkar Ashok. *Language: Linguistics: The Application*, Vol. 8. Simla : A Reprint

*from Language and Society in India, Transaction of the Indian Institute of Advance  
Studies, Vol. 8. 1969.*

S.Y.B.A. (Semester – III)

Elective Course

Course Title: **कोंकणी कविता – एक खाशेलो अभ्यास**  
(Special Study of Konkani Poetry)

Course Code: KON-III.E-1

Marks: 100

Credits: 04

**Course Objectives:**

1. आर्विल्ले कोंकणी कवितेचो अभ्यास करप.
2. कोंकणी कवितेचो आरंभ आनी उदरगत तपासप.
3. कोंकणी कवितेच्या साबार प्रवाहांची समिक्षा करप.
4. वेंचीक कोंकणी कवींचो अभ्यास करप.

**Learning Outcomes:**

1. विद्यार्थ्यांक आर्विल्ले कोंकणी कवितेची वळख जातली.
2. कोंकणी कवितेची इतिहासीक फाटभूंय विद्यार्थ्यांक कळटली.
3. विद्यार्थी कोंकणी कवितेच्या साबार प्रवाहांचें आस्वादन करूंक शकतले.
4. विद्यार्थी वेंचीक कोंकणी कवींचो आनी तांच्या कवितांचो अभ्यास करतले.

**No. of Hours: 04 Hours per week**

**अभ्यासक्रम :**

**1. कविता एक साहित्य प्रकार (10 तासिका)**

- संकल्पना आनी व्याख्या
- घटक आनी प्रकार
  - अ. आशय-विशयाचे नदरेन
  - आ. मांडावळीचे नदरेन

**2. काव्यालंकारांचो अभ्यास (10 तासिका)**

- शब्दालंकार (अनुप्रास, यमक, श्लेष, वक्रोक्ती)
- अर्थालंकार (उत्प्रेक्षा, व्यतिरेक, अनन्वय, रूपक)

**3. आर्विल्ली कोंकणी कविता – आरंभ आनी उदरगत (10 तासिका)**

- आर्विल्ले कोंकणी कवितेचो आरंभ आनी उदरगत.
- आर्विल्ले कोंकणी कवितेंतले मुखेल प्रवाह.

#### 4. वेंचीक कोंकणी कवी आनी तांच्या कवितांचो अभ्यास (15 तासिका)

अ. पयलो वांटो (प्रस्तूत कविता झेल्यांतली एक कविता वेंचून घेवंची)

1. रमेश वेळुस्कार (दर्या)
2. प्रकाश पाडगांवकार (पुनरार्थोपनिषद)
3. माधव बोरकार (सिम्फनी)
4. युसुफ शेख (रंगघाय)
5. आर्. एस्. भास्कर (युगपरिवर्तनांचो यात्री)

#### 5. वेंचीक कोंकणी कवी आनी तांच्या कवितांचो अभ्यास (15 तासिका)

आ. दुसरो वांटो (प्रस्तूत कविता झेल्यांतली एक कविता वेंचून घेवंची)

1. मेल्वीन रोड्रीगीस (प्रकृतीचो पास)
2. निलबा खांडेकार (दंडकारण्य)
3. शशिकांत पुनाजी (उमज)
4. नुतन साखरदांडे (पासवर्ड)
5. ग्वादालूप डायस (जलस्थल)

#### संदर्भ ग्रंथ :

1. गुप्त, गणपतीचंद्र. *भारतीय एवं पाश्चात्य काव्य -सिध्दांत*, 15-ए, महात्मा गांधी मार्ग, इलाहाबाद : लोकभारती प्रकाशन, 1998.
2. चोपडेकार हनुमंत. *साहित्य धारा*. सारा क्रिएशन. 2016
3. पवार, राजय. *कोंकणी कवितेचो इतिहास (1960 ते 1990 मेरेनची कोंकणी कविता)*. बोरी, फोंडें : सानिका प्रॉडक्शन, 2014.
4. देशपांडे, बालशंकर. काव्य विवेचन आणि विश्लेषण. नागपूर 440010 : श्रीवत्स प्रकाशन, 2010.
5. बोरकार माधव. *कोंकणी कवितेची पांच दसकां*. कोंकणी भाशा मंडळ. 2016
6. भावे भुषण. *साहित्य विमर्ष*. शालमली प्रकाशन. 2018
7. रोड्रीगस, मेल्वीन. (संपादक) *20 व्या शेंकड्याच्यो कोंकणी कविता*. मंगळूर : कर्नाटक कोंकणी साहित्य अकादेमी, 2007
8. वजरीकार, प्रकाश. *वज्राघात*. वजरी सांखळी. प्राची प्रकाशन. 2010.

9. वेरेंकार, श्याम., सरदेसाय, माधवी., म्हाळशी, कमलाकर. (संपादक) *कोंकणी भास, साहित्य आनी संस्कृताय*. मडगांव गोंय : कोंकणी भाशा मंडळ, 2003.
10. सरदेसाय मनोहर. स्वतंत्र गोंयांतली कोंकणी कविता. कोंकणी भाशा मंडळ. 1977
11. हळर्णकार, तानाजी. (संपादक) *कोंकणी विश्वकोश- खंड- 1*, ताळगांव गोंय : गोंय विद्यापीठ, 1999.
12. Bradley, A. C. *Oxford Lectures on Poetry*. New Delhi: Atlantic Publishers & Distributors Pvt. Ltd., 2010.
13. Sardesai, Manoharrai. (Editor) *An Anthology of Modern Konkani Poems*. Priol Goa: Gomant Bharati Publications, 1964.

**S.Y.B.A. (Semester – III)**

**Elective Course**

**Course Title:** कोंकणी कथेचो खाशेलो अभ्यास

(Special Study of Konkani Short Story)

**Course Code:** KON-III.E-2

**Marks:** 100

**Credits:** 4

**Course Objectives:**

1. विद्यार्थ्यांक कथा हया साहित्य प्रकाराची वळख घडोवप.
2. कथा हया साहित्य प्रकाराची सिध्दांतीक स्वरुपाची वळख घडोवप.
3. कोंकणी कथेच्या इतिहासीक फांटभूंयेची वळख घडोवन कोंकणी कथेचो विकास कसो जालो ताची म्हायती करून दिवप.
4. कोंकणी कथेच्या मळा वेल्या वेंचीक कथांच्या आभ्यासांतल्यान कोंकणी साहित्यांत कथेचें मळ कशें विकसीत जालें ताचो अभ्यास करप.

**Learning Outcomes:**

1. विद्यार्थ्यांक कथा हया साहित्य प्रकाराची सिध्दांतीक वळख घडिल्ल्यान तांकां कथा हो साहित्य प्रकार समजून घेवपाक आदार जातलो.
2. कोंकणी साहित्यांत कथा हया साहित्य प्रकाराचो विकास कसो जालो ताची वळख विद्यार्थ्यांक जातली.
3. विद्यार्थ्यांक कोंकणी कथेच्या मळार वावर करपी वेंचीक कथाकारांचें योगदान समजतलें.
4. कथा बरोवपाची आनी कथेचें आस्वादन करपाची विद्यार्थ्यांची तांक विकसीत जातली.

**No. of Hours: 04 Hours per week**

**अभ्यासक्रम**

1. कथा हया साहित्य प्रकाराची सिध्दांतीक म्हायती - (10 तासिका)
2. कोंकणी कथेचो आरंभ आनी उदरगत (05 तासिका)



3. हिंदी आनी मराठी कथेची वळख (05 तासिका)

4. कोंकणींतल्या कांय जेश्ट कथाकारांच्या कथांचो सिध्दांतीक पांवड्यार अभ्यास (20 तासिका)

अ. चंद्रकांत केणी (व्हंकल पावणी)

आ. दामोदर मावजो (सपनमोगी)

इ. मीना काकोडकार (आमी)

ई. शीला कोळंबकार (गेर)

5. वेंचीक कोंकणी नवकथाकारांच्या कथांचो सिध्दांतीक पांवड्यार अभ्यास (20 तासिका)

अ. एड्विन जे. एफ, डिसौझा (च्यॉकलेटां)

आ. जयंती नायक (गर्जन)

आ. भालचंद्र गांवकार (दोंगराचे आवंडे)

इ. विन्सी क्वाद्रुस (कणसां)

टीप : वयल्या कथाझेल्यांतली दर सेमिस्टरा खातीर एक एक कथा वेंचची.

संदर्भ ग्रंथ –

1. क्वाद्रुस, विन्सी. *कणसां*. आर्लेम राय, गोंय : स्नोज प्रकाशन, 2011.
2. काकोडकार, मीना. *आमी*. विद्यानगर, मडगांव गोंय : दुर्गा प्रकाशन, 2011.
3. केणी, चंद्रकांत. *व्हंकल पावणी*. मडगांव गोंय : कुळागर अक्षर मुद्रा, 2000.
4. कोळंबकार, शीला. *गेर*. वळवय, फोंडें गोंय : अपुरबाय प्रकाशन, 2007.
5. केणी चंद्रकांत. *कोंकणी कथा संग्रह*. साहित्य अकादेमी. 1985.
6. गांवकार, भालचंद्र. *दोंगराचे आवंडे*, सौ. मनुजा भा. गांवकर, मित्र प्राकाशन 2003.
7. जोशी, सुधा., *कथा संपना आणि समिक्षा*. मुंबई : मुंबई विद्यापीठ आणि मौज प्रकाशन गृह, 2000.
8. देसाई, सं. श., *लेखन कला परिचय*, परिमल प्रकाशन औरंगाबाद, 1998.
9. नायक जयंती. *गर्जन*. राजाई प्रकाशन. 2008
10. नायक पुंडलीक. *समकालीन कोंकणी कथा*. नॅशनल बुक ट्रस्ट.1998.
11. बुडकुले, किरण. *साहित्यनियाळ अंतरंग आनी कायरुपां*. काणकोण गोंय : ओम दत्त पद्मजा प्रकाशन, 1998.

12. मावजो, दामोदर. *सपनमोगी*. पाजीफोंड मडगांव गोंय : जाग प्रकाशन, 2014.
13. वेरेंकार, श्याम., सरदेसाय, माधवी., म्हाळशी, कमलाकर. (संपादक) *कोंकणी भास, साहित्य आनी संस्कृताय*. मडगांव गोंय : कोंकणी भाशा मंडळ, 2003.
14. सावंत, वसंत. *निवलकाणयो*. सावर्डे गोंय : वैशाखी वसंत, 2008.
15. सरदेसाय लक्ष्मीमणराव. *कथा शिल्प*. जाग प्रकाशन.1977.
16. हळर्णकार, तानाजी. (संपादक) *कोंकणी विश्वकोश - खंड - 1*, ताळगांव गोंय : गोंय विद्यापीठ, 1999.

S.Y.B.A. (Semester – III)

Elective Course

Course Title: **कोंकणी कादंबरेचो खाशेलो अभ्यास**  
(Special Study of Konkani Novel)

Course Code: KON-III.E-3

Marks: 100

Credits: 04

**Course Objectives:**

1. कादंबरी हया साहित्य प्रकाराचो सखोल अभ्यास करप.
2. कोंकणी कादंबरेचो आरंभ आनी उदरगत शिकप.
3. कोंकणी कादंबरेच्या साबार विशयांची वळख करप.
4. वेंचीक कोंकणी कादंबरेचो अभ्यास करप.

**Learning Outcomes:**

1. विद्यार्थ्यांक आर्विल्ले कोंकणी कादंबरेचो अभ्यास जातलो.
2. कोंकणी कादंबरेचो आरंभ आनी उदरगत कशी जाल्या तें विद्यार्थी शिकतले.
3. विद्यार्थ्यांक कोंकणी कादंबरेच्या प्रवाहांची वळख जातली.
4. विद्यार्थ्यांक वेंचीक कोंकणी कादंबरेचो खोलायेन अभ्यास करपाची संद मेळटली.

**No. of Hours: 04 Hours per week**

**अभ्यासक्रम :**

1. कादंबरी एक साहित्य प्रकार (10 तासिका)
  - संकल्पना आनी व्याख्या
  - घटक आनी प्रकार
2. भारतीय आनी संवसारीक कादंबरी – एक सुपुल्लो नियाळ (10 तासिका)
  - भारतीय कादंबरेचो सुपुल्लो नियाळ
  - संवसारीक कादंबरेचो सुपुल्लो नियाळ
3. आर्विल्ली कोंकणी कादंबरी – आरंभ आनी उदरगत (10 तासिका)
  - आर्विल्ले कोंकणी कादंबरेचो आरंभ आनी उदरगत
  - आर्विल्ले कोंकणी कादंबरेतले मुखेल प्रवाह

#### 4. वेंचीक कोंकणी कादंबरीकाराचो अभ्यास (05) तासिका)

- वेंचिल्ल्या लेखकाची साहित्यीक वळख

#### 5. वेंचीक कोंकणी कादंबरेचो अभ्यास (25 तासिका)

- 'काळी गंगा' / 'भोगदंड' / 'खांद' हातूंतल्या खंयचेय एका वेंचीक कादंबरेचो सखोल अभ्यास

- कथानक
- निवेदन
- पात्रचित्रण
- संवाद
- संघर्ष
- भाशाशैली
- कादंबरेची समाजशास्त्रीय मोलावणी

#### संदर्भ ग्रंथ :

1. गणोरकर, डहाके, दडकर, भटकळ, वरखेडे (संपादीत). *वाडमयीन संज्ञा - संकल्पना कोश*. ग. रा. भटकळ फाऊंडेशन, मुंबई, 2001.
2. चोपडेकार, हनुमंत. *अस्तुरी प्रतिमा : मुक्ती उपरांतच्या कोंकणी कादंबरींतली*. फोंडें गोंय : सारा क्रिएशन, 2010.
3. दादेगांवकार, उमा., तडकोडकार, प्रियदर्शिनी., भावे, भुषण. (संपादक) *साहित्य नवनीत*. ताळगांव गोंय : स्नेह प्रकाशन, 1997.
4. नागवेंकार, हरिश्चंद्र. *आस्वाद*. प्रियोळ गोंय : जाग प्रकाशन, 1992.
5. पंडित, टापरे. *कादंबरी संवाद*. पांडुरंग कॉलनी, एरंडवन, पुणे 411038 : पद्मगंधा प्रकाशन, 2005.
6. बुडकुले, किरण. *अक्षर सरिता*. आगशी गोंय : बिम्ब प्रकाशन, 2009.
7. वेरेंकार, श्याम., सरदेसाय, माधवी., म्हाळशी, कमलाकर (संपादक) *कोंकणी भास, साहित्य आनी संस्कृताय*. मडगांव गोंय : कोंकणी भाशा मंडळ, 2003.
8. वजरीकार, प्रकाश. *वज्रघात*. वजरी सांखळी. प्राची प्रकाशन. 2010.
9. सरदेसाय, माधवी. *जाग कादंबरी विशेशांक 2011*. मडगांव गोंय : जाग प्रकाशन, 2011.
10. शेळके, भास्कर. *मराठी प्रादेशीक कादंबरी : स्वरुप आणि विश्लेषण*. सुमती लांडे, श्रीरामपूर 413709 : शब्दालय प्रकाशन, 2012.

11. हळर्णकार, तानाजी. (संपादक) *कोंकणी संस्कृती कोश* – खंड – 1, 2. शक्ती नगर, मंगळूर. विश्व कोंकणी केंद्र, 2010.
12. Gupta, Monika. *Women Writers in the Twentieth Century Literature*. New Delhi: New Delhi: Atlantic Publishers & Distributors Pvt. Ltd., 2000.
13. Kidwai. A. R. *Stranger Than Fiction: Images of Islam And Muslims in English fiction*. Daryaganj, New Delhi: A. P. H. Publishing House Corporation, 2000.

S.Y.B.A. (Semester – III)

Elective Course

Course Title: **कोंकणी साहित्याचें आस्वादन (भाग 01)**

**(कथा, कविता आनी कादंबरी)**

**(Appreciation of Selected Konkani Writings)**

Course Code: KON-III.E- 4

Marks: 100

Credits: 04

**Course Objectives:**

1. वेंचीक कोंकणी साहित्याचो अभ्यास करप.
2. कोंकणी साहित्यीक परंपरेचो चिकित्सक अभ्यास करप.
3. वेंचीक साहित्यीक विशयाचेर आस्वादनात्मक स्वाध्याय बरोवप.
4. कोंकणी साहित्याचें आस्वादन करप.

**Learning Outcomes:**

1. कोंकणी साहित्याची स्थित्यंतरां विद्यार्थ्यांक कळटलीं.
2. आयच्या कोंकणी साहित्याचो पांवडो खंय आसा ताचो सोद लागतलो.
3. नव्या साहित्यीक विशयांचेर स्वाध्याय बरोवन जातले.
4. कोंकणी समिक्षेक उर्बा मेळटली.

**अभ्यासक्रम**

1. आस्वादन प्रक्रियेची सिद्धांतीक म्हायती आनी अभ्यास : (10 तासिका)
2. शिक्षकाच्या मार्गदर्शना खाला वेंचिल्ल्या विशयाचो अभ्यास : (10 तासिका)
3. वाचपघरांतलो वावर : (15 तासिका)
4. प्रत्यक्ष साहित्यकृतीचेर वावर करून स्वाध्याय बरोवप : (15 तासिका)
5. सादरीकरण : (10 तासिका)

**देखी खातीर कांय विशय :**

**अ. कोंकणी कविता :**

1. बयाभाव हांची कोंकणी कविता : एक अभ्यास
2. बाकीबाब बोरकार हांच्या काव्यांतलें गोंय
3. डॉ. मनोहरराय सरदेसाय हांच्या कवितेंतलो गोंयचो सैम

4. र. वि. पंडीत हांच्या काव्यांतलो गावडा समाज
5. चा. फ्रां. द कोशत हांच्या कवितेंतली मिशकीलताय / विद्रोह
6. रमेश वेळुस्कार हांच्या कवितेंतलो लोकवेद
7. माधव बोरकार हांचे कवितेचो आशय आनी विशय : एक अध्ययन
8. प्रकाश पाडगांवकार हांच्या काव्यांतली समाजीक जाणीव
9. नयना आडारकार आनी माया खरंगटे हांचे कवितेंतली अस्तुरी
10. नुतन साखरदांडे आनी ग्वादालूप डायस हांच्या काव्याचो तुळात्मक अभ्यास

#### आ. कोंकणी कथा :

1. चंद्रकांत केणी हांच्या कथेंतली स्त्री-प्रतिमा
2. लक्ष्मणराव सरदेसाय हांचे कथेंतलें गांवगिरे जिवीत
3. अच्युत तोटेकार हांचे कथेंतलो ब्राह्मण समाज
4. दामोदर मावजो हांचे कथेंतलो क्रिस्ती समाज
5. मीना काकोडकार हांच्या कथांचो चिकित्सक अभ्यास
6. शीला कोळंबकार हांचे कथेंतलें शारी जिवीत
7. एन्. शिवदास हांचे कथेंतलो गांवगिरो समाज
8. पुंडलीक नायक हांचे कथेंतलो स्त्रीपुरुश संबंद
9. शशांक सिताराम आनी विन्सी क्वाद्रूस हांच्या कथनात्मक साहित्याचो तुळात्मक अभ्यास
10. भालचंद्र गांवकार आनी अजय बुवा हांच्या कथेंतली आधुनीक जिवनशैली

#### इ. कोंकणी नवलिका आनी कादंबरी :

1. *कार्मेलीन* आनी *अच्छेव* : एक तुळात्मक विवेचन
2. महाबळेश्वर सैलाच्या कादंबरेंतलें ग्रामीण जिवीत
3. देविदास कदम हांच्या कादंबरेंतलो तरनाटो आनी ताचें भावविश्व : एक विश्लेशण
4. न. ध. बोरकार हांच्या कादंबरेंतल्यान व्यक्त जावपी भुरग्यांची मानसिकताय
5. *वारें आनी वादळ* तशेंच *क्रिस्तांव घराबो* ह्या कादंबऱ्यांचो चिकित्सक अभ्यास
6. हेमा नायक हांच्या कादंबरेंतलें स्त्री-जिवीत : एक अभ्यास
7. अशोक कामत हांच्या कादंबरेंतले तुटत वचपी नातेसंबंद : एक समाजशास्त्रीय अध्ययन
8. वि. जे. पी. सालदाना हांच्या *देवाचे कुरपेन* आनी *सायबा भोगोस* ह्या कादंबऱ्यांचो चिकित्सक अभ्यास
9. विली गोयश आनी बाँवेन्तूर द पियेत्र हांच्या कादंबरेंतलें आधुनीक जिवीत

10. ज्योती कुंकळकार, सुर्या अशोक आनी सुजाता सिंगबाळ हांचे कादंबरेंत येवपी आधुनीक अस्तुरी

**संदर्भ ग्रंथ :**

1. गोमीश, ओलिविन्यु. *कोंकणी सरस्पतीचो इतिहास*. चांदोर गोंय : सरस्पत प्रकाशन, 1989.
2. जोशी, सुधा. *कथा : संकल्पना आनी समीक्षा*. खटाववाडी, गिरगांव मुंबई : मौज प्रकाशन, 2000.
3. पवार, राजय. *कोंकणी कवितेचो इतिहास*. बोरी फोंडें : सानिका प्रॉडक्शन, 2014.
4. पंडित, टापरे. *कादंबरी संवाद*. पांडुरंग कॉलनी, एरंडवन, पुणे 411038 : पद्मगंधा प्रकाशन, 2005.
5. बुडकुले, किरण. *अक्षर सरिता*. आगशी गोंय : बिम्ब प्रकाशन, 2009.
6. बुडकुले, किरण. *साहित्यनियाळ अंतरंग आनी कायरुपां*. काणकोण गोंय : ओम दत्त पद्मजा प्रकाशन, 1998.
7. वजरीकार, प्रकाश. *वज्रघात*. वजरी, साखळी गोंय : प्राची प्रकाशन, 2010.
8. वेरेंकार, श्याम., सरदेसाय, माधवी., म्हाळशी, कमलाकर. (संपादक) *कोंकणी भास, साहित्य आनी संस्कृताय*. मडगांव गोंय : कोंकणी भाशा मंडळ, 2003.
9. सरदेसाय, माधवी. *मंथन*. मडगांव गोंय : जाग प्रकाशन, 2012.
10. सैल, महाबळेश्वर. *अरण्यकांड*. पाजीफोंड, मडगांव गोंय : जाग प्रकाशन, 2012 (दु. आ.)
11. शेळके, भास्कर. *मराठी प्रादेशीक कादंबरी : स्वरुप आणि विश्लेषण*. सुमती लांडे, श्रीरामपूर 413709 : शब्दालय प्रकाशन, 2012.

**टिप :** वयले विशय सुचयल्यात ते नमुन्या खातीर आसून विद्यार्थ्यांनी अशे तरेचे हेर विशय अभ्यासाक घेवं येतात.



**S.Y.B.A. (Semester – IV)**

**Core Course**

**Course Title: कोंकणी लोकवेदाचो अभ्यास**

**(Study of Konkani Folklore)**

**Course Code: KON-IV.C-6**

**Marks: 100**

**Credits: 04**

**Course Objectives:**

1. कोंकणी लोकवेदाचो सखोल अभ्यास करप.
2. कोंकणी लोकवेदाचे साबार घटक अभ्यासप.
3. कोंकणी लोकवेदाच्या साबार प्रकारांची वळख घडोवप.
4. कोंकणी लोकवेदाच्या वेंचीक प्रकारांची अभ्यासणी जावची म्हणून भोंवडी करप.

**Learning Outcomes:**

1. विद्यार्थी कोंकणी लोकवेदाचो सखोल अभ्यास करतले.
2. कोंकणी लोकवेदाचे साबार घटक विद्यार्थी अभ्यासतले.
3. विद्यार्थ्यांक कोंकणी लोकवेदाच्या साबार प्रकारांची वळख जातली.
4. कोंकणी लोकवेदाच्या वेंचीक प्रकारांची अभ्यासणी करपाक विद्यार्थी भोंवडी करतले.

**No. of Hours: 4 Hours per week**

**अभ्यासक्रम :**

**1. लोकवेद : संकल्पना आनी स्वरूप (10 तासिका)**

- संकल्पना
- स्वरूप

**2. लोकवेद : व्याख्या आनी घटक (10 तासिका)**

- व्याख्या
- घटक

**3. कोंकणी लोकवेदाच्यो खाशेलतायो (10 तासिका)**

- सांस्कृतीक खाशेलतायो
- भाशीक खाशेलतायो

#### 4. लोकवेदाचे प्रकार (30 तासिका)

##### पयलो वांटो (10 तासिका)

- लोकगीत : लग्न-गीत, होंवयो, आल्लय, मांडो आनी दुल्पदां, सोकारत

##### दुसरो वांटो (10 तासिका)

- लोकनृत्य : धालो, फुगडी, मूसळ नाच, घोडेमोडणी, गोफ, तोण्यांमेळ, तालगडी, कुणबी नाच, देखणी, चपय (धनगर नाच)

##### तिसरो वांटो (10 तासिका)

- लोककथा : मिथक, आख्यायिका, कल्पित काणी

- टीप – 1. गोंयांत वेगवेगळ्या वाठारांनी जावपी सण आनी लोकउत्सव अभ्यासपा खातीर विद्यार्थ्यांची अभ्यास भोंवडी आयोजीत करची.
2. लोकवेद प्रकारांतल्या कांय विशयांचेर विद्यार्थ्यांनी संकलन आनी सादरीकरण करचें (CA) खातीर.

#### संदर्भ ग्रंथ :

1. एल. सुनिताबाय. हिन्दी और कोंकणी लोकसाहित्य का तुलनात्मक अध्ययन. काक्कनाड कोच्ची, 2010.
2. केरकर, पौर्णीमा. गोव्यातील धालो उत्सवाचे स्वरूप . आलत परवरी गोवा: गोमन्तक मराठी अकादमी, 2011.
3. खेडेकर, विनायक. गोमंतकीय लोकभाषा. पणजी गोवा: शारदीय वितरण.
4. खेडेकर, विनायक. लोकसरिता – गोमन्तकीय जन जीवनाचा समग्र अभ्यास. कला अकादमी गोवा, 1993.
5. पैगिणकर अजित. काणकोणची लोककला एक दायज. सुखदा पैगिणकर. 2001
6. फळदेसाय पांडुरंग. गोंय लोकवेदाचें सौंदर्यशास्त्र. सासाय प्रकाशन. 2017
7. फेर्नांडीस, जुवांव. गोंयचो आवाज., केपें, गोंय : जे. पी. एल. प्रकाशन 2013.
8. मराठी लोककथा- स्वरूपमीमांसा. सविता प्रकाशन
9. नायक, जयंती. लोकमंथन. केपें गोंय : राजाई प्रकाशन, 2008
10. नायक, जयंती. आमोणेचीं धालो गीतां. पणजी गोंय : गोवा कोंकणी अकादेमी, 1992.
11. नायक, जयंती. गोंयची लोककला. केपें गोंय : राजाई प्रकाशन, 2004.
12. नायक, जयंती. लोकबींब. पणजी गोंय: गोवा कोंकणी अकादेमी, 1998.

13. नायक, जयंती. *लोकरंग*. आमोर्णे, केपें गोंय: राजाई प्रकाशन, 2008.
14. वेरेंकार, श्याम. *गोंयच्या लोकवेदाचो रुपकार*. पणजी गोंय : गोवा कोंकणी अकादेमी, 1991.
15. वेरेंकार, श्याम. *धालो*. बेती वेरें : कोंकण टायम्स प्रकाशन, 1984.
16. हळर्णकार, तानाजी. (संपादक). *कोंकणी विश्वकोश – खंड – 1*, ताळगांव गोंय : गोंय विद्यापीठ, 1999.
17. Khedekar, Vinayak. *Folk Dances of Goa*. Udaipur: West Zone Culture.
18. Pereira, Jose Micael Martins; Da Costa Antonio. *Song of Goa: Crown of Mandos*. Broadway Publishing House, 2010.
19. Ramanujan A. K. *Folk tales from India*. Penguin Books. 1994.

**S.Y.B.A. (Semester – IV)**

**Elective Course**

**Course Title: कोंकणी नाटक – एक खाशेलो अभ्यास**

**(Special Study of Konkani Drama)**

**Course Code: KON-IV.E-5**

**Marks: 100**

**Credits: 04**

**Course Objectives:**

1. अर्विल्ल्याकोंकणीनाटकाचोअभ्यासकरप.
2. कोंकणीनाटकांचोआरंभआनीउदरगततपासप.
3. कोंकणीनाटकाच्यासाबारप्रवाहांचीसमिक्षाकरप.
4. वेंचीककोंकणीनाटकाचोअभ्यासकरप.

**Learning Outcomes:**

1. विद्यार्थ्यांकअर्विल्ल्याकोंकणीनाटकाचीवळखजातली.
2. कोंकणीनाटकाचीइतिहासीकफाटभूंयविद्यार्थ्यांककळटली.
3. विद्यार्थीकोंकणीनाटकाच्यासाबारप्रवाहांचेंआस्वादनकरूंकशकतले.
4. विद्यार्थीवेंचीककोंकणीनाटकाचोअभ्यासकरतले.

**No. of Hours: 4 Hours per week**

**अभ्यासक्रम:**

**1. नाटकएकसाहित्यप्रकार (10 तासिका)**

- संकल्पना
- व्याख्या
- घटक
- प्रकार

**2. नाटकाचीसंवसारीकफाटभूंयेचीवळख (10 तासिका)**

- संवसारीकनाट्यपरंपरा

- भारतीयनाट्यपरंपरा

### 3. कौंकणीनाटक – आरंभआनीउदरगत (10तासिका)

-कौंकणीनाटकाचोआरंभआनीउदरगत

- कौंकणीनाटकांतलेमुखेलप्रवाह

### 4. सकयलदिल्ल्याखंयच्यायएकावेंचीककौंकणीनाटकाचोसखोलअभ्यास (30 तासिका)

अ. *परिक्रमा* - नायकपुंडलीक

आ. *डॅडी* -कामतबांबोळकारदत्ताराम

इ. *बनवड* - वजरीकारप्रकाश

ई. *काळमाया* – नायकजयंती

उ. *आमचोहातजगन्नाथ* -पवारराजय

टीप- नाटकाचीसी. डी. दाखोवप, चर्चाकरप

संदर्भग्रंथ:

1. गांवकार, भालचंद्र. *साहित्य एकभासाभास*. किटोलें, बेतोडें: मित्रप्रकाशन, 1993.
2. नायक, पुंडलीक. *रंगपाट*. वळवयगोंय: अपुरबायप्रकाशन, 1996.
3. नायक, पुंडलीक. *समकालीनकौंकणीएकांकी – संपादक*. साहित्यअकादमी, 2014.
4. बुडकुले, किरण. *साहित्यनियाळअंतरंगआनीकायरुपां*. काणकोणगोंय: ओमदत्तपद्मजाप्रकाशन, 1998.
5. वेरेंकार, श्याम., सरदेसाय, माधवी., म्हाळशी, कमलाकर.(संपादक) *कौंकणीभास, साहित्यआनीसंस्कृताय*. मडगांवगोंय: कौंकणीभाशामंडळ, 2003.
6. सरदेसाय, मनोहरराय. (संपादक). *कौंकणीविश्वकोश – खंड – 1*. ताळगांवगोंय : गोंयविद्यापीठ, 1999.
7. Bisariya, Subhash. *William Shakespeare Anthony and Cleopatra*. Karol Bhag, New Delhi: Rama Brothers India Pvt. Ltd., 2007.

**S.Y.B.A. (Semester – IV)**

**Elective Course**

**Course Title: कोंकणी तियात्राचो अभ्यास**

**(Special Study of Konkani Tiatr)**

**Course Code: KON-IV.E-6**

**Marks: 100**

**Credits: 04**

**Course Objectives:**

1. अर्विल्ल्या कोंकणी तियात्राचो अभ्यास करप .
2. कोंकणी तियात्रांचो आरंभ आनी उदरगत तपासप.
3. कोंकणी तियात्राच्या साबार प्रवाहांची समिक्षा करप.
4. वेंचीक कोंकणी तियात्राचो अभ्यास करप.

**Learning Outcomes:**

1. विद्यार्थ्यांक आर्विल्ल्या कोंकणी तियात्राची वळख जातली .
2. कोंकणी तियात्राची इतिहासीक फाटभूंय विद्यार्थ्यांक कळटली.
3. विद्यार्थी कोंकणी तियात्राच्या साबार प्रवाहांचें आस्वादन करूंक शकतले .
4. विद्यार्थी वेंचीक कोंकणी तियात्राचो अभ्यास करतले.

**No. of Hours: 4 Hours per week**

**अभ्यासक्रम :**

**1. तियात्र एक साहित्य प्रकार (10 तासिका)**

- संकल्पना
- व्याख्या
- घटक
- प्रकार

**2. कोंकणी तियात्र – आरंभ आनी उदरगत (10 तासिका)**

- कोंकणी तियात्राचो आरंभ आनी उदरगत.
- कोंकणी तियात्रांतले मुखेल प्रवाह.

3. वेंचीक तियात्रीस्ताचो खोलायेन अभ्यास (10 तासिका)

- अ. जुंआंव आगोस्तीन फेर्नाडीस
- आ. लुकाझीन रिबेरो
- इ. एम्. बाँयर
- ई. प्रिन्स जेकब

4. सकयल दिल्ल्या खंयच्याय एका वेंचीक कोंकणी तियात्राचो सखोल अभ्यास (30 तासिका)

- अ. म्होवाळ विख - कार्दोज तॉमाजीन
- आ. सुकती भरती - माजरेलो विल्मीक्स
- इ. भाड्याचो कुसवो - आरावजो मिनीन
- ई. रोडो नाका - जॅकोब प्रिन्स

टीप- 1. विद्यार्थ्यांक कोंकणी तियात्रांचे प्रयोग पळोवपाक व्हरप. (सी. ए.)

2. तियात्राची सी. डी. दाखोवप (चर्चा करप)

संदर्भ ग्रंथ :

1. थळी, प्रकाश. *तियात्राचो इतिहास 1892 - 1992*. पणजी गोवा : गोवा कोंकणी अकादेमी, 1993.
2. नायक, पुंडलीक. *रंगपाट*. वळवय गोंय : अपुरबाय प्रकाशन, 1996.
3. माजारेलो विल्मीक्स. सुकती भरती. अपुरबाय प्रकाशन. 1993
4. वेरेंकार, श्याम., सरदेसाय, माधवी., कमलाकर, म्हाळशी. (संपादक) *कोंकणी भास, साहित्य आनी संस्कृताय*. मडगांव गोंय : कोंकणी भाशा मंडळ, 2003.
5. Cardozo, Felicio. (Editor) *Tiatrancho Jhelo – II*. Panaji Goa: Goa Konkani Academy, 1998.
6. Cardozo, Tomazinho. *Silver Jubilee of Konkani Tiatro*. Panaji Goa: Goa Kala Academy, 1990.
7. Fernandes, André Rafael. *When the Curtains Rise... Understanding Goa's vibrant Konkani theatre*. Panaji Goa: Tiatr Academy of Goa, 2010.
8. Mazarello, Wilmix Wilson. *100 years of Konkani Tiatro*. Panjim Goa: Directorate of Art & Culture, Government of Goa, 2000.

**S.Y.B.A. (Semester – IV)**

**Elective Course**

**Course Title: कोंकणी निबंदाचो खाशेलो अभ्यास**

**(Study of Konkani Essays)**

**Course Code: KON-IV.E-7**

**Marks: 100**

**Credits: 4**

**Course Objectives:**

1. कोंकणीविभागांतशिकपीविद्यार्थ्यांकनिबंदहयासाहित्यप्रकाराचीवळखघडोवप.
2. निबंदसाहित्यप्रकाराचीसिध्दांतीकस्वरुपाचीवळखघडोवप.
3. कोंकणीनिबंदाच्याइतिहासीकफाटभूंयेचीवळखघडोवनकोंकणीनिबंदाचोविकासकसोजालोताचीम्हायतीकरूनदिवप.
4. कोंकणीनिबंदमळावेल्यावेंचीकनिबंदांच्याअभ्यासांतल्यानकोंकणीसाहित्यांतनिबंदाचेंमळकशेंविकसीतजालेंताचोअभ्यासकरप.

**Learning Outcomes:**

1. कोंकणीविभागांतशिकपीविद्यार्थ्यांकनिबंदसाहित्यप्रकाराचीसिध्दांतीकवळखघडिल्ल्यानतांकांनिबंदहोसाहित्यप्रकारसमजूनघेवपाकआधारजातलो.
2. कोंकणीसाहित्यांतनिबंदसाहित्यप्रकाराचोविकासकसोजालोताचीवळखविद्यार्थ्यांकजातली.
3. कोंकणीनिबंदाच्यामळारवावरकरपीवेंचीकनिबंदकारांचेंयोगदानसमजूनघेवपाकविद्यार्थ्यांकआधारजातलो.
4. निबंदबरोवपाचीआनीनिबंदाचेंआस्वादनकरपाचीविद्यार्थ्यांचीतांकविकसीतजातली.

**No. of Hours: 4 Hours per week**

**अभ्यासक्रम**

1. निबंदसाहित्यप्रकाराचीसिध्दांतीकम्हायती(10तासिका)



2. संवसारीकपांवड्यारनिबंदलेखनाचीवळख(05 तासिका)
3. कोंकणीनिबंदाचोविकास(10तासिका)
4. वेंचीककोंकणीनिबंदकारांच्यानिबंदांचोअभ्यास(35तासिका)

1. केळेकाररवींद्र – सर्जकाचीआंतरकथा (जागप्रकाशन)
2. नायकदत्तादामोदर – जायकायजूय (लोकायतप्रकाशन)
3. पर्येकारप्रकाश – दवरणें (भूमीप्रकाशन)
4. मुकेशथळी - हंसध्वनी (आनंदप्रकाशन)
5. रोमियोआल्मेदा – आमोरीमुरपीकी (अपूरबायप्रकाशन)
6. कृ. म. सुखटणकार -चिमटे धुमके (बिम्ब प्रकाशन)
7. नमन धावस्कार- मुक्त मन (अमन प्रकाशन)
8. पवार राजय - गिरमीट (सानिका प्रॉडक्शन)

टीप- वयरदिल्ल्यासाहित्यकृतींतल्यावेंचीक01 निबंदांचोअभ्यासकरप

संदर्भग्रंथ-

1. देसाई, सं. श. लेखनकलापरिचय,परिमलप्रकाशनऔरंगाबाद, 1998.
2. पवार राजय. गिरमीट. सानिका प्रॉडक्शन. 2009
3. भावे, भूषण. साहित्यविमर्श. पणजीगोंय: शाल्मिलीप्रकाशन, 2016.
4. भांगी, पांडूरंग. साहित्यशिल्प, पणजीगोंय:गोवाकोंकणीअकादेमी, 1995.
5. वेरेंकार, श्याम., सरदेसाय, माधवी., कमलाकार, म्हाळशी. (संपादक) कोंकणीभास, साहित्यआनीसंस्कृताय.मडगांवगोंय: कोंकणीभाशामंडळ, 2003.
6. वेरेंकार, श्याम. (संपादक) कोंकणीललितनिबंद. नवीदिल्ली:साहित्यअकादेमी, 1997.
7. सरदेसाय, मनोहरराय. (संपादक). कोंकणीविश्वकोश- खंड- 1, ताळगांवगोंय:गोंय विद्यापीठ,1999.
8. यादव, आनंद. ललितगद्याचेतात्वीकस्वरुपआणिमराठीलघुनिबंदाचाइतिहास. पुणे:सुनीलअनीलमेहता, 1995

**S.Y.B.A. (Semester – IV)**

**Elective Course**

**Course Title: कोंकणी साहित्याचें आस्वादन (भाग - 2)**

**(निबंद, नाटक, तियात्र)**

**(Appreciation of Selected Konkani Writings) (Part -2)**

**Course Code: KON-IV.E- 8**

**Marks: 100**

**Credits: 04**

**Course Objectives:**

1. वेंचीक कोंकणी साहित्याचो अभ्यास करप.
2. कोंकणी साहित्यीक परंपरेचो चिकित्सक अभ्यास करप.
3. वेंचीक साहित्यीक विशयाचेर आस्वादनात्मक स्वाध्याय बरोवप.
4. कोंकणी साहित्याचें आस्वादन करप.

**Learning Outcomes:**

1. कोंकणी साहित्याचीं स्थित्यंतरां विद्यार्थ्यांक कळटलीं.
2. आयच्या कोंकणी साहित्याचो पांवडो खंय आसा ताचो सोद लागतलो.
3. नव्या साहित्यीक विशयांचेर स्वाध्याय बरोवन जातले.
4. कोंकणी समिक्षेक उर्बा मेळटली.

**अभ्यासक्रम**

1. आस्वादन प्रक्रियेची सिद्धांतीक म्हायती आनी अभ्यास : (10 तासिका)
2. शिक्षकाच्या मार्गदर्शना खाला वेंचिल्ल्या विशयाचो अभ्यास : (10 तासिका)
3. वाचपघरांतलो वावर : (15 तासिका)
4. प्रत्यक्ष साहित्यकृतीचेर वावर करून स्वाध्याय बरोवप : (15 तासिका)
5. सादरीकरण : (10 तासिका)

**टीप – लेखक, अभ्यासक, वाचक तशेंच हेर जाणकारांलागीं भासाभास करून विद्यार्थ्यांनी स्वाध्याय तयार करचो. (CA) खातीर**

देखी खातीर सकयल दिल्ल्या विशयां भायर हेर विशयांचो आस्पाव करूं येता:

### 1. कोंकणी निबंद -

1. रवीन्द्र केळेकारांच्या वैचारीक निबंदांतली चिंतनशिलताय : एक अभ्यास
2. अ. ना. म्हांबरो हांच्या निबंदांतली मिशकील नदर : एक सोद
3. प्रकाश थळी हांच्या निबंदांचो समाजीक अभ्यास
4. दत्ता दामोदर नायक हांच्या निबंद शैलींतली कलात्मक नदर : एक चिकित्सा
5. दिलीप बोरकार हांच्या निबंदांतलो विचार आनी विनोद : एक विवेचन
6. डॉ. तानाजी हळर्णकार हांच्या निबंदांतलो समाजीक विचार : एक विवेचन
7. मुकेश थळी हांच्या निबंदांतले नवे विचारप्रवाह : एक संशोधन
8. सुमेधा कामत हांची निबंद संपदा : आस्वादन आनी विश्लेशण
9. प्रकाश पर्येकार हांच्या निबंदांतली सैमीक आनी संस्कृतीक गिरेस्तकाय : एक सोद
10. दिनेश मणेरकार हांच्या निबंदांतली समाजीक जाणीव

### 2. कोंकणी नाटक आनी तियात्र -

1. ताची करामत आनी निमित्ताक कारण ह्या नाटकांचो समाजीक अभ्यास
2. पुंडलीक नायक : कोंकणी भाशेंत बरोवपी भारतीय नाटककार
3. पुंडलीक नायकांच्या पुराय नाट्यसंपदेची चिकित्सक अभ्यासणी
4. डॉ. प्रकाश वजरीकार हांच्या नाटकांतली समाजीक जाणविकाय
5. डॉ. राजय पवार हांच्या नाटकांतलो गंभीर विनोद : एक अभ्यास
6. 21 व्या शेंकड्यांतल्या कोंकणी नाटकांतलें स्त्री-जिवन
7. जुआंव आगोस्तीन फेर्नांडीस हांचे तियात्र : एक रंगमंचीय नियाळ
8. तॉमाझीन कार्दोज हांच्या तियात्रांतली समाजीकताय : एक अभ्यास
9. प्रिन्स जॅकॉब एक आधुनीक तियात्रिस्त : एक चिकित्सक अभ्यासणी
10. आग्नेल दे बोरी हांच्या तियात्रांचो अभ्यास
11. 21 व्या शेंकड्यांतल्या कोंकणी तियात्रांतली अस्तुरी प्रतिमा : चर्चा आनी चिकित्सा
12. 21 व्या शेंकड्यांतल्या कोंकणी तियात्रांतलो विनोद : एक अध्ययन

### संदर्भ ग्रंथ :

1. नायक, पुंडलीक. *रंगपाट*. वळवय गोंय : अपुरबाय प्रकाशन, 1992.

2. वेरेंकार, श्याम., सरदेसाय, माधवी., म्हाळशी कमलाकार. (संपादक) *कोंकणी भास, साहित्य आनी संस्कृताय*. मडगांव गोंय : कोंकणी भाशा मंडळ, 2003.
3. हळर्णकार, तानाजी. (संपादक) *कोंकणी विश्वकोश - खंड - 2, 3, 4*. ताळगांव गोंय : गोंय विद्यापीठ, 1997, 1999, 2000.
4. Gomes, Olivinho J.F. *Old Konkani Language and Literature – A Portuguese Role*. Chandor Goa: Konkani Sorospat Publication, 1999.
5. Mazarello, Wilmix Wilson. *100 years of Konkani Tiatro*. Panjim Goa: Directorate of Art & Culture Govt. of Goa, 2000.

T.Y.B.A. (Semester – V)

**Core Course**

**Course Title:** गोंय मुक्ती उपरांतर्ची कोंकणी साहित्यांतलीं स्थित्यंतरां  
(कोंकणी कविता, कथा आनी नाटकाचीं स्थित्यंतरां)  
(Important Trends in Post Liberation Konkani Literature)

**Course Code:** KON-V.C-7

**Marks:** 100

**Credits:** 04

**Course Objectives:**

1. कोंकणी साहित्यांतलीं मुखेल स्थित्यंतरां सोदप.
2. मुखेल साहित्य प्रवाहांचो वेध घेवप.
3. वेंचीक साहित्य प्रवाहांचें संकलन करप.
4. मुखेल प्रवाहांची मोलावणी करप.

**Learning Outcomes:**

1. कोंकणी साहित्याचीं मुखेल स्थित्यंतरां विद्यार्थ्यांक कळटलीं.
2. कोंकणी साहित्य प्रवाहांचो अभ्यास जातलो.
3. वेंचीक कोंकणी साहित्य प्रवाहांचें संकलन जातलें.
4. मुखेल प्रवाहांची मोलावणी जातली.

**No. of Hours:** 4 Hours per week

**अभ्यासक्रम :**

1. कोंकणी काव्याचीं कांय स्थित्यंतरां (20 तासिका)  
अ. र. वि. पंडीत  
आ. डॉ. मनोहरराय सरदेसाय  
इ. चा. फ्रा. द. काँशिता  
ई. रमेश वेळुस्कार
2. कोंकणी कथेचीं स्थित्यंतरां (20 तासिका)  
अ. चंद्रकांत केणी

- आ. गजानन जोग  
इ. दामोदर मावजो  
ई. एन. शिवदास
3. कोंकणी नाटकाची स्थित्यंतरां (20 तासिका)  
अ. पुंडलीक नायक  
आ. दत्ताराम कामत बांबोळकार  
इ. डॉ. प्रकाश वजरीकार  
ई. डॉ. राजय पवार

**संदर्भ ग्रंथ :**

1. गोमीश, ओलिविन्यु. *कोंकणी सरस्पतीचो इतिहास*. चांदोर गोंय: सरस्पत प्रकाशन, 1989.
2. नायक, पुंडलीक. *कोंकणी नाट्य स्पर्धेचीं 25 वर्सां*. पणजी गोंय: गोवा कला अकादमी, 2005.
3. पवार, राजय. *कोंकणी कवितेचो इतिहास (1960 ते 1990 मेरेनची कोंकणी कविता)*. बोरी फोंडें: सानिका प्रॉडक्शन, 2014.
4. बोरकार, माधव. (संपादक) *पांच दशकां कोंकणी कवितेचीं*. कोंकणी भाशा मंडळ, 2010.
5. मोरास, पाव्लु. *कोंकणी चळवळ*. मंगळूर: कोंकणी इन्स्टिट्यूट, सां. लुविस कॉलेज, 2003.
6. वजरीकार, प्रकाश. *वज्रघात*. वजरी, साखळी गोंय: प्राची प्रकाशन, 2010.
7. वेरेंकार, श्याम; सरदेसाय, माधवी; कमलाकार, म्हाळशी. (संपादक) *कोंकणी भास, साहित्य आनी संस्कृताय*. मडगांव गोंय: कोंकणी भाशा मंडळ, 2003.
8. सरदेसाय, मनोहरराय. (संपादक) *कोंकणी विश्वकोश खंड - 1,2,3,4*. ताळगांव गोंय: गोंय विद्यापीठ, 1999.
9. Cardozo, Felicio. *Tiatracho Jhelo II*. Panjim Goa: Goa Konkani Academi, 1998.

**T.Y.B.A. (Semester – V)**

**Elective Course**

**Course Title:** चित्रपट आनी नाटक आस्वादन  
(Film and Drama Appreciation)

**Course Code:** KON-V.E-9

**Marks:** 100

**Credits:** 04

**Course Objectives:**

1. विद्यार्थ्यांक चित्रपट आनी नाटकाच्या आस्वादानाचें म्हत्व समजावन सांगप.
2. चित्रपट आनी नाटक हांचो संबंद शिकपाक मदत करप.
3. चित्रपट आनी नाटकाच्या वेगळ्या वेगळ्या आंगांची वळख घडोवप.
4. चित्रपट आनी नाटकाच्या आस्वादानाची वळख घडोवप.
5. चित्रपट आनी नाटकाच्या वेगळ्या वेगळ्या प्रकारांची वळख घडोवप.

**Learning Outcomes:**

1. विद्यार्थ्यांक चित्रपट आनी नाटकाच्या आस्वादानाचें म्हत्व समजतलें.
2. चित्रपट आनी नाटक हांचो संबंद समजतलो.
3. चित्रपट आनी नाटकाच्या वेगळ्या वेगळ्या आंगांची वळख जातली.
4. चित्रपट आनी नाटकाच्या आस्वादानाची वळख जातली.
5. चित्रपट आनी नाटकाच्या वेगळ्या वेगळ्या प्रकारांची वळख जातली.

**No. of Hours: 4 Hours per week**

**अभ्यासक्रम:**

**चित्रपट**

1. चित्रपट, संकल्पना, गरज (05 तासिका)
2. भारतीय चित्रपटाची वळख (05 तासिका)
3. चित्रपटाच्या प्रकारांचो अभ्यास (05 तासिका)
4. चित्रपटाचें आस्वादन (कथा, पटकथा, संकलन, गीत रचना) (05 तासिका)
5. वर्गांत ल्हान फिल्म तयार करप (05 तासिका)

6. माध्यम प्रकारांतरण (05 तासिका)

### सुचोवणी-

1. चित्रपटाचे वेगळे वेगळे प्रकार दाखोवन ताचेर उक्ती भासाभास करची.
2. चित्रपटाच्या मळाचेर वावुरपी अभ्यासकांक / तंत्रज्ञ आमंत्रित करून चर्चा करची.
3. संबंधित विशयांचेर कार्याशाळा घडोवन हाडची.

### नाटक

1. नाटक, संकल्पना, गरज (05 तासिका)
2. भारतीय नाटकाची वळख - (05 तासिका)
3. नाटकाच्या प्रकारांचो अभ्यास (05 तासिका)
4. नाटकाचें आस्वादन (लेखनाचें आनी सादरीकरणाचें) (10 तासिका)
5. वर्गांत नाटक लेखन करप (05 तासिका)

### सुचोवणी-

1. विद्यार्थ्यांक वेंचीक नाटकां दाखोवन ताचेर उक्ती भासाभास करची.
2. नाटकाच्या मळाचेर वावुरपी अभ्यासक / तंत्रज्ञ आमंत्रित करून चर्चा करची.
3. संबंधित विशयांचेर कार्याशाळा घडोवन हाडची.
4. महाविद्यालयाच्या नेमा प्रमाण आमंत्रित तज्ञाक मानधन दिवपाची व्यवस्था करची.
5. गोवा कोंकणी अकादेमी वा भाशा संचालनालयाच्या आदारान कार्यावळ करची.

### संदर्भ ग्रंथ :

1. नायक, पुंडलीक. *रंगपाट*. वळवय गोंय: अपुरबाय प्रकाशन, 1996.
2. नायक युगांक. *वेंचीक अंतराष्ट्रीय चलचित्रां*. राजभाशा संचालनालय. 2013
3. बोरकार, दिलीप. “कोंकणी नाट्य स्पर्धेक चार दसकां जालीं तरी अशी कशी काय गोठेली”. जाग : एप्रिल, 2016.



4. फळदेसाय, पांडुरंग. *कोंकणी लोकवेदाचें सौंदर्यशास्त्र*. पर्वरी गोंय : सासाय प्रकाशन, 2017.
5. सरदेसाय, मनोहरराय (संपादक). *कोंकणी विश्वकोश – खंड – 1*. ताळगांव गोंय: गोंय विद्यापीठ, 1999.
6. हळर्णकार, तानाजी. (संपादक). *कोंकणी विश्वकोश – खंड – 2.3.4* ताळगांव गोंय: गोंय विद्यापीठ, 1999.
7. Balwant, [Gargi](#). *Theatre in India*. Theatre Arts Books, 1962.
8. Dantas, Isidore. *Konkani Cholchitram*. Uzvaddavpi : Dantas Publication, 2010.
9. Dix, Andrew. *Beginning Film Studies*. Manchester University Press, 2015.
10. Ghosh, Arjun. *A History of the Jana Natya Manch: Plays for the People*. New Delhi: SAGE Publications India, 2012.
11. Rachel, Dwyer and Jerry, Pinto. *Beyond the boundaries of Bollywood: The moving forms of Hindi Cinema*. New Delhi: Oxford, 2011.
12. Viegas, Felinzha. *50 years of Konkani Cinema 1950- 2000*. Konkani Entertainment Vol 1, 2003.
13. D'sa, Mario Cabral, Location Goa. Dept. of Information and Technology, 2006/
14. [www.indiandrama.com](http://www.indiandrama.com)'

**T.Y.B.A. (Semester – V)**

**Elective Course**

**Course Title: वेंचीक कादंबरेचो समाजीक अभ्यास**

**(Social Study of Selected Novel)**

**Course Code: KON-V.E-10**

**Marks: 100**

**Credits: 04**

**Course Objectives:**

1. विद्यार्थ्यांक साहित्याच्या माध्यमांतल्यान समाजीक विशयांचें म्हत्व समजावन सांगप.
2. साहित्य, भास आनी समाज हांचो संबंद शिकपाक मदत करप.
3. साहित्य आनी समाजाच्या वेगळ्या वेगळ्या घटकांची वळख घडोवप.
4. साहित्य कृतींतल्यान संस्कृतायेच्या वेगळ्या वेगळ्या आंगांची वळख घडोवप.

**Learning Outcomes:**

1. विद्यार्थ्यांक साहित्याच्या माध्यमांतल्यान समाजीक विशयांचें म्हत्व समजतलें.
2. साहित्य, भास आनी समाज हांचो संबंद समजतलो.
3. साहित्य आनी समाजाच्या वेगळ्या वेगळ्या घटकांची वळख जातली.
4. साहित्य कृतींतल्यान संस्कृतायेच्या वेगळ्या वेगळ्या आंगांची वळख जातली.

**No. of Hours: 4 Hours per week**

**अभ्यासक्रम:**

- अ. समाज आनी समाजवेवस्था. (10 तासिका)
- आ. लोकजीवन आनी लोकसंस्कृताय. (10 तासिका)
- इ. सैम आनी पर्यावरण. (10 तासिका)
- ई. मानवीय संवेदना आनी संघर्श. (10 तासिका)
- उ. स्त्री-पुरुष संबंद (5 तासिका)
- ऊ. लेखकाची समाजीक जाणविकाय. (5 तासिका)

## ऋ. कादंबरेविशीं विद्यार्थ्यांचें सादरीकरण (10 तासिका)

### सुचोवण्यो:

1. विभागान वेंचून काडिल्ल्या मौलीक आनी कोंकणीत अणकारीत जाल्ल्या कादंबरेचो अभ्यास करचो.
2. कादंबरी लेखकाक / अभ्यासकाक आमंत्रित करून विद्यार्थ्यां कडेन चर्चा घडोवन हाडची.
3. महाविद्यालयाच्या नेमा प्रमाण आमंत्रित तज्ञाक मानधन दिवपाची व्यवस्था करची.
4. गोवा कोंकणी अकादेमी वा भाशा संचालनालयाच्या आदारान कार्यावळ करची.

### संदर्भ ग्रंथ :

1. गोमीश, ओलिविन्यु. *कोंकणी सरस्पतीचो इतिहास*. चांदोर गोंय: सरस्पत प्रकाशन, 1989.
2. नागवेंकार, हरिश्चंद्र. *आस्वादन*. प्रियोळ गोंय: जाग प्रकाशन, 1991
3. बुडकुले, किरण. *साहित्य नियाळ अंतरंग आनी कायरुपां*. काणकोण गोंय : ओम दत्त पद्मजा प्रकाशन, 1998.
4. बुडकुले, किरण. *अक्षर सरिता*. आगशी गोंय : बिम्ब प्रकाशन, 2009.
5. भांगी, पांडूरंग. *साहित्य शिल्प*. पणजी गोंय : गोवा कोंकणी अकादेमी, 1995.
6. वजरीकार, प्रकाश. *वज्राघात*. वजरी सांखळी: प्राची प्रकाशन, 2010.
7. सरदेसाय, माधवी. *जाग कादंबरी विशेशांक 2011*. मडगांव गोंय : जाग प्रकाशन, 2011.
8. शेळके, भास्कर. *मराठी प्रादेशीक कादंबरी : स्वरुप आणि विश्लेषण*. सुमती लांडे, श्रीरामपूर: शब्दालय प्रकाशन, 2012.
9. सरदेसाय, माधवी. *मंथन*. मडगांव गोंय : जाग प्रकाशन, 2012.
10. भावे, भुषण. *साहित्य विमर्ष*. पणजी गोंय : शाल्मली प्रकाशन, 2016.
11. Gupta, Monika. *Women Writers in the Twentieth Century Literature*. New Delhi: Atlantic Publishers & Distributors Pvt. Ltd., 2000.
12. Kdwai A. R. *Stranger than Fiction: Images of Islam and Muslims in English Fiction*. Daryaganj, New Delhi: A. P. H. Publishing House Corporation, 2000.

T.Y.B.A. (Semester – V)

Elective Course

Course Title: कर्नाटक आनी केरळ राज्यांतल्या कोंकणी साहित्याची वळख

(Introduction of Konkani Literature from Karnataka and Kerala)

Course Code: KON-V.E-11

Marks: 100

Credits: 04

**Course Objectives:**

1. विद्यार्थ्यांक कर्नाटक आनी केरळ राज्यांतल्या कोंकणी साहित्याचें म्हत्व समजावन सांगप.
2. कर्नाटक आनी केरळ कोंकणी साहित्य समजून घेवप.
3. कर्नाटक आनी केरळ कोंकणी साहित्याची वळख घडोवप.

**Learning Outcomes:**

1. विद्यार्थ्यांक कर्नाटक आनी केरळ राज्यांतल्या कोंकणी साहित्याचें म्हत्व समजतलें.
2. कर्नाटक आनी केरळ कोंकणी साहित्याविशीं म्हायती समजतली.
3. कर्नाटक आनी केरळ साहित्याची वळख जातली.

**No. of Hours: 4 Hours per week**

**अभ्यासक्रम:**

1. कर्नाटकांतल्या कोंकणी साहित्याची वळख (20 तासिका)
  - अ. कविता
  - आ. कथा
  - इ. कादंबरी
  - ई. नाटक
2. कर्नाटकांतल्या मुखेल पांच कोंकणी लेखकांची साहित्यिक वळख (10 तासिका)
3. केरळांतल्या कोंकणी साहित्याची वळख (20 तासिका)
  - अ. कविता
  - आ. कथा

- इ. कादंबरी
- ई. नाटक

#### 4. केरळांतल्या मुखेल पांच कोंकणी लेखकांची साहित्यीक वळख (10 तासिका)

##### सुचोवण्यो –

1. केरळ आनी कर्नाटक वाठारांतल्या कोंकणी लेखकांक आमंत्रित करून विद्यार्थ्यांकडेन चर्चा घडोवन हाडची.
2. केरळ आनी कर्नाटक राज्यांत विद्यार्थ्यांची अभ्यास भोंवडी घडोवन हाडची.

##### संदर्भ ग्रंथ :

1. गोमीश, ओलिविन्यु. *कोंकणी सरस्पतीचो इतिहास*. चांदोर गोंय : सरस्पत प्रकाशन , 1989.
2. पवार, राजय. *कोंकणी कवितेचो इतिहास (1960 ते 1990 मेरेनची कोंकणी कविता)*. बोरी, फोंडें : सानिका प्रॉडक्शन, 2014.
3. नायक, जयंती. *अखील भारतीय कोंकणी साहित्य संमेलनाचीं अध्यक्षीय भाशणां*. पणजी गोंय: अखील भारतीय कोंकणी परिशद, 2016.
4. मोरास, पाव्लू. *जागरण*. मंगळूर: कोंकणी संस्थो, सां लुवीस कॉलेज , 2007.
5. रोड्रीगस, मेल्वीन. (संपादक) *20 व्या शेंकड्याच्यो कोंकणी कविता*. मंगळूर: कर्नाटक कोंकणी साहित्य अकादमी, 2007.
6. वेरेंकार, श्याम; सरदेसाय, माधवी; म्हाळशी, कमलाकार. (संपादक) *कोंकणी भास, साहित्य आनी संस्कृताय*. मडगांव गोंय : कोंकणी भाशा मंडळ, 2003.
7. सरदेसाय, माधवी. *मंथन*. मडगांव गोंय : जाग प्रकाशन, 2012.
8. हळर्णकार, तानाजी (संपादक). *कोंकणी विश्वकोश : खंड – 1*. ताळगांव गोंय: गोंय विद्यापीठ, 1999.
9. Sardesai, Manohar Rai. (Editor) *An Anthology of Modern Konkani Poems*. Priol Goa: Gomant Bharati Publications, 1964.

**T.Y.B.A. (Semester – VI)**

**Course Title: कोंकणी अध्यापनाची पद्दत**

**(Konkani: Teaching Methodology)**

**Course Code: KON-VI.E-13**

**Marks: 100**

**Credits: 04**

**Course Objectives:**

1. विद्यार्थ्यांक कोंकणी भाशेचें म्हत्व समजावन सांगप.
2. अध्ययन आनी अध्यापन पध्दती शिकपाक मदत करप.
3. अध्यापनाच्या आंगांचीं वळख घडोवप.
4. अध्यापनाच्या प्रकारांची वळख घडोवप.
5. विद्यार्थ्यांच्या मानसीकतायेची वळख घडोवप.

**Learning Outcomes:**

1. विद्यार्थ्यांक कोंकणी भाशेचें म्हत्व समजतलें.
2. अध्ययन आनी अध्यापन समजतलें.
3. अध्यापनाच्या आंगांचीं वळख जातली.
4. अध्यापनाच्या प्रकारांची वळख जातली.
5. विद्यार्थ्यांच्या मानसीकतायेची वळख जातली.

**No. of Hours: 4 Hours per week**

**अभ्यासक्रम:**

**अध्यापन 1**

1. भाशेचें म्हत्व, आवयभाशेचें म्हत्व (05 तासिका)
2. पाठ नियोजन (08 तासिका)
3. गद्याचें अध्यापन (07 तासिका)
4. स्वाध्याय (05 तासिका)

**अध्यापन 2**

1. कवितेचें अध्यापन (05 तासिका)

2. व्याकरण आनी पत्र (07 तासिका)
3. मुल्यमापन (07 तासिका)
4. विद्यार्थ्यांचें मानस आनी उपचारी अध्ययन (06 तासिका)

### अध्यापन 3

Peer teaching (05 hours)

Practice Teaching (05 hours)

### सुचोवणी-

1. उपक्रम – विद्यार्थ्यांनी सरभोंवतणच्या शाळांनी वचून अध्यापन करचें.
2. एक 'सी. ए.' खातीर शाळेंतलें अध्यापन आस्पावीत करचें.

### संदर्भ ग्रंथ :

1. केळेकार, रवीन्द्र. *नवी शाळा*. प्रियोळ गोंय: जाग प्रकाशन, 1962.
2. भाटीकर, स्नेहलता. *पालक आनी भुरगीं*. मडगांव गोंय: युगवेद प्रकाशन, 1999.
3. लवंदे, वसंत. *कोंकणी भाशेचें अध्यापन*. गोवा कोंकणी अकादेमी: वि, एम, धुमे, 1995.
4. सरदेसाय, मनोहरराय (संपादक). *कोंकणी विश्वकोश: खंड – 1*. ताळगांव गोंय: गोंय विद्यापीठ, 1999.
5. वेरेंकार, श्याम; सरदेसाय, माधवी; कमलाकार, म्हाळशी. (संपादक) *कोंकणी भास, साहित्य आनी संस्कृताय*. मडगांव गोंय: कोंकणी भाशा मंडळ, 2003.
6. Malekandathil, Pius; Dias, Remy. (Ed.) *Goa in the 20<sup>th</sup> Century: History & Culture*. Panaji, Goa: Institute Menezes Braganza, 2008.
7. Varde, P. S. *History of Education in Goa from 1510 to 1975*. Panjim Goa: Directorate of Art and Culture, (second Edition) 2012.
8. <http://en.wikipedia.org>
9. <http://www.languageinindia.com/may2005/motilalnehrureport1.html> (excerpts)

**T.Y.B.A. (Semester – VI)**

**Core Course**

**Course Title: भारतीय आनी पाश्चात्य काव्यशास्त्राची वळख**

**(Introduction to the Study of Indian and Western Poetics)**

**Course Code: KON-VI.C-8**

**Marks: 100**

**Credits: 04**

**Course Objectives:**

1. भारतीय आनी पाश्चात्य काव्यशास्त्राची फाटभूंय समजून घेवप.
2. भारतीय आनी पाश्चात्य काव्यशास्त्राचो पुराय अभ्यास करप.
3. भारतीय काव्यशास्त्राची वळख घडोवप.
4. पाश्चात्य काव्यशास्त्राची वळख घडोवप.

**Learning Outcomes:**

1. विद्यार्थी भारतीय आनी पाश्चात्य काव्यशास्त्राची फाटभूंय समजून घेतले.
2. विद्यार्थी भारतीय आनी पाश्चात्य काव्यशास्त्राचो पुराय अभ्यास करतले.
3. भारतीय काव्यशास्त्राची वळख विद्यार्थ्यांक जातली.
4. पाश्चात्य काव्यशास्त्राची वळख विद्यार्थ्यांक घडटली.

**No. of Hours: 4 Hours per week**

**अभ्यासक्रम :**

1. भारतीय काव्यशास्त्राची फाटभूंय आनी परंपरा (10 तासिका)
2. भारतीय काव्यशास्त्र – सोद आनी सिद्धांत (20 तासिका)
  - अ. काव्यलक्षणा
  - आ. काव्यप्रयोजना
  - इ. काव्यलंकार
  - ई. रससिद्धांत
3. पाश्चात्य काव्यशास्त्राची फाटभूंय आनी परंपरा (10 तासिका)
4. पाश्चात्य काव्यशास्त्र – सोद आनी सिद्धांत (20 तासिका)



अ. प्लॅटो

आ. ऍरिस्टॉटल

संदर्भ ग्रंथ :

1. गोविलकर, लिला. *भारतीय साहित्य विचार*. सदाशिवपेठ पुणे : स्नेहवर्धन प्रकाशन, 2003.
2. गुप्त गणपतीचंद्र. *भारतीय एवं पाश्चात्य काव्य-सिद्धान्त*. इलाहाबाद : लोकभारती प्रकाशन, 1986.
3. तिवारी, बालेन्दू शेखर. *वस्तुनिष्ठ काव्यशास्त्र – सम्पूर्ण भारतीय-पाश्चात्य काव्य चिन्तन*. नई दिल्ली : क्लासिकल पब्लिशिंग कम्पनी, 2015.
4. देशपांडे, बालशंकर. *काव्य विवेचन आणि विश्लेषण*. नागपूर: श्रीवत्स प्रकाशन, 2010.
5. देशपांडे, गणेश त्र्यंबक. *भारतीय साहित्य शास्त्र*. नवी दिल्ली: साहित्य अकादमी, 2016
6. फडके, श्री. शं. *भारतीय साहित्य विचार*. पणजी, गोंय : गोवा कोंकणी अकादेमी, 1999.
7. बुडकुले, किरण. *पश्चिमी समिक्षे केडन इश्टागत*. पणजी गोंय : राजहंस प्रकाशन, 1998.
8. Harmon, William. *Classic Writings on Poetry*. New York: Columbia University Press, 2003.
9. Hobsbaum, Philip. *Metre, Rhythm, and Verse Form*. New York: Routledge, 1996.

**T.Y.B.A. – (Semester – V)**  
**Elective Course**

**Course Title:** एका वेंचीक बरोवप्याचो समग्र अभ्यास  
(Study of Selected Konkani Writer)

**Course Code:** KON-V.E-12

**Marks:** 100

**Credits:** 04

**Course Objectives:**

1. विद्यार्थ्यांक लेखकाच्या माध्यमांतल्यान समाजीक विशयांचें म्हत्व समजावन सांगप.
2. लेखकाचें साहित्य, भास आनी समाज हांचो संबंद शिकपाक मदत करप.
3. लेखकाचें साहित्य आनी समाजाच्या वेगवेगळ्या घटकांची वळख घडोवप.
4. लेखकाच्या साहित्यकृतींतल्यान वेगवेगळ्या आंगांची वळख घडोवप.

**Learning Outcomes:**

1. विद्यार्थ्यांक लेखकाच्या साहित्याच्या माध्यमांतल्यान समाजीक विशयांचें म्हत्व समजतलें.
2. लेखकाचें साहित्य, भास आनी समाज हांचो संबंद समजतलो.
3. लेखकाचें साहित्य आनी समाजाच्या वेगवेगळ्या घटकांची वळख जातली.
4. लेखकाच्या साहित्यकृतींतल्यान वेगवेगळ्या आंगांची वळख जातली.

**No. of Hours:** 4 Hours per week

**अभ्यासक्रम:**

- अ. लेखकाचें जीवन आनी ताच्या साहित्यिक वावराचो समग्र अभ्यास जावचो.
- आ. परिक्षक मंडळा मुखार पन्नास गुणां खातीर वावराचें सादरीकरण जातलें.
- इ. पन्नास गुणां खातीर विद्यार्थ्यांन सादर केल्ल्या लिखित प्रकल्पाचें मुल्यमापन मार्गदर्शक करतलो.
- ई. फाँट सायज - 12, मंगल फाँट, ए-4 सायज, 1.5 स्पेस, नॉर्मल मार्जिन सँटींग.
- उ. पानां - 25 – 30 आदारा वळ आनी परिशिष्ट सोडून.

**सुचोवण्यो**

1. विभागान दर एका वर्सा वेंचून काडिल्ल्या लेखकांतल्या खंयच्याय एका लेखकाचो अभ्यास करचो पडटलो.
2. विद्यार्थ्यांक आपल्या आवडीचो कोंकणी लेखक वेंचपाची मेकळीक आसतली.

### संदर्भग्रंथः

1. नागवेंकार, हरिश्चंद्र. *आस्वादन*. प्रियोळ, फोंडें: जागप्रकाशन, 1991.
2. नायक, भिकू.बोमी. (सं.) *युगपुरुशशणैगोंयबाब: एकपरिचर्चा*. खोर्लीगोंय: जैतप्रकाशन, 2005.
3. पवार, राजय. *कोंकणीकवितेचोइतिहास (1960 ते 1990 मेरेनचीकोंकणीकविता)*. बोरीफोंडें:सानिकाप्रॉडक्शन, 2014.
4. बुडकुले, किरण. *अक्षरसरिता*. आगशीगोंय: बिम्बप्रकाशन, 2009.
5. भांगी, पांडूरंग. *साहित्यशिल्प*. पणजीगोंय: गोवाकोंकणीअकादेमी, 1995
6. वजरीकार, प्रकाश. *वज्रघात*. वजरीसाखळीगोंय: प्राचीप्रकाशन, 2010.
7. सिरसमकर, मीरा. *नोबेलललना*. (भाग – 02). सदाशिवपेठ, पुणे: मेहतापब्लिशिंगहाऊस, 2001.
8. Bradley, A. C. *Oxford Lectures on Poetry*. New Delhi: Atlantic Publishers & Distributors Pvt. Ltd., 2010.
9. Gupta, Monika. *Women Writers in the Twentieth Century Literature*. New Delhi: Atlantic Publishers & Distributors Pvt. Ltd., 2000
10. Sardesai, Manoharrai. (Editor) *An Anthology of Modern Konkani Poems*. Priol Goa: Gomant Bharati Publications, 1964.

**T.Y.B.A. (Semester – VI)**

**Elective Course**

**Course Title: अर्विल्ल्या प्रसारमाध्यमांचो अभ्यास**

**(Study of Modern Medias)**

**Course Code: KON-VI.E-14**

**Marks: 100**

**Credits: 04**

**Course Objectives:**

1. प्रसारमाध्यमांचो आरंभ आनी इतिहास समजून घेवप.
2. अर्विल्ल्या प्रसारमाध्यमांची शास्त्रीय अभ्यासणी करप.
3. अर्विल्ल्या प्रसारमाध्यमांची साबार आंगां आनी कौशल्यां विद्यार्थ्यांक शिकोवप.
4. विद्यार्थ्यां मदीं कोंकणी प्रसारमाध्यमां खातीर वावर करपाची अभिरुची विकसीत करप.

**Learning Outcomes:**

1. विद्यार्थ्यांक प्रसारमाध्यमांचो आरंभ आनी इतिहासीक फाटभूंय समजतली.
2. अर्विल्ल्या प्रसारमाध्यमांची शास्त्रीय अभ्यासणी विद्यार्थी करतले.
3. अर्विल्ल्या प्रसारमाध्यमांची साबार आंगां आनी कौशल्यां विद्यार्थ्यांक कळटलीं
4. कोंकणी प्रसारमाध्यमां खातीर पत्रकार, निवेदक, पटकथा लेखक, बातमी सांगपी आदी तयार जातले.

**No. of Hours: 4 Hours per week**

**अभ्यासक्रम :**

1. आर्विल्लीं प्रसारमाध्यमां – एक इतिहासीक आनी शास्त्रीय वळख (10 तासिका)
  - अ. प्रसारमाध्यमां – संकल्पना आनी स्वरूप
  - आ. प्रसारमाध्यमांचो आरंभ – संवसारांत आनी भारतांत
  - इ. प्रसारमाध्यमांची समाजीक गरज
  - ई. प्रसारमाध्यमांचे विंगड विंगड प्रकार – एक वळख
2. कोंकणी छापील प्रसारमाध्यमांचो इतिहास (10 तासिका)
  - अ. कोंकणी नेमाळ्यांचो इतिहास

आ. कोंकणी दिसाळ्यांचो इतिहास

3. कोंकणी इलॅक्टॉनिक प्रसारमाध्यमांचो इतिहास (10 तासिका)

अ. रेडिओ

आ. एफ्. एम्.

इ. टी. वी. चॅनल

4. छापील आनी इलॅक्ट्रॉनिक प्रसारमाध्यमां खातीर लेखन-कौशल्ल्यां (15 तासिका)

अ. छापील प्रसारमाध्यामां खातीर लेखन कौशल्ल्यां

- बातमी आनी मुखेल स्टोरी बरोवपाचीं कौशल्ल्यां
- लेख बरोवपाचीं कौशल्ल्यां
- मुलाखत लेखन कौशल्ल्यां
- नभोनाट्य लेखन कौशल्ल्यां

आ. इलॅक्ट्रॉनिक प्रसारमाध्यमां खातीर लेखन-कौशल्ल्यां (15 तासिका)

- निवेदन लेखन कौशल्ल्यां
- बातम्यो लेखन आनी संपादन कौशल्ल्यां
- मुलाखती खातीर प्रस्न तयार करपाचीं कौशल्ल्यां
- जायरातीं लेखन कौशल्ल्यां.

संदर्भ ग्रंथ :

1. कप्तान, संजय. *जनसंपर्क*. पुणे : डायंड प्रकाशन, 2009.
2. दळवी, जयमती(अनुवादक). *भारतातील प्रसारमाध्यमे काल आणि आज*. पुणे: डायमंड प्रकाशन, 2008.
3. पिंगळे, किरण (संपादक). *संवाद कौशल्ये आणि प्रसारमाध्यमे*. जुन्नर पुणे: शब्दश्री प्रकाशन, 2015
4. भावे, भुषण; वजरीकार, प्रकाश; पर्येकार प्रकाश. *कारबारी कोंकणी*. पणजी गोंय: राजहंस प्रकाशन, 2013.
5. Ludlow, Ron. *The Essence of Effective Communication*. New Delhi: Prentice Production, 1995

6. Mohan, K.; Banerji, M. *Developing Communication Skills*. New Delhi: Macmillan India, 2005.
7. [http://www.daijiworld.com/news/news\\_disp.asp?n\\_id=59256&n\\_tit=Panaji%3A+Konkani+Cinema](http://www.daijiworld.com/news/news_disp.asp?n_id=59256&n_tit=Panaji%3A+Konkani+Cinema)

**Course Title:** कोंकणी लिप्यंतरीत साहित्याचो अभ्यास

(कन्नड आनी रोमी लिपींतल्यान)

Study of Transliterated Konkani Literature

(From Kannada and Romi Script)

**Course Code:** KON-VLE-15

**Marks:** 100

**Credits:** 04

**Course Objectives:**

1. कोंकणी भास बरोवपाच्या पांच लिपयांची वळख घडोवप.
2. कन्नड आनी रोमी लिपयांनी रचिल्ल्या साहित्याची उडटी वळख घडोवप.
3. कन्नड लिपयेंतल्यान देवनागरींत उजवाडाक आयिल्ल्या वेंचीक साहित्यकृतीचो अभ्यास करप.
4. रोमी लिपयेंतल्यान देवनागरींत उजवाडाक आयिल्ल्या वेंचीक साहित्यकृतीचो अभ्यास करप.

**Learning Outcomes:**

1. कोंकणी भास बरोवपाच्या पांच लिपयांची वळख विद्यार्थ्यांक घडटली.
2. कन्नड आनी रोमी लिपयांनी रचिल्ल्या साहित्याची उडटी वळख विद्यार्थ्यांक घडटली.
3. कन्नड लिपयेंतल्यान देवनागरींत उजवाडाक आयिल्ल्या वेंचीक साहित्यकृतीचो अभ्यास जातलो.
4. रोमी लिपयेंतल्यान देवनागरींत उजवाडाक आयिल्ल्या वेंचीक साहित्यकृतीचो अभ्यास जातलो.

**No. of Hours:** 4 Hours per week

**अभ्यासक्रम :**

1. कन्नड लिपयेंतलें कोंकणी साहित्य – फाटभूंय आनी वळख (05 तासिका)
2. वेंचीक साहित्यकृतीचो अभ्यास (25 तासिका)
  - मूळ कन्नड लिपयेंतली देवनागरींत लिपयांतरीत साहित्यकृती
    1. देवाच्ये कुर्पेन (कादंबरी) – वि. जे. पी. सालदाना  
वा
    2. प्रकृतिचो पास (कविता झेलो) – मेल्वीन रोड्रीगस
3. रोमी लिपयेंतलें कोंकणी साहित्य – फाटभूंय आनी वळख (05 तासिका)

#### 4. वेंचीक साहित्यकृतींचो अभ्यास (25 तासिका)

- मूळ रोमी लिपयेंतली देवनागरींत लिपयांतरीत साहित्यकृती
  1. *ज्वालामुखी* (निबंद झेलो) – ग्वादालूप डायस  
वा
  2. *खांद (नवलिका)* – विली गोयश

#### संदर्भ ग्रंथ :

1. चोपडेकार, हनुमंत. *साहित्य धारा*. फोंडें गोंय: सारा क्रिएशन, 2016.
2. दुबे, श्यामाचरण. *परंपरा, इतिहास-बोध और संस्कृति*. नई दिल्ली: राधाकृष्ण प्रकाशन, 1995.
3. प्रभुदेसाई, वि. बा. *सतराव्या शतकातील गोमन्तकीय बोली*. मुंबई : मुंबई विश्वविद्यालय, 1963.
4. मोरास, पाव्लु. *कोंकणी चळवळ*. मंगळूर: कोंकणी इन्स्टिट्यूट, सां. लुविस कॉलेज, 2003.
5. सरदेसाय, माधवी. *मंथन*. मडगांव गोंय: जाग प्रकाशन, 2012.
6. हरिमोहन. *संपादन कला एवं प्रूफ पठन*. दरियागंज नई दिल्ली तक्षशिला प्रकाशन, 1995, 2004.
7. Da Cunha, J. Gerson. *The Konkani Language and Literature*. New Delhi: Asian Educational Services, 1981, 1991.
8. Desai, N. B. *Politics of Script: The Case of Konkani*. (1961 – 1992). Taleigao Goa: Goa University, 2002. (Unpublished Thesis)
9. Gomes, Olivinho J.F. *Old Konkani Language and Literature – A Portuguese Role*. Chandor Goa: Konkani Sorospat Publication, 1999.



Course Title: **अनुवाद अभ्यास**  
(Translation Study)

Course Code: KON-VI.E-16

Marks: 100

Credits: 04

**Course Objectives:**

1. अनुवाद तंत्राचो अभ्यास करप.
2. अणकार करपाचें कसब विद्यार्थ्यांक शिकोवप.
3. सर्जनशील साहित्याचो अणकार करपाचो सराव करप.
4. कोंकणी विद्यार्थ्यां मदीं अनुवादकाची वृत्ती आनी कौशल्य विकसीत करप.

**Learning Outcomes:**

1. अनुवाद तंत्राचो अभ्यास विद्यार्थी करतले.
2. अणकार करपाचें कसब विद्यार्थी शिकतले.
3. सर्जनशील साहित्याचो अणकार करपाचो सराव विद्यार्थी सेगीतपणान करतले.
4. कोंकणी विद्यार्थ्यां मदीं अनुवादकाची वृत्ती आनी कौशल्य विकसीत जावपाक मदत जातली.

**No. of Hours: 4 Hours per week**

**अभ्यासक्रम :**

1. अनुवाद – एक आधुनीक शास्त्र (10 तासिका)
  - अ. अनुवादाची गरज आनी उपयुक्तताय
  - आ. अनुवाद प्रक्रिया आनी स्वरूप
  - इ. अनुवादाचें तंत्र आनी मंत्र
  - ई. अनुवाद एक कौशल्य
2. कोंकणीतली साहित्यीक अनुवादाची परंपरा – एक वळख (10 तासिका)
3. हेर भाशेंतल्यान कोंकणीत अनुवादीत जाल्ल्या गद्य बरपाचो अभ्यास (10 तासिका)  
(कथा, नाटक आनी लेख)
4. कोंकणीतल्यान हेर भाशेंत अनुवादीत जाल्ल्या गद्य बरपाचो अभ्यास (10 तासिका)  
(कथा आनी लेख)

5. वेंचीक कोंकणी कथेचो / निबंदाचो हेर भाशेंत अनुवाद (10 तासिका)

6. हेर खंयच्याय वेंचीक भाशेंतल्या कथेचो / निबंदाचो कोंकणींत अनुवाद (10 तासिका)

**संदर्भ ग्रंथ :**

1. तिवारी, भोलानाथ; गावा, ओमप्रकाश. *अनुवाद की व्यावहारिक समस्याएँ*. नई दिल्ली: शब्दकार प्रकाशन, 1978.
2. बुडकुले, किरण. *अणकार : आयच्या संदर्भांत एक विचार*. अक्षर सरिता. बिम्ब प्रकाशन, 2009.
3. बुडकुले, किरण; सुर्लकर, मोहनदास. *कथा दर्पण*. पणजी गोवा: इन्स्टिट्यूट मिनेझिस ब्रागांझा, 2009.
4. भावे, भूषण; वजरीकार, प्रकाश; पर्येकार प्रकाश. *कारबारी कोंकणी*. पणजी गोंय: रजहंस प्रकाशन, 1999, 2013.
5. माकाशी, सयाजीराजे., नेमाडे, रंजना. *व्यवहारीक मराठी*. बारामती पुणे : शेतकरी साहित्य इर्जिक, 2010.
6. लांडगे, संजय. *उपयोजित मराठी*. शनिवारपेठ पुणे: दिपराज प्रकाशन प्रा. लि., 2011.
7. वेरेंकार, श्याम; सरदेसाय, माधवी; कमलाकार, म्हाळशी. (संपादक). *कोंकणी भास, साहित्य आनी संस्कृताय*. मडगांव गोंय: कोंकणी भाशा मंडळ, 2003.
8. सिंहल, सुरेश. *अनुवाद अवधारणा और आयाम*. दरयागंज नई दिल्ली: संजय प्रकाशन, 2006.
9. Budkule, Kiran. "Building Bridges across Languages and Culture." *Mapping the Mosaic of Culture : Essays in Language and Literature*. Jaipur : University Book House, 2009

**Course Title:** कोंकणी एकांकी आनी पथनाट्याचो अभ्यास - (भाग - 2)  
(Study of Konkani One Act Play & Street Play) (Part – 2)

**Course Code:**

**Marks:** 100

**Credits:** 04

**Course Objectives:**

1. विद्यार्थ्यांक पथनाट्य हया साहित्य प्रकाराची वळख करून दिवप.
2. विद्यार्थ्यां मेरेन पथनाट्यांतली समाजीक जाणीव पावोवप.
3. विद्यार्थ्यांक कोंकणी पथनाट्य निर्मितींत वांटेकार करून घेवप.
4. विद्यार्थ्यांच्या सहकार्यान कोंकणी पथनाट्याचें सादरीकरण करप.

**Learning Outcomes:**

1. विद्यार्थी पथनाट्य हया साहित्य प्रकाराचें शास्त्रीय गिन्यान घेवंक शकतले.
2. विद्यार्थ्यां मदीं पथनाट्यांतल्यान समाजीक जाणीव निर्माण जातली.
3. विद्यार्थ्यांच्या साबार कलागुणांक माची मेळटली.
4. नाट्य सादरीकरणांतल्यान विद्यार्थ्यांच्या व्यक्तिमत्वांत भर पडटली.

**No. of Hours:** 4 Hours per week

**अभ्यासक्रम :**

**1. पथनाट्य - एक साहित्य प्रकार (10 तासिका)**

- पथनाट्याची संकल्पना, व्याख्या आनी प्रकार
- पथनाट्याचे घटक

- संहितेचे नदरेन घटक : कथानक, संवाद, पात्रचित्रण, गीतरचना, संघर्श, शेवट, आदी

- प्रयोगाचे नदरेन घटक : दिग्दर्शन, अभिनय, नाच, संगीत, रंगवण, मुस्तायकी, आदी

**2. पथनाट्य – आरंभ आनी उदरगत (15 तासिका)**

- संवसारीक पावंड्यार पथनाट्याचो आरंभ आनी उदरगत
- पथनाट्याची भारतीय फाटभूंय आनी मुखेल स्थित्यंतरां
- पथनाट्यांतली समाजीक लागणूक

### 3. वेंचीक कोंकणी पथनाट्यांचो अभ्यास (25 तासिका)

- वेंचीक पांच लेखकांच्या पथनाट्यांचो संहितेचे नदरेन अभ्यास

- अ. हनुमंत चोपडेकार
- आ. सत्यवान नायक
- इ. कवीन्द्र फळदेसाय
- ई. जयेश राऊत
- उ. मनोज कामत

### 4. वेंचीक कोंकणी पथनाट्याचें सादरीकरण (10 तासिका)

- अभ्याशिल्ल्या एका पथनाट्याचो प्रयोगाचे नदरेन अभ्यास

- अ. अभ्याशिल्ल्या पथनाट्याची निवड आनी नाट्यवाचन
- आ. वेंचिल्ल्या प्रयोगक्षम पथनाट्याचो सराव आनी सादरीकरण

### संदर्भ ग्रंथ :

1. प्रभूदेसाय, संदेश. *रस्तो नाट्य द फस्ट थियेटर. दत्तवाडी सांगे गोंय : संजना पब्लिकेशन्स, 2018.*
2. नायक, पुंडलीक. (संपादक) *आधुनीक कोंकणी एकांकी.* नवी, दिल्ली : साहित्य अकादेमी, 2014.
3. नायक, पुंडलीक. *रंगपाट. वळवय गोंय : अपुरबाय प्रकाशन, 1996.*
4. नायक, सत्यवान. *जमजाग. खोर्ली तिसवाडी : जैत प्रकाशन, 2014.*
5. फळदेसाय, कविन्द्र. *सर फुडें. दत्तवाडी, सांगे गोंय : संजना प्रकाशन, 2014.*
6. वेरेंकार, श्याम., सरदेसाय, माधवी., कमलाकर, म्हाळशी. (संपादक) *कोंकणी भास, साहित्य आनी संस्कृताय.* मडगांव गोंय : कोंकणी भाशा मंडळ, 2003.
7. भगत, दत्ता. *मराठी दलित एकांकी.* नवी दिल्ली : साहित्य अकादेमी, 2012.

**MARATHI**

1.1.3 Average percentage of courses having focus on employability/entrepreneurship/skills development/SEC

**Department of Marathi**  
**Year of Introduction :- 2015**

**Parvatibai Chowgule College of Arts And Science**

**Autonomous**

**Department of Marathi**

**Syllabi of Semester I And semester II for the Academic Year 2015 – 16**

**F.Y.B.A - (Semester - I)**

**Core Paper**

Paper Title: मराठी कथा आणि उपयोजित स्तर

Paper Code: MAR-I.C-1

Marks: 100

Credits: 04

**Course Objective:**

साहित्याच्या मूलभूत प्रकारांपैकी कथा हा एक साहित्याचा प्रकार आहे. या साहित्यप्रकाराची गुण वैशिष्ट्ये समजावून घेणे. मराठी कथा साहित्याचा ऐतिहासिक परामर्श घेणे. सैध्दांतिक तसेच उपयोजित स्तरावर त्याचा अभ्यास करणे. मराठी कथा साहित्याला समृद्ध बनवणाऱ्या कथांच्या अध्ययनातून या साहित्यप्रकारातील बदलत्या प्रवाहांचा परिचय करून देणे.

**Syllabus:**

1. सैध्दांतिक स्तर: कथा या साहित्यप्रकाराचा सैध्दांतिक स्तरावर अभ्यास - घटक व प्रकार (10 lectures)
2. मराठी कथेची वाटचाल - स्थूल स्वरूप (05 lectures)
3. उपयोजित स्तरावर नेमलेल्या कथांचे अध्ययन (45 lectures)

#### 4. निवडक कथांचे स्वयंअध्ययन (कथा निवडीचे स्वातंत्र्य विद्यार्थ्यांना असेल)

#### Learning Outcome:

सैध्दांतिक व उपयोजित स्तरावर कथा या साहित्यप्रकाराचे अध्ययन केल्यामुळे या साहित्यप्रकाराचे मूल्यमापन करण्याची क्षमता विद्यार्थ्यांमध्ये निर्माण होईल. तसेच मराठी कथासाहित्यातील महत्त्वाच्या कथाकारांचा परिचय होईल. कथालेखनाविषयीची आवड निर्माण होईल. परीक्षण, कथेचं अध्यापन कसे करावे याची ओळख होऊ शकेल. इतर सर्वच लेखनप्रकाराचा पायाभूत लेखनप्रकार म्हणून या प्रकाराची ओळख विद्यार्थ्यांना होऊ श

#### संदर्भ ग्रंथ

1. मराठी कथा: स्वरूप आणि आस्वाद - दा. वि. कलकर्णी स्वाध्याय महाविद्यालय प्रकाशन, पुणे.
2. कथा: संकल्पना आणि समीक्षा - डॉ. सुधा जोशी, मुंबई विद्यापीठ आणि मौज प्रकाशन गृह, मुंबई २०००.
3. मराठी कथा: उगम आणि विकास - डॉ. इंदुमती शेवडे, सोमैया प्रकाशन, मुंबई, १९७३.
4. मराठी कथा: रूप आणि परिसर - म. द. हातकणंगलेकर, सुपर्ण प्रकाशन, पुणे १९८६.
5. लेखन कला परिचय - स. शं. देसाई, अनंत दशरथे, परिमल प्रकाशन, औरंगाबाद, १९९८.
6. मराठी वाङ्मयाचा इतिहास - संपादक रा. श्री. जोग, महाराष्ट्र साहित्य परिषद, पुणे.
7. मराठी साहित्य समालोचन (खंड चौथा) - वि. सी. सरवटे, महाराष्ट्र साहित्य सभा, इंदूर, १९७९.
8. वाङ्मयीन संज्ञा - संकल्पना कोश - संपादक प्रभा गणोरकर, वसंत आबाजी डहाके व इतर, पॉप्युलर प्रकाशन, मुंबई २००१
9. प्रदक्षिणा. खंड २ - संपादक रवींद्र घवी, पुष्पा भावे व इतर. कॉन्टिनेंटल, पुणे २००८.

## **F.Y.B.A - (Semester - 1)**

### **Core Paper**

Paper Title: मराठी कविता आणि उपयोजित स्तर

Paper Code: MAR-I.C-2

Marks: 100

Credits: 04

### **Course Objective:**

कविता हा साहित्याचा एक मूलभूत प्रकार आहे. या साहित्यप्रकाराची गुण वैशिष्ट्ये समजावून घेणे. मराठी कवितेचा ऐतिहासिक परामर्श घेणे. कवितेच्या अध्ययनातील मूलभूत घटकांचा परिचय करून देणे. सैध्दांतिक तसेच उपयोजित स्तरावर त्याचा अभ्यास करणे. कवितेच्या प्रत्यक्ष अध्ययनातून या साहित्यप्रकारातील बदलत्या प्रवाहांचा परिचय करून देणे. कवितेचा आशय, अभिव्यक्ती आणि रचनासौंदर्य अभ्यासणे.

### **Syllabus:**

सैध्दांतिक स्तर: कविता या साहित्यप्रकाराचे स्वरूप - इतर वाङ्मयप्रकारांपेक्षा असलेले वेगळेपण (05 lectures) मराठी कवितेची वाटचाल - प्रातिनिधीक स्वरूपात (05 lectures) कवितेतील स्थित्यंतरे - प्राचीन आणि आधुनिक कवितेच्या संदर्भात (05 lectures) उपयोजित स्तरावर नेमलेल्या कवितांचे अध्ययन. (45 lectures) निवडक कवितांचे स्वयंअध्ययन (कविता निवडीचे स्वातंत्र्य विद्यार्थ्यांना असेल)

### **Learning Outcome:**

सैध्दांतिक व उपयोजित स्तरावर कविता या साहित्यप्रकाराचे अध्ययन केल्यामुळे या साहित्यप्रकाराचे मूल्यमापन करण्याची क्षमता विद्यार्थ्यांमध्ये निर्माण होईल. कवितालेखनाविषयीची आवड निर्माण होईल. परीक्षण, कवितेचं अध्यापन कसे करावे याची ओळख होऊ शकेल. इतर सर्वच लेखनप्रकाराचा पायाभूत लेखनप्रकार म्हणून या प्रकाराची ओळख विद्यार्थ्यांना होऊ शकेल.



## संदर्भ ग्रंथ

१. कविता: जुनी आणि नवी - वा. ल. कुलकर्णी
२. आधुनिक मराठी काव्य: उद्गम आणि भवितव्य - दि. के. बेडेकर, नागपूर विद्यापीठ, नागपूर १९६९
३. मराठी कविता - नवी वळणे - प्रकाश देशपांडे - केजरकर, साकेत प्रकाशन, औरंगाबाद १९९४.
४. साठोत्तरी मराठी कविता - रा. ग. जाधव
५. कवितेविशयी - वसंत आबाजी डहाके, स्वरूप प्रकाशन, औरंगाबाद
६. कविता फुलते अशी - संपादक वा. रा. ढवळे आणि व. दि. कुलकर्णी
७. मराठी कविता: परंपरा आणि दर्शन - संपादक रवींद्र शोभणे, विजय नागपूर
८. काही मराठी कविता: जाणिवा आणि शैली - सुधीर रसाळ, शारदा १९८४
९. पुन्हा एकदा कविता - संपा. महानोर व चंद्रकांत पाटील, नीळकंठ प्रकाशन.
१०. मराठी वाङ्मयाचा इतिहास - संपादक रा. श्री. जोग, महाराष्ट्र साहित्य परिषद, पुणे.
११. वाङ्मयीन संज्ञा - संकल्पना कोश - संपादक प्रभा गणोरकर, वसंत आबाजी डहाके व इतर, पॉप्युलर प्रकाशन, मुंबई २००१
१२. प्रदक्षिणा. खंड २ - संपादक, रवींद्र घवी, पुष्पा भावे व इतर. कॉन्टिनेंटल, पुणे २००८.

## **F.Y.B.A - (Semester - II)**

### **Core Paper**

Paper Title: मराठी कादंबरी आणि उपयोजित स्तर

Paper Code: MAR-II.C-3

Marks: 100

Credits: 04

### **Course Objective:**

कादंबरी हा कथात्म साहित्याचा प्रकार आहे. या साहित्यप्रकाराची गुण वैशिष्ट्ये समजावून घेणे. मराठी कादंबरीचा ऐतिहासिक परामर्श घेणे. सैध्दांतिक तसेच उपयोजित स्तरावर त्याचा अभ्यास करणे. मराठी कादंबरीला समृद्ध बनवणाऱ्या कादंबरीच्या अध्ययनातून या साहित्यप्रकारातील बदलत्या प्रवाहांचा परिचय करून देणे. अभ्यासक्रमाव्यतिरिक्त इतर कादंबऱ्यांच्या वाचनाला विद्यार्थ्यांना प्रवृत्त करणे

### **Syllabus:**

1. सैध्दांतिक स्तर: कादंबरी या साहित्यप्रकाराचा सैध्दांतिक स्तरावर अभ्यास -  
घटक व प्रकार (10 lectures)
2. मराठी कादंबरीची वाटचाल - स्थूल स्वरूप (05 lectures)
3. उपयोजित स्तरावर नेमलेल्या कादंबरीचे अध्ययन (45 lectures)
4. निवडलेल्या एका कादंबरीचे स्वयंअध्ययन (कादंबरी निवडीचे स्वातंत्र्य विद्यार्थ्यांना असेल)

### **Learning Outcome:**

सैध्दांतिक व उपयोजित स्तरावर कादंबरी या साहित्यप्रकाराचे अध्ययन केल्यामुळे या साहित्यप्रकाराचे मूल्यमापन करण्याची क्षमता विद्यार्थ्यांमध्ये निर्माण होईल. तसेच मराठीतील महत्त्वाच्या कादंबरीकारांचा परिचय होईल. कादंबरीलेखनाविषयीची आवड निर्माण होईल. कादंबरीचे सूक्ष्म वाचन कसे करावे, परीक्षण कसे करावे आणि कादंबरीचे अध्यापन कसे करावे याची पूर्व तयारी होईल.

## संदर्भ ग्रंथ

1. 'गेल्या अर्धशतकातील मराठी कादंबरी', संपादक विलास खोले
2. मराठी कादंबरी : चिंतन आणि समीक्षा - चंद्रकांत बांदिवडेकर
3. मराठी कादंबरी : समाजशास्त्रीय समीक्षा - रविंद्र ठाकूर
4. 'मराठी कादंबरी विसावे शतक - कुसुमावती देशपांडे
5. धार आणि काठ - नरहर कुरुंदकर
6. मराठी वाङ्मयाचा इतिहास - संपादक रा. श्री जोग, महाराष्ट्र साहित्य परिषद, पुणे
7. वाङ्मयीन संज्ञा - संकल्पना कोश, संपादक प्रभा गणोरकर, वसंत आबाजी डहाके, व इतर पॉप्युलर प्रकाशन, मुंबई 2001
8. प्रदक्षिणा खंड 2 - संपादक रवींद्र घवी, पुष्पा भावे व इतर, कॉन्टिनेंटल प्रकाशन, पुणे 2008

## F.Y.B.A - (Semester -II)

### Core Paper

Paper Title: मराठी नाटक आणि उपयोजित स्तर

Paper Code: MAR-II.C-4

Marks: 100

Credits: 4

### **Course Objective:**

साहित्याच्या मूलभूत प्रकारांपैकी नाटक हा एक प्रकार आहे. नाट्य संहिता म्हणजे काय? काही उपलब्ध नाट्य संहितांच्या आधारे अभ्यास. या साहित्यप्रकाराची घटकांतर्गत गुण वैशिष्ट्ये समजावून घेणे. मराठी नाटकांची परंपरा समजावून घेणे. सैध्दांतिक तसेच उपयोजित स्तरावर त्याचा अभ्यास करणे. मराठी नाटकाला समृद्ध बनवणाऱ्या नाटकांच्या अध्ययनातून या साहित्यप्रकारातील बदलत्या प्रवाहांचा परिचय करून देणे.

### **Syllabus:**

1. सैध्दांतिक स्तर: नाटक या साहित्यप्रकाराचा सैध्दांतिक स्तरावर अभ्यास - घटक व प्रकार (10 lectures)
2. मराठी नाटकाची वाटचाल - स्थूल स्वरूप (05 lectures)
3. उपयोजित स्तरावर नेमलेल्या नाटकाचे अध्ययन (45 lectures)
4. निवडलेल्या एका नाटकाचे स्वयंअध्ययन/संहिता लेखन

### **Learning Outcome:**

सैध्दांतिक व उपयोजित स्तरावर नाटक या साहित्यप्रकाराचे अध्ययन केल्यामुळे नाट्याभ्यासाची एक व्यापक दृष्टी येईल. विद्यार्थ्यांच्या मनामध्ये या प्रकाराविषयी आवड निर्माण होऊन या साहित्यप्रकाराचे मूल्यमापन करण्याची क्षमता विद्यार्थ्यांमध्ये निर्माण होईल. तसेच मराठीतील महत्त्वाच्या नाटककारांचा परिचय होईल. नाटक लिहिण्याची आवड निर्माण होईल.

## संदर्भ ग्रंथ

१. मराठी रंगभूमी: नाटक, घटना आणि परंपरा - कृ. नारायण काळे व इतर, मुंबई मराठी साहित्य संघ. मुंबई १९७१.
२. रंगचर्या - कृ. रा. सावंत,
३. शोकनाट्याचे साहित्यरूप - सदा कहाडे, पी. पी. एच् बुकस्टॉल, मुंबई नं. ४.
४. भारतीय प्रयोग कलांचा परिचय व एतिहास - नाट्य - राजीव नाईक आणि प्रवीण भोळे, लोकवाडमयगृह. २०१०
५. खानोलकरांची नाट्यसृष्टी - डॉ. पुष्पलता राजापुणे - तापस, प्रतिमा प्रकाशन
६. मराठी वाङ्मयाचा इतिहास - संपादक रा. श्री. जोग, महाराष्ट्र साहित्य परिषद, पुणे.
७. वाङ्मयीन संज्ञा - संकल्पना कोश - संपादक प्रभा गणोरकर, वसंत आबाजी डहाके व इतर, पॉप्युलर प्रकाशन, मुंबई २००१
८. प्रदक्षिणा. खंड २ - संपादक, रवींद्र घवी, पुष्पा भावे व इतर. कॉन्टिनेंटल, पुणे २००८.

## **F.Y.B.A - (Semester - I)**

### **Optional Paper**

Paper Title: व्यावहारिक मराठी

Paper Code:

Name of Faculty: Mr. Shrikrishna Adsul

Marks: 100 Credits: 04

#### **Course Objective:**

साहित्याच्या अध्यापनाबरोबरच विद्यार्थ्यांना मराठी भाषेच्या, दैनंदिन व्यवहारामध्ये आवश्यक असलेल्या भाषिक कौशल्यांचा - क्षमतांचा विकास करणे. भाषिक कौशल्याचे विविध आविष्कार व संपर्क माध्यमे यांच्यातील परस्पर संबंध समजावून घेणे, मराठीचा कार्यालयीन, व्यावसायिक कामकाजात होणारा वापर, गरज व स्वरूपविशेष यांची माहिती करून देणे.

#### **Syllabus:**

वर्तमानपत्र आणि दृक -श्राव्य माध्यमांसाठी बातमी लेखन (10 lectures) माहितीपत्रक आणि निवेदन लेखन (10 lectures) टिप्पणी लेखन (05 lectures) कार्यालयीन पत्रलेखन (10 lectures) इतिवृत्त (05 lectures) स्मरणिका, गौरविका (10 lectures) निमंत्रण, प्रमाणपत्र, शुभसंदेश, मुखपृष्ठ - मलपृष्ठ (10 lectures)

#### **Learning Outcome:**

मराठीचा कार्यालयीन, व्यावसायिक कामकाजात कसा वापर होतो त्याची माहिती होईल. व्यावहारात भाषा व्यवहारासाठी आवश्यक असलेल्या लेखन कौशल्याचा विकास होईल. नोकरी व्यवसाय सांभाळूनही फावल्या वेळात या लेखन कौशल्यामुळे अर्थप्राप्ती होऊ शकेल. स्वतंत्रपणे या लेखनकौशल्यामुळे विद्यार्थ्यांच्या ठिकाणी रोजगारक्षमता कशी प्राप्त होऊ शकते ते ध्यानात येईल.

## संदर्भ ग्रंथ

१. व्यावहारिक मराठी - पुणे विद्यापीठ प्रकाशन
२. व्यावहारिक मराठी - डॉ. कल्याण काळे, डॉ. दत्तात्रय पुंडे
३. व्यावहारिक मराठी - संपा. डॉ. स्नेहल तावरे, स्नेहवर्धन प्रकाशन, पुणे
४. व्यावहारिक मराठी - डॉ. लीला गोविलकर, डॉ. जयश्री पाटणकर, स्नेहवर्धन प्रकाशन, पुणे
५. व्यावहारिक मराठी - डॉ. ल. रा. नसिराबादकर, फडके प्रकाशन, कोल्हापूर
६. यशस्वी वार्ताहर कसे व्हावे? - ज्ञानोदय प्रकाशन केंद्र, वाळंज, औरंगाबाद - ३६.
७. पत्रकारांसाठी मराठी - बा. ग. गुर्जर, ल. ना. गोखले, बाबासाहेब घोरपडे, वृत्तविद्या प्रबोधिनी, पुणे.
८. संपादक व संपादकीय - के. ए. पोतदार
९. पत्रकारिता विद्या - संपादक किरण गोखले.

## **F.Y.B.A - (Semester - II)**

### **Optional Paper**

Paper Title: मराठी वाचन लेखन कौशल्य

Paper Code:

Name of Faculty: Mr. Shrikrishna Adsul

Marks: 100

Credits: 4

#### **Course Objective:**

वाचनाबरोबरच विविध लेखनकौशल्यांची ओळख करून घेणे, लेखनकौशल्याची क्षमता निर्माण करणे. भाषिक कौशल्ये ज्या ज्या घटकांद्वारे वा माध्यमांद्वारे विकसित होऊ शकतील त्या सर्व घटकांचा माध्यमांचा सविस्तर परिचय करून देणे. प्रत्यक्ष प्रात्यक्षिक व उपयोजनांस उद्द्युक्त करून एकंदरीतच लेखन कौशल्याचे आजच्या संदर्भातील महत्त्व पटवून देणे.

#### **Syllabus:**

मुलाखत लेखन (10 lectures) सारांश लेखन (05 lectures) परीक्षण, रसग्रहण (10 lectures) भाषांतर (10 lectures) श्रुतिका, नाटिका लेखन (10 lectures) संवाद लेखन (05 lectures) पटकथा लेखन, माहितीपट लेखन (10 lectures)

#### **Learning Outcome:**

लेखन क्षमता विकसित झाल्यामुळे सर्व माध्यमांसाठी त्या - त्या लेखनप्रकारानुसार विद्यार्थ्यांच्या ठिकाणी लेखनकौशल्ये विकसित होऊ शकतील. अर्थप्राप्तीच्या दृष्टीने ही लेखनकौशल्ये अत्यंत उपयुक्त ठरतील. या लेखनकौशल्यामुळे जीवनात यशस्वी झालेल्यांशी संपर्क होऊन स्वतःचा उपयोग व्यवसाय निर्माण करण्याची क्षमता - आवड विद्यार्थ्यांमध्ये निर्माण होऊ शकेल.



## संदर्भ ग्रंथ

१. प्रसारमाध्यमे आणि मराठी भाषा - संपादक डॉ. भास्कर शेळके
२. व्यावहारिक मराठी भाषा - शरदिनी मोहिते.
३. व्यावहारिक आणि उपयोजित मराठी - डॉ. मनोहर रोकडे
४. मराठी भाषा उपयोजन आणि सर्जन - प्रा. सुहासकुमार बोबडे
५. मराठी लेखन कोश - अरुण फडके
६. मराठी शुध्दलेखन प्रदीप - मो. रा. वाळंबे.
७. भाषांतरमीमांसा - कल्याण काळे, अंजली सोमण
८. लेखनकला परिचय - स. शं. देसाई
९. भाषांतर - सदा करहाडे, लोकवाडमयगृह प्रकाशन, मुंबई.

2016

**S.Y.B.A - (Semester - III)**

**Core Paper**

Paper Title: काव्यशास्त्र (भारतीय व पाश्चात्य)

Paper Code: MAR-III.C-5

Name of Faculty: Adsul Shrikrishna

Marks: 100

Credits: 04

**Course Objective:**

1. काव्य या वाङ्मयप्रकाराच्या व्याख्या व स्वरूप समजावून घेणे.
2. काव्यशास्त्र - शास्त्र म्हणून मीमांसा/सिध्दांतन अभ्यासणे.
3. संस्कृत साहित्यातील काव्यलक्षणाची ओळख करून घेण्या बरोबरच पाश्चात्य साहित्यातील काव्यलक्षणांचा परिचय करून देणे.
4. भारतीयांची काव्यप्रयोजने व पाश्चात्यांची काव्यप्रयोजने यांची माहिती होईल.
5. प्रतिभेचे स्वरूप व काव्यातील तिचे महत्त्व कोणते याविषयी विद्यार्थ्यांना माहिती होईल.

**Learning Outcome:**

1. काव्य या साहित्यप्रकाराची विद्यार्थ्यांना ओळख होईल त्याचबरोबर एक शास्त्र म्हणून काव्यशास्त्राची बाजू ध्यानात येईल.
2. प्राचीन काव्यापासून म्हणजे संस्कृत साहित्यातील काव्यलक्षणे व पाश्चात्य साहित्यातील काव्यलक्षणे समजल्यामुळे, एकूणच काव्यशास्त्राचा सखोल अभ्यास होईल.
3. काव्यनिर्मितीकडे, प्राचीन भारतीय साहित्याभ्यासकांनी आणि पाश्चात्य साहित्याभ्यासकांनी कोणकोणत्या हेतूने पाहिले आणि काव्यनिर्मितीची कोणकोणती प्रयोजने होती त्याचा

सविस्तर अभ्यास होईल.

4. काव्यनिर्मितीत प्रतिभेचा महत्त्वाचा परिचय होईल. 5. काव्याकडे पाहण्याची एक समीक्षात्मक, काव्यदृष्टी प्राप्त होईल.

### **Syllabus:**

1. काव्य - व्याख्या, स्वरूप व शास्त्र म्हणून मीमांसा (15 Lecture)
2. काव्यलक्षणे - भारतीय व पाश्चात्य (15 Lecture)
3. काव्यप्रयोजने - भारतीय व पाश्चात्य (15 Lecture)
4. प्रतिभेचे स्वरूप व कार्य (15 Lecture)

### **संदर्भ ग्रंथ**

1. कुलकर्णी वा. ल., साहित्य स्वरूप आणि समीक्षा, मुंबई. दु. आ. 1995
2. गाडगीळ स. रा., काव्यशास्त्रप्रदीप, व्हीनस प्रकाशन, पुणे - 2010
3. जोग रा. श्री., अभिनव काव्यप्रकाश
4. ढवळे वि. ना., साहित्याचे तत्वज्ञान, प. आ. 1984 पुणे
5. देशपांडे ग. त्र्यं., भारतीय साहित्यशास्त्र, मुंबई - 1980
6. पाटील गंगाधर, समीक्षेची नवी रूपे, मुंबई - 1982
7. यादव आनंद, साहित्याची निर्मिती प्रक्रिया, मेहता प्रकाशन, पुणे 1989
8. यशवंत मनोहर, नवे साहित्यशास्त्र, विजय प्रकाशन, नागपूर - 2001

**S.Y.B.A - (Semester - III)**

**Elective Paper**

Paper Title: प्राचीन मराठी वाङ्मय (प्रारंभ - 1650)

(Old Marathi Literature - Beginning to 1650)

Paper Code: MAR-III.E-1

Name of Faculty: Sarika Advilkar

Marks: 100

Credits: 04

**Course Objective:**

1. मराठी भाषेच्या उगमाच्या खुणा जाणून घेऊन प्राचीन मराठी भाषा, साहित्य आणि संस्कृती यांचा परिचय करून देणे.
2. जुन्या मराठी साहित्याच्या विकासाला हातभार लावणाऱ्या साहित्यिकांचा त्यांच्या महत्वाच्या कलाकृतींच्या आधारे परिचय करून देणे.
3. प्राचीन मराठी साहित्यातील बदलत्या प्रवृत्ती आणि प्रवाहांची ओळख करून देणे.
4. विविध पंथीय मराठी वाङ्मयाच्या लेखनप्रेरणा व स्वरूप सजावून देणे.

**Learning Outcome:**

1. या अभ्यासक्रमाच्या अध्ययनातून मराठी भाषेच्या उगमापासूनचा इतिहास विद्यार्थ्यांना अभ्यासता येईल.
2. प्राचीन मराठीच्या विविध कालखंडांमध्ये साहित्यातील बदलत्या प्रवृत्ती आणि प्रवाह यांचा परिचय होईल.
3. विविध कालखंडातील साहित्यिक व त्यांच्या साहित्याचा परिचय विद्यार्थ्यांना करून घेता येईल.
4. प्राचीन मराठी साहित्यातील विविध साहित्यप्रकारांचा विद्यार्थ्यांना परिचय होईल,

## Syllabus:

1. यादवपूर्व काळातील मराठीचे स्वरूप. (05 तासिका)
2. यादवकालीन मराठी वाङ्मय (नाथसंप्रदाय, महानभाव संप्रदाय, वारकरी संप्रदाय) (25 तासिका)
3. बहामनी कालीन मराठी वाङ्मय (दत्त संप्रदाय, ख्रिस्ती मराठी वाङ्मय, संत कवींची वाङ्मय निर्मिती) (15 तासिका)
4. शिवकालान मराठी वाङ्मय (रामदास आणि तकाराम व इतर संत कवी) (15 तासिका)

## संदर्भ ग्रंथ

1. गोसावी, र. रा., महाराष्ट्रातील पाच भक्ती संप्रदाय, प्रतिमा प्रकाशन
2. जोग, रा. श्री. (संपा.), मराठी वाङ्मयाचा इतिहास (खंड एक ते तीन), महाराष्ट्र साहित्य परिषद, पुणे.
3. डहाके, वसंत आबाजी., मराठी साहित्य इतिहास आणि संस्कृती, पॉप्युलर प्रकाशन, मुंबई.
4. तुळपुळे, शं. गो., महानुभाव पंथ व त्यांचे वाङ्मय, व्हीनस प्रकाशन, पुणे.
5. देशपांडे, अ. ना., प्राचीन मराठी वाङ्मयाचा इतिहास भाग एक ( महानुभाव अखेर), व्हीनस प्रकाशन, पुणे, आ. दुसरी, जाने 1995.
6. देशपांडे, अ. ना., प्राचीन मराठी वाङ्मयाचा इतिहास भाग दुसरा ( ज्ञानदेव - नामदेव), व्हीनस प्रकाशन, पुणे, आ. दुसरी, जाने 1996.
7. देशपांडे, अ. ना., प्राचीन मराठी वाङ्मयाचा इतिहास भाग तिसरा ( एकनाथ - पर्व - प्रारंभ), व्हीनस प्रकाशन, पुणे, आ. दुसरी, मे 2002.
8. देशपांडे, अ. ना., प्राचीन मराठी वाङ्मयाचा इतिहास भाग चौथा ( एकनाथ - मुक्तेश्वर), व्हीनस प्रकाशन, पुणे, आ. पहिली, जाने 1977.
9. देशपांडे, अ. ना., प्राचीन मराठी वाङ्मयाचा इतिहास भाग पाचवा ( तुकाराम - रामदास), व्हीनस प्रकाशन, पुणे, आ. पहिली, जाने 1982.
10. नसिराबादकर, ल. रा., प्राचीन मराठी वाङ्मयाचा इतिहास, फडके प्रकाशन, कोल्हापूर.

## **S.Y.B.A - (Semester - III)**

### **Elective Paper**

paper Title: मराठी ललित गद्य स्वरूप आणि उपयोजन  
(Marathi Literary Essays Nature and Application)

Paper Code: MAR-III.E-2

Name of Faculty: Sarika Advilkar

Marks: 100

Credits: 04

#### **Course Objective:**

1. हा एक ललित साहित्याचा प्रकार आहे. या साहित्यप्रकाराची गुण वैशिष्ट्ये समजावून घेणे,
2. मराठी ललित गद्याचा ऐतिहासिक परामर्श घेणे.
3. सैध्दांतिक तसेच उपयोजित स्तरावर त्याचा अभ्यास करणे.
4. मराठी ललित गद्याला समृद्ध बनवणाऱ्या ललित निबंधांच्या अध्ययनातून या साहित्यप्रकारातील बदलत्या प्रवाहांचा परिचय करून देणे.

#### **Learning Outcome:**

1. ललित गद्य या वाङ्मयप्रकाराची ओळख होईल.
2. सैध्दांतिक व उपयोजित स्तरावर ललित गद्याचे अध्ययन केल्यामुळे या लेखनप्रकाराचे मूल्यमापन करण्याची क्षमता विद्यार्थ्यांमध्ये निर्माण होईल.
3. मराठी ललित निबंधांचे लेखन करणाऱ्या महत्त्वाच्या लेखकांचा परिचय होईल.
4. या लेखनप्रकारातील विविध प्रवाह समजून घेता येतील.
5. ललित गद्याच्या वाचन व लेखनाची आवड निर्माण होईल.

#### **Syllabus:**

1. सैध्दांतिक स्तर: मराठी ललित गद्य स्वरूप व प्रकार (05 तासिका)
2. मराठी ललित गद्य वाटचाल - स्थूल स्वरूप (05 तासिका)

3. उपयोजित स्तर

(45 तासिका)

4. निवडक ललित निबंधांचे स्वयंअध्ययन (निबंध निवडीचे स्वातंत्र्य विद्यार्थ्यांना असेल)

(5 तासिका)

### संदर्भ ग्रंथ

1. अदवन्त, म. ना., बनहट्टी, श्री. ना., बहुरूपी निबन्ध, सुविचार प्रकाशन मंडळ, नागपूर. 1966.
2. आचार्य, मा. ना., अनुषंग,
3. चौघुले, वि. शं., ललितगद्य ते मुक्तगद्य, मौज प्रकाशन गृह, मुंबई.
4. देसाई, स. शं., दशरथे, अनंत., लेखन कला परिचय, परिमल प्रकाशन, औरंगाबाद, 1998.
5. यादव, आनंद, ललित गद्याचे तात्त्विक स्वरूप आणि मराठी लघुनिबंधाचा इतिहास, मेहता पब्लिशिंग हाऊस, पुणे, 1996.

## **S.Y.B.A - (Semester - III)**

### **Elective Paper**

paper Title: साहित्याशिरूचीचे स्वरूप

(Nature of Literary Taste)

Paper Code: MAR-III.E-3

Name of Faculty: Shrikrishna Adsul

Marks: 100

Credits: 04

#### **Course Objective:**

1. विद्यार्थ्यांची वाङ्मयीन अभिरूची विकसित करणे.
2. मराठी साहित्यासंबंधी रूची निर्माण करणे.
3. विद्यार्थ्यांमध्ये साहित्यास्वाद घेण्याची विविधांगी क्षमता विकसित करणे.
4. साहित्याभ्यासातून जीवनविषयक दृष्टी विकसित करणे.
5. विविध साहित्यविषयक उपक्रमांचा प्रसार आणि नेतृत्व करणे.

#### **Learning Outcome:**

1. वैयक्तिक पातळीवर आणि कौटुंबिक किंवा सामाजिक पातळीवरील वाचन संस्कृती विकसित होण्यास हातभार लागेल.
2. वाचनसंस्कृतीतून घरोघरी ग्रंथ संपदा वाढीस लागेल.
3. वैयक्तिक पातळीवरील नेतृत्व गुणांची जोपासना करण्याबरोबरच सामाजिक पातळीवरील साहित्यविषयक उपक्रमशिलता वाढीस लागेल.

#### **Syllabus:**

1. साहित्याचा वाचन व्यवहार - वाचनसंस्कृती वृद्धिंगत होण्यासाठी विद्यार्थ्यांचा सहभाग वाढवण्याचे विविध मार्ग. (15 तासिका)



2. साहित्याचा सामाजिक व्यवहार - ग्रंथ प्रकाशन, ग्रंथ चर्चा, साहित्यिकांशी संवाद.  
(15 तासिका)
3. साहित्यविषयक उपक्रमशिलता - ग्रंथ प्रदर्शने, ग्रंथ वितरण, ई. वितरण प्रणाली  
(15 तासिका)
4. गटवार पध्दतीने विविध उपक्रमांचे आयोजन - काव्यवाचन, कथाकथन, पारितोषिक वितरण, परिसरातील एखाद्या लोककलेचे आयोजन.  
(15 तासिका)

### संदर्भ ग्रंथ

1. जोंधळे, महावीर., साहित्य आणि आविष्कार, स्वरूप प्रकाशन, औरंगाबाद, 2002.
2. पवार, गो. मा., साहित्यमूल्य आणि अभिरूची, साकेत प्रकाशन, औरंगाबाद.
3. पाटील, मोहन., ग्रामीण साहित्य आणि संस्कृती, स्वरूप प्रकाशन, औरंगाबाद.
4. पाध्ये, दिगंबर., साहित्य, समाज आणि संस्कृती, लोकवाङ्मय गृह, मुंबई.
5. मेश्राम, केशव., साहित्य संस्कृती मंथन, स्वरूप प्रकाशन, औरंगाबाद, 2004.
6. यादव, आनंद., साहित्याची निर्मितीप्रक्रिया, मेहता प्रकाशन, पुणे.
7. साने. ह. श्री., सामाजिकशास्त्रे आणि साहित्य अंतःसंबंध, प्रतिमा प्रकाशन
8. सोमण, अंजली., साहित्य आणि सामाजिक संदर्भ, प्रतिमा प्रकाशन, पुणे.

**S.Y.B.A - (Semester - III)**

**Elective Paper**

Paper Title: गोमंतकीय मराठी साहित्य: समीक्षा आणि संशोधन

(कविता, कथा, कादंबरी, बालसाहित्य) Goan Marathi Literature Critics and Research

Paper Code: MAR-III.E-4

Name of Faculty: Shrikrishna Adsul

Marks: 100

Credits: 04

**Course Objective:**

1. गोमंतकीय मराठी साहित्य वाचण्याची आवड निर्माण करणे.
2. विविध साहित्यप्रकारातील साहित्याचे वाचन व त्या त्या साहित्यप्रकारातील साहित्याची ओळख करून घेणे.
3. साहित्याची समीक्षा - विविध साहित्य प्रकारांची ओळख व समीक्षेचे विशेष समजावून घेणे.
4. साहित्य संशोधन - संशोधन स्वरूप, पद्धती व प्राथमिक संशोधनपर अभ्यासाचे महत्त्व समजावून घेता येईल.
5. निवडलेल्या विषयावर लघुशोधनिबंध वा लघुप्रकल्प लेखन तयार करून घेणे.

**Learning Outcome:**

1. गोमंतकीय मराठी साहित्याची/साहित्यप्रकाराची विद्यार्थ्यांना ओळख होईल.
2. गोमंतकीय मराठी साहित्याचे कोणकोणत्याप्रकारे विकसन झाले, स्थित्यंतरे झाली त्याचा स्थूल परिचय विद्यार्थ्यांना होऊ शकेल.
3. वाचलेल्या गोमंतकीय मराठी साहित्यावर/पुस्तकांवर विविध मराठी वृत्तपत्रांतून, नियत कालिकांतून विद्यार्थ्यांना समीक्षणे लिहिता येतील.

4. साहित्याच्या संशोधन पद्धतीनुसार एखाद्या साहित्य प्रकारातील गोमंतकीय साहित्यावर वा पुस्तकावर लघुशोधनिबंध वा लघुप्रकल्पकार्य तयार करून घेता येतील.

### Syllabus:

1. चार गोमंतकीय मराठी साहित्य प्रकाराचे आरंभापासूनचे स्वरूप (15 तासिका)
2. समीक्षा - स्वरूप, विविध पद्धती, परीक्षण/समीक्षण (15 तासिका)
3. लघुशोधनिबंध आणि लघुप्रकल्पकार्यासाठीचे संशोधन व त्याचे स्वरूप (15 तासिका)
4. संशोधन लेखन, सादरीकरण, मूल्यांकन (15 तासिका)

लघुशोधनिबंध वा लघुप्रकल्पकार्य - विषय

(अ) गोमंतकीय मराठी कविता

1. संत सोहिरोबानाथ अंबिये यांच्या कवितेतील सामाजिक उपदेश
2. दा. अ. कारे यांच्या 'नंदादीप' मधील सात्त्विक भक्तिभाव
3. बा.भ. बोरकर यांच्या कवितेतील गोमंतकीय निसर्ग
4. गजानन रायकर यांच्या कवितेतील सामाजिकता
5. नरेंद्र बोडके यांच्या कवितेतील प्रतिमासृष्टी

(ब) गोमंतकीय मराठी कथा

1. वि.स. सुखटणकर यांच्या कथेतील, व्यक्तिचित्रणातील प्रादेशिकता.
2. लक्ष्मणराव सरदेसाई यांच्या कथेतील रिब्रस्ती समाजजीवन.
3. पं.महादेवशास्त्री जोशी यांच्या कथेतील संस्कारिततेचे स्वरूप.
4. पु.शि. नार्वेकर यांच्या कथेतील गोमंतकीय समाजजीवन
5. विठ्ठल गावस यांच्या कथेतील प्रादेशिकता.

(क) गोमंतकीय मराठी कादंबरी

1. सुभाष भेंडे यांच्या कादंबरीतील महानगरीय जीवनाचे दर्शन.
2. अरुण हेबळेकर यांच्या कादंबरीतील वैज्ञानिक दृष्टिकोण.
3. स.शं.देसाई यांच्या 'महापर्व' कादंबरीतील महाराणी ताराबाईची व्यक्तिरेखा.
4. माधवी देसाई यांच्या कादंबरीतील स्त्रीजीवन.

5. ज्ञानेश्वर कोलवेकर यांच्या कादंबरीतील गोमंतक व मुंबईच्या जीवनातील साम्यसंबंध,  
( ) गोमंतकीय मराठी बालसाहित्य
1. काशीनाथ पुंडलिक घोडे यांच्या बालकथेचे स्वरूप.
  2. सुधाकर प्रभू यांचे कादंबरीका लेखन.
  3. निलिमा आंगले यांची बालकविता.
  4. अवधूत कुडतरकर यांचे बालसाहित्य
  5. लता काळे यांची बडबडगीते.

### संदर्भ ग्रंथ

1. अडसूळ श्रीकृष्ण, गोमंतकीय मराठी साहित्य आशय आणि आविष्कार, शब्दालय प्रकाशन, श्रीरामपूर-2013
2. अडसूळ श्रीकृष्ण (संपा.), गजानन रायकर यांचे साहित्य - स्वरूप आणि मीमांसा, मराठी विभाग-चौगुले कॉलेज प्रकाशन, मडगाव -2013
3. घवी रवींद्र, श्रीकांत रासकर (संपा.), स्वातंत्र्योत्तर गोमंतकीय मराठी कथा, गोमंतक साहित्य सेवक मंडळ प्रकाशन, पणजी -2006
4. घवी रवींद्र, मागोवा: गोमंतकीय मराठी साहित्यिकांचा, राजहंस वितरण, पणजी -1998
5. तडकोड सु.म.(संपा.), नरेंद्र बोडके यांची समग्र कविता, शारिवा प्रकाशन, पुणे-2012.
6. नाडकरी एस्.एस्., कोमरपंत सोमनाथ (संपा.), गोमंतकीय मराठी वाङ्मयाचा इतिहास (खंड-2), गोमंतक मराठी अकादमी प्रकाशन, पणजी-2003.
7. प्रभुदेसाई वि. बा., घवी रवींद्र (संपा.), गोमंतकीय मराठी वाङ्मयाचा इतिहास (खंड-1). गोमंतक मराठी अकादमी प्रकाशन, पणजी-2003.
8. बोडके नरेंद्र (संपा.), गोमंतकीय मराठी कवितेचे अर्धशतक 1960-2010, नंदिनी प्रकाशन, पुणे-2010.

**S.Y.B.A - (Semester - III)**

**Inter disciplinary Paper**

Paper Title: मराठी पथनाट्य व एकांकिका स्वरूप व सिद्धांतन

(Marathi Street Play & One -Act Play Nature & Theory)

Paper Code: MAR-III ID-1

Name of Faculty: Shrikrishna Adsul

Marks: 100

Credits: 04

**Course Objective:** 1. पथनाट्य व एकांकिका या नाट्यप्रकारांचा परिचय होईल.

2. या नाट्यप्रकाराला असलेले वाङ्मयमूल्य, प्रयोगमूल्य व नाट्यमूल्य अभ्यासणे शक्य होईल.

3. पथनाट्य व एकांकिका लेखनातील विविध घटकांचा परिचय होईल.

4. पथनाट्य व एकांकिका लेखन व परीक्षणाविषयीची आवड निर्माण होईल.

**Learning Outcome:**

1. पथनाट्य व एकांकिका या नाट्यप्रकाराची एक वाङ्मयप्रकार व कलाप्रकार म्हणून ओळख होईल.

2. पथनाट्य व एकांकिका या नाट्यप्रकारांचे, वाचन व लेखनविषयक जाणिवेचे विकसन होऊ शकेल.

3. सुप्त लेखन व अभिनयगुणांना वाव मिळेल.

4. या दोन्ही नाट्यप्रकारांच्या मूल्यमापनाची क्षमता निर्माण होईल.

**Syllabus:**

1. पथनाट्य एक नाट्यप्रकार, साहित्यप्रकार व घटकांतर्गत अभ्यास (15 तासिका)

2. एकांकिका एक नाट्यप्रकार, साहित्यप्रकार व घटकांतर्गत अभ्यास (15 तासिका)

3. पथनाट्य व एकांकिका - संहिता लेखनाचे स्वरूप (15 तासिका)
4. पथनाट्य व एकांकिका - वाडमयमूल्य, प्रयोगमूल्य व नाट्यमूल्य, परीक्षण - समीक्षा (15 तासिका)

### संदर्भ ग्रंथ

1. कानडे मु.श्री., नाट्यशोध, नीहारा प्रकाशन, पुणे - 1987.
2. काळे के.ना व इतर, मराठी रंगभूमी नाटक, घटना आणि परंपरा, मराठी साहित्यसंघ, मुंबई -1971.
3. कुलकर्णी द.भि, नाटक स्वरूप व समीक्षा, पध्मगंधा प्रकाशन पुणे -2010.
4. कुलकर्णी गो.म., मराठी नाट्यसृष्टी, मेहता पब्लिशिंग हाऊस, पुणे -30
5. गणोरकर प्रभा., उहाके वसंत आबाजी व इतर (संपा), वाडमयीन संज्ञा - संकल्पना कोश, पॉप्युलर प्रकाशन, मुंबई - 2001.
6. घवी रवींद्र, भावे पुष्पा, व इतर (संपा.), प्रदक्षिणा (खंड -2), कॉन्टिनेंटल प्रकाशन, पुणे - 2008.
7. जोग रा.श्री. (संपा.), मराठी वाडमयाचा इतिहास (खंड-4), महाराष्ट्र साहित्य परिषद, पुणे 1965.
8. नाईक राजीव, भोळे प्रवीण, भारतीय प्रयोग कलांचा परिचय व इतिहास - नाट्य, लोकवाडमयगृह, मुंबई - 2010.
9. शिंदे विठ्ठल, (संपा.), सर्वात्कृष्ट एकांकिका, जाईप्रकाशन, उल्हासनगर -2007.
10. सरदेसाई माया, भारतीय रंगभूमीची परंपरा, स्नेहवर्धन प्रकाशन, पुणे - 1996.

## **SYBA - (Semester - IV)**

### **Core Paper**

Paper Title: रसविचार आणि समीक्षाविचार

(Rasa Theory and Literary Criticism)

Paper Code: MAR-IV.C-6

Name of Faculty: Adsul Shrikrishna

Marks: 100

Credits: 04.

### **Course Objective:**

1. प्राचीन भारतीय साहित्यशास्त्रातील रससंकल्पना समजावन घेणे.
2. साहित्याभ्यासात असलेले रससौंदर्याचे महत्त्व ध्यानात घेणे.
3. साहित्यातील समीक्षेचे महत्त्व ध्यानात आणून देणे.
4. विविध समीक्षा पद्धतीद्वारे एखाद्या पुस्तकाचे समीक्षण करणे,

### **Learning Outcome:**

1. रसविचार समजावून घेतल्याने समीक्षेसाठी आवश्यक ती दृष्टी येईल.
2. साहित्याच्या सौंदर्यातील रसविचाराचे महत्त्व ध्यानात येईल.
3. वेगवेगळ्या समीक्षा पद्धतीचा अभ्यास होईल.
4. निवडलेल्या वाङ्मयप्रकारातील एखाद्या ग्रंथाचे परीक्षण करणे शक्य होईल.

### **Syllabus:**

1. 'रस' - स्वरूप व सिद्धांतन (15 तासिका)
- 2 रसनिष्पत्तिविषयक विविध उपपत्ती व आधुनिकांचे रसविवेचन (15 तासिका)
3. समीक्षा - संकल्पना, प्रयोजन, स्वरूप (15 तासिका)
4. विविध समीक्षा पद्धती (15 तासिका)

## संदर्भ ग्रंथ

1. कुळकर्णी वा. ल., साहित्य स्वरूप आणि समीक्षा, मंबई, 1995
2. गाडगीळ गंगाधर., खडक आणि पाणी, उत्कर्ष प्रकाशन, पुणे, 2003.
3. गाडगीळ स. रा., काव्यशास्त्रप्रदीप, व्हीनस प्रकाशन, पुणे - 2010
4. गोडबोले, एन., साहित्य समीक्षा: स्वरूप आणि विकास, व्हीनस प्रकाशन, पुणे - 1981
6. दादेगावकर पद्माकर., रसचर्चा., पॉप्युलर प्रकाशन, मुंबई, 1994
7. देशपांडे ग. व्यं., भारतीय साहित्यशास्त्र, मुंबई - 1980
8. देशपांडे, माधव., साहित्य साधन, कॉन्टिनेंटल प्रकाशन, पुणे, 1961.
9. पाटणकर वसंत., साहित्यशास्त्र, पद्मगंध प्रकाशन, पुणे. 2006
10. यशवत मनोहर, नवे साहित्यशास्त्र, विजय प्रकाशन, नागपूर - 2001



**S.Y.B.A - (Semester - IV).**

**Elective Paper:**

Paper Title: प्राचीन मराठी वाङ्मय (1651 - 1818)

(Old Marathi Literature 1651 to 1810).

Paper Code: MAR-IV. E-5

Name of Faculty: Sarika Advilkar

Marks: 100

Credits: 04

**Course Objective:**

1. प्राचीन मराठी भाषा साहित्य आणि संस्कृती यांचा परिचय करून देणे.
2. जुन्या मराठी साहित्याच्या विकासाला हातभार लावणारया साहित्यिकांचा त्यांच्या महत्त्वाच्या कलाकृतींच्या आधारे परिचय करून देणे.
3. प्राचीन मराठी साहित्यातील बदलत्या प्रवृत्ती आणि प्रवाहांची ओळख करून देणे.

**Learning Outcome:**

1. या अभ्यासक्रमाच्या अध्ययनातून जुन्या मराठी साहित्याचा विद्यार्थ्यांना परिचय होईल.
2. प्राचीन मराठीच्या विविध कालखंडांमध्ये साहित्यातील बदलत्या प्रवृत्ती आणि प्रवाह यांचा परिचय होईल.
3. विविध कालखंडातील साहित्यिक व त्यांच्या साहित्याचा परिचय विद्यार्थ्यांना करून घेता येईल.
5. प्राचीन मराठी साहित्यातील विविध साहित्यप्रकारांचा विद्यार्थ्यांना परिचय होईल.

**Syllabus:**

1. प्राचीन आणि मध्ययुगीन साहित्य: या संज्ञातील साम्यभेद (02 तासिका)
2. मराठीतील पंडिती काव्य: प्रेरणा, स्वरूप आणि परंपरा (काही प्रातिनिधीक पंडित कवींच्या काव्याशाच्या आधारे) (13 तासिका)
3. मराठीतील शाहिरी काव्य: स्वरूप व प्रकार (निवडक शाहीर) (10 तासिका)

4. मराठीतील बखर वाङ्मय: (शिवपूर्वकाल, शिवकाल, पेशवेकाल) (10 तासिका)
5. उपयोजित स्तर - पाठ्यपुस्तक: पैंजण - म. ना. अदवंत (निवडक कवी व कविता)  
(25 तासिका)

### संदर्भ ग्रंथ

1. अदवत, म. ना., पैंजण, साहित्य प्रसार केद्र, नागपूर, सहा. आ, 2013.
2. . ग्रामोपाध्ये, ग. ब., मराठी बखरगद्याचा पुनर्विचार, मेहता पब्लिशिंग हाऊस, पुणे, 1986 युनिव्हर्सल पब्लिकेशन्स, कोल्हापूर .
3. जोग रा. श्री. (सपा.), मराठी वाङ्मयाचा इतिहास (खंड तीन ते पाच), महाराष्ट्र साहित्य परिषद, पुणे, 1965
4. डहाके, वसंत आबाजी., मराठी साहित्य इतिहास आणि संस्कृती, पॉप्युलर प्रकाशन, मुंबई, 2006
5. नसिराबादकर, ल. रा., प्राचीन मराठी वाङ्मयाचा इतिहास, फडके प्रकाशन, कोल्हापूर, 1994
6. वाटवे, के. ना., प्राचीन मराठी पंडितीकाव्य, जोशी आणि लोखंडे प्रकाशन, पुणे, 1964
7. हेरवाडकर, र. वि., मराठी बखर, व्हीनस प्रकाशन, पुणे, 1957

## **S.Y.B.A - (Semester - IV)**

### **Elective Paper:**

Paper Title: प्रवासवर्णनः एक अभ्यास  
(Travelogues: Form and Application)

Paper Code: MAR-IV.E-6

Name of Faculty: Sarika Advilkar

Marks: 100

Credits: () 4

### **Course Objective:**

1. या साहित्यप्रकाराची गुणवैशिष्ट्ये समजावून घेणे.
2. मराठी प्रवासवर्णनाचा स्थूल परिचय करून देणे.
3. सैद्धांतिक तसेच उपयोजित स्तरावर या प्रकाराचा अभ्यास करणे.
4. काही निवडक प्रवासवर्णनांच्या अध्ययनातून या साहित्यप्रकारातील बदलत्या प्रवाहांचा परिचय करून देणे.

### **Learning Outcome:**

1. प्रवासवर्णन या वाङ्मयप्रकाराची ओळख होईल.
2. सैद्धांतिक व उपयोजित स्तरावर प्रवासवर्णनांचे अध्ययन केल्यामुळे या लेखनप्रकाराचे मूल्यमापन करण्याची क्षमता विद्यार्थ्यांमध्ये निर्माण होईल.
3. मराठी प्रवासवर्णनांचे लेखन करणाऱ्या महत्त्वाच्या लेखकांचा परिचय होईल.
4. या लेखनप्रकारातील बदलते प्रवाह समजून घेता येतील.
5. या लेखनप्रकाराचे बदलते स्वरूप समजून घेता येईल.
6. प्रवासवर्णनाच्या वाचन व लेखनाची आवड निर्माण होईल.

### **Syllabus:**

1. सैद्धांतिक स्तर: मराठी प्रवासवर्णन प्रेरणा, स्वरूप व घटक (10 तासिका)

2. मराठी प्रवासवर्णन वाटचाल - स्थूल स्वरूप (05 तासिका)
3. उपयोजित स्तर हिममय अलास्का, गंगाधर गाडगीळ (40 तासिका)
4. निवडक प्रवासवर्णनांचे स्वयंअध्ययन: वाचन, चर्चा आणि मूल्यांकन  
(कोणत्याही गोमंतकीय प्रवासवर्णनाची निवड करता येईल) (05 तासिका)

### संदर्भ ग्रंथ

१. उषा पाणंदीकरांची प्रवासवर्णने स्वरूप आणि चिकित्सा., अडसूळ, श्रीकृष्ण.,(संपा.), गोमंतक मराठी अकादमी, 2009
२. देसाई स. शं., अनंत, लेखन कला परीचय, परिमल प्रकाशन, औरंगाबाद १९९८
३. मराठी वादायाचा इतिहास, कलकर्णी, गो. म., (सपा,) महाराष्ट्र साहित्य परिषद, पुणे, पृ. २१३, १९९१
४. सावंत, वसंत, प्रवासवर्णन: एक वाङ्मयप्रकार महाराष्ट्र राज्य साहित्य आणि सस्कता मंडळ, मुंबई, 1987.

## **S.Y.B.A - (Semester - IV)**

### **Elective Paper:**

Paper Title: कार्यक्रम संयोजन व संचालन कौशल्य

(Event Management and Compering Skills)

Paper Code: MAR-IV.E-7

Name of Faculty: Sarika Advilkar

Marks: 100

Credits: ( ) 4.

### **Course Objective:**

1. विद्यार्थ्यांमध्ये संयोजन व संचालनाचे कौशल्य विकसित करणे.
2. कायकमाची आखणी व अन्य तयारी याविषयीची कौशल्ये आत्मसात करणे.
3. व्यक्तिमत्त्व विकास साधणे.
4. विद्यार्थ्यांमध्ये विविधांगी कलागण विकसित करून त्यांची जीवनविषयक दृष्टी विकसित करणे.
5. विविध साहित्यविषयक उपक्रमांचा प्रसार आणि नेतृत्व करणे.

### **Learning Outcome:**

1. या क्षेत्रामध्ये रोजगाराची संधी उपलब्ध होईल.
2. स्वयंरोजगाराच्या दृष्टीने या दोन्ही प्रकारांचे महत्त्व पटवून देणे.
3. वैयक्तिक पातळीवरील नेतृत्व गुणांची जोपासना करण्याबरोबरच सामाजिक पातळीवरील साहित्यविषयक उपक्रमशिलता वाढीस लागेल.

### **Syllabus:**

1. कार्यक्रमाची पूर्वतयारी (10 तासिका)
2. कार्यक्रमाची आखणी व अन्य पूरक तयारी (10 तासिका)
3. कार्यक्रमाच्या स्वरूपानुसार संयोजन (10 तासिका)
4. सूत्रसंचालनाचे स्वरूप, वैशिष्ट्ये व प्रकार (10 तासिका)
5. सूत्रसंचालनाचे तंत्र व सूत्रसंचालकाची भूमिका (10 तासिका)

संदर्भ ग्रंथ

1. उपयोजित मराठी - डॉ. गं. ना. जोगळेकर कृतज्ञताग्रंथ., मोडक केतकी आणि इतर पद्मगंधा प्रकाशन, पुणे, 2012.
2. गडकरी, माधव. सभेत कसे बोलावे. क्षितीज प्रकाशन, मुंबई, 1989
3. घाणेकर - थत्ते, ऋचा., असे करावे सत्रसंचालन, अक्षय्य प्रकाशन, पुणे, 2012
4. पंडित, माधव., त्रिवेध, प्रकाशन, मडगाव, 2008
5. पाटील, के आर., सूत्रसंचालन कसे करावे? ज्ञानसंवर्धन प्रकाशन, कोल्हापूर, 2014

**S.Y.B.A - (Semester - IV).**

**Elective Paper**

Paper Title: गोमंतक आणि कोकण या प्रदेशातील लोककला  
(Folk Art in Goa and Konkan)

Paper Code: MAR-IV.E-8

Name of Faculty: Adsul Shrikrishna

Marks: 100

Credits: 04

**Course Objective:**

1. लोककलांच्या अभ्यासाचे महत्त्व ध्यानात आणून देणे.
2. गोमंतकीय लोककलांच्या अभ्यासाविषयीची आवड निर्माण करणे.
3. कोकणातील लोककलांचा परिचय करून घेणे.
4. गोमंतक आणि कोकण या प्रदेशातील लोककलांतील साम्यभेदांचा शोध घेणे.

**Learning Outcome:**

1. लोककलांच्या परिचयातून लोकसाहित्याचा अभ्यास होईल.
2. गोमंतकीय लोककलांच्या परिचया बरोबरच त्यांचा अभ्यास करणे शक्य होईल.
3. कोकणातील लोककलांचा परिचय होईल.
4. गोमंतक आणि कोकणातील लोककलांत आढळणारे साम्यभेद शोधण्यातून सांस्कृतिक अनुबंध निर्माण होईल.

**Syllabus:**

1. लोकसाहित्याच्या अभ्यासाचे महत्त्व व स्वरूप (10 तासिका)
2. गोमंतकीय लोककला - धालो, जागर, मांड, सुंवारी, तालगडी, बनवड, झाडो, शिवोड (20 तासिका)
3. कोकणातील लोककला - चपई, धालोत्सव, दशावतार, पांगुळ, नमन, जाखडी, चित्रकथी (20 तासिका)
4. गोमंतक आणि कोकणातील, लोककलांचा सांस्कृतिक साम्यसंबंध (10 तासिका)

संदर्भ ग्रंथ

1. कुबल रमेश, लोकसाहित्याचे अंतरंग शब्दालय प्रकाशन, श्रीरामपूर 2014
2. खेडेकर विनायक, लोकसरिता, कला आणि संस्कृती संचालनालय, 1993
3. तापस - राजापुणे पुष्पलता, कोकणातील लोककला, शब्दालय प्रकाशन, 2014
4. नायक काशिनाथ टामोटर गोमंतकीय संस्कृतीची जडणघडण गोमतक विद्यानिक प्रकाशन, 1980
5. पैगिणकर अजित काणकोणची लोककला एक दायज, काणकोण अनुजित प्रकाशन 2001.
6. माने वसुधा, गोमंतकातील धालो, 1964
7. सातोस्कर बा.द., गोमंतक प्रकृती आणि संस्कृती, खंड-1 व खंड -2, 1979
8. सुखटणकर ज.स. -रुपडयाची रूपककथा, 1970



## **Semester - IV)**

### **Inter disciplinary Paper**

Paper Title: मराठी पथनाट्य व एकांकिका: लेखन व सादरीकरण

(Marathi Street Play & One Act Play Writing and Presentation)

Paper Code: MAR-IIL ID-2

Credits: 04

Name of Faculty: Adsul Shrikrishna

Marks: 100

### **Course Objective:**

1. पथनाट्य लेखनाचा सराव करून घेणे.
2. एकांकिका लेखन करणे.
3. पथनाट्याच्या सादरीकरणातून अभिनय गुणांचे विकसन करणे.
4. एकांकिका सादर करणे.

### **Learning Outcome:**

1. पथनाट्याची एक लेखनप्रकार म्हणून ओळख होईल.
2. एकांकिका लेखनातून सुप्त लेखनगुणांना वाव मिळवून देता येईल.
3. पथनाट्य व एकांकिका सादर करण्याची सवय होईल.
4. इतर कलाप्रकारांची आवड निर्माण होईल.

### **Syllabus:**

1. पथनाट्य / प्राथमिक लेखन, वाचन, गटचर्चा, सुधारित लेखन (15 तासिका)
2. एकांकिका प्राथमिक लेखन, वाचन, गटचर्चा, सुधारित लेखन (15 तासिका)
3. पथनाट्य / गटवार सादरीकरण, गटचर्चा, मूल्यांकन, सुधारित लेखन (15 तासिका)
4. एकांकिका / गटवार सादरीकरण, गटचर्चा, मूल्यांकन, सुधारित लेखन (15 तासिका)

संदर्भ ग्रंथ

1. नाईक राजीव, भोळे प्रवीण, भारतीय प्रयोग कलांचा परिचय व इतिहास नाट्य, लोकवाडमयगृह, मुंबई -2010
2. भगत दत्ता, निवडक एकांकिका, साहित्य अकादमी प्रकाशन, 2010
3. भगत दत्ता, दलित एकांकिका, साहित्य अकादमी प्रकाशन, 2013
4. शिंदे विठ्ठल, (संपा) सर्वोत्कृष्ट एकांकिका, जाई प्रकाशन, उल्हासनगर, 2007

2017

T.Y.B.A

Semestel V

**Course Title: व्याकरण**

**Course Code: MAR-V.C-7**

**Marks: 100**

**Credits: 04**

**Course Objectives:**

1. एक स्वतंत्र विषय म्हणून व्याकरणाकडे पाहण्याची जाणीव निर्माण करणे,
2. मराठी व्याकरण परंपरेचा परिचय करून देणे.
3. व्याकरणातील पायाभूत संकल्पनांच्या अभ्यासाचे महत्त्व पटवून देणे,
4. भाषाभ्यासाला व्याकरणाचा अभ्यास कसा साहाय्यभूत ठरतो ते पाहणे.

**Learning Outcome:**

1. व्याकरण या विषयाची विद्यार्थ्यांना स्वतंत्रपणे ओळख होईल,
2. मराठी व्याकरणाची परंपरा समजू शकेल.
3. व्याकरणातील विविध संकल्पनांकडे व्याकरणकारांनी कोणकोणत्या भूमिकातून पाहिले आहे ते समजावून घेता येईल.
4. भाषेच्या अभ्यासाकडे व्याकरणाच्या दृष्टिकोनातून पाहण्याची दृष्टी प्राप्त होईल.

**Syllabus:**

1. व्याकरण- व्याख्या, व्याकरणाच्या अभ्यासाचे महत्त्व, मराठीतील व्याकरण परंपरेची ओळख  
(07 lectures)
2. वर्णविचार व संधी- वर्णांचे प्रकार, वर्णांचे वर्गीकरण: - एक स्थूल परिचय संधी - संधीचे प्रकार; स्वरसंधी, व्यंजनसंधी, विसर्गसंधी  
(15 lectures)
3. शब्दविचार- शब्दांचा विकारी व अविकारी जातीलिंग, वचन.  
(20 lectures)

4. शब्दविकरण- विभक्ती विचार (स्वरूप व वादविवादांसह अभ्यास) (12 lectures)
5. समास - 1. अव्ययीभाव समास  
2. तत्पुरुष समास  
3. व्दंब्द समास (06 lectures)  
4. बहुव्रीही समास

**संदर्भ ग्रंथः**

- 1 गोविलकर लीला, 'मराठीचे व्याकरण', मेहता पब्लिशिंग हाऊस, पुणे, 2006
2. दामले मो. के, "शास्त्रीय मराठी व्याकरण", देशमुख आणि कं., पुणे, 1970
3. भागवत श्रीपाद, 'मराठी व्याकरण', विद्याभारती प्रकाशन, लातूर, 1980
4. मंगरूळकर अरविंद, 'मराठीच्या व्याकरणाचा पुनर्विचार', पुणे विद्यापीठ, पुणे, 1978
5. वाळंबे मो.रा., 'सुगम मराठी व्याकरण लेखन, नितीन प्रकाशन, पुणे, 2011
6. शहा के.पी., 'मराठी व्याकरण', ओम पब्लिकेशन्स, कोल्हापूर, 2012

course Title: मराठी वाङ्मयाचे सांस्कृतिक स्वरूप

course Code: MAR-V.E-9

Marks: 100

Credits: 04

### Course Objective:

1. संस्कृती आणि साहित्य यातील परस्पर संबंध समजावून देणे.
2. इंग्रजांच्या आगमनामुळे सांस्कृतिक जीवनात झालेल्या स्थित्यंतरांचा परिचय करून देणे.
3. सामाजिक, शैक्षणिक व सांस्कृतिक क्षेत्राच्या विकासामध्ये योगदान देणाऱ्या व्यक्ती व संस्था यांच्या कार्याचा परिचय करून देणे.
4. साहित्यक्षेत्रातील नवीन प्रेरणा व प्रवाहांचा परिचय करून देणे.

### Learning Outcome:

1. समाजाच्या विकासामध्ये साहित्य आणि संस्कृती यांच्यातील स्थित्यंतरे कशी कारणीभूत ठरतात यांचा विद्यार्थ्यांना परिचय होईल.
2. इंग्रजांच्या आगमनामुळे साहित्य आणि समाज यांच्यावर झालेले परिणाम समजून घेता येतील.
3. सामाजिक क्षेत्रामध्ये वैचारिक प्रबोधनाच्या दृष्टीने राबवलेल्या उपाययोजनांचे विद्यार्थ्यांना ज्ञान होईल.
4. साहित्य क्षेत्रातील नवीन प्रवाहांच्या निर्मितीमागील हेतू समजावून घेता येतील.

### Syllabus:

1. संस्कृती म्हणजे काय ? साहित्य आणि संस्कृती यांचा परस्पर संबंध (15 lectures)
2. अक्विल इंग्रजी कालखंडातील-सांस्कृतिक बदलाचा साहित्यावरील परिणाम
1. सांस्कृतिक, सामाजिक - परमहंस सभा, आर्य समाज, प्रार्थना समाज, ब्राह्मो समाज, सत्यशोधक समाज

- II. शैक्षणिक - एलफिस्टन, मे. कॅडी, बोर्ड ऑफ एज्युकेशन, दक्षिणा प्राईज कमिटी III.  
साहित्यनिर्मिती (15 lectures)
3. 1874-1920 या कालखंडातील साहित्य निर्मितीमागील प्रेरणा व प्रवृत्तीविष्णुशास्त्री चिपळूणकर, गो.ग.आगरकर, लोकमान्य टिळक यांचे सामाजिक व सांस्कृतिक कार्य-सुधारणावादाच्या संदर्भात पडलेला प्रभाव (15 lectures)
4. मार्क्सवाद, समाजवाद आणि गांधीवाद (15 lectures)

### संदर्भ ग्रंथ

1. कराडे सदा, अर्वाचीन मराठी साहित्याची सांस्कृतिक पार्श्वभूमी', लोकवाडमय गृह, मुंबई, 1981
2. कुलकर्णी कृ.भि, आधुनिक मराठी गद्याची उत्क्रांती', मुंबई मराठी ग्रंथ संग्रहालय, मुंबई, 1956
3. जोशी महादेवशास्त्री, भारतीय संस्कृतिकोश, भारतीय संस्कृतीकोश मंडळ, पुणे, 1979
4. जोशी लक्ष्मणशास्त्री, 'मराठी विश्वकोश', महाराष्ट्र राज्य साहित्य संस्कृती मंडळ, मुंबई, 1986
5. श्री.जोग रा..(संपा.) 'मराठी वाडमयाचा इतिहास खंड तिसरा, महाराष्ट्र साहित्य परिषद, पुणे, 1999
6. श्री.जोग रा..(संपा.) 'मराठी वाडमयाचा इतिहास खंड चौथा, महाराष्ट्र साहित्य परिषद, पुणे, 1999
7. श्री.जोग रा..(संपा.) मराठी वाडमयाचा इतिहास खंड पाचवा (भाग पहिला व दुसरा), महाराष्ट्र साहित्य परिषद, पुणे, 1999
8. रा. ग. जाधव,(संपा.) 'मराठी वाडमयाचा इतिहास खंड सातवा (भाग पहिला)', महाराष्ट्र साहित्य परिषद, पुणे, 2009
9. मालशे स.गं, 'साहित्य- सिध्दांत', महाराष्ट्र राज्य साहित्य संस्कृती मंडळ, मुंबई, 1982 व रा.ग., 'मराठी वाडमयाचा इतिहास खंड 7', (संपा) महाराष्ट्र साहित्य परिषद प्रकाशन, पुणे, 2011
- 10.जोशी अ.म., 'चरित्र-आत्मचरित्र', सुविचार प्रकाशन, धंतोली, 1965 देशपांडे अ.ना., आधुनिक मराठी वाडमयाचा इतिहास भाग 2', (संपा.) व्हीनस प्रकाशन, पुणे, 1979
11. मोराळे महालक्ष्मी, आत्मचरित्रात्मक कादंबरी', पद्मगंधा प्रकाशन, पुणे, 2010 8. यादव आनंद, आत्मचरित्रमीमांसा', मेहता पब्लिशिंग हाऊस, पुणे, 2014

*Course Title:* पत्रकारिता: स्वरूप आणि कौशल्ये

Course Code :- MAR-V.E-11

Marks: 100

Credits: 04.

**Course Objective:**

1. पत्रकारिता म्हणजे काय? तिची उपयुक्तता समजावून देणे.
2. पत्रकारितेतील लेखनकौशल्ये समजावून देणे.
3. पत्रकारितेचे स्वरूप व्याख्या व प्रकार समजावून देणे.
4. पत्रकारितेसाठी आवश्यक गुणकौशल्यांचे ज्ञान करून देणे.

**Learning Outcome:**

1. पत्रकारिता म्हणजे काय? व तिची आजच्या काळातील उपयुक्ततेचा विद्यार्थ्यांना परिचय होईल.
2. मराठी पत्रकारितेचा परिचय करून घेता येईल.
3. बातमीदारासाठी आवश्यक नीतिमूल्यांचा परिचय होईल.
4. बातमीलेखनाचे कौशल्य आत्मसात करता येईल.
5. वृत्तपत्राच्या वार्ताहराला आवश्यक गुणकौशल्ये आत्मसात करता येतील.

**Syllabus:**

1. पत्रकार आणि पत्रकारिता म्हणजे काय?, मराठी पत्रकारितेचा परिचय (15 lectures)
2. बातमी: स्वरूप, व्याख्या वरचना, बातमीपत्र लेखन, वार्तासंकलन- बातमी लेखनातील कायदेशीर बाबी (15 lectures)
3. मुद्रित व वृत्तपत्रीय लेखन: (अग्रलेख, लेख, स्तंभलेखन, सदरलेखन, वाचकांचा पत्रव्यवहार व मुलाखत) (15 lectures)
4. इलेक्ट्रॉनिक पत्रकारितेचे स्वरूप (15 lectures)

## संदर्भ ग्रंथ

1. अकलूजकर प्रसन्नकुमार, 'फीचर रायटिंग', श्रीविया प्रकाशन, पुणे, 2008
2. कुलकर्णी एस. के., 'बातमीदारी', विद्या प्रकाशन गृह, पुणे, 2001
3. गर्गे स.मा., 'पत्रकार आणि पत्रकारिता', मानसन्मान प्रकाशन, पुणे, 1990
4. ताम्हणे चन्द्रकान्त, 'वार्ता संकलन, पॉप्युलर प्रकाशन, मुंबई, 2003
5. पांडे ए.व्ही., 'मराठी पत्रकारिता', सुखद सौरभ प्रकाशन, सातारा, 2008
6. पाध्ये प्रभाकर, 'पत्रकारितेची मूलतत्वे', (अनुवाद : परांजपे प्र.ना, परांजपे वसुधा), मेहता  
\_\_\_ पब्लिशिंग हाऊस, पुणे, 2007 -
7. माळी सुनील, 'बातमीदारी', राजहंस प्रकाशन, पुणे, 2008
8. लांडगे संजय, 'उपयोजित मराठी', दिलीपराज प्रकाशन प्रा. लि., पुणे, 2011
9. लेले रा.का., 'मराठी वृत्तपत्रांचा इतिहास', कॉन्टिनेन्टल प्रकाशन, पुणे, 2000
10. पिंगळे किरण नामदेव, (संपा), 'संवाद कौशल्ये आणि प्रसारमाध्यमे, शब्दश्री प्रकाशन,  
पुणे, 2015



Course Title: मराठी पथनाट्य: स्वरूप व सादरीकरण

Course Code :- MAR-V ID-1

Marks: 100

Credits: ( ) 4

**Course Objective:**

1. पथनाट्य या नाट्यप्रकारांचा परिचय होईल.
2. या नाट्यप्रकाराला असलेले वाङ्मयमूल्य, प्रयोगमूल्य व नाट्यमूल्य अभ्यासणे शक्य होईल.
3. पथनाट्य लेखनातील विविध घटकांचा परिचय होईल.
4. पथनाट्य लेखन व परीक्षणाविषयीची आवड निर्माण होईल.
5. पथनाट्य सादर करण्याची सवय होईल.

**Learning Outcome:**

1. पथनाट्य या नाट्यप्रकाराची एक वाङ्मयप्रकार व कलाप्रकार म्हणून ओळख होईल.
2. पथनाट्य या नाट्यप्रकारांचे, वाचन व लेखनविषयक जाणिवेचे विकसन होऊ शकेल.
3. सुप्त लेखन व अभिनयगुणांना वाव मिळेल.
4. या नाट्यप्रकाराच्या मूल्यमापनाची क्षमता निर्माण होईल.

**Syllabus:**

1. पथनाट्य एक नाट्यप्रकार, साहित्यप्रकार व घटकांतर्गत अभ्यास (05 Lectures)
2. पथनाट्य-संहिता लेखनाचे स्वरूप (15 Lectures)
3. पथनाट्य- वाङ्मयमूल्य, प्रयोगमूल्य व नाट्यमूल्य- समीक्षण (15 Lectures)
4. पथनाट्य- प्राथमिक लेखन, वाचन, गटचर्चा, सुधारित लेखन (10 Lectures)
5. पथनाट्य / गटवार सादरीकरण, गटचर्चा, मूल्यांकन, सुधारित लेखन (15 Lectures)

## संदर्भ ग्रंथ

1. कानडे मु.श्री., 'नाट्यशोधा, नीहारा प्रकाशन, पुणे- 1987.
2. काळे के.ना व इतर, 'मराठी रंगभूमी नाटक, घटना आणि परंपरा, मराठी साहित्यसंघ, मुंबई -1971.
3. कुलकर्णी गो.म., 'मराठी नाट्यसृष्टी', मेहता पब्लिशिंग हाऊस, पुणे -30
4. पेंडसे अंजली, 'देहबोली', नीलकंठ प्रकाशन, पुणे. 2004
5. नसिराबादकर ल.रा., 'व्यावहारिक मराठी', फडके प्रकाशन, कोल्हापूर, 2008
6. माळी सुनील, 'बातमीदारी', राजहंस प्रकाशन, पुणे, 2008
7. साने र.य., 'लेखनमित्र', विद्या विकास पब्लिशर्स प्रा.लि. नागपूर, 2007

## B.A (Semester - VI)

Course Title: भाषाविज्ञान

Course Code: MAR-VI.C-8

Marks: 100

Credits: 04

### Course Objectives:

1. भाषाविज्ञान, विज्ञान म्हणून स्वरूप समजावून घेणे.
2. भाषेच्या उत्पत्तीविषयक सिद्धांतनाचा परिचय करून घेणे.
3. प्रमाणभाषा व बोलीभाषांच्या अभ्यासाच्या पद्धती अभ्यासणे.
4. भाषाविज्ञानाच्या दृष्टीने मराठीची पूर्वपीठिका समजावून घेणे.

### Learning Outcomes:

1. एक विज्ञान म्हणून भाषाविज्ञानाची विद्यार्थ्यांना ओळख होईल.
2. भाषेचे उत्पत्तीविषयक सिद्धांत समजावून घेण्याबरोबरच विविध भाषाभ्यास पद्धतीचा अभ्यास होईल.
3. प्रमाणभाषा म्हणून मराठीचा व इतर बोलींचा परिचय होईल.
4. एकूणच मराठीची पूर्वपीठिका समजावून घेता येईल.

### Syllabus:

1. भाषा आणि भाषाविज्ञान (15 lectures)  
- भाषा व्याख्या, भाषेचे स्वरूप, भाषेच्या विविध अवस्था- आंगिक हावभावाची, दृश्यचिन्हांची, लिपिबद्ध, मौखिक,
2. भाषेचे उपपत्तीविषयक सिद्धांत व भाषाभ्यासपद्धती (15 lectures) -  
ऐतिहासिक, वर्णनात्मक व सामाजिक)
3. मराठीची पूर्वपीठिका (15 lectures)  
आर्यभाषा, आंतर-बहिर्वर्तुळ सिद्धांत, संस्कृत-प्राकृत- महाराष्ट्री- मराठी असा प्रवासाभ्यास

#### 4. प्रमाणभाषा व बोलीभाषा

(15 lectures)

- स्वरूप, विशेष व प्रकार, मराठीच्या प्रमुख बोलींचा अभ्यास- मालवणी, चित्पावनी, आगरी

#### संदर्भ ग्रंथ

1. कालेलकर ना.गो., भाषा आणि संस्कृती', मौज प्रकाशन गृह, मुंबई, 2012 ,
2. कालेलकर ना.गो., भाषा इतिहास आणि भुगोल', मौज प्रकाशन गृह, मुंबई, 1985
3. कुलकर्णी कृ.पा., 'मराठी भाषा उद्गम आणि विकास', मोर्डन बुक डिपोट प्रकाशन, 1973
4. केळकर अशोक, वैखरी, मॅजेस्टिक बुक प्रकाशन, मुंबई, 1983
5. गर्जेद्रगडकर न., भाषा आणि भाषाशास्त्र', व्हिनस प्रकाशन, पुणे, 1991
6. गोविलकर लिला, 'वर्णनात्मक भाषाविज्ञान', आरती प्रकाशन, डोंबीवली, 1992
7. ग्रामोपाध्ये ग., भाषाविचार आणि मराठी भाषा', व्हिनस प्रकाशन, पुणे, 1964
8. जोगळेकरगं. ना., आधुनिक भाषाविज्ञान', सुविचार प्रकाशन, पुणे, 1987
9. जोशी प्र. न., 'सुबोध भाषाशास्त्र', स्नेहवर्धन पब्लिशिंग हाऊस, पुणे, 2003
10. पुंडे दत्तात्रय, 'सुलभ भाषाविज्ञान', स्नेहवर्धन पब्लिशिंग हाऊस, पुणे, 1996
11. भंडारे आनंद, भाषाशास्त्र, निर्मल प्रकाशन, नांदेड, 2004
12. मालशे मिलिंद, 'आधुनिक भाषाविज्ञान: सिद्धांत आणि उपयोजन, लोकवाङ्मय गृह, मुंबई, 2004
13. मालशे स गं., भाषाविज्ञान परिचय', व्हिनस प्रकाशन, पुणे, 1987
14. मालशे स गं., 'भाषाविज्ञान: वर्णनात्मक आणि ऐतिहासिक, पद्मगंधा प्रकाशन, पुणे, 2005

Course Title: मुक्तीपूर्व गोमंतकीय मराठी

Course Code: MAR-VLE-13

Marks: 100

Credits: 04

**Course Objective:**

1. गोमंतकीय मराठी साहित्य वाचनाची आवड निर्माण करणे.
2. पोर्तुगीजपूर्वकालीन साहित्याची ओळख करून घेणे.
3. पोर्तुगीजकालीन साहित्याचे महत्त्व व विशेषांचा अभ्यास करणे.
4. पोर्तुगीजकालीन नियतकालिकांचे स्वरूप व कामगिरी समजावून घेणे.

**Learning Outcome:**

1. गोमंतकीय मराठी साहित्याची/साहित्यप्रकाराची विद्यार्थ्यांना ओळख होईल.
2. गोमंतकीय मराठी वाङ्मयातील, विविध साहित्यप्रकारातील स्थित्यंतरे विद्यार्थ्यांना समजतील.
3. गोमंतकीय मराठी वाङ्मयातील संतसाहित्याचे महत्त्व य वेगळेपण ध्यानात येऊ शकेल.
4. गोमंतकीय मराठी नियतकालिकांचे, मुक्तिलढ्यातील योगदान ध्यानात येईल.

**Syllabus:**

1. पोर्तुगीजपूर्व गोमंतकीय संस्कृती व साहित्याचे स्वरूप पोर्तुगीजकालीन गोमंतकीय संस्कृती व तिचे गोमंतकीय जीवनावर झालेले परिणाम (15 lectures)
2. पोर्तुगीजकालीन साहित्य -कृष्णभट बांदकर, विठ्ठल केरीकर, सोहिरोबानाथ आंबिये व स्त्री कवयित्री (15 lectures)
3. ख्रिस्ती मराठी वाङ्मयातील भाषेचे स्वरूप व महत्त्व (15 lectures)
4. पोर्तुगीजपूर्व कालखंडातील नियतकालिके - स्वरूप व कार्य (15 lectures)

**संदर्भ ग्रंथ**

1. नायक काशिनाथ दामोदर, गोमंतकाची सांस्कृतिक जडणघडण, गोमंत विद्या निकेतन प्रकाशित, मडगाव, 2012
2. नायक केशव अनंत, पायशतकातील गोमंतक, (संपा.) सारस्वत ब्राम्हण समाज प्रकाशित, मडगाव, 1938
3. प्रभुदेसाई वि.बा., घवी रवीन्द्र, गोमंतकीय मराठी वाङ्मयाचा इतिहास खंडा, (संपा) गोमंतक मराठी अकादमी प्रकाशित, पणजी, 2003

## **Elective paper**

Course Title: मराठी प्रादेशिक कादंबरी: स्वरूप आणि उपयोजन

Course Code: MAR-VLE-14

Marks: 100

Credits: (04)

### **Course Objective:**

1. प्रादेशिक कादंबरीचे वेगळेपण समजावून घेणे.
2. मराठी प्रादेशिक कादंबरीचा स्थूल आढावा घेणे.
3. सैध्दांतिक तसेच उपयोजित स्तरावर त्याचा अभ्यास करणे,
4. मराठी प्रादेशिक कादंबरीच्या वैशिष्ट्यांचा परिचय करून देणे.

### **Learning Outcome:**

1. प्रादेशिक कादंबरी या साहित्यप्रवाहाची ओळख होईल.
2. सैध्दांतिक व उपयोजित स्तरावर प्रादेशिक कादंबरीचे अध्ययन केल्यामुळे या लेखनप्रकाराचे मूल्यमापन करण्याची क्षमता विद्यार्थ्यांमध्ये निर्माण होईल.
3. मराठी प्रादेशिक कादंबरीलेखन करणाऱ्या महत्त्वाच्या लेखकांचा परिचय होईल.
4. या लेखनप्रकारातील विविध प्रवाह समजून घेता येतील.

### **Syllabus:**

1. मराठी प्रादेशिक कादंबरी-स्वरूप व घटक (05 lectures)
2. मराठी प्रादेशिक कादंबरीची वाटचाल (05 lectures)
3. उपयोजन - जोगीण - सुभाष भेण्डे (45 lectures)
4. निवडक प्रादेशिक कादंबरी-स्वाध्याय(वाचन, चर्चा आणि मूल्यांकन) (05 lectures)

## संदर्भ ग्रंथ

1. कुलकर्णी मदन, 'मराठी प्रादेशिक कादंबरी: तंत्र आणि स्वरूप', श्री मंगेश प्रकाशन, नागपूर, 1984
2. जगनाळे रेखा रामकृष्ण, 'प्रादेशिक ग्रामीण साहित्य समीक्षेची समीक्षा', विजय प्रकाशन, नागपूर, 2007
3. कुलकर्णी अनिरुद्ध (संपा), प्रदक्षिणा- खंड दुसरा', कॉन्टिनेन्टल प्रकाशन, पुणे, 2004.
4. प्रभुदेसाई वि.बा., 'सतराव्या शतकातील गोमंतकीय बोली', मुंबई विश्वविद्यालय, मुंबई, 1963
5. भोले गोपाळकृष्ण केशव, 'असा हा गोमंतक', पंचेचाळीसावे साहित्य संमेलन समिती प्रकाशित, मडगाव, 1964
6. सरदेसाई मनोहर हिरबा, 'गोमंतकाचे असे ते दिवस', पुरोगामी प्रकाशन, गोवा, 1994
7. सरदेसाई मनोहर हिरबा, 'गोमंतकीय ख्रिश्चन समाज: निर्मिती व कार्य, कला व संस्कृती संचालनालय, गोवा, 2001
8. सातोस्कर बा.द., 'गोमंतक: प्रकृती व संस्कृती(खंड 1 ते खंड 3)', शारदीय प्रकाशन, पणजी, 2009



## **Elective paper**

Course Title: भाषांतर विद्या

Course Code: MAR-VI.E-15

Marks: 100

Credits: 04

### **Course Objective:**

1. भाषांतराचे स्वरूप व उद्दिष्टे समजावून देणे.
2. भाषांतराचे महत्व विशद करणे.
3. भाषांतराचे विविध प्रकार समजावून देणे.
4. भाषांतरासाठीच्या आवश्यक कौशल्यांचे ज्ञान करून देणे.
5. तौलनिक साहित्याभ्यासात भाषांतर विद्येचे महत्व समजावून देणे.

### **Learning Outcome:**

1. भाषांतर म्हणजे काय - त्याची आजच्या काळातील उपयुक्ततेची विद्यार्थ्यांना जाणीव होईल.
2. भाषांतर करताना येणाऱ्या समस्यांवर मात करण्याची क्षमता निर्माण होईल.
3. भाषांतरप्रक्रिया समजावून घेता येईल.
4. प्रत्यक्ष अनुवाद करण्याची क्षमता निर्माण होईल.

### **Syllabus:**

1. भाषांतर स्वरूप आणि उद्दिष्टे (05 lectures)
2. भाषांतराचे प्रकार आणि वर्गीकरण (10 lectures)
3. भाषान्तरप्रक्रिया, भाषांतरातील समस्या, भाषांतरकाराचे गुण (20 lectures)
4. स्वाध्याय - (मुळ साहित्यकृती व तिचे मराठीमधील भाषांतर) (25 lectures)

## संदर्भ ग्रंथ

1. अर्जुनवाडकर लीला, 'ललित साहित्याचे भाषांतर: एक यक्षप्रश्न ' (भाषा आणि जीवन, 1992)
2. कर्हाडे सदा, भाषांतर', मुंबई, लोकवाडमय गृह प्रकाशन, 2011
3. चित्रे दिलीप, 'कवितेचे भाषांतर', नवभारत, 36.7, एप्रिल 1983
4. देशपांडे एल. एस., 'साहित्य सेतू (साहित्याचे भाषांतर एक अभ्यास)', निर्मल प्रकाशन, 1999
5. कल्याण काळे /अंजली सोमण (संपा), भाषांतरमीमांसा', प्रतिमा प्रकाशन, पुणे, 1997
6. सारंग विलास, भाषांतर आणि भाषा', मौज प्रकाशन, मुंबई, 2011
7. 'साहित्यसूची' (भाषांतर विशेषांक) दिवाळी. 1949

## **Elective paper**

Course Title: माहितीपट (डॉक्युमेंटरी): लेखन आणि उपयोजन

Course Code: MAR-VI.E-16

Marks: 100

Credits: 04

### **Course objectives:**

1. प्रसारमाध्यम आणि जनसंपर्क क्षेत्रातील माहितीपटाचे महत्त्व ध्यानात आणून देणे,
2. माहितीपटाचे स्वरूप आणि एकूणच रचना कशी असते त्याची माहिती करून देणे.
3. माहितीपट लेखनाचा परिचय आणि सराव करून देणे.
4. माहितीपटाच्या संपूर्ण- चित्रिकरण प्रक्रियेचा परिचय करून देणे.

### **Learning outcomes:**

1. माहितीपटाचे स्वरूप अभ्यासल्यामुळे एक व्यावसायिक कौशल्य विकसित होईल.
2. माहितीपटाच्या अभ्यासामुळे पुढील पटकथा वा चित्रपटकथा लेखनाची प्राथमिक तयारी होऊ शकेल.
3. चित्रिकरण प्रक्रियेचा परिचय होऊ शकेल.
4. प्रसारमाध्यमे आणि जनसंपर्क क्षेत्रात रोजगाराची संधी.

### **Syllabus:**

1. माहितीपट- व्याख्या, स्वरूप व उद्दिष्टे (15 lectures)

प्रकार-परिचयात्मक (व्यक्ती, संस्था, स्थल इ.) जागृतीपर- प्रबोधनपर, संशोधनपर इ.  
माहितीपट रचनेचे स्वरूप

2. माहितीपट लेखन-विषय, रूपरेषा, साधनसामग्री, इ. (15 lectures)

घटकाभ्यास- निवेदन, संवाद, वातावरण, स्वभावदर्शन, गीत, प्रतीक, श्रेयनामावलीचे महत्त्व

3. माहितीपट निर्मितीप्रक्रिया- चित्रिकरणपूर्व तयारी, प्रत्यक्ष चित्रिकरण, (15 lectures)

उपलब्ध चित्रण, छायाचित्रे व अन्य दस्तावेज, प्रमुख व्यक्तीचे भाष्य व प्रसंगाची पुनर्निर्मिती

4. माहितीपटाचे उपयोजन / निर्मितीचे सादरीकरण (15 lectures)

- निवडलेल्या विषयावरील माहितीपटाचे सादरीकरण, माहितीपटाचे मूल्यमापन

#### संदर्भ ग्रंथ

1. पाडळकर विजय, 'गर्द रानात... भर दुपारी', मौज प्रकाशन, मुंबई, 2002
2. पाडळकर विजय, 'फ्लॅशबॅक', मौज प्रकाशन, मुंबई, 2005
3. बर्वे उज्जला, 'जनसंज्ञापन व आधुनिक प्रसारमाध्यमे, वाय.बी.चव्हाण मुक्त विद्यापीठ प्रकाशन, नाशिक, 2010
4. माळी सुनील, 'बातमीदारी', राजहंस प्रकाशन, पुणे, 2008
5. मुळे अंजली, 'सृजनाचे साक्षात्कार', मौज प्रकाशन, मुंबई, 2001
6. सपकाळ अनिल, 'मराठी चित्रपटाची पटकथा', प्रतिमा प्रकाशन, पुणे, 2003

Course Title: मराठी एकांकिका: स्वरूप व सादरीकरण

Course Code: MAR-VI. ID-2

Marks: 100

Credits: 04

**Course Objective:**

1. एकांकिका या नाट्यप्रकारांचा परिचय होईल.
2. या नाट्यप्रकाराला असलेले वाडमयमूल्य, प्रयोगमूल्य व नाट्यमूल्य अभ्यासणे शक्य होईल.
3. एकांकिका लेखनातील विविध घटकांचा परिचय होईल.
4. एकांकिका लेखन व परीक्षणाविषयीची आवड निर्माण होईल.
5. एकांकिका सादर करण्याची सवय होईल.

**Learning Outcome:**

1. एकांकिका या नाट्यप्रकाराची एक वाडमयप्रकार व कलाप्रकार म्हणून ओळख होईल.
2. एकांकिका या नाट्यप्रकारांचे, वाचन व लेखनविषयक जाणिवेचे विकसन होऊ शकेल.
3. सुप्त लेखन व अभिनयगुणांना वाव मिळेल.
4. या नाट्यप्रकाराच्या मूल्यमापनाची क्षमता निर्माण होईल.

**Syllabus:**

1. एकांकिका एक नाट्यप्रकार, साहित्यप्रकार व घटकांतर्गत अभ्यास (05 Hours)
2. एकांकिका - संहिता लेखनाचे स्वरूप (15 Hours)
3. एकांकिका - वाडमयमूल्य, प्रयोगमूल्य व नाट्यमूल्य-समीक्षा (15 Hours)
4. एकांकिका - प्राथमिक लेखन, वाचन, गटचर्चा, सुधारित लेखन (10 Hours)
5. एकांकिका / गटवार सादरीकरण, गटचर्चा, मूल्यांकन, सुधारित लेखन (15 Hours)

**संदर्भ ग्रंथ**

1. नाईक राजीव, भोळे प्रवीण, भारतीय प्रयोग कलांचा परिचय व इतिहासनाट्य', लोकवाडमयगृह, मुंबई , 2010
2. कानडे मु.श्री., 'नाट्यशोध', नीहारा प्रकाशन, पुणे ,1987

3. काळे के.ना व इतर, 'मराठी रंगभूमी नाटक', घटना आणि परंपरा, मराठी साहित्यसंघ, मुंबई - 1971.
4. कुलकर्णी गो.म., 'मराठी नाट्यसृष्टी', मेहता पब्लिशिंग हाऊस, पुणे -30
5. गणोरकर प्रभा., उहाके वसंत आबाजी व इतर (संपा) वाडमयीन संज्ञा-संकल्पना कोश, पॉप्युलर प्रकाशन, मुंबई,2001
6. घवी रवीद्र, भावे पुष्पा, व इतर (संपा.), 'प्रदक्षिणा (खंड -2), कॉन्टिनेंटल प्रकाशन, पुणे, 2008
7. भगत दत्ता निवडक एकांकिका. साहित्य अकादमी प्रकाशन,
8. शिंदे विठ्ठल, (संपा) सर्वोत्कृष्ट एकांकिका' जाई प्रकाशन, उल्हासनगर, 2007

# PHILOSOPHY

1.1.3 Average percentage of courses having focus on employability/ entrepreneurship/skill development/SEC (10)						
Department	Name of the Course	Course Code	Name of the programme	Activities with direct bearing on Employability/ Entrepreneurship/Skill development	Year of introduction	✓(to confirm) X (to delete)
Philosophy	Moral Philosophy (Core)	PHI-I.C-1	B.A. in Philosophy	Skills in application of Ethical theories to ethical issues in a given workplace	2014-15	✓
	Logic (Core)	PHI-I.C-2	B.A. in Philosophy	Learning of skill to be implemented in competitive exams	2014-15	✓
	Practical Ethics (Core)	PHI-II.C-4	B.A. in Philosophy	Skills in application of Ethical theories to ethical issues in a given workplace	2014-15	✓
	Study of World Religion	PHI-III.E-1	B.A. in Philosophy	Promotion of Inter-religious Dialogue	2015-16	✓



Course Title: **MORAL PHILOSOPHY**

Course code: **PHI-I.C-1**

Credits: 04

Marks: 100

Duration: 60 hours

**CourseObjective:** The objective of the paper is to –

1. Enable the students realize the importance of ethics and morality in life
2. Introduce the basic concepts and theories of ethics to students
3. Enable the students to analyze and evaluate a situation from moral perspective

**CourseOutcome:** At the end of the course students should be able to –

**CO1:** Define various concepts related to ethics such as Ethical relativism, absolutism, dharma, free will and determinism.

**CO 2:** Describe various theories of ethics,

**CO 3:** Illustrate the nature of moral evil and various forms of punishments

**CO 4:**Analyse any situation in terms of different ethical theories such as Kantian ethics, Utilitarianism and Virtue ethics.

**CO 5:** Critically analyse ethical theories and issues; reduce personal bias.

**CO 6:** Write research articles providing creative suggestions to problems of ethics and taking an ethical position on any situation.

**Each paper in non-experimental subject shall have sixty hours of one hour duration i.e. four hours per week over a period of fifteen weeks of a semester.**

## **Syllabus**

### **Unit I: About Ethics**

**(15 hours)**

- 1.1. Man, Society and Ethics
- 1.2. Meaning, nature and importance of ethics.
- 1.3. Sub-divisions of ethics.
- 1.4. Meaning of moral concepts.
- 1.5. Ethical relativism v/s absolutism.
- 1.6. Concept of Dharma

### **Unit II: Freedom and moral responsibility**

**(15 hours)**

- 2.1. Problem of free-will
- 2.2. Freedom and determinism
- 2.3. Freedom as indeterminism
- 2.4 Freedom as self-determinism
- 2.5. Customary morality and reflective morality.

**Unit III: Ethical theories.****(15 hours)**

- 3.1. Consequentialist theories
- 3.2. Deontological theories.
- 3.3. Virtue theories.
- 3.4. Indian Theories

**Unit IV: Crime and punishment.****(15 hours)**

- 4.1. Nature and types of moral evil.
- 4.2. Justification for punishment.
- 4.3. Evaluation of capital punishment

**References****Mandatory reading:**

1. Grcic, Joseph (1989). *Moral Choices–Ethical Theories and Problems*. New Delhi: West publishing Co.
2. Lillie, William (1984). *An Introduction to Ethics*. New Delhi: Allied publishers, Pvt. Ltd.
3. Sinha, J. N. (1978). *A Manual of Ethic*. New Delhi: New central Book Agency Pvt. Ltd.
4. Edwards, Paul (1968). *The Encyclopaedia of Philosophy*, [University of Pennsylvania Press. https://www.jstor.org/stable/2708299](https://www.jstor.org/stable/2708299)

**Supplementary Reading:**

1. Dowd, Joseph S.K. (2011). *Maximizing Dharma: Krsna's Consequentialism in the Mahabharata*. Praxis Journal of Philosophy (vol-3:1), Department of Philosophy, University of Manchester, U.K.
2. Maitra, S.K. (1978) – *The Ethics of Hindus*. Delhi: Asia Publication Services.
3. Teichman, Jenny & Evans, Katherine C. (1999). *Philosophy-A Beginner's Guide*. U.K.: Wiley -Blackwell Publishers.

**Web Links:**

1. Crimes of Misery and Theories of Punishment. John B. Mitchell *New Criminal Law Review: An International and Interdisciplinary Journal*, Vol. 15, No. 4 (Fall 2012), pp. 465-510 <https://www.jstor.org/stable/10.1525/nclr.2012.15.4.465>
2. Ethical Types (pp. 133 – 164) From: Ethical Life: Its Natural and Social Histories Webb Keane Princeton University Press (2016) <https://www.jstor.org/stable/j.ctt1h4mhxw>

Course Title: **LOGIC**

Course Code: **PHI-I.C-2**

Credits: 04

Marks: 100

Duration: 60 hours

**Course Objective:** The objective of the paper is to

1. Introduce to the students the basic elements and concepts in logic.
2. Develop logical thinking skill among the student.

**Course Outcome:** At the end of the course students should be able to

**CO 1:**Enumerate and elaborate various methods to reason better logically

**CO 2:** Interpret different arguments so as to design stronger and better logical arguments.

**CO 3:** Apply the concepts of logical thinking to identify mistakes in the points opponents make.

**CO 4:** Critically analyse and assess logical arguments in the context of their relevance in today's world.

**Each paper in non-experimental subject shall have 60 hours of one hour duration i.e. four hours per week over a period of fifteen weeks of a semester.**

## **Syllabus**

### **Unit I: About Logic**

**(15 hours)**

- 1.1. Meaning, nature and importance of logic.
- 1.2. Argument : Identifying reason and conclusion
- 1.3. Sentences and propositions.
- 1.4. Deductive and Inductive arguments.
- 1.5. Truth, Validity and Soundness.

### **Unit II: Propositions**

**(15 hours)**

- 2.1.meaning and classification of propositions
- 2.2.Nature of standard form categorical propositions
- 2.3.Representation through Venn diagram.
- 2.4.Reduction of sentences to standard form categorical proposition.
- 2.5.Distribution of terms.

### **Unit III: Inferences**

**(15 hours)**

- 3.1. Meaning and types of inferences.
- 3.2. Opposition of proposition.
- 3.3. Eduction-its types.
- 3.4. Categorical Syllogism – its structure and evaluation

#### Unit IV: Ordinary language arguments

(15 hours)

- 4.1 Hypothetical argument –its nature and rules of validity.
- 4.2 Disjunctive argument – its nature and rules of validity.
- 4.3 Enthymeme- its meaning and types.
- 4.4 Socrates-its meaning and distinction between Aristotelian and Gocleniansorites.

#### *References*

#### **Mandatory Reading:**

1. Copi, Irving M. & Cohen, Carl. (2006) – 8<sup>th</sup> & 9<sup>th</sup> edition. *Introduction to Logic*. New Delhi: Prentice Hall of India.
2. Hurley, Patrick J. (2007). *Introduction to Logic*. New Delhi: CengageCourse India Pvt. Ltd.

#### **Supplementary reading:**

1. Black, Max. Critical thinking.(1946). *An Introduction to logic and scientific method*. Prentice-Hall, Inc., New York
2. K.T. Basantani, *Introduction to Logic*, ( Bombay, A.R. Sheth& Co., 1973 )

#### **Web links:**

1. *Use of Formal Logic* [Alfred Sidgwick](https://www.jstor.org/stable/2250309) *Mind*, Vol. 41, No. 163 (Jul., 1932), pp. 341-3  
<https://www.jstor.org/stable/2250309>
2. *Ancient Logic* [A. C. Lloyd](https://www.jstor.org/stable/2217144) *The Philosophical Quarterly (1950-)*, Vol. 5, No. 19 (Apr., 1955), pp. 175-178 <https://www.jstor.org/stable/2217144>

Course Title: **PRACTICAL ETHICS**

Course code: **PHI-II.C-4**

Credits: 04

Marks: 100

Duration: 60 hours

**CourseObjective:** The objective of the paper is

1. Expose students to multiple view points on situations of daily life.
2. To give guidance in analyzing the conflicting positions.
3. To develop decision making skill among the students.

**CourseOutcome:** After completing the course students should

**CO 1:** Enumerate and elaborate various ethical situations through which one can have a stronger moral code – as an individual and as a member of society.

**CO 2:** Interpret different ethical situations so as to understand the uniqueness of morality based on context.

**CO 3:** Apply the concepts of logical thinking in daily life situations when faced with moral dilemmas.

**CO 4:** Critically analyse and assess unethical situations and challenge their validity in the context of today's world.

**Each paper in non-experimental subject shall have sixty hours of one hour duration i.e. four hours per week over a period of fifteen weeks of a semester.**

## **Syllabus**

### **Unit I: Bio-ethics**

**(15 hours)**

- 1.1 Euthanasia
- 1.2 Abortion
- 1.3 Animal experimentation
- 1.4 Cloning
- 1.5 Surrogacy

### **Unit II: Professional Ethics**

**(15 hours)**

2. 1. Medical ethics
2. 2. Legal ethics.
2. 3. Media ethics
2. 4. Business ethics

### Unit III: Social Ethics

(15 hours)

3. 1. Homosexuality, gay and lesbian marriages
3. 2. Racism
3. 3. Gender discrimination.
3. 4. Corruption

### Unit IV: Environmental Ethics

(15 hours)

4. 1. Eco-crisis
4. 2. Dominion Perspective
4. 3. Participation Perspective
4. 4. Stewardship Perspective.

### References

#### Mandatory reading:

1. LaFollette, Hugh. (1997). *Ethics in Practice – An Anthology*. U.K: Blackwell Publishers.
2. Piet, John & Ayodhya, Prasad. (2000) *An introduction to Applied Ethics*. New Delhi: Cosme Publications.
3. Singer, Peter. (1995). *Practical Ethics*. New York: Cambridge University Press
4. Titus, H.H. (1994). *Living Issues in Philosophy*. New Delhi: CenagageCourse India Pvt. Ltd.

#### Supplementary Reading:

1. Day, Louis Alvin. (2003). *Ethics in Media Communication-Cases and Controversies*. U.S.: Wadsworth / Thomas Course.
2. DesJardins, Joseph. (2011). *An introduction to Business Ethics*. New Delhi: Tata McGraw Hill Education Pvt. Ltd.
3. Reich, Warren T.(1995). *Encyclopedia of Bio-Ethics* (relevant articles). New York: Macmillan Publishing Company.
4. Kush, Helga & Singer, Peter. (2006). *Bioethics – An Anthology*. Blackwell Publishing; 2nd edition (March 20, 2006)
5. Theory and Bioethics. Stanford Encyclopedia. Published Tuesday May 18, 2010. <https://plato.stanford.edu/entries/theory-bioethics/>

#### Web Links:

1. Applied Ethics (pp. 517-538) From: *Biblical Studies, Theology, Religion and Philosophy: An Introduction for African Universities*. Joseph B. R. GaieZapf Chancery Publishers Africa Ltd. (2010)<https://www.jstor.org/stable/j.ctvgc6054>

Course title: **STUDY OF WORLD RELIGION**

Course code: **PHI-III.E-1**

Credits: 04

Marks: 100

Duration: 60 hours

**The papers shall have sixty hours of one hour duration i.e. four hours per week over a period of fifteen weeks of a semester.**

**Course Objective:** The objective of the paper is to:

- 1) Introduce the students to the major religions of the world.
- 2) Study the belief system and teachings in particular religion.
- 3) Enable the students to compare different religions.

**Course Outcome:** At the end of this course students should be able to-

**CO 1:** Awareness of multiple religious traditions and cultures

**CO 2:** Knowledge of rituals used in different religious traditions

**CO 3:** Awareness of the concept of “religion” and its evolution in multifaceted ways

**CO 4:** General appreciation for the different religious traditions all over the world

### **Syllabus**

#### **Unit I: Hinduism**

**(15 hours)**

- 1.1. History
- 1.2. Concepts
- 1.3. Myths, beliefs, Customs and Practices
- 1.4. Sacred Texts and Scriptures.

#### **Unit II: Buddhism, Jainism and Sikhism**

**(15 hours)**

- 2.1. Buddhism: Origin, History and Development, Schools, Practices
- 2.2. Jainism: History, Schools, Principles, Teachings, Ethics and Sects
- 2.3. Sikhism: History, Profound, Worship, Beliefs and Practices

#### **Unit III: Judaism, Christianity and Islam**

**(15 hours)**

3. 1. Judaism: History; Old testaments; Torah; Ten Commandments; Beliefs and practices.
3. 2. Christianity: Origin; Concepts of Christianity; Beliefs and Practices; New Testament; Major Denominations.
3. 3. Islam: Origin; Beliefs and Practices; Five pillars; Sects.

**Unit IV: Confucianism Taoism and Universal Religion (15 hours)**

- 4.1. Confucianism: Founders and Teachings; Beliefs and Practices
- 4.2. Taoism: Founders and Teachings; Beliefs and Practices
- 4.3. Elements of Universal Religion

**References**

**Mandatory reading:**

1. Chatterjee, P.B. (1971). *Studies in Comparative Religion*. Calcutta.
2. Mohapatra, A.R. *Philosophy of Religion (An Approach to World Religions)*. New Delhi: Sterling Publishers Pvt. Ltd.
3. Y. Masih. (1991). *Introduction to Religious Philosophy*. Motilal Banarsidass Publisher.

**Supplementary reading:**

1. Bakshi S.R. and Lipi Mahajan. (2000). *Encyclopaedic History of Indian Culture and Religion: Religion of India*.
2. India: Deep & Deep Publications. Eliade, Mircea. (2005). *Encyclopedia of Religions*. USA: McMillan Publishers.
3. George, Galloway. (2009). *Philosophy of Religion*. Charleston: Biblio Bazar.
4. Haneef Suzanne. (1994). *Whatever you should know about Islam and Muslims*. United States.
5. Helm, E. Thomas. *The Christian Religion An Introduction*: Western Illinois University, Prentice Hall, Englewood Cliffs.
6. Jacob, Hermann (1990). *Jaina Sutras*. Atlantic Publishers and Distributors, New Delhi.
7. Krisnamurthy, V. (1989). *Essentials of Hinduism*. Narosa Publishing House.
8. Robert S. Ellwood, Gregory D. Alles. (2008). *The Encyclopedia of World Religions* InfoBase Publishing.
9. Shushtery, A.M.A (1954). *Outlines of Islamic Culture - Historical and Cultural Aspects*: The Bangalore Printing and Publishing Co, Ltd.
10. Singh, Karan. (1983). *Religion of India*. University of Michigan. Clarion Books
11. Wright Beth. (2013). *A Study Companion to Introduction to World Religions*. Augsburg Fortress Publishing

**Web Links:**

1. [Confucianism and Taoism](#) (pp. 54-57) From: *Atlas of World Religions*. Tim Dowley Augsburg Fortress, Publishers (2018)  
<https://www.jstor.org/stable/j.ctt1tm7gnj>
2. Hinduism' and 'Taoism' in Singapore: ' Seeing Points of Convergence [Vineeta Sinha](#) *Journal of Southeast Asian Studies*, Vol. 39, No. 1 (Feb., 2008), pp. 123-147  
<https://www.jstor.org/stable/20071873>



# PHYSICS

**Paper Title** : Computational Physics  
**Paper Code** : PHY-IV.CE-7  
**Name of Faculty** : Ananya Das  
**Marks** : 75 (Theory) + 25 (Practical)  
**Credits** : 3 (Theory) + 1 (Practical)  
**Contact Hours** : 45 (Theory) + 30 (Practical)

**Course Objectives:** The course aims to enable the students to solve problems in Physics which involves numerical methods by using FORTRAN as a programming language.

**Learning Outcome:** On completion of this course, the students will be able to:

- Understand various numerical methods
- Use FORTRAN language for numerical calculations
- Understand various concepts of Physics using numerical methods using FORTRAN as a programming language.

**Pre-requisite:** Nil

**Theory:**

**1. Concepts of programming:** [5L]

Definition and Properties of algorithms, Algorithm development, Flow charts- symbols and simple flowcharts.

**2. FORTRAN Programming** [20L]

Evolution of Fortran.

Simple Fortran Programs:

Writing a Program, Input statements, Some Fortran program examples.

Numerical Constants and Variables:

Constants, Scalar Variables, Declaring Variable Names, Implicit Declaration, Named Constants.

Arithmetic Expressions:

Arithmetic Operators and Modes of Expression, Integer Expressions, Real Expressions, Precedence of Operations in Expressions, Assignment Statements, Defining Variables, Some problems due to rounding of real numbers, mixed mode expressions, Intrinsic functions, Examples of Use of Functions.

Input-Output Statements:

List-directed input statements, List-directed output statements.

Conditional Statements:

Relational Operators, The block IF construct, Example programs Using IF structure.

Implementing Loops in Program:

The block DO loop, count control DO loop, Rules to be followed in writing DO loops.

Logical expressions and More Control statements:

Introduction, Logical constants, variables and expressions, precedence rules for logical operators, Some examples of use of Logical expressions, The case statements.

Functions and subroutines:

Introduction, function subprogram, syntax rules for function subprograms, Generic functions, Subroutines, Internal Procedures.

Defining and Manipulating Arrays:

Arrays Variables, Use of multiple subscripts, Do type notation for Input/Output Statements, Initializing arrays, Terminology used for multidimensional arrays, use of arrays in DO loops, whole array operations.

**[Ref.1: Chapter-1 to Chapter-10]**

### **3. Computational Physics:**

**[20L]**

Errors in Computation:

Inherent errors in storing, Numbers due to finite bit representation to use in Computer, Truncation error, round off errors (Explain with the help of examples)

Iterative methods:

Discussion of algorithm and flowcharts and writing FORTRAN programs for finding single root of equation using bi-section method, Newton-Raphson method.

Least Square Curve fitting:

Discussion of algorithm and flowcharts and writing FORTRAN program for straight line fit with example in physics.

Numerical Integration:

Discussion of algorithm and flowcharts and writing FORTRAN program for trapezoidal rule and Simpson's 1/3rd rule.

Solution of Differential equations:

Discussion of algorithm and flowcharts and writing FORTRAN program for Euler's method for finding solution of differential equation.

*(Derivation of formula is not expected for all the above numerical methods)*

**[Ref.2: Chapters - 2, 3, 6, 8 and 9]**

### **Experiments:**

Following programs may be discussed thoroughly in theory lectures and implemented in the practicals.

1. Sum of digits of an integer
2. To find factorial of a number
3. Checking and printing of prime numbers
4. Generation of Fibonacci numbers
5. To find  $\sin(X)$ ,  $\cos(X)$  using series method
6. Sorting of Numerical data - ascending, descending.
7. Matrix operations – addition, subtraction, multiplication
8. Graphics- line, circle, arc, bar, ellipse.

9. Root of equation-Bisection method, Newton Raphson method
10. Numerical integration- Trapezoidal, Simpson's 1/3rd rule.
11. Least square curve fitting- data for ohm's law.
12. Freely falling body and motion of falling body including air drag. (using Euler's method)
13. Electric field due to a point charge
14. Charging and Discharging of Capacitor in RC circuit/Growth and Decay of current in RL Circuit.

**References:**

1. Rajaraman V., Computer Programming in Fortran 90 and 95, Prentice-Hall of India, New Delhi, 2<sup>nd</sup> Edition (1987).
2. Rajaraman V., Computer Oriented Numerical Methods, Prentice-Hall of India, New Delhi, 2<sup>nd</sup> Printing (1999).

**Additional References:**

Verma P. K. and Ahluwalia and Sharma K. C., Computational Physics, New Age International Publishers, India, (1999).

**Paper Title : Instrumentation**

**Paper Code : PHY-IV.CE-8**

**Name of Faculty: Ananya Das and Yatin P. Desai**

**Marks: 75 (Theory) + 25 (Practical)**

**Credit: 3 (Theory) + 1(Practical)**

**Contact Hours : 45 (Theory) + 30 (Practical)**

**Course Objectives:** The objective of this course is to understand basic concepts related to the various types of measuring instruments and measuring techniques.

**Learning Outcome:** On completion of this course, the students will get necessary knowledge of errors associated with instruments and basic principles involved in measuring instruments like Ammeter, Voltmeter, Ohmmeter and Multimeters. Students get familiar with working and use of CROs and Signal Generators. Students understand working and usage of the various types of transducers.

**Pre-requisite:** Nil

**Theory:**

**1. Fundamentals of Measurement: [6 L]**

Introduction, Performance Characteristics, Static Characteristics, Errors in Measurements, Types of Static Error, Sources of Error, Dynamic Characteristics, Standard, Electrical Standards.

[Ref.1: Chapter 1.2 to 1.7, 1.9, 1.10]

**2. Indicators and Display Devices: [5 L]**

Types of Instrument, Basic Meter Movement: PMMC Movement and Practical PMMC Movement, Classification of Displays, Use of LED and LCD as Display Devices, Segmental Displays using LEDs.

[Ref.1: Chapter 2.1, 2.2, 2.8, 2.10, 2.11, 2.12.3]

**3. Measuring Instruments: [12 L]**

DC Ammeter, Multirange Ammeter, Universal Shunt, Requirements of a Shunt, Extending of Ammeter Ranges. Basic Meter as a DC Voltmeter, DC Voltmeter, Multirange Voltmeter, Extending Voltmeter Ranges, Loading, Transistor Voltmeter(TVM), FET DC Voltmeter. AC Voltmeter using Rectifiers, Multirange AC Voltmeter, AC current measurements using AC Voltmeter and a series Resistor. Ohmmeter: Series type and Shunt type, Multimeter. Digital voltmeter: Ramp Technique, Digital Multimeters and Frequency meter (with help of Block Diagrams), Q meter.

[Ref.1: Chapter 3.1 to 3.5, 4.2 to 4.7, 4.12 to 4.15, 4.21, 4.22, 4.25, 5.2, 6.2, 6.3, 10.7 and Ref.2: Chapter 22: 22-9]

**4. Oscilloscope: [6 L]**

Basic Principle, Block Diagram of Oscilloscope, Simple CRO, Vertical Amplifier, Horizontal Deflecting System, sweep generator, Delay line.

[Ref.1: Chapter 7.2.1, 7.4, 7.5, 7.5.1, 7.6, 7.7.1, 7.10]

### 5. Signal Generator:

[4L]

Standard Signal Generator, AF Sine and Square Wave Generator, Function Generator.  
[Ref.1: Chapter 8.4, 8.5, 8.7, 8.8]

### 6. Transducers:

[12 L]

Introduction, Electrical Transducer, Selecting a Transducer, Strain Gauges, Resistance Wire Gauge, Types of Strain Gauges(Wire), Foil Strain Gauge, Semiconductor Strain Gauge, Inductive Transducer, Differential Output Transducers, Linear Variable Differential Transducers (LVDT), Capacitive Transducer, Piezo-Electric Transducer, Semiconductor Diode Temperature Sensor, Temperature Transducers: Resistance Temperature Detectors, Thermistors, Thermocouples.

[Ref.3: Chapter 36.1 to 36.3, 36.12 to 36.15] [Ref.1: Chapter 13.1 to 13.3, 13.6, 13.6.1 to 13.6.4, 13.9, 13.9.1, 13.9.2, 13.10, 13.11, 13.13, 13.15, 13.20.7]

### Experiments: (Minimum six)

1. Use of CRO and Function Generator (AC/DC voltage measurement, frequency measurement).
2. To measure displacement (linear and angular) using potentiometer/variable inductor/variable capacitor.
3. Construction and design of analog two ranges Voltmeter.
4. Construction and design of analog two ranges Ohmmeter.
5. Crystal Oscillator: Determination of velocity of ultrasonic waves in a liquid medium.
6. Study of strain Gauges
7. Study of LVDT (including calibration) and its use in any one application.
8. Calibration of Thermocouple
9. Thermistor as a temperature sensor.

### References:

1. Kalsi H S, Electronics Instrumentation, Tata McGraw Hill Education Pvt. Ltd. New Delhi, 3<sup>rd</sup> Edition (2010).
2. Mottershead Allen, Electronics Devices and Circuits An Introduction, Prentice-Hall of India Pvt. Ltd., New Delhi, 23<sup>rd</sup> Printing, (2000).
3. Theraja B. L., Basic Electronics (Solid State), S. Chand and Company Ltd., New Delhi, 1<sup>st</sup> Multicolour Edition (2005).

### Additional References:

1. Boylestad Robert and Nashelsky Louis, Electronic Devices and Circuit Theory, Prentice-Hall of India Pvt. Ltd., New Delhi, 6<sup>th</sup> Edition (2000).

**Paper Title: Mathematical Physics**

**Paper Code: PHY-V.CE-12**

**Marks: 75 (Theory) + 25 (Practical)**

**Credits: 3 (Theory) + 1 (Practical)**

**Contact Hours: 45 (Theory) + 30 (Practical)**

**Course Objectives:** To acquaint students with mathematical skills which are required to study various concepts of Physics.

**Learning Outcome:** At the end of this course, students would be able to apply mathematical techniques such as: calculus of residues, solutions of Legendre, Bessel and Hermite equations, Fourier transforms of different functions in solving various Physics problems.

**Pre-requisite:** Introduction to Mathematical Physics (PHY-I.C-1)

**Theory:**

**1. Functions of a Complex Variables [8 L]**

Introduction, complex variables and representations: algebraic operations, Argand diagram: vector representation, complex conjugate, Euler's formula, De Moivre's theorem, the  $n^{\text{th}}$  root or power of a complex number, analytic functions of a complex variable: the derivative of  $f(z)$  and analyticity, harmonic functions, contour integrals, Cauchy's integral theorem, Cauchy's integral formula.

[Harper: 3.1, 3.2: 3.2.1 – 3.2.6, 3.3: 3.3.1 – 3.3.5]

**2. Calculus of Residues [8 L]**

Zeros, isolated singular points, evaluation of residues:  $m^{\text{th}}$  order pole, simple pole, the Cauchy residue theorem, the Cauchy principal value, evaluation of some definite integrals.

[Harper: 4.1 – 4.3: 4.3.1 – 4.3.2, 4.4 – 4.6: 4.6.1-4.6.4]

**3. Partial Differential Equations and Special Functions of Mathematical Physics [14 L]**

Introduction, Some important partial differential equations in physics, an illustration of the method of direct integration, method of separation of variables, the Hermite polynomials: basic equations of motion in mechanics, one-dimensional linear harmonic oscillator, solution of Hermite's differential equation, Legendre and associate Legendre polynomials: spherical harmonics, the azimuthal equation, Legendre polynomials, Bessel function: introduction: solution of Bessel's equation, analysis of various solutions of Bessel's equation, characteristics of Bessel functions.

[Harper: 6.1 – 6.5: 6.5.1 – 6.5.3, 6.5.8]

**4. Fourier Series [7 L]**

Introduction: The Fourier cosine and sine series, change of interval, Fourier integral, complex form of Fourier series, generalized Fourier series and Dirac-delta function, summation of the Fourier series.

[Harper: 7.1 – 7.3]

## 5. Fourier Transforms

[8 L]

Introduction, theory of Fourier transforms: formal development of the complex Fourier transform, cosine and sine transforms, multiple-dimensional Fourier transforms, the transforms of derivatives, the convolution theorem, Parseval's relation, the wave packet in quantum mechanics: origin of the problem - quantization of energy, the development of a new quantum theory, a wave equation for particles - the wave packet.

[Harper: 8.1 – 8.3]

### Experiments: (Minimum Six)

1. Generating and plotting Legendre Polynomials.
2. Generating and plotting Bessel function.
3. Generating and plotting Hermite Polynomials.
4. Using spherical polar co-ordinates obtain an expression for divergence and curl of a vector function, operate gradient and Laplacean operator on a scalar function.
5. Using cylindrical co-ordinates obtain an expression for divergence and curl of a vector function, operate gradient and Laplacean operator on a scalar function.
6. Fourier series: programme to sum:  $\sum_{n=1}^{\infty} (0.2)^n$ , and to evaluate Fourier co-efficients of a given periodic functions.
7. Compute the  $n^{\text{th}}$  roots of unity for  $n = 2, 3$ , and 4.

### References:

1. Harper, C., 1993, *Introduction to Mathematical Physics*, 5<sup>th</sup> Ed. , Prentice Hall of India,.
2. Arfken G., 2005, *Mathematical Methods for Physicists*, Elsevier.
3. Spiegel, M.R., 2004, *Fourier Analysis*, Tata McGraw-Hill.

### Additional References:

1. Riley K. F., Hobson M. P., Bence S. J., 1998, *Mathematical Methods for Physics and Engineering*, Cambridge University Press
2. Boas M. L., 2013, *Mathematical Methods in Physical Sciences*, John Wiley and Sons, 3<sup>rd</sup> Ed.
3. Lipschutz S., 1974, *Schaum Outline of Theory and Problems of Complex Variables*, Mc Graw Hill.



**Paper Title: Introduction to Materials Science**

**Paper Code: PHY-VI.CE-16**

**Marks: 75 (Theory) + 25 (Practical)**

**Credits: 3 (Theory) + 1 (Practical)**

**Contact Hours: 45 (Theory) + 30 (Practical)**

**Course Objectives:** To acquaint students with fundamentals of materials science and study the properties and applications of materials.

**Learning Outcome:** At the end of this course, students would be able to investigate the relationship that exists between the structures and properties of materials.

**Pre-requisite:** Quantum Mechanics (PHY-IV.C-6), Solid State physics (PHY-V.CE-9).

**Theory:**

**1. Structure of Crystalline Solids** [14L]

Introduction, metallic crystal structures: the face centered cubic crystal structure, the body centered cubic crystal structure, the hexagonal close-packed crystal structure, density computations, atomic arrangements, linear and planar densities, close-packed crystal structures, polymorphism and allotropy, ceramic crystal structures: radius ratio rules, AX-type crystal structures,  $A_mX_p$ -type crystal structures,  $A_mB_nX_p$ -type crystal structures, crystal structures from close packing of anions, ceramic density computations, silicate ceramics, carbon, polymer structures: polymer crystallinity, polymer crystals, x-ray diffraction: determination of crystal structures.

[Callister: 4.1 – 4.20]

**2. Imperfections in Solids** [8 L]

Introduction, point defects: vacancies and self-interstitials, impurities in solids, specification of composition, imperfections in ceramics, miscellaneous imperfections: dislocations-linear defects, interfacial defects, bulk or volume defects, atomic vibrations, defects in polymers, microscopic examination: microscopic techniques, grain size determination.

[Callister: 5.1 – 5.13]

**3. Diffusion** [6 L]

Introduction, diffusion mechanisms, steady-state diffusion, nonsteady-state diffusion, factors that influence diffusion, diffusion in ionic materials, diffusion in polymeric materials.

[Callister: 6.1 – 6.8]

**4. Applications and Properties of Ceramics** [9 L]

Introduction, types and applications of ceramics: glasses, Glass-ceramics, clay products, refractories, abrasives, cements, advanced ceramics, mechanical properties: brittle fracture of ceramics, stress-strain behavior, mechanism of plastic deformations, miscellaneous mechanical considerations, glass properties, heat treatment of glasses, heat treatment of glass ceramics.

[Callister: 12.1 – 12.8, 12.10 – 12.16]

## **5. Structures of Polymers:**

**[8 L]**

Introduction, hydrocarbon molecules, polymer molecules, the chemistry of polymer molecules, molecular weight, molecular shape, molecular structure, molecular configurations, thermoplastic and thermosetting polymers, copolymers.

**[Callister: 13.1 –13.10]**

### **Experiments: (Minimum Six)**

1. Grain size estimation using XRD.
2. Determination of density of materials.
3. Analysis of surface morphology using SEM/TEM
4. Determination of compressibility of liquids using crystal oscillator.
5. To study the corrosion of metals with the help of galvanic cells.
6. Thermal diffusivity of brass.
7. Thermal conductivity of a poor conductor.
8. Specific heat of graphite.

### **References:**

1. Callister W. D., 2015, *Materials Science and Engineering*, John Wiley and Sons, 2<sup>nd</sup> Ed.
2. West A. R., 2014, *Solid State Chemistry and its Applications*, John Wiley and Sons.

### **Additional Reference:**

1. Kittel C., 2015, *Introduction to Solid State Physics*, John Wiley and Sons, 8<sup>th</sup> Edition.

**Paper Title : Introduction to Astronomy and Astrophysics**

**Paper Code : PHY-VI.CE-17**

**Marks : 75 (Theory) + 25 (Practical)**

**Credits : 3 (Theory) + 1 (Practical)**

**Contact Hours : 45 (Theory) + 30 (Practical)**

**Course Objectives:** The course aims to introduce the students to the Exciting World of Extra-galactic Universe.

**Learning Outcome:** On completion of this course the students will be able to understand

- a) the various Extra-galactic objects.
- b) the construction, working and mounting of modern telescopes.
- c) Co-ordinate system of Celestial Objects.
- d) types of stars and their life cycle.

**Theory:**

**1. Fundamentals of Astronomy: [9 L]**

Introduction: Components of the Universe; Stars, Planets, Asteroids, Meteors, Comets, Galaxies. Solar System: Age, Origin Basic measurements: Planetary orbits, distances, physical size, mass, density, temperature, rotation period determination, Kepler's laws, black body radiation and curves, Doppler effect.

[Ref#1: chapter1: 1.1-1.5, chapter 3: 3.1- 3.4]

**2. Astronomical Instruments: [10 L]**

Optical telescopes, mounts, light gathering power, magnification, resolution. Spectroscopes, CCD camera, photometer, filters Radio telescopes, interferometry UV, IR, X-ray and Gamma ray telescopes. Modern telescopes: HST, Chandra.

[Ref#1: chapter19: 19.1-19.5, chapter20: 20.1-20.5]

**3. Star and Star Systems [10 L]**

Stars life cycle, Neutron stars, black holes, white dwarf, Chandrasekhar limit. Spectral classification of stars, O,B,A,F,G,K,M. System of stars: Binaries / Cepheids / RR Lyrae, HR diagram, sun and solar system.

[Ref#1: chapter5: 5.1-5.7, chapter12: 12.3, 12.4]

**4. Galaxies, Dark Matter and Dark Energy [7 L]**

Galaxies, classification of galaxies, Hubble's tuning fork diagram, Open and Globular clusters, ISM.

[Ref#1: chapter16: 16.4, chapter 17: 17.1-17.4]

## 5. Observational Astronomy

[9 L]

Co-ordinate system, Celestial hemisphere, Concept of time, Magnitudes: apparent and absolute, constellations. Star dial, Observation of Sun, Eclipses, Moon, planets, meteor showers, transits, occultation's.

[Ref#1: chapter2; 2.1-2., Ref#2; chapter1: 1.1-1.4]

### Experiments: (Minimum six)

1. Resolving power of telescope.
2. Study of scattering of light (Diameter of Lycopodium powder).
3. Study of Diffraction using plane grating.
4. To find radius of curvature of a convex lens using optical lever.
5. Measurement of the solar constant.
6. To obtain proper motion of Barnard's star using Aladin.
7. Draw constellation map of a) Orion b) Auriga c) Taurus d) Ursa Major (Big Dipper) marking of pole star.
8. To determine the elements in sun using Fraunhofer spectra.
9. To estimate Astronomical Unit using Venus transit data by parallax method.
10. Data analysis technique using virtual observatory.
11. Determine the period of revolution of sun using virtual laboratory.

### Reference

1. Abhyankar K.D., 2001, *Astrophysics - Stars and Galaxies*, Tata McGraw Hill Pub.
2. Shu F., 1981, *Physical Universe-An Introduction to Astronomy*, University Science Books, U.S.
3. Roy A.E. and Clarke D., 1989, *Astronomy structure of the Universe*, Adam Hilger Pub.
4. Glasstone S., 1965, *Source book on the Space Sciences*, Van Nostrand Reinhold Inc.,U.S
5. Bhatia V. B., 2001, *Textbook of Astronomy and Astrophysics with Elements of Cosmology*, Narosa Pub.
6. Narlikar J.V., 1976, *Structure of the Universe*, Oxford Paperbacks.
7. Badyanath and Basu., 2010, *An Introduction to Astrophysics*, 2<sup>nd</sup> Edition, Prentice Hall India Learning Private Limited

**Course Title : Introduction to Error Analysis**

**Course Code : PHY-E18**

**Marks : 75 (Theory) + 25 (Practical)**

**Credits : 3 (Theory) + 1 (Practical)**

**Course Objectives:** The objective of this course is that the students will be able to comprehend some of the important methods used in estimate uncertainties and should be able to use these methods in estimating uncertainty in laboratory experiments.

**Course Outcomes:** After successful completion of this course, the students will be able to understand:

CO1: the techniques involved in analyzing measurement data and the errors associated with the measurement system used.

CO2: the importance of knowing the uncertainty and nature of uncertainty that occurs during measurements

CO3: the method of propagation of errors and applying it to estimate uncertainties.

CO4: the method of statistical analysis in applying it to estimate uncertainties.

CO5: several probability distribution functions like Gaussian distribution, Binomial distribution, and Poisson distribution.

CO6: plotting of graphs and estimate the best fit lines through the data points.

**Theory:**

**1. Preliminary description [6 h]**

Errors as uncertainty and its inevitability. Importance of knowing the uncertainties. Estimating uncertainties. Significant figures. Discrepancy. Comparison of measures and accepted values. Comparison of two measured numbers. Checking relationship with graphs. Fractional uncertainties. Multiplying two measured numbers.

[Taylor: 1.1-1.6, 2.1-2.9]

**2. Propagation of uncertainties [6 h]**

Uncertainties in direct measurements. The square root rule for a counting experiment. Sums and differences; product and quotient. Arbitrary functions of one variable. General formula for error propagation.

[Taylor: 2.1-2.9]

**3. Statistical analysis of random uncertainties [6 h]**

Random and systematic errors. The mean and standard deviation. The standard deviation as the uncertainty in the single measurement. The standard deviation of the mean. Systematic errors.

[Taylor: 4.1- 4.6]

**4. The Normal Distribution [9 h]**

Histograms and Distributions, Limiting distributions. The normal distribution. The standard deviation as 68% confidence limit. Justification of the mean as the best

estimate. Justification of addition in quadrature. Standard deviation of the mean. Acceptability of the measured answer.

[Taylor: 5.1-5.8]

**5. Least-Squares fitting [6 h]**

Data that should fit a straight line. Calculation of slope and intercept. Uncertainty in the slope and intercept. Least-squares fit to other curves.

[Taylor: 8.1-8.6]

**6. The Binomial Distribution [7 h]**

Distributions. Probability in dice throwing. Definition of binomial distribution. Properties of binomial distribution. The Gauss distribution for random errors. Application: testing of hypothesis

[Taylor: 10.1-10.6]

**7. The Poisson Distribution [5 h]**

Definition of Poisson distribution. Properties of Poisson distribution. Applications. Subtracting a background.

[Taylor: 11.1-11.4]

**Experiments: (Minimum Six)**

1. Tutorial on Propagation of uncertainties
2. Tutorial on Statistical Analysis of Random measurement
3. Tutorial on Normal Distribution
4. Tutorial on Binomial distribution
5. Tutorial on Poisson Distribution
6. Application of Error Analysis based on experimental data.
7. Application of Error analysis based on experimental data.
8. Application of Error analysis based on experimental data.

**References:**

1. Taylor J, *An Introduction to Error analysis* (University Science Books, 1997)

**Additional References:**

1. Drosig M., *Dealing with Uncertainties: A guide to error analysis* (Springer, 2007)

# PSYCHOLOGY

**Course Title:** Emotional Development

**Course Code:** PSY-I.C-2 (Experimental – Theory)

**Marks:** 75

**Credits:** 03

**Course Objectives:**

1. To introduce students to the development of emotions in human beings.
2. To help understand emotions of self and others.

**Course Outcomes:** At the end of this course students will be able to:

CO1: Describe the process involved in the experience of emotions

CO2: Analyse the impact of maturation, gender, and culture on expression of emotions

CO3: Describe the importance of emotional intelligence

CO4: Categorize people according to their temperament

CO5: Extrapolate how attachment between a parent and child can influence future relationships of the child

**Course Duration:** Each paper in Experimental subjects shall have forty five lectures of one hour duration i.e. three lectures per week over a period of fifteen weeks of a semester. Each Experimental paper shall have fifteen practicals of two hours duration i.e. one practical per week per Experimental paper over a period of fifteen weeks of a semester.

**Syllabus**

**UNIT I. Introduction to emotions**

Number of Hours: 15

- A. Introduction
  - a. Expression and perception of emotions
  - b. The physiology of emotions
    - i. The autonomic nervous system
    - ii. Patterns of bodily response in emotion
    - iii. The brain and emotion
    - iv. Arousal
- B. Theories of Emotions
  - a. Emotions and bodily states
    - i. James-Lange Theory
    - ii. Cannon-Bard Theory
    - iii. Schachter Singer Theory
  - b. A Cognitive Appraisal Theory of Emotions
  - c. A theory of relationships among emotions
  - d. Opponent process theory

**UNIT II. Development of Emotions**

Number of Hours: 15

- A. Development of emotional expression



- a. Basic emotions
  - b. Self-conscious emotions
  - c. Emotional self-regulation
  - d. Acquiring emotional display rule
  - e. Emotions, Gender and Culture
- B. Understanding and responding to the emotions of others
- a. Social Referencing
  - b. Emotional Understanding in childhood
  - c. Empathy and sympathy
- C. Emotional Intelligence
- a. Major components of emotional intelligence
  - b. EI: Evidence on its existence and effects

### **UNIT III. Temperament and Attachment**

Number of Hours:15

- A. Temperament
- a. Structure of Temperament
  - b. Measuring temperament
  - c. Stability of temperament
  - d. Genetic and environmental influences
  - e. Temperament as a predictor of children's behaviour
  - f. Temperament and child rearing: goodness of fit model
- B. Attachment
- a. Bowlby's Ethological Theory
  - b. Measuring the security of attachment
  - c. Stability of attachment
  - d. Cultural variations
  - e. Factors that affect attachment security
  - f. Multiple attachment
  - g. Attachment and later development

### **Books for study:**

1. Baron, R. A. (2012) Psychology (5<sup>th</sup> Edition) New Delhi, Dorling Kindersley.
2. Berk, L. E. (2013). *Exploring Lifespan Development* (3rd ed.). Pearson Education
3. Berk, L. E. (2014). *Development Through the Lifespan* (4th ed.). Pearson Education
4. Lahey, B.B. (2012). Psychology An Introduction (11<sup>th</sup> Edition). New York, McGraw Hill
5. Morgan, C.T., King, R. A., Weisz, J. R., & Schopler, J. (1993) Introduction to Psychology (7<sup>th</sup> edition) Chennai, McGraw Hill Education Pvt Ltd.
6. Smith, E.S., Nolen-Hoeksema, S., Fredrickson, B., Loftus, G.R. (2006). *Atkinson & Hilgard's Introduction to Psychology* (14<sup>th</sup> Ed.- 4<sup>th</sup> Reprint). Bangalore: Thomson Business Information India Pvt. Ltd.

## Web Resources:

1. Martin Luenendonk, Overview of the 6 major theories of emotion, Retrieved from <https://www.cleverism.com/6-major-theories-of-emotion/>
2. Emotional Intelligence, Mind Tools, Retrieved from [https://www.mindtools.com/pages/article/newCDV\\_59.htm](https://www.mindtools.com/pages/article/newCDV_59.htm)
3. Catherine Moore, Emotional Intelligence Skills and How to develop them, Retrieved from <https://positivepsychology.com/emotional-intelligence-skills/>
4. Albert, Isabelle & Trommsdorff, Gisela & Mishra, Ramesh. (2007). Parenting and adolescent attachment in India and Germany, Retrieved from [https://www.researchgate.net/publication/30014433\\_Parenting\\_and\\_adolescent\\_attachment\\_in\\_India\\_and\\_Germany](https://www.researchgate.net/publication/30014433_Parenting_and_adolescent_attachment_in_India_and_Germany)

**Course Title:** Emotional Development

**Course Code:** PSY-I.C-2 (Experimental component)

**Marks:** 25

**Credits:** 1

**Course Objectives:**

1. To train students to build rapport, collect subject's information, and give instructions

**Course Outcomes:** At the end of this course students will be able to:

CO1: Build rapport, Collect subject's information, Give instructions

CO2: Follow practical reporting format

**Syllabus:**

- A. Introduction to Experimentation and Testing in Psychology  
\*Orient students toward elements of practical reports
- B. Experiments (to be conducted in the order specified below)
  - a. Strength of motives
  - b. Judgment of emotions
  - c. Measures of Retention
  - d. Retroactive inhibition, (Parmeshwaran and Rao, Pg. 132)
  - e. Emotional Intelligence Test
  - f. Attachment styles

**Books for Study:**

1. Dandeker, W.N. (1999). *Fundamentals in Experimental Psychology*. Pune : Anmol Prakashan.
2. Kuppaswamy, B. (1954). *Elementary Experiments in Psychology*. Madras : Geoffrey Cumberlege Oxford University Press.
3. Mohanty, G. (1996). *Experiments in Psychology*. New Delhi : Kalyani Publishers.
4. Parry, J., & Adisheshiah, W. (1997). *Experimental Psychology*. Bombay : Allied Publishers Private Limited.
5. Smith, E.S., Nolen-Hoeksema, S., Fredrickson, B., Loftus, G.R. (2006). *Atkinson & Hilgards's Introduction to Psychology* (14<sup>th</sup> Ed.- 4<sup>th</sup> Reprint). Bangalore: Thomson Business Information India Pvt. Ltd.

**Course Title:** Basics of Counselling

**Course Code:** PSY-II.C-4 (Experimental: Theory)

**Marks:** 75

**Credits:** 3

**Course Objectives:**

1. To help students understand the nature of Counselling
2. To help students understand basic approaches of Counselling.
3. To help students understand basic skills of counselling.

**Course Outcomes:** At the end of this course students will be able to:

- CO1: Differentiate between mental health professionals
- CO2: Describe characteristics of an effective helper
- CO3: Contrast Individual Approaches to Counseling
- CO4: Describe skills needed for effective counselling
- CO5: Discuss ethical issues in counselling

**Course Duration:** Each course in Experimental subjects shall have forty five lectures of one hour duration i.e. three lectures per week over a period of fifteen weeks of a semester. Each Experimental course shall have fifteen practicals of two hours duration i.e. one practical per week per Experimental paper over a period of fifteen weeks of a semester.

**Syllabus**

**UNIT I. The Counsellor's Identity: What, Who and How?**      Number of Hours:15

- A. Guidance, Counselling and Psychotherapy: Variations on the same theme?
- B. Comparison of mental health professionals
- C. Characteristics of the Effective Helper

**UNIT II. Individual Approaches to Counseling**      Number of Hours:15

- A. Four Conceptual Orientations to Counseling and Associated Theories
  - a. Psychodynamic Approaches
  - b. Existential–Humanistic Approaches
  - c. Cognitive–Behavioral Approaches
  - d. Post-Modern Approaches
- B. Extensions, Adaptations, and Spinoffs of the Major Theories
- C. Integrative Counseling and Psychotherapy (Eclecticism)
- D. Multicultural/Social Justice Focus: Bias in Counseling Approaches
- E. Ethical, Professional, and Legal Issues
- F. The Counselor in Process: Embracing a Theory but Open to Change

### **UNIT III. Counselling Process**

Number of Hours:15

- A. The Counseling Environment
- B. Counseling Skills
- C. Conceptualizing Client Problems: Case Conceptualization
- D. Stages of the Counseling Relationship
- E. Theory, Skills, Stages, and Case Conceptualization: A Reciprocal Relationship
- F. Case Notes
- G. Multicultural/Social Justice Focus: Applying Skills Cross- Culturally
- H. Ethical, Professional, and Legal Issues
- I. The Counselor in Process: The Developmental Nature of Counseling Skills

#### **Books for study:**

1. Ed Neukrug (2012) *The World of the Counselor: An Introduction to the Counseling Profession* Fourth Edition, Canada, Brooks Cole
2. Rao, S.N. (1991) *Counselling and Guidance*, New Delhi, Tata McGraw Hill Publishing Company Limited.
3. Welfel, E.R. and Patterson, L.E. (2005) *The Counselling Process*, New Delhi, Cengage Learning
4. Sharry, J. (2004) *Counselling Children, Adolescents and Families*, New Delhi, Sage Publications.
5. Gerald, C. (1996) *Theory and Practice of Counselling and Psychotherapy*, USA, Brooks/Cole Publishing Company.
6. Leukefeld, C.G. ; Gullotta, T.P and Tindall M.S. (2009) *Adolescent Substance Abuse: Evidence Based Approaches to Prevention and Treatment*, Springer Science, New York, NY 10013, USA, Springer Publications.

#### **Web resources**

1. A guide to careers in counselling. Retrieved from <https://www.learnpsychology.org/counseling/>
2. Drab K. J. The top ten basic counselling skills. Retrieved from <https://www.people.vcu.edu/~krhall/resources/cnslskills.pdf>
3. Brunt B. V. (2010). The Preparation and Role of College Counsellors. Retrieved from <https://www.counseling.org/resources/library/ACA%20Digests/ACAPCD-36.pdf>
4. Counselling vs Clinical Psychology. Retrieved from. <https://www.div17.org/about-cp/counseling-vs-clinical-psychology/>

**Course Title: Basics of Counselling**

**Course Code:** PSY-II.C-4 (Experimental component)

**Marks:** 25

**Credits:** 1

**Course Objectives:**

1. To train students to be able to write citations in introduction and references according to the APA guidelines
2. To Introduce students to personality tests
3. To practice basic counselling techniques

**Course Outcomes:** At the end of this course, students will be able to

CO1: Include citations in introduction

CO2: Write references according to the APA guidelines

CO3: Administer a personality test and write a report

CO4: Exhibit basic skills of counselling

**Syllabus**

- A. Basics of Counselling
  - a. History taking
  - b. Counselling Techniques – to be conducted in groups of 3 wherein group members rotate roles of being client, counsellor and observer
- B. Psychological Tests:
  - a. Neyman Kohlstedt Test for Intraversion Extraversion
  - b. Free association technique
  - c. Locus of Control
  - d. Big Five Inventory

**Books for study:**

1. Anastasi , A. , Urbina, S.(2008). *Psychological Testing*. (7<sup>th</sup> Ed.). New Delhi: Pearson Education.
2. Cohen, J.R. , & Swerdlik, M.E.(2010). *Psychological Testing and Assessment: An Introduction to Test and Measurements*. (7<sup>th</sup> Ed.). NewYork: Mc Graw-Hill Publishing International Edition Company Ltd.
3. Dandeker, W.N. (1999). *Fundamentals in Experimental Psychology*. Pune : Anmol Prakashan.
4. Kuppaswamy, B. (1954). *Elementary Experiments in Psychology*. Madras : Geoffrey Cumberlege Oxford University Press.
5. Mohanty, G. (1996). *Experiments in Psychology*. New Delhi : Kalyani Publishers.

6. Parry, J., & Adisheshiah, W. (1997). *Experimental Psychology*. Bombay : Allied Publishers Private Limited.
7. Test Manuals

**Course Title:** Psychopathology I

**Course Code:** PSY-III.C-5 (Experimental)

**Marks:** 75

**Credits:** 03

**Course Objectives:**

1. To impart knowledge and understanding of the basic concepts in Abnormal Psychology and the theories about Abnormality
2. To know the historical development of the study of abnormal behaviour, criteria and perspectives in abnormal behaviour and common classification systems,
3. To create awareness about Mental Health problems in society
4. To create a foundation for higher education, and for a career in Clinical Psychology.

**Course Outcomes:** At the completion of the course students will be able to:

CO1: Describe various forms of assessment used to classify mental disorders/conditions

CO2: Analyse maladaptive behaviour from different theoretical perspectives

CO3: Describe different therapeutic approaches to deal with maladaptive behaviour

CO4: Differentiate between symptoms of various mood disorders

CO5: Differentiate between symptoms of various anxiety disorders

CO6: Differentiate between symptoms of various eating disorders.

**Course Duration:** Each paper in Experimental subjects shall have forty five lectures of one hour duration i.e. three lectures per week over a period of fifteen weeks of a semester.

**Syllabus**

Each paper in Experimental subjects shall have forty five lectures of one hour duration i.e. three lectures per week over a period of fifteen weeks of a semester.

**UNIT I: Abnormal Psychology: An overview**

Number of Hours: 14

- A. What is abnormal psychology
  - a) Triggers of mental health problems
  - b) The stigma of abnormal behaviour
  - c) Adaptive and maladaptive behaviour
- B. Classification of mental disorders
  - a) Why do we need to classify mental disorders
  - b) What are the advantages and disadvantages of classification
  - c) The DSM V and ICD 11
- C. Assessment: the basic classification
  - a) The interview



- b) Intelligence tests
- c) Neuropsychological tests
- d) Personality, behavioural, cognitive, relational and bodily assessment.

## **UNIT II. Theoretical perspectives and Therapies of maladaptive behaviour**

Number of Hours: 14

- A. Theoretical perspectives
  - a. The biological perspective
  - b. The psychodynamic perspective
  - c. The behavioural perspective
  - d. The cognitive perspective
  - e. The community-cultural perspective
  
- B. The Therapeutic enterprise: Choices, Techniques and Evaluation
  - a. Psychotherapy
  - b. Humanistic and existential therapies
  - c. Brief psychotherapies
  - d. Cognitive-behavioural approaches
  - e. Group approaches
  - f. Biological therapies
  - g. Hospitalization

## **UNIT III: Mood and Anxiety disorders**

Number of Hours: 17

- A. Depression
  - a. Major Depressive Disorder
- B. Bipolar Disorder
  - a. Bipolar I and Bipolar II Disorders
- C. Anxiety Disorders
  - a. Social Anxiety Disorder
  - b. Panic Disorder
  - c. Generalized Anxiety Disorder
  - d. Obsessive Compulsive Disorder
  - e. PTSD
- D. Eating Disorders
  - a. Anorexia Nervosa
  - b. Bulimia Nervosa
  - c. Binge-eating disorder

\*For disorders in UNIT III discuss only diagnostic criteria from DSM V

### **References:**

1. Sarason, I. G., & Sarason, B.R. (2013). *Abnormal Psychology: The Problem Of Maladaptive Behavior*. (11<sup>th</sup>Ed.). New Delhi: Indian Reprint by Pearson Education Hall, Taj Press.
2. Carson, Robert C., Butcher, James, N, Mineka, Susan and Hooley, Jill, M, (2008). *Abnormal Psychology*, Pearson Education Inc and Dorling Kindersley Publishing Inc., New Delhi, 13<sup>th</sup> Edition.
3. American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.

### **Suggested Reading:**

1. Comer, R.J. (2005). *Fundamentals of Abnormal psychology*. (4<sup>th</sup> edi). Worth publishers. 41 Madison Avenue.
2. Davison, G.C. & Neale, J.M. (1998). *Abnormal Psychology*. (7<sup>th</sup> edi). John Wiley & sons, Inc. New York/Chichester/Weinheim/Brisbane/Singapore/Toronto.
3. Koeksema-susan Nolen. (2007). *Abnormal Psychology*. (3<sup>rd</sup> Edi) the McGraw-Hill companies, New York.

### **Web Resources:**

1. American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC. Retrieved from <https://documentcloud.adobe.com/link/track?uri=urn%3Aaaid%3Ascds%3AUS%3A907fa51f-b6cb-494c-95b1-5cacf626fc55>
2. Publications and Databases of the American Psychological Association (<https://www.apa.org/pubs/>)
3. Mental health resources of the World Health Organization ([https://www.who.int/health-topics/mental-health#tab=tab\\_1](https://www.who.int/health-topics/mental-health#tab=tab_1))

**Course Title:** Psychopathology I

**Course Code:** PSY-III.C-5 (Practical Component)

**Marks:** 25

**Credits:** 1

**No. of Practicals:** 08

**Duration:** 15 Session of 2 hrs

**Practical Session:** one session per week

**Course Objective:**

1. To introduce students to different psychological screening tools
2. To enhance students ability to identify a disorder based on the symptoms

**Course Outcomes:** At the end of this course, students will be able to

CO1: Carry out a survey on mental health and compile a report

CO2: Analyse the symptoms of a case to diagnose it and suggest appropriate therapy

CO3: Administer screening tools and interpret the findings

**Syllabus:**

A. Survey (Mental Health)

B. Case Study Analysis (Mental Disorder)

C. Experiments (Any four, 4 hrs each)

- a. General health questionnaire (depression/anxiety)
- b. Beck's depression inventory
- c. Leobowitz Social Anxiety scale
- d. OCD scale (YBOCS)
- e. Perceived Stress scale (Sheldon Cohen)
- f. Yale Food Addiction Scale by Gearhardt, Corbin, Brownell, 2009

**References:**

1. Carson, Robert C., Butcher, James, N, Mineka, Susan and Hooley, Jill, M, (2008). Abnormal Psychology, Pearson Education Inc and Dorling Kindersley Publishing Inc., New Delhi, 13th Edition.

2. Salvatore V. Didato. (2003). *The Big Book of Personality Tests: 90 Easy-To-Score Quizzes That Reveal the Real You*. Black Dog & Leventhal.
3. Sarason, I. G., & Sarason, B.R. (2013). *Abnormal Psychology: The Problem of Maladaptive Behavior*. (11th Ed.). New Delhi: Indian Reprint by Pearson Education Hall, Taj Press.
4. Smith, E.S., Nolen-Hoeksema, S., Fredrickson, B., Loftus, G.R. (2006). *Atkinson & Hilgards's Introduction to Psychology* (14th Ed.- 4th Reprint). Bangalore: Thomson Business Information India Pvt. Ltd.
5. Thomas F. Oltmanns, Michele T. Martin, John M. Neale, Gerald C. Davison. (2012). *Case Studies in Abnormal Psychology*. 7th Edition. Wiley.

**Course Title:** Psychopathology II  
**Course Code:** PSY-IV.C-6 (Experimental)  
**Marks:** 75  
**Credit:** 03

**Course Objective:**

1. To create awareness about mental health problems
2. To provide students with a foundation for both future clinical work and future empirical studies focused on the development of psychopathology across the lifespan.

**Course Outcomes:** At the completion of the course students will be able to:

- CO1: Describe the symptoms of schizophrenia
- CO2: Describe the symptoms of dissociative disorders
- CO3: Differentiate between various types of somatic symptom based disorders
- CO4: Differentiate between various types of personality disorders
- CO5: Explain the symptoms of gender dysphoria
- CO6: Contrast between addictive, substance-related and non-substance related disorders

**Course Duration:** Each paper in Experimental subjects shall have forty five lectures of one hour duration i.e. three lectures per week over a period of fifteen weeks of a semester.

**Syllabus:**

**UNIT I: Schizophrenia, Dissociative and Somatic Disorders**

Number of Hours: 15

- A. Schizophrenia
  - a. Positive and Negative symptoms
  - b. The Development of Schizophrenia
  - c. The Schizophrenia spectrum in DSM V
- B. Dissociative Disorders
  - a) Dissociative Identity Disorder
  - b) Other Specified Dissociative Disorder
    - a. Dissociative Trance
- C. Somatic Symptom and Related Disorders
  - a) Somatic Symptom Disorder
  - b) Illness Anxiety Disorder
  - c) Conversion Disorder

**UNIT II: Personality Disorders and Gender Dysphoria**

Number of Hours: 18

- A. Classification of Personality Disorders
- B. Cluster A Personality Disorders
  - a. Paranoid Personality Disorder
  - b. Schizoid Personality Disorder
  - c. Schizotypal Personality Disorder
- C. Cluster B Personality Disorders
  - a. Antisocial Personality Disorder
  - b. Borderline Personality Disorder

- c. Histrionic Personality Disorder
  - d. Narcissistic Personality Disorder
- D. Cluster C Personality Disorders
- a. Avoidant Personality Disorder
  - b. Dependent Personality Disorder
  - c. Obsessive-Compulsive Personality Disorder
- E. Gender Dysphoria
- a. In Children
  - b. In Adolescents and Adults

### **UNIT III: Addictive, Substance-related and Non-substance related Disorders**

Number of Hours: 12

- A. Substance –Use Disorder
- a. Features, Severity and Specifiers
  - b. Substance intoxication and withdrawal
  - c. Substance/Medication-Induced Mental Disorders
- B. Alcohol-Related Disorders
- a. Alcohol Use Disorder
  - b. Alcohol Intoxication
  - c. Alcohol Withdrawal
- C. Other Drugs and related effects
- D. Non-substance related Disorders
- a. Internet Gaming disorder
  - b. Gambling disorder

**\*Probable CA idea:** Research facts about serious mental illness from 2010

#### **References: Mandatory:**

1. Sarason, I. G., & Sarason, B.R. (2013). *Abnormal Psychology: The Problem Of Maladaptive Behavior*. (11<sup>th</sup>Ed.). New Delhi: Indian Reprint by Pearson Education Hall, Taj Press.
2. Carson, Robert C., Butcher, James, N, Mineka, Susan and Hooley, Jill, M, (2008). *Abnormal Psychology*, Pearson Education Inc and Dorling Kindersley Publishing Inc., New Delhi, 13th Edition.
3. American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.

#### **Supplementary:**

1. Carson, Robert C., Butcher, James, N, Mineka, Susan and Hooley, Jill, M, (2008). *Abnormal Psychology*, Pearson Education Inc and Dorling Kindersley Publishing Inc., New Delhi, 13th Edition.
2. Davison, G.C. & Neale, J.M. (1998). *Abnormal Psychology*. (7<sup>th</sup> edi). John Wiley & sons, Inc. New York/Chichester/Weinheim/Brisbane/Singapore/Toronto.
3. Koeksma-susan Nolen. (2007). *Abnormal Psychology*. (3rdEdi) the McGraw-Hill companies, New York.
4. Comer, R.J. (2005). *Fundamentals of Abnormal psychology*. (4<sup>th</sup> edi). Worth publishers. 41 Madison Avenue.

**Note:** Additional articles and web resources will be provided to students as required.

**Web Resources:**

1. American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC. Retrieved from <https://documentcloud.adobe.com/link/track?uri=urn%3Aaaid%3Ascde%3AUS%3A907fa51f-b6cb-494c-95b1-5cacf626fc55>
2. Publications and Databases of the American Psychological Association (<https://www.apa.org/pubs/>)
3. Mental health resources of the World Health Organization ([https://www.who.int/health-topics/mental-health#tab=tab\\_1](https://www.who.int/health-topics/mental-health#tab=tab_1))

**Paper Title:** Psychopathology II

**Paper Code:** PSY-IV.C-6 (Practical Component)

**Marks:** 25

**Credits:** 1

**No. of Practical:** 08

**Duration:** 15 Session of 2 hrs

**Practical Session:** one session per week

**Course Objective:**

1. To introduce students to different psychological screening tools
2. To enhance students ability to identify a disorder based on the symptoms

**Course Outcomes:** At the end of this course, students will be able to

1. Analyse the symptoms of a case to diagnose it and suggest appropriate therapy
2. Administer screening tools and interpret the findings

**Syllabus:**

- A. Case Study Analysis (Mental Disorder).
- B. Experiments (Any five, 4 hrs each)
  - a. Internet Addiction scale (Internet Addiction Test)
  - b. Alcohol Use Disorders Identification Test (AUDIT) by John Saunders et al.
  - c. Drug Assessment Scale (DAS10)
  - d. Severity of Dependence Scale (SDS) By Gossop, M., Darke et al.
  - e. Gambling Scale (Gambling symptoms assessment scale)
  - f. Personality Disorder scale (suggestions follow)
    - i. Dependence personality disorder
    - ii. Antisocial personality disorder
    - iii. Narcissistic Personality disorder scale (Jonathan Cheek)

**References:**

1. Thomas F. Oltmanns, Michele T. Martin, John M. Neale, Gerald C. Davison. (2012). *Case Studies in Abnormal Psychology*. 7th Edition. Wiley.
2. Salvatore V. Didato. (2003). *The Big Book of Personality Tests: 90 Easy-To-Score Quizzes That Reveal the Real You*. Black Dog & Leventhal.
3. Smith, E.S., Nolen-Hoeksema, S., Fredrickson, B., Loftus, G.R. (2006). *Atkinson & Hilgards's Introduction to Psychology* (14th Ed.- 4th Reprint). Bangalore: Thomson Business Information India Pvt. Ltd.
4. Carson, Robert C., Butcher, James, N, Mineka, Susan and Hooley, Jill, M, (2008). *Abnormal Psychology*, Pearson Education Inc and Dorling Kindersley Publishing Inc., New Delhi, 13th Edition.
5. Sarason, I. G., & Sarason, B.R. (2013). *Abnormal Psychology: The Problem Of Maladaptive Behavior*. (11<sup>th</sup>Ed.). New Delhi: Indian Reprint by Pearson Education Hall, Taj Press.



**Course Title:** Experimental Psychology

**Course Code:** PSY-V.C-7 (Experimental- Theory)

**Marks:** 75

**Credits:** 3

**Course Objectives:**

1. To introduce students to basics of experimentation
2. To help students to design an experiment
3. To analyse experiments along various dimensions

**Course Outcomes:** At the end of this course, students will be able to

CO1: Design an experiment having one or two variables

CO2: Weigh methods of subject selection from subject populations

CO3: Examine the criteria for selecting stimuli from stimulus population.

CO4: Select the statistical test to be used for the given experimental research

CO5: Minimize pitfalls in experiments

**Course Duration:** Each paper in Experimental subjects shall have forty five lectures of one hour duration i.e. three lectures per week over a period of fifteen weeks of a semester. Each Experimental paper shall have fifteen practicals of two hours duration i.e. one practical per week per Experimental paper over a period of fifteen weeks of a semester.

**Syllabus:**

**UNIT I: Designing the Experiment**

Number of Hours: 15

- A. The experimental approach
- B. Independent, Control and Dependent Variables
- C. Types of experimental research
- D. A single independent variable
- E. Two independent variables
- F. Role of randomization and control in experiments

**UNIT II: Selecting Experimental Components**

Number of Hours: 15

- A. Selecting subjects from subject populations
- B. Selecting stimuli from stimulus populations
- C. Selecting conditions from trials or trial blocks
- D. Selecting a Statistical Test: (Sani and Todman)
  - a. The Nature of the Research Question
  - b. Type of Experimental Design
  - c. Type of Measurement Used
  - d. Deciding Whether Your Data Are Parametric or Non-Parametric
  - e. The Nature of the Specific Hypothesis to be Tested
  - f. Deciding What Test to Use

### **UNIT III: Pitfalls in Experimentation**

Number of Hours: 15

- A. Pitfalls in designing the experiment
- B. Pitfalls in running the experiment
- C. Pitfalls in data analysis
- D. Pitfalls in interpreting the results

#### **References:**

1. American Psychological Association, (2009), *Publication Manual of the American Psychological Association*, (6th Ed.). USA: American Psychological Association.
2. Goodwin, J., & Goodwin, K. (2012). *Research In Psychology: Methods and Design*, (7<sup>th</sup>Ed.). US: Wiley-Blackwell.
3. Sani, F., & Todman, J. (2005). *Experimental Design and Statistics for Psychology: A First Course*. US: Wiley-Blackwell.
4. Snodgrass, J. G., Levy-Berger, G., Haydon, M. (1985). *Human Experimental Psychology*. USA: Oxford University Press.

#### **Web Resources:**

1. Paul C. P, Jhangiani, R& I-Chant (2015). Experimental research, Research Methods in Psychology, Retrieved from <https://opentextbc.ca/researchmethods/chapter/experimental-design/>
2. Mendonça, Gulnar Azevedo Silva. (1995). Selection of subjects in case-controls studies. Sao Paulo Medical Journal, 113(2, Suppl. ), 41-42. <https://doi.org/10.1590/S1516-31801995000700024>
3. Suresh K. (2011). An overview of randomization techniques: An unbiased assessment of outcome in clinical research. Journal of human reproductive sciences, 4(1), 8–11. <https://doi.org/10.4103/0974-1208.82352>

**Course Title:** Experimental Psychology

**Course Code:** PSY-V.C-7 (Experimental component)

**Marks:** 25

**Credits:** 1

**Course Objectives:**

1. To bridge the gap between theory and experimentation
2. To introduce students to various experimental designs

**Course Outcomes:** At the end of this course, students will be able to

CO1: Write the methodology i.e. operationally define the variables, write hypothesis and state the design of the experiment

**Syllabus:**

- A. APA guidelines – ethical guidelines (APA Publication 7<sup>th</sup> edition)
- B. Experiments (*Any one from set a to e; f is compulsory*)
  - a. Psychophysics:
    - a. Signal detection (Cog lab) (Introduction should include the Signal detection theory)
    - b. Method of constant stimuli (Introduction should include classical theory)
  - b. Memory:
    - a. Encoding specificity (Cog lab)
    - b. Word superiority (Cog lab)
  - c. Perception:
    - a. Visual depth perception
    - b. Muller Lyer Illusion
  - d. Concepts:
    - a. Concept formation
    - b. Prototypes (Cog lab)
  - e. Attention:
    - a. Stroop effect (Cog lab)
    - b. Spatial cueing (Cog lab)
  - f. Mental Chronometry
    - a. Reaction time (simple/choice)(Cog lab)(Introduction should include methodological issues of dealing with outliers)

**References:**

1. Dandeker, W.N. (1999). *Fundamentals in Experimental Psychology*. Pune, Anmol Prakashan.
2. Kuppaswamy, B. (1954). *Elementary Experiments in Psychology*. Madras, Geoffrey Cumberlege Oxford University Press.
3. Mohanty, G. (1996). *Experiments in Psychology*. New Delhi : Kalyani Publisher

**Course Title:** Psychological Testing

**Course Code:** PSY-VI.C-8 (Experimental)

**Marks:** 75

**Credits:** 03

**Course Objective:**

1. The course will provide students an understanding of the principles of assessment
2. The course will provide students beginning competency in the application of assessment principles to selecting and using assessment instruments.

**Course outcomes:** At the end of the course students will be able to

- CO1: Describe the characteristics, and user guidelines of a psychological test.
- CO2: Explain the importance and types of norms in testing.
- CO3: Describe the essential components (reliability and validity) of a psychological test.
- CO4: Critically evaluate the scientific soundness of a psychological test.
- CO5: Draft items for a psychological test.

**Course Duration:** Each paper in Experimental subjects shall have forty five lectures of one hour duration i.e. three lectures per week over a period of fifteen weeks of a semester. Each Experimental paper shall have fifteen practicals of two hours duration i.e. one practical per week per Experimental paper over a period of fifteen weeks of a semester.

**Syllabus:**

**UNIT I: Nature and Use of Psychological Tests** Number of Hours- 15

- A. What is a psychological test and characteristics of a good test?
- B. Uses and varieties and control of use of psychological tests
- C. Test administration Examiner and situational variables and test-takers perspective.
- D. Effects of training on test performance
- E. Sources of information about tests
- F. Some assumptions about psychological Testing and Assessment

**UNIT II: Norms, Reliability and Validity in Testing** Number of Hours- 15

- A. What are norms
- B. Sampling to develop norms
- C. Types of norms
- D. The concept of Reliability
- E. Estimates of Reliability
- F. Definition
- G. Content validity

- H. Criterion- related validity
- I. Construct validity

### **UNIT III: Test Development**

Number of Hours- 15

- A. Test Conceptualization
  - a. Some preliminary questions
  - b. Pilot work
- B. Test Construction
  - a. Scaling
  - b. Writing items
  - c. Scoring items
- C. Test Tryout
- D. Item Analysis
  - a. Item-reliability index
  - b. Item-validity index
  - c. Item-discrimination index
  - d. Qualitative item analysis
- E. Test Revision
  - a. As a Stage in New Test Development
  - b. In the Life Cycle of an Existing Test

### **References:**

#### Mandatory

1. Anastasi. A. Psychological testing, 7th ed. By Pearson Education, Inc., Publishing as Prentice Hall.
2. Cohen, R. J. & Swerdlik, M. E, Psychological Testing and Assessment: An Introduction to Tests and Measurement (seventh Edition). New York: McGraw-Hill
3. Gregory, R. J. (2011). Psychological Testing: History, Principles, and Applications (6th Ed.). Boston: Allyn & Bacon.

#### Supplementary Reading

1. N.J. Salkind, (2013), Test Measurement for People Who (Think They) Hate Test & Measurements, 2nd edition, Delhi. American
2. Psychological Association, (2009), Publication Manual of the American Psychological Association, (6th Ed.). USA: American Psychological Association.

### **Web Resources:**

1. Overview of Psychological Testing. (2015). Retrieved from [https://www.ncbi.nlm.nih.gov/books/NBK305233/#sec\\_000071](https://www.ncbi.nlm.nih.gov/books/NBK305233/#sec_000071)

2. Understanding psychological testing and assessment. (2013). Retrieved from <https://www.apa.org/topics/psychological-testing-assessment>
3. Naglieri, J. A.; et. al. (2004). Psychological Testing on the Internet: New Problems, Old Issue. *American Psychologist*. 59 (3). 150-162.  
Retrieved from <https://www.psychosphere.com/Psych%20Testing%20on%20the%20Internet%20by%20Naglieri%20et%20al..pdf>
4. Framingham, J. (2018). What is Psychological Assessment. Retrieved from <https://psychcentral.com/lib/what-is-psychological-assessment/>

**Course Title:** Psychological testing (Practical component)

**Course Code:** PSY-VI. C-8

**Marks:** 25

**Credits:** 01

**No. of Practical:** 8

**Duration:** 15 sessions of 2hours each Practical session: one session per week

**Course Objectives:**

1. To train students to administer, score and interpret different types of tests

**Course Outcomes:** At the end of this course students will be able to:

CO1: Administer, score and interpret different types of tests

CO2: Differentiate between different types of tests

CO3: Construct a consent form and socio demographic form

**Syllabus:**

- A. Constructing a consent form and socio demographic form
- B. Psychological tests (any five):
  - a. Individual test (projective technique or intelligence test)
  - b. Group tests (personality/aptitude/interest/attitude/well-being etc)
  - c. Speed test (clerical aptitude)
  - d. Power test (ability test)
  - e. Verbal (intelligence/personality)
  - f. Performance tests (any two components of WAIS)

\*Special emphasis to be given to the test construction procedures mentioned in test manuals.

**References:**

- 1) Anastasi. A. *Psychological testing*, 7th ed. By Pearson Education, Inc., Publishing Prentice Hall.
- 2) Gregory, R. J. (2011). *Psychological Testing: History, Principles, and Applications* (6th Ed.). Boston: Allyn & Bacon.

# **SOCIOLOGY**

### **1.1.3: Course Syllabus of skill based and employment related courses**

## **INTRODUCTION TO SOCIAL WORK**

Course Code: **SOC-V.E-12**

Marks: 100

Credits: 4

Duration: 60 hours

### **Course Objectives:**

1. To update the students the increasing demand for social work.
2. To equip the students with the skills required to undertake social work.
3. To qualify the students for the careers demanding social work.

### **Course Outcomes:**

1. The students will be able to know the history of social work.
2. The students will be able to know the ethics, methods and process of social work.

### **Course Content**

- |   |                 |
|---|-----------------|
| <b>1. Introduction to Social Work</b>                         | <b>10 hours</b> |
| 1.1 Evolution of Social Work in America                       |                 |
| 1.2 Evolution of Social Work in Europe                        |                 |
| 1.3 Evolution of Social Work in India                         |                 |
| <b>2. Social Work and Social Welfare services in India</b>    | <b>15 hours</b> |
| 2.1: Definition and Nature of Voluntary Action                |                 |
| 2.2: Area of Intervention and Implication of Voluntary Action |                 |
| 2.3: Voluntary Service in India                               |                 |
| 2.4: Government and Voluntary Action                          |                 |
| 2.5: Trends in Social Welfare, Inequality and Participation   |                 |
| <b>3: Social Work Ethics</b>                                  | <b>15 hours</b> |
| 3.1: Ethics – An Introduction,                                |                 |
| 3.2: Need for Ethical Behaviour in Social Work                |                 |
| 3.3: Purpose of a Code of Ethics                              |                 |



**4: Methods of Conducting Social Work Programmes**

**10 hours**

4.1: Approaches in Doing Social Work

4.2: Managing of Social Work Programmes

**5: Social Work in Goa: A case study**

**10 hours**

**Basic References:**

1. Charles H. Zastrow, Introduction to Social Work and Social Welfare: Empowering People, Cengage Learning, USA, 2010
2. David Howe, A Brief Introduction to Social Work Theory, Palgrave Macmillan, Norwich, 2009
3. O. William Farley, Scott W. Boyle, Larry Lorenzo Smith, Introduction to Social Work, Allyn& Bacon, 2011

## **INTRODUCTION TO NGO MANAGEMENT**

Course Code:

Credits: 04

Marks: 100

Duration: 60 hours

### **Course Objectives:**

1. To introduce students about the Non – Government Organization and its structure.
2. To understand the Management of Projects individually and organizationally.
3. Students should be informed about the working areas of Non – Government organizations.
4. To acquire skills to participate in management and administrative process and programme delivery.

### **Learning Outcomes:**

1. Understand the meaning and functioning of NGO.
2. Plan and manage simple projects at the individual and organizational level.
3. Demonstrate the steps in starting an NGO.
4. Appraise the various processes in the smooth functioning of an NGO.

### **Course Content**

#### **1 – Introduction**

**16 hours**

Management Concepts: Definition, Principles of Management, Functions of Management, Management of interpersonal, inter-group and organizational theories, Significance of management for social work, Management for Non-Governmental Organizations, Development Concepts: Definition, Objectives, Developed, Underdeveloped and Developing, Indicators of Development, Social Development and Ngo's.

#### **2 - Non- Governmental Organization**

**16 hours**

History and concepts of NGO in India, NGO Movement in India, Role and Function of NGO's, Advocacy and Lobbying, NGO and Social Problems, Challenges to NGO's, Legislation related to NGO's in India: Indian Societies Registration Act 1860, Indian Trust Act 1950, Indian Companies Act 1948, Foreign Contribution of Regulation Act 1976.

#### **3. - NGO Types**

**12 hours**

Voluntary Organization, Charity, Community based Organization, Faith Based Organization, Civil Society Organization, Right Based Organization, Relief providing organization.

#### **4. - NGO Formation**

**16 hours**

Process of establishment of an NGO, Preparation of Bye Laws and Memorandum of Association, Factors in NGO Management: Visioning and envisioning as a Team, Capacity Building of Staff, Conducting Performance Appraisal, NGO culture and Social Work Ethics. Preparation of Agenda of Meeting, Fund Raising, Writing meeting Minutes, Proceedings of meeting, Passing Resolutions, Preparation of MOU, Ledgers, Registers, Vouchers, Receipts and payments, Audit Report, Structure of a Project Proposal, Preparation and Submission of Monthly, Half yearly and Yearly Reports.

#### **Essential Reading**

1. Sarkar, Ashok.: NGOs and Globalization, Jaipur: Rawat Publication, 2008.
2. Dharmarajan, Shivani.:, NGO as Prime movers, Kaniska Publication, New Delhi
3. Subedar, I.S.,2007, Field work Practice in Social Work
4. Bills and Margaret Harris: Voluntary Agencies: Challenges of Organization and Management (ed) .Macmillan, London, 2000.

#### **Additional Reading**

1. Todaro, Michael.: Economic Development, 7<sup>th</sup> Edition, Pearson Education Ltd. 2000.
2. Desai, Vandana and Robert B. Potter (Ed).: The Companion of Development Studies
3. Kapila, Uma.: Understanding the Problems of India Economy, Academic Foundation, 2004.
4. Drez, Jean and Amartya Sen, India Development, Second edition, Oxford University Press, 1997.

### **3. GLOBALIZATION AND NEW MEDIA (DIGITAL STORYTELLING)**

Course Code:

Credits: 4

Marks 100

Duration: 60 hours

#### **Course Objectives:**

1. Make students able to express their stories from a sociological perspective using the new media.
2. Make the students able to produce knowledge using technology.

**Learning outcomes:** Students will learn;

1. How to structure story.
2. Voice recording and editing.
3. Picture selection and basic editing.
4. Video filming and basic editing.
5. Use free ready to use software for merging sound and images.
6. To digitally narrate stories from Sociological perspective.

#### **Course Contents**

<b>1. Globalisation and the role of media</b>	<b>10 hours</b>
<b>2. Digital Story Telling (using images only)</b>	<b>20 hours</b>
2.1: Structuring a story	
2.2: Editing pictures	
2.3: Voice recording	
2.4: Making of DST	
<b>3. Video Filming and Editing.</b>	<b>15 hours</b>
3.1 Structuring a story	

3.2 Video Recording

3.3 Editing

**4. Creating a documentary (final product)**

**15 hours**

**Essential Reading:**

1. Cohen, Dan. Roy Rosenzweig., *Digital History: A Guide to Gathering, Preserving and Presenting the past on the web*, University Of Pennsylvania Press, 2005.
2. Macionis John J. Ken Plummer., *Sociology: A Global Introduction*, England New York Pearson/Prentice Hall, Harlow, 2012.
3. Frazel, Midge. *Digital Storytelling: Guide for Educators*, International Society For Technology in Education, 2010.

#### **4. Course Title: INTRODUCTION TO QUALITATIVE RESEARCH METHODS**

Course Code:

Credits: 04

Marks: 100

Duration: 60 hours

#### **Course Objectives:**

1. To introduce students to research methods and differentiate between Qualitative and Quantitative methods.
2. To familiarize students with basic Qualitative Methods.
3. To provide students with a hands-on experience of using Qualitative methods.

**Learning Outcomes:** On the completion of this course students will be:

1. Able to understand the fundamentals of qualitative research.
2. Able to independently use Qualitative methods in order to undertake a research.
3. To raise the issue of ethics in Qualitative research.
4. To design a research proposal based on Qualitative methods.

#### **Course Content**

<b>1: Introduction</b>	<b>10 hours</b>
1.1 Introduction to qualitative research.	
1.2 Understanding qualitative methods.	
1.3 Qualitative research ethics.	
<b>2: Qualitative Interviews</b>	<b>10 hours</b>
2.1 Understanding interview guides, schedules, and interview questions.	
2.2 Issues of language and power.	
2.3 Design an interview schedule.	
2.4 Interviewing Skills.	
<b>3: Case Study</b>	<b>10 hours</b>
3.1 What is a case?	
3.2 Value of Case study research.	

3.3 Problems of Case study?

3.4 How to do case study?

**4: Ethnography and Participant Observation.**

**20 hours**

4.1 Entering the field and doing Observation.

4.2 Negotiating Insider/Outsider concerns.

4.3 Technicalities of Field based observation.

**5: Designing a Research Proposal**

**10 hours**

**Essential Reading.**

1. Curtis, B. and Cate Curtis, Social Research: A practical Introduction, Sage Publication, New Delhi. 2011.
2. Sharma, B.A. V. Et al., Research Methods in Social Sciences, Sterling Publishers Private Limited, New Delhi. 1983.
3. Neuman, W.L., Social Reseach Methods: Qualitative and Quantitaive Approaches, Sixth Edition, Dorling Kindersley (India) Pvt. Ltd. New Delhi, 2007.
4. Goode W.J. and Hatt P. K., Methods in Social Research, McGraw-Hill International book Company, New Delhi, 1983.

## 5. Course Title: TEACHING SOCIOLOGY: THEORY AND PRACTICE

Course Code: **SOC-IV.E-5**

Marks: 100

Credits: 4

Duration: 60 hours

### **Course Objectives:**

1. Gain insight into the general aims and specific objectives of teaching.
2. Acquire knowledge of various methods of teaching sociology and develop skills related to it.
3. Give practice in planning and the usage of teaching learning material.
4. Identify and utilize appropriate resources in teaching sociology.
5. Acquire evaluation skills.

### **Learning outcomes:**

1. Demonstrate knowledge of teaching philosophies including critical pedagogy.
2. Demonstrate familiarity with addressing diversity in the classroom, particularly as it relates to teaching Sociology topics.
3. Describe and use multiple methods for teaching key sociological ideas.
4. Locate and use a variety of resources for teaching sociology.
5. Present materials necessary for applying for a teaching Sociology position.

### **Course Content:**

**1: Understanding Learners, Learning and Learning Styles** **10 hours**

**2: Approaches / Methods & Techniques of Teaching** **10 hours**

2.1 Teacher – Centered Methods -Lecture, Lecture Cum Demonstration, Historical

2.2 Learner – Centered Methods- Project, Heuristic, Experimental, Activity, Problem Solving Methods, Group.

2.3 Techniques of Teaching, Supervisory Study, Source Method, Jurisprudential Enquiry, Dramatization, Role Play, Brain-Storming, Assignment and Quiz



**3: Planning****15 hours**

3.1 Course Plan: Meaning, Components, objective and Construction

3.2 Unit Plan : Meaning, Components, objective and Construction

3.3 Lesson Plan: Meaning, Components, objective and Construction

**4: Execution and Assessment (Practical)****15 hours**

4.1 Execution of the Lesson plan

4.2 Execution using multiple teaching-learning methods

4.3 Formative assessment: Types, objectives and construction

4.4 Summative assessment: Types, objectives and construction

**5: Evaluation****10 hours**

5.1 Evaluating the process of teaching and learning

5.2 Reflection

5.3 Student feedback

**Essential Readings**

1. Heather, Fry. Ketteridge, Steve and Stephanie Marshal. 2009. A Handbook of Teaching and Learning in Higher Education. Routledge: New York.
2. Braun, Henry. Kanjee, Anil. Bettinger, Eric. and Michael Kremer. 2006. Improving Education, Through Assessment, Innovation and Evaluation. Cambridge: American Academy of Arts and Science.
3. Dummont, H. Instance, D. and Benavedes, F.2010.The Nature of Learning: Using Research to Inspire Practice.OECD.

**Additional Readings**

1. Wirth, K. Perkins, D. 2008. Learning to Learn
2. <http://www.maclester.edu/geology/wirth/CourseMaterials.html>
3. Kaur, B. 2012. Understanding Teaching and Learning: Classroom Research Revisited. Rotterdam: Sense Publishers.

## **6.Course Title: TEACHING-LEARNING: THEORY AND PRACTICE**

Course Code: **SEC**

Marks: 100

Credits: 4

Duration: 60 hours

### **Course Objectives:**

1. Gain insight into the general aims and specific objectives of teaching.
2. Acquire knowledge of various methods of teaching and develop skills related to it.
3. Give practice in planning and the usage of teaching learning material.
4. Identify and utilize appropriate resources in teaching.
5. Acquire evaluation skills.

### **Learning outcomes:**

1. Demonstrate knowledge of teaching philosophies including critical pedagogy.
2. Demonstrate familiarity with addressing diversity in the classroom, particularly as it relates to teaching any discipline specific topics.
3. Describe and use multiple methods for teaching.
4. Locate and use a variety of resources for teaching.
5. Present materials necessary for applying for a teaching position.

### **Course Content:**

**1: Understanding Learners, Learning and Learning Styles** **10 hours**

**2: Approaches / Methods & Techniques of Teaching** **10 hours**

2.1 Teacher – Centered Methods -Lecture, Lecture Cum Demonstration, Historical

2.2 Learner – Centered Methods- Project, Heuristic, Experimental, Activity, Problem Solving Methods, Group.

2.3 Techniques of Teaching, Supervisory Study, Source Method, Jurisprudential Enquiry, Dramatization, Role Play, Brain-Storming, Assignment and Quiz

**3: Planning** **15 hours**

3.1 Course Plan: Meaning, Components, objective and Construction

- 3.2 Unit Plan : Meaning, Components, objective and Construction
- 3.3 Lesson Plan: Meaning, Components, objective and Construction

**4: Execution and Assessment (Practical)**

**15 hours**

- 4.1 Execution of the Lesson plan
- 4.2 Execution using multiple teaching-learning methods
- 4.3 Formative assessment: Types, objectives and construction
- 4.4 Summative assessment: Types, objectives and construction

**5: Evaluation**

**10 hours**

- 5.1 Evaluating the process of teaching and learning
- 5.2 Reflection
- 5.3 Student feedback

**Essential Readings**

1. Heather, Fry. Ketteridge, Steve and Stephanie Marshal. 2009. A Handbook of Teaching and Learning in Higher Education. Routledge: New York.
2. Braun, Henry. Kanjee, Anil. Bettinger, Eric. and Michael Kremer. 2006. Improving Education, Through Assessment, Innovation and Evaluation. Cambridge: American Academy of Arts and Science.
3. Dummont, H. Instance, D. and Benavedes, F.2010.The Nature of Learning: Using Research to Inspire Practice. OECD.

**Additional Readings**

1. Wirth, K. Perkins, D. 2008. Learning to Learn
2. <http://www.macalester.edu/geology/wirth/CourseMaterials.html>
3. Kaur, B. 2012. Understanding Teaching and Learning: Classroom Research Revisited. Rotterdam: Sense Publishers.

- 3) Cohen, R. J. & Swerdlik, M. E, Psychological Testing and Assessment: An Introduction to Tests and Measurement (seventh Edition). New York: McGraw-Hill.

# ZOOLOGY

**PARVATIBAI CHOWGULE COLLEGE OF ARTS AND SCIENCE**  
**(Autonomous)**  
**PROGRAMME BSC ZOOLOGY**  
**CORE AND ELECTIVES COURSES**

SEMESTER	COURSE CODE	CORE COURSES	COURSE CODE	ELECTIVE COURSES
<b>I</b>	ZOO-I.C-1	Animal Diversity : Non Chordates		
	ZOO-I.C-2	Cell and Molecular Biology		
<b>II</b>	ZOO-II.C-3	Diversity and Biological Systems of Chordates		
	ZOO-II.C-4	Fundamentals of Animal and Human Genetics		
<b>III</b>	ZOO-III.C-5	Human Physiology	ZOO-III.E-1	Vertebrate Endocrinology
			ZOO-III.E-2	Basic microbiology and Fundamentals of Animal Biotechnology
			ZOO-III.E-3	Environmental Toxicology
			ZOO-III.E-4	Parasitology
<b>IV</b>	ZOO-IV.C-6	Biochemistry and Metabolic Regulation	ZOO-IV.E-5	Animal cell culture and Applications
			ZOO-IV.E-6	Aquaculture and Fisheries
			ZOO-IV.E-7	Immunology
			ZOO-IV.E-8	Evolutionary Biology
<b>V</b>	ZOO-V.C-7	Developmental Biology	ZOO-V.E-9	Molecular Genetics and Forensic Science
			ZOO-V.E-10	Economic Zoology
			ZOO-V.E-11	Ecology and Ethology
			ZOO-V.E-12	Fish Preservation and Processing
<b>VI</b>	ZOO-VI.C-8	Wildlife Biology	ZOO-VI.E-13	Health and Nutrition
			ZOO-VI.E-14	Basic and Applied Entomology
			ZOO-VI.E-15	Laboratory Techniques in Pathology
			ZOO-VI.E-16	Bio Entrepreneurship

## PROGRAMME: BSC ZOOLOGY CORE COURSES

<b>CORE COURSES FOR ZOOLOGY SINGLE MAJOR / DOUBLE MAJOR</b>		
<b>SEMESTER</b>	<b>COURSE CODE</b>	<b>COURSE TITLE</b>
1	ZOO-I.C-1	Animal Diversity : Non Chordates
1	ZOO-I.C-2	Cell and Molecular Biology
2	ZOO-II.C-3	Diversity and Biological Systems of Chordates
2	ZOO-I.C-4	Fundamentals of Animal and Human Genetics
3	ZOO-III.C-5	Human Physiology
4	ZOO-IV.C-6	Biochemistry and Metabolic Regulation
5	ZOO-V.C-7	Developmental Biology
6	ZOO-VI.C-8	Wildlife Biology

<b>CORE COURSES FOR ZOOLOGY MAJOR - MINOR</b>		
<b>SEMESTER</b>	<b>COURSE CODE</b>	<b>COURSE TITLE</b>
1	ZOO-I.C-1	Animal Diversity : Non Chordates
2	ZOO-II.C-3	Diversity and Biological Systems of Chordates
3	ZOO-III.C-5	Human Physiology
4	ZOO-IV.C-6	Biochemistry and Metabolic Regulation
5	ZOO-V.C-7	Developmental Biology
6	ZOO-VI.C-8	Wildlife Biology

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**PROGRAMME: BSC ZOOLOGY  
ELECTIVE COURSES**

<b>ELECTIVE COURSES FOR BSc ZOOLOGY</b>		
<b>SEMESTER</b>	<b>COURSE CODE</b>	<b>COURSE TITLE</b>
<b>Odd semester</b>	ZOO-III.E-1	Vertebrate Endocrinology
	ZOO-III.E-2	Basic microbiology and Fundamentals of Animal Biotechnology
	ZOO-III.E-3	Environmental Toxicology
	ZOO-III.E-4	Parasitology
	ZOO-V.E-9	Molecular Genetics and Forensic Science
	ZOO-V.E-10	Economic Zoology
	ZOO-V.E-11	Ecology and Ethology
	ZOO-V.E-12	Fish Preservation and Processing
<b>Even semester</b>	ZOO-IV.E-5	Animal cell culture and Applications
	ZOO-IV.E-6	Aquaculture and Fisheries
	ZOO-IV.E-7	Immunology
	ZOO-IV.E-8	Evolutionary Biology
	ZOO-VI.E-13	Health and Nutrition
	ZOO-VI.E-14	Basic and Applied Entomology
	ZOO-VI.E-15	Laboratory Techniques in Pathology
	ZOO-VI.E-16	Bio Entrepreneurship





## COURSE STRUCTURE FOR PROGRAMME: BSC ZOOLOGY

STRUCTURE		CREDITS	SUBJECTS & PAPERS	CC Major + Project	CC Minor	Elective
Component A (84 Credits)	<b>CHOICE – 1 Single Major</b>	<b>32+4</b>	8 Core Papers (Major) + Project Paper	8 + 1		
		<b>48</b>	12 Elective Papers (Major)		--	12
	<b>CHOICE – 2 Major and Minor</b>	<b>32+4</b>	8 Core Papers (Major) + Project Paper	8 + 1		
		<b>24</b>	6 Core Papers (Minor)		6	
		<b>24</b>	6 Elective Papers (Major)			6
	<b>CHOICE – 3 Double Majors</b>	<b>32+4</b>	8 Core Papers (Major 1) + Project Paper	8 + 1	--	
		<b>32</b>	8 Core Papers (Major 2)	8	--	
<b>16</b>		2+2 Elective Papers (Major 1 / Major 2)			4	
STRUCTURE	CREDITS	GENERAL SUBJECTS & PAPERS		Compulsory	Elective	
Component B (36 Credits)	Compulsory Subjects	<b>8</b>	A. Languages (Two Papers of 4 Credits each)	2		
		<b>8</b>	B. (1) Academic Writing (2) Cyber Security	2		
		<b>2 + 2</b>	C. EVS (Two papers of 2 Credits each)	2		
		<b>8</b>	D. (1) Statistical Methods (2) Research Writing	2		
		<b>8</b>	E. Interdisciplinary (Arts / Science) (Two Papers of 4 Credits each)		2	
Component C (6 Credits)	Extra-curricular	<b>2</b>	Music, Arts (2 Credits)		1	
		<b>2</b>	Sports (2 Credits)		1	
		<b>2</b>	NCC, NSS (2 Credits)		1	
Component D (4 Credits)	Internship	<b>4</b>	Internship (Minimum 1 Month)	1		
Abbreviations:		CC – Core Compulsory CE – Core Electives CP – Core Project CM – Core Minor GC – General Compulsory GE – General Electives I – Internship				

## COURSE DISTRIBUTION FOR PROGRAMME: BSC ZOOLOGY

Distribution of courses (Single Major)						
Semesters	I	II	III	IV	V	VI
Courses	2CC	2CC	CC	CC	CC	CC
	GC - B	GC - B	3CE	3CE	3CE	3CE
	LANG	LANG	GC - D	GC - D	GC - E	GC - E
	EVS	EVS			PROJ	PROJ
Total	4.5	4.5	5	5	5.5	5.5

Distribution of Courses (Major - Minor)						
Semesters	I	II	III	IV	V	VI
Courses	2CC	2CC	CC	CC	CC	CC
	GC - B	GC - B	CE	CE	2CE	2CE
	LANG	LANG	GC - D	GC - D	GC - E	GC - E
	CCm	CCm	CCm	CCm	CCm	CCm
			EVS	EVS	PROJ	PROJ
Total	5	5	4.5	4.5	5.5	5.5

Distribution of Courses (Double Majors)						
Semesters	I	II	III	IV	V	VI
Courses	2CC - 1	2CC - 1	CC - 1	CC - 1	CC - 1	CC - 1
			CE	CE	CE	CE
	LANG	LANG	2GC - B, D	2GC - B, D	GC - E	GC - E
	2CC - 2	2CC - 2	CC - 2	CC - 2	CC - 2	CC - 2
					EVS	EVS
					PROJ	PROJ
Total	5	5	5	5	5	5

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**PARVATIBAI CHOWGULE COLLEGE OF ARTS AND SCIENCE**  
**(Autonomous)**  
**PROGRAMME BSC ZOOLOGY**  
**COURSE CURRICULUM - CORE COURSES**

<b>SEMESTER</b>	<b>COURSE CODE</b>	<b>CORE COURSES</b>
<b>I</b>	ZOO-I.C-1	Animal Diversity : Non Chordates
	ZOO-I.C-2	Cell and Molecular Biology
<b>II</b>	ZOO-II.C-3	Diversity and Biological Systems of Chordates
	ZOO-II.C-4	Fundamentals of Animal and Human Genetics
<b>III</b>	ZOO-III.C-5	Human Physiology
<b>IV</b>	ZOO-IV.C-6	Biochemistry and Metabolic Regulation
<b>V</b>	ZOO-V.C-7	Developmental Biology
<b>VI</b>	ZOO-VI.C-8	Wildlife Biology

## SEMESTER –I:

### CORE COURSE : **ANIMAL DIVERSITY: NON CHORDATES**

<b>COURSE CODE:</b>	ZOO-I.C-1
<b>MARKS:</b>	100 [ 75 -Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 -Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	<ul style="list-style-type: none"><li>• To be familiar with the different non-chordate phyla.</li><li>• To know the general and distinguishing characters of each of them.</li><li>• To study how the different systems evolved in their complexity.</li><li>• To compare and contrasts the life processes in different phyla.</li></ul>
<b>LEARNING OUTCOME:</b>	At the end of the course, the students will be familiar with the non-chordate world that surrounds us. They will be able to appreciate the process of evolution and see how it progressed from simple, unicellular cells to complex, multicellular organisms. Students will be able to identify the invertebrates and classify them upto the class level. Students will understand the basis of life processes in the non-chordates.

## **ZOO-I.C-1: ANIMAL DIVERSITY: NON CHORDATES**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
<b>Module 1: Evolution of Animal Diversity and Diversity of lower non chordates</b>	1.1 Non chordate evolution and diversity 1.2 Taxonomy and phylogeny of animals 1.3 Invertebrate cladogram 1.4 Protista Classification and general characters upto class for the following phyla: 1.5 Porifera 1.6 Cnidaria 1.7 Platyhelminthes 1.8 Aschelminthes 1.9 Annelida	15
<b>Module 2: Diversity of higher Non Chordates And Biological systems of non chordates 1</b>	Classification and general characters upto class for the following phyla: 3.1: Onychophora 3.2: Arthropoda 3.3: Mollusca 3.4: Echinodermata 3.5: Hemichordata Comparison of life processes such as nutrition, sensory and neural control and coordination, sense organs	15
<b>Module 3: Biological systems of Non Chordates 2</b>	Comparison of life processes (Phylum Porifera to hemichordate) such as: <ul style="list-style-type: none"><li>• blood vascular system,</li><li>• exoskeleton,</li><li>• endoskeleton,</li><li>• locomotion and muscular system,</li><li>• respiration,</li><li>• excretion,</li><li>• Reproduction and development.</li></ul>	15

<b>PRACTICAL COMPONENT OF ZOO-I.C-1: ANIMAL DIVERSITY: NON CHORDATES ( DURATION -02 HRS /WEEK)</b>		
Sr. No	Practical	No. of Practicals
1.	Identification of organisms from phylum protozoa to phylum Hemichordata	06
2.	Observation of permanent slides	03
3.	Mountings: Cockroach mouth parts, prawn appendages	02
4.	Field trip to terrestrial environment to study the invertebrates in their natural habitats	01

**REFERENCE BOOKS:**

1. Barnes R.D. (2000). Invertebrate Zoology.Hall Saunders International Edition, London.
2. Barrington E.J.W. 1979. Invertebrate structure and Function.John Wiley and Sons Inc.
3. Jordan, E. L. and Verma, P.S. (2000). Invertebrate Zoology. S. Chand & Co. Pvt. Ltd. New Delhi.
4. Marshall A.J.and W.D. Williams. 1974. Textbook of Zoology. Macmillan.
5. Pechenik J.A.( 2002). Biology of the invertebrates. Tata McGraw hill Publishing company limited, New Delhi .

**REFERENCE BOOKS FOR PRACTICALS:**

- 1) Ziser. W.S (2014) Biology 1413 Introductory Zoology Lab Manual.Morton Publishing Co. Austin Community College.
  - 2) Lal S.S. (2004) A textbook of practical zoology vertebrate. Rastogi publications, Meerut India.
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**ZOO-I.C-2 : CELL AND MOLECULAR BIOLOGY****CORE COURSE : CELL AND MOLECULAR BIOLOGY**

<b>COURSE CODE:</b>	ZOO-I.C-2
<b>MARKS:</b>	100 [ 75 -Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [03 -Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	This course will give firm and rigorous foundation in the principles of modern molecular and cellular biology. It discusses the fundamental processes that enable cells to grow, move and communicate and will cover topics such as cell architecture, cell chemistry, cell division, functions and cell cycle. Students will also learn current molecular biological techniques that are used to study cell biology. Laboratories will focus both on exercises that help illustrate cellular phenomena, as well as on the introduction of techniques and procedures commonly utilized in modern cell and molecular biology research.
<b>LEARNING OUTCOME:</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• Develop deeper understanding of what life is and how it functions at cellular level.</li><li>• Describe cellular membrane structure and function, fine structure and function of cell organelles.</li><li>• Perform a variety of molecular and cellular biology techniques.</li></ul>

<b>MODULE</b>	<b>TOPICS</b>	<b>CONT ACT HOUR S</b>
<b>MODULE 1: TECHNIQUES OF CELL STUDY AND CELL CHEMISTRY (15 Hrs)</b>	Unit 1: MICROSCOPY <ul style="list-style-type: none"> <li>• Light Microscopy</li> <li>• Electron Microscopy (SEM, TEM, IEM,STEM).</li> </ul>	04
	Unit 2: CELL STUDY METHODS <ul style="list-style-type: none"> <li>• Cell Fractionation, Chromatography and electrophoresis</li> <li>• X-ray diffraction and NMR spectroscopy</li> <li>• Radioisotope tracer technique, Autoradiography, intracellular electrodes</li> </ul>	04
	Unit 3: MOLECULES IN CELL. <ul style="list-style-type: none"> <li>• Micromolecules in cells: Sugars, Fatty acids, aminoacids, Nucleotides.</li> <li>• Macromolecules in cells: Nucleic acids, proteins, Polysaccharides, glycogen, fats.</li> </ul>	05
	Unit 4: CHEMICAL BONDS IN BIOMOLECULES <ul style="list-style-type: none"> <li>• covalent bonds, ionic bonds, noncovalent interactions</li> </ul>	02
<b>MODULE 2: CELL ARCHITECTURE (15 Hrs)</b>	Unit 5: MEMBRANE STRUCTURE AND MEMBRANE PROTEINS <ul style="list-style-type: none"> <li>• lipid bilayer – composition and structural organization (amphipathic phospholipids, Fluidity of cell membrane)</li> <li>• Membrane Proteins –structure and function (transmembrane proteins, peripheral membrane proteins)</li> <li>• Phospholipids, sphingolipids, Cholesterol in cell membrane.</li> </ul>	06
	Unit 6: MOLECULAR STRUCTURE AND FUNCTION <ul style="list-style-type: none"> <li>• Plasma Membrane</li> <li>• Cell matrix: Physical nature and Properties.</li> <li>• Nucleus: Ultra Structure and function</li> <li>• Mitochondria: Ultra Structure and functions</li> <li>• Endoplasmic Reticulum: ultra structure, modifications, functions</li> </ul>	06
	UNIT 7: MOLECULAR STRUCTURE AND FUNCTION <ul style="list-style-type: none"> <li>• Golgi Complex: detailed structure and function</li> <li>• Ribosomes- Structure and function</li> <li>• Microsomes: Lysosome-morphology and function, Microbodies</li> <li>• Cytoskeleton – Microtubules, Microfilaments, intermediate filaments</li> </ul>	03
<b>MODULE 3: CELLULAR TRANSPORT OF PROTEINS AND VESICLES (15 Hrs)</b>	Unit 8: TRANSPORT ACROSS CELL MEMBRANES <ul style="list-style-type: none"> <li>• Principle of transmembrane transport (transporters and channels, active and passive transport, osmosis)</li> <li>• Transporters and their function- passive transporters, Pumps ( Na<sup>+</sup>, K<sup>+</sup>, Ca<sup>++</sup>), functions of transporters.</li> <li>• Ion Channels - ion channels activities, regulation of opening and closing of channels.</li> <li>• Protein transport into organelles (nucleus, mitochondria,ER).</li> </ul>	10
	Unit 9: VESICULAR TRANSPORT. <ul style="list-style-type: none"> <li>• Vesicular transport – transport of soluble proteins, vesicle budding, vesicle docking, endocytic pathways</li> <li>• General principles of cell signaling, G-Protein coupled receptors, enzyme coupled receptors</li> </ul>	05



<b>PRACTICAL COMPONENT OF ZOO-I.C-2: CELL AND MOLECULAR BIOLOGY ( DURATION -02 HRS /WEEK)</b>		
<b>Sr. No</b>	<b>Practical</b>	<b>No. of Practicals</b>
1)	Introduction to Lab techniques – Pipetting, preparation of buffers and solutions, Lab equipments (use and maintenance), acquaintance with general laboratory practices	02
2)	Cytochemistry: Localisation of Proteins, Carbohydrates & fats using different stains.	03
3)	Comparison of membrane permeability – Cellophane and Chick intestine.	01
4)	Osmotic studies – Using Human Red blood cells.	01
5)	Permanent slides: <ul style="list-style-type: none"> <li>- Mitotic stages</li> <li>- Meiotic stages (mounting from grasshopper testes)</li> <li>- Histology - Study of different cell types (animal cells)</li> </ul>	03
6)	Technique of Agarose gel electrophoresis (Observation of technique)	01
7)	Protein study – SDS-PAGE (Observation of technique)	01

#### **REFERENCE BOOKS:**

##### **Essential books:**

- 1) *Alberts B, Hopkins, Lewis J, Raff M, Robertis K, Walter P (2014): Essential Cell Biology, Fourth Edition, Garland Science Taylor & Francis Group, UK.*
- 2) *Lodish H, Berk A, Kaiser CA, Krieger M, Scott MP, Anthony, Bretscher A, Amon A. Scott MP (2013): Molecular Cell Biology, Seventh Edition, W. H. Freeman and Company New York.*

##### **Supplementary Reading:**

- 3) *Gupta PK (2003): Cell and Molecular Biology, Second Edition, Rakesh Kumar Rastogi for Rastogi Publications, Meerut, New Delhi, India.*
- 4) *Bolsover SR, Shephard EA, Hugh AW, Hyams JS (2011): Cell Biology, Third Edition, Wiley Blackwell, A John Wiley & Sons, Inc., Publications.*
- 5) *Verma PS and Agarwal VK (2007): Cell Biology Genetics Molecular Biology Evolution & Ecology. S Chand and Company PVT LTD, New Delhi.*

#### **REFERENCE BOOKS FOR PRACTICALS:**

- 1) *Alberts B, Hopkins, Lewis J, Raff M, Robertis K, Walter P (2014): Essential Cell Biology, Fourth Edition, Garland Science Taylor & Francis Group, UK.*
- 2) *Bolsover SR, Shephard EA, Hugh AW, Hyams JS (2011): Cell Biology, Third Edition, Wiley Blackwell, A John Wiley & Sons, Inc., Publications.*
- 3) *Verma PS and Agarwal VK (2007): Cell Biology Genetics Molecular Biology Evolution & Ecology. S Chand and Company PVT LTD, New Delhi.*
- 4) *Alberts B, Johnson A, Lewis J, Raff M, Robertis K, Walter P (2008): Molecular Biology of the Cell, Fifth Edition, Published by Garland Science, Taylor & Francis Group, UK.*

## SEMESTER – II

<b>CORE COURSE:</b> <b>DIVERSITY AND BIOLOGICAL SYSTEMS OF CHORDATES</b>	
<b>COURSE CODE:</b>	ZOO-II.C-3
<b>MARKS:</b>	100 [ 75 -Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 -Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	<ul style="list-style-type: none"><li>• To be familiar with the different Chordate phyla.</li><li>• To know the general and distinguishing characters of each of them.</li><li>• To compare and contrast the major biological systems amongst them.</li></ul>
<b>LEARNING OUTCOME:</b>	At the end of the course, the students will be familiar with the chordate world that surrounds us. They would be able to identify the different chordates upto the order. They will understand the functioning and mechanism of the various biological systems in the chordates.

<b>ZOO-II.C-3: DIVERSITY AND BIOLOGICAL SYSTEMS OF CHORDATES</b>		
<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
<b>MODULE 1: Diversity of chordates (upto order)</b>	1.1: Chordata: General plan of organization and Outline classification 1.2: General characters and classification of Protochordates 1.3: General characters and classification of Agnatha 1.4: General characters and classification of Pisces 1.5: General characters and classification of Amphibia 1.6: General characters and classification of Reptilia 1.7: General characters and classification of Aves 1.8: General characters and classification of Mammalia	<b>15</b>
<b>MODULE 2: Biological Systems I</b>	3.1: Integument: Pisces, Amphibia, Reptilia, Aves, Mammalia 3.2: Locomotory apparatus: Pisces, Amphibia, Reptilia, Aves, Mammalia 3.3: Digestive system: Pisces, Amphibia, Reptilia, Aves, Mammalia 3.4: Respiratory system: Pisces, Lungs in Amphibia, Reptilia, Aves, Mammalia	<b>15</b>
<b>MODULE 3: Biological systems - II</b>	3.1: Circulatory system: Pisces, Amphibia, Reptilia, Aves, Mammalia 3.2: Brain and cranial nerves: Pisces, Amphibia, Reptilia, Aves, Mammalia 3.3: Reproductive system: Pisces, Amphibia, Reptilia, Aves, Mammalia	<b>15</b>

<b>PRACTICAL COMPONENT OF ZOO-II.C-3: DIVERSITY OF CHORDATES ( DURATION -02 HRS /WEEK)</b>		
<b>Sr. No</b>	<b>Practical</b>	<b>No. of Practicals</b>
1.	Identification and Systematic classification of organisms from protochordates to mammalia	05
2.	Mounting of scales and chromatophores in fishes	01
3.	Observation of general viscera of chordate phyla	01
4.	Observation and study of nests of birds- crow, baya weaver, munia, sun bird (any three)	01
5.	Identification of Indian venomous and non venomous snakes with the help of keys provided (four each)	01
6.	Mounting of pecten of eye (chick)	01
7.	Mounting of hyoid apparatus of chick; observation of hyoid apparatus of reptiles and mammals	01
8.	Overview of skull from fish to mammals	01
9.	Observation of permanent slides (amphioxus, doliolum, salpa)	01
10.	Field trip to fish landing site and wild life sanctuary	02

#### **REFERENCE BOOKS:**

1. Cleveland Hickman Jr., Roberts Larry, Susan Keen, Allan Larson and Eisenhour D (2014). Animal Diversity. McGraw Hill Science.
2. Kardong K(2011). Vertebrates: Comparative anatomy, evolution, function. McGraw-Hill Higher Education.
3. Kent G.C. and Carr R.K. (2000). Comparative anatomy of the vertebrates. McGraw-Hill Higher Education.
4. Young J.Z. (2006). The life of vertebrates. Radha Press Delhi, Indian Edition.

#### **REFERENCE BOOKS FOR PRACTICALS:**

- 1) Ziser. W.S (2014) Biology 1413 Introductory Zoology Lab Manual. Morton Publishing Co. Austin Community College.
- 2) Lal S.S. (2004) A textbook of practical zoology vertebrate. Rastogi publications, Meerut India.

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## **ZOO-II.C-4: FUNDAMENTALS OF ANIMAL AND HUMAN GENETICS**

### **FUNDAMENTALS OF ANIMAL AND HUMAN GENETICS**

<b>COURSE CODE:</b>	ZOO-II.C-4
<b>MARKS:</b>	100 [ 75 –Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 –Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	This course is intended to provide solid understanding of concepts and principles of genetics as it applies to animals and humans. Students will receive good foundation of chromosome structure, its aberrations and inheritance patterns of traits and disease which will help one to develop conceptual skills to address questions in genetic research.
<b>LEARNING OUTCOME:</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• Describe the basic structure of genes and chromosomes.</li><li>• Relate an organism’s genotype and phenotype and explain the role of genes in inheritance.</li><li>• Understand the reason why a given genotype does not always result in the same phenotype</li><li>• Demonstrate knowledge of genetic principles and their application in society</li><li>• Construct and analyze pedigrees to determine mode of inheritance of disorders and traits.</li></ul>

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
MODULE 1: TRANSMISSION GENETICS	UNIT 1: MODES OF INHERITANCE <ul style="list-style-type: none"> <li>• Mendel's laws of inheritance, test cross, back cross</li> <li>• Gene interactions: 9:3:3:1/12:3:1 / 9:3:4 / 9:6:1 / 9:7 / 15:1 / 13:3. lethal genes, penetrance.</li> <li>• Inheritance of Multiple Alleles and Multiple genes</li> </ul>	06
	UNIT 2: PATTERN OF INHERITANCE BY PEDIGREES <ul style="list-style-type: none"> <li>• Construction of Pedigrees</li> <li>• Analysis of Pedigree analysis: autosomal dominant, autosomal recessive, X-Linked dominant, X-linked recessive, Y-linked, Mitochondrial inheritance</li> <li>• Sex limited and Sex influenced and multifactorial inheritance disorders in humans</li> </ul>	09
MODULE 2: CHROMOSOME STRUCTURE AND ABNORMALITIES	UNIT 3: CHROMOSOME STRUCTURE <ul style="list-style-type: none"> <li>• Chromosome morphology- chromatid, Centromere, secondary constriction, chromomere</li> <li>• Heterochromatin and euchromatin</li> <li>• Chromosome structure and organization.</li> <li>• Human chromosomes and karyotype.</li> </ul>	06
	UNIT 4: CHROMOSOMAL ABERRATION <ul style="list-style-type: none"> <li>• Numerical aberrations: Types- Aneuploidies and Euploidies, Mosaicism, Numerical aberrations in humans</li> <li>• Structural Abnormalities: Types-Deletions, inversions, Translocations, duplications. Structural aberrations in humans.</li> </ul>	09
MODULE 3: GENE MUTATIONS, SEX DETERMINATION.	UNIT 5: GENETIC MUTATIONS. <ul style="list-style-type: none"> <li>• characteristics of mutations</li> <li>• classification of mutations (Spontaneous, Induced)</li> <li>• molecular basis of mutations</li> <li>• Mutagens – physical and chemical</li> </ul>	08
	UNIT 6: SEX DETERMINATION. <ul style="list-style-type: none"> <li>• Environmental Sex Determination – hormonal, egg size, incubation temperature.</li> <li>• Chromosomal sex determination - <math>XX^{\ominus}</math> and <math>XO^{\sigma}</math>, <math>XO^{\ominus}</math> and <math>XX^{\sigma}</math>, <math>ZW^{\ominus}</math> and <math>ZZ^{\sigma}</math>, <math>XX^{\ominus}</math> and <math>XY^{\sigma}</math>, Diploid female and Haploid male, single gene effect.</li> <li>• Molecular basis of sex determination: Geneic imbalance, Sex index, Intersex and gynandomorphs, X/A Ratio.</li> <li>• Sex determination by Y linked genes, Dosage compensation, X-inactivation</li> </ul>	07

<b>PRACTICAL COMPONENT OF ZOO-II.C-4: FUNDAMENTALS OF ANIMAL AND HUMAN GENETICS. DURATION - 02 HRS /WEEK</b>		
Sr. No	Practical	No. of Practicals
1)	Verification of Mendel's laws - monohybrid cross	01
2)	Verification of Mendel's laws - dihybrid cross	01
3)	Manual Karyotyping of human chromosome plates: 1) Normal Male and Female 2) Downs syndrome 3) Turners Syndrome	04
4)	Drosophila Culture technique	01
5)	Study of Mutants of Drosophila	01
6)	Exercises for Multiple alleles and Multiple genes	02
7)	Construction of pedigrees	01
8)	Analysis and interpretation of Pedigrees	01

#### **REFERENCE BOOKS FOR THEORY:**

- 1) Gardner EJ, Simmons MJ and Snustad DP (2013): Principles of Genetics, Eighth Edition, John Wiley Publication, Singapore.
- 2) De Robertis EDP, De Robertis EMF (2012): Cell and Molecular Biology, Eighth Edition. Wolter Kluwer Publication, Philadelphia.
- 3) Singh BD (2014): Fundamentals of Genetics. Second Edition, Kalyani Publishers, New Delhi.
- 4) Lewis R (2009): Human Genetics, Concepts and Applications, Seventh Edition. McGraw-Hill International Edition, New York.
- 5) Gangane SD (2009): Human genetics, Third Edition, Reed Elsevier India Pvt Ltd., Haryana India.
- 6) Gardner A, Davies T (2010): Human Genetics, Second Edition, Scion Publishing Ltd, UK.
- 7) Marcus A(2011): Genetics, MJP Publishers, Chennai.
- 8) Verma PS and Agarwal VK (2014): Cell Biology Genetics Molecular Biology Evolution & Ecology. S Chand and Company PVT LTD, New Delhi.
- 9) Kothari ML, Mehta L, Roychoudhury SS (2009): Essentials of Human Genetics, Fifth edition, University Press Pvt. Ltd. Hyderabad.

#### **REFERENCE BOOKS FOR PRACTICALS:**

- 1) Gangane SD (2009): Human genetics, Third Edition, Reed Elsevier India Pvt Ltd., Haryana India.
- 2) Marcus A(2011): Genetics, MJP Publishers, Chennai.
- 3) Gardner A, Davies T (2010): Human Genetics, Second Edition, Scion Publishing Ltd, UK.
- 4) Lewis R (2009): Human Genetics, Concepts and Applications, Seventh Edition. McGraw-Hill International Edition, New York.

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## SEMESTER –III

### CORE COURSE :HUMAN PHYSIOLOGY

<b>COURSE CODE:</b>	ZOO-III.C-5
<b>MARKS:</b>	100 [75 –Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [03 –Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	The primary goal of this course is to offer an in-depth presentation of the function of the major organs and organ systems of the human body. The course is designed to expand physiological concepts presented in prerequisite courses.
<b>LEARNING OUTCOME:</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• describe and explain the normal function of the cells, tissues, organs, and organ systems of the human body</li><li>• develop understanding of the functional relationships of anatomical structures to one another</li></ul>



## ZOO-III.C-5: HUMAN PHYSIOLOGY

MODULE	TOPICS	CONTACT HOURS
<b>MODULE 1: PHYSIOLOGY OF DIGESTION AND RESPIRATION (15 Hrs)</b>	UNIT 1: <i>DIGESTIVE SYSTEM</i> <ul style="list-style-type: none"> <li>• Structural organization, histology and functions of gastrointestinal tract and its associated glands;</li> <li>• Mechanical and chemical digestion of food; Absorptions of carbohydrates, lipids, proteins, water, minerals and vitamins.</li> <li>• Role of gastrointestinal hormones on the secretion and control of enzymes of Gastrointestinal tract</li> </ul>	08
	UNIT 2: <i>RESPIRATORY SYSTEM</i> <ul style="list-style-type: none"> <li>• Histology of trachea and lung;</li> <li>• Mechanism of respiration, Pulmonary ventilation; Respiratory volumes and capacities;</li> <li>• Transport of oxygen in the blood oxygen- hemoglobin &amp; myoglobin , dissociation curve and the factors influencing it Carbon monoxide poisoning; Carbon dioxide transport in the blood;</li> <li>• Buffering action of blood and haemoglobin Control of respiration</li> </ul>	07
<b>MODULE 2: PHYSIOLOGY OF EXCRETION AND CIRCULATION (15 Hrs)</b>	UNIT 3: <i>EXCRETORY SYSTEM</i> <ul style="list-style-type: none"> <li>• Structure of kidney and its histological details, Renal blood supply; Mechanism urine</li> <li>• Formation and its regulation, Regulation of acid-base balance.</li> </ul>	05
	UNIT 4: <i>CIRCULATORY SYSTEM</i> <ul style="list-style-type: none"> <li>• An outline structure of heart; Coronary circulation; structure of conducting and working</li> <li>• Myocardial fibers. Origin and conduction of cardiac impulses functions of AV node; Cardiac cycle; Cardiac output and its regulation-Frank-Starling Law of the heart, nervous and chemical regulation of heart rate; Blood pressure and its regulation; Electrocardiogram</li> <li>• Components of blood and their functions; Structure and functions of haemoglobin; Haemopoiesis; Haemostasis and Coagulation of blood; Disorders of blood.</li> </ul>	10
<b>MODULE 3: PHYSIOLOGY OF NERVOUS SYSTEM, MUSCLES AND REPRODUCTIVE SYSTEM (15 hrs)</b>	UNIT 5: <i>NERVOUS SYSTEM</i> <ul style="list-style-type: none"> <li>• Structure of neuron, resting membrane potential , Origin of action potential and its propagation across the myelinated and unmyelinated nerve fibers;</li> <li>• types of synapsis, Synaptic transmission and, Neuromuscular junction; Reflex action &amp; its types -reflex arc</li> <li>• Physiology of hearing and vision</li> </ul>	06
	UNIT 6: <i>MUSCLE</i> <ul style="list-style-type: none"> <li>• Histology of different types of muscle;</li> <li>• Ultra structure of skeletal muscle;</li> <li>• Molecular and chemical basis of muscle contraction;</li> <li>• Characteristics of muscle twitch; Motor Unit, summation &amp; tetanus</li> </ul>	04
	UNIT 7: <i>REPRODUCTIVE SYSTEM</i> <ul style="list-style-type: none"> <li>• Histology of male and female reproductive systems.</li> <li>• Puberty, Physiology of male and female reproduction.</li> </ul>	05

<b>PRACTICAL COMPONENT OF ZOO-III.C-5: HUMAN PHYSIOLOGY ( DURATION -02 HRS /WEEK)</b>		
<b>SR. NO</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1)	Enumeration of red blood cells / WBC using haemocytometer	02
2)	Estimation of haemoglobin using Sahli's haemoglobinometer	01
3)	Determination of activities of digestive enzymes (Amylase, Pepsin, Trypsin and Lipase)	02
4)	Temporary preparation of Striated muscle fibers and nerve cells.	02
5)	Urine analysis (for organic, inorganic and abnormal components)	03
6)	Examination of sections of mammalian tissues: Lung, Kidney, Gonads, Intestine, Muscles, Spinal cord, Bone and cartilage	02

#### **REFERENCE BOOKS:**

##### *Essential books:*

1. Singh HD(2011):*Textbook of Human Physiology, S Chand Publishers, New Delhi.*
2. Widmaier, Raff, & Strang(2008), *Vander's Human Physiology: The Mechanisms of Body Function, 12th edition, McGraw Hill,. ISBN 978-0-07-337810-7*
3. Tortara G J and Derrickson BH(2009). *Principles of Anatomy and physiology, 12<sup>th</sup> Edition. John Wiley & sons, Inc.*
4. Guyton Ac and Hall JE(2011). *Testbook of Medical Physiology, 12<sup>th</sup> Edition, Harcourt Asia Pvt Ltd, WB Saunders Company.*

##### *Supplementary Reading:*

5. Openstax College (2013). *Anatomy and Physiology. Vol II. Mainstreet MS, Houston Texas(Ebook)*
6. Forciea B (2012). *An eText of Human Anatomy and Physiology(Ebook).*
7. Wingerd B(2008). *The Human Body, Essential Anatomy and Physiology. University Readers, SanDiego CA.*

#### **REFERENCE BOOKS FOR PRACTICALS:**

1. Openstax College (2013). *Anatomy and Physiology. Vol II. Mainstreet MS, Houston Texas(Ebook)*
2. Forciea B (2012). *An eText of Human Anatomy and Physiology(Ebook).*
3. Wingerd B(2008). *The Human Body, Essential Anatomy and Physiology. University Readers, SanDiego CA.*

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## SEMESTER - IV

<b>CORE COURSE: BIOCHEMISTRY AND METABOLIC REGULATION</b>	
COURSE CODE:	ZOO-IV.C-6
MARKS:	100 [ 75 -Theory ; 25- Practicals]
CREDITS:	04 [ 03 -Theory; 01- Practical]
CONTACT HOURS:	THEORY : 45 HOURS (03 LEC /WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
COURSE OBJECTIVES:	<ul style="list-style-type: none"><li>• To understand the basic principles that govern the functioning of living systems</li><li>• To know the structure of biomolecules and the role they play in governing life processes through the pathways</li><li>• To be familiar with enzymes and their activities</li></ul>
LEARNING OUTCOME:	At the end of the course, the students will be able to understand better the chemical basis in life. They will appreciate better the interactions between the biological molecules.

## ZOO-IV.C-6: BIOCHEMISTRY AND METABOLIC REGULATION

MODULE	TOPICS	CONTACT HOURS
<b>MODULE 1:</b>  <b>Fundamentals of biochemistry and Carbohydrate metabolism</b>	1.1 Principles of pH, buffer, thermodynamics 1.2 Enzymes: classification, properties of enzyme, enzyme kinetics, Michaelis-Menten Equation, enzyme inhibition 1.3 Carbohydrate structure, aerobic and anaerobic glycolysis, Citric acid cycle, glycogenesis, glycogenolysis, Pentose phosphate pathway, 1.4 Diabetes mellitus	<b>15</b>
<b>MODULE 2:</b> <b>Lipid and Protein metabolism</b>	2.1: Lipid: -structure and classification, -fatty acid synthesis -fatty acid oxidation (saturated and unsaturated), - metabolism of glycerophospholipids, sphingolipids, cholesterol - disorders: fatty liver types (NAFL, AFL)  2.2 Protein: - structure (primary, secondary, tertiary) and classification -amino acid biosynthesis, nucleotide biosynthesis, - amino acid catabolism, urea cycle, Fate of carbamoyl P, - Hyper uricemia	<b>15</b>
<b>MODULE 3:</b> <b>Nucleotide metabolism and integration of metabolism</b>	3.1 Biosynthesis of purine and pyrimidine (de novo and salvage pathway) 3.2 Degradation of purine and pyrimidine 3.3 Interconversions between the three principal components 3.4 Metabolism in starvation: Carbohydrate, lipid, proteins (The feed/fast cycle)	<b>15</b>

<b>PRACTICAL COMPONENT OF ZOO-IV.C-6: BIOCHEMISTRY AND METABOLIC REGULATION ( DURATION -02 HRS /WEEK)</b>		
Sr. No	Practical	No. of Practicals
1)	Principle and working of spectrophotometer	01
2)	Estimation of reducing sugars DNSA method	01
3)	Estimation of protein – Folin Lowry’s method	01
4)	Estimation of fatty acids by titration method	01
5)	Separation of lipids by thin layer chromatography	02
6)	Colorimetric estimation of liver glycogen of chick by Anthrone method	02
7)	Effect of substrate concentration on amylase activity	01
8)	Estimation of DNA by DPA method	01
9)	Isolation of lecithin and cholesterol from yolk	02

#### **REFERENCE BOOKS:**

1. David, L.N. and Cox, M. Michael (2008) Lehninger principles of biochemistry. W.H. Freeman and Company, New York.
2. Delvin, T.M. (1997). Textbook of biochemistry with clinical correlations. Wiley liss.
3. Harvey, A.R. and Ferrier, D. (2011). Lippincott’s Illustrated Reviews Biochemistry. Wolters Kluwer, Lippincott Williams and Wilkins. 5<sup>th</sup> Edition.
4. Pratt, W.C. and K. Cornely 2003 Essential Biochemistry Wiley Publications third edition.

#### **REFERENCE BOOKS FOR PRACTICALS:**

Plummer, M. and D.T. Plummer (1988) Introduction to practical biochemistry. Tata McGraw Hill Education ,UK.

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## SEMESTER – V

### CORE COURSE: DEVELOPMENTAL BIOLOGY

<b>COURSE CODE:</b>	ZOO-V.C-7
<b>MARKS:</b>	100 [ 75 –Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 –Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	<ul style="list-style-type: none"><li>• To understand the processes of fertilization, polyspermy and activation of egg metabolism</li><li>• To know the basics of animal development, specifically in sea urchin and chick</li><li>• To be familiar with the processes that help in the establishment of basic plan of development</li></ul>
<b>LEARNING OUTCOME:</b>	<ul style="list-style-type: none"><li>• At the end of the course, the students will be able to understand the basic plan of animal development. They will be familiar with the processes which occur during the course of development in invertebrates and vertebrates. This paper will provide the basic knowledge of developmental biology.</li></ul>

## ZOO-V.C-7: CORE COURSE:DEVELOPMENTAL BIOLOGY

MODULE	TOPICS	CONTACT HOURS
<b>MODULE 1:</b> <b>Early embryonic development and early development of model organism: sea urchin</b>	1.1: Introduction to cell division: mitosis and meiosis	} 05
	1.2: Fertilization: structure of the gametes	
	1.3: Species recognition specificity of egg and sperm	} 04
	1.4: Gamete fusion and the prevention of polyspermy	
	1.5: The activation of egg metabolism	} 06
	1.6: Fusion of the genetic material	
	1.7: Rearrangement of the egg cytoplasm	
	1.8: Sea Urchin: cleavage, gastrulation, blastula formation	
	1.9: Fate maps and the determination of sea urchin blastomeres, gastrulation	
	1.10: Embryonic stem cells: Pluripotency and totipotency	
<b>MODULE 2:</b> <b>Early development of model organism: chick</b>	2.1: Chick: cleavage, gastrulation, primitive streak, epiboly	} 05
	2.2: Axis formation in the chick embryo	07
	2.3: Development upto three days of incubation	03
	2.4: Extra embryonic membranes of chick development, structure and functions of yolk sac, amnion, chorion and allantois	
<b>MODULE 3:</b> <b>Growth and regeneration</b>	3.1: Nuclear transplantations and embryonic inductions	04
	3.2: Size and proportion, aging, theories of ageing, postnatal disorders of growth and differentiation	06
	3.3: Distribution of regenerative capacity, Planarian regeneration, regeneration of limb and tail in vertebrates	05
	3.4: Hejmadi Mohanty's experiment	

<b>PRACTICAL COMPONENT OF ZOO-V.C-7 ( DURATION -02 HRS /WEEK)</b>		
<b>SR. NO.</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1)	Observation of developmental stages of sea urchin: cleavage, blastula, gastrula (permanent slides)	01
2)	Study of morphogenetic movement <i>in vivo</i> in hens egg using vital staining technique by preparing window opening	01
3)	<i>In vitro</i> observation of different extra embryonic membrane in a six days old chick embryo	01
4)	Preparation of permanent slides of chick embryo: 24 hours, 36 hours, 48 hours, 72 hours	06
5)	Effect of retinoic acid on regeneration of fin in fish	01
6)	Mounting of eye vesicles and limb buds of six day old chick embryo	01
7)	Effect of lead acetate / mercuric chloride on the neural tube development of chick embryo	01

**REFERENCE BOOKS:**

1. Gilberts, S.F. (2013). *Developmental Biology*, Sinauer Associates, Sunderland.
2. Jain, P.C. (2013). *Elements of developmental biology*, Vishal Publications, Jalandhar
3. Slack, J.M.W. (2006). *Essential developmental biology*. Blackwell Publishing, U.K.

**REFERENCE BOOKS FOR PRACTICALS:**

1. Beffa – Mari, M. And J. Knight (2005) *Key experiments in practical developmental biology*. Cambridge University Press.
2. Tyler, M.S. (2000) *Developmental biology, a guide for experimental study*. Sinauer Associates, Inc. Publishers, Sunderland, MA.

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## SEMESTER – VI

<b>CORE COURSE: WILDLIFE BIOLOGY</b>	
<b>COURSE CODE</b>	<b>ZOO-VI-C-8</b>
<b>MARKS</b>	100 [75 –Theory ; 25- Practical]
<b>CREDITS</b>	04 [03 –Theory; 01- Practical]
<b>CONTACT HOURS</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES</b>	This course is designed to enable students to understand the basics of wildlife status, conservation, assessment and management.
<b>LEARNING OUTCOME</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>▪ Know the techniques used in assessment and monitoring of wildlife.</li><li>▪ Know about the diversity, extent, range of wildlife population dynamics.</li></ul>

## ZOO-VI-C-8: WILDLIFE BIOLOGY

MODULE	TOPICS	CONTACT HOURS
<b>MODULE 1: INTRODUCTION TO WILDLIFE</b>	<p>UNIT 1: Introduction to wildlife</p> <ul style="list-style-type: none"> <li>• Values of wildlife - Conservation ethics, Importance of conservation, Causes of depletion, World conservation strategies.</li> </ul> <p>UNIT 2: Evaluation and management of wildlife</p> <ul style="list-style-type: none"> <li>• Habitat analyses, Physical parameters: Topography, Geology, Soil and water.</li> <li>• Biological Parameters: food, cover, forage, browse and ground cover estimation.</li> <li>• Standard evaluation procedures: remote sensing and GIS.</li> </ul>	15
<b>MODULE 2: POPULATION ESTIMATION AND PROTECTED AREAS</b>	<p>UNIT 3: Population estimation</p> <ul style="list-style-type: none"> <li>• Population density, natality, mortality, fertility schedules and sex ratio computation.</li> <li>• Analysis of scat and dropping of ungulates and carnivores.</li> <li>• Trichotaxonomy, pug marks and census method based on indirect evidences.</li> </ul> <p>UNIT 4: Protected areas</p> <ul style="list-style-type: none"> <li>• Protected Area network (PAN): National parks and wildlife sanctuaries.</li> <li>• Biogeographical features of important features of protected areas in India (any 3).</li> <li>• Tiger conservation - tiger reserves in India, challenges and management of tiger reserves.</li> </ul>	15
<b>MODULE 3: MANAGEMENT OF WILDLIFE</b>	<p>UNIT 5: Management of habitats</p> <ul style="list-style-type: none"> <li>• Setting back succession, grazing logging, mechanical treatment, advancing the succession process, artificial feeding grounds.</li> <li>• Cover construction, preservation of general genetic diversity, restoration of degraded habitats,</li> </ul> <p>UNIT 6: Management planning of wildlife in protected areas</p> <ul style="list-style-type: none"> <li>• Habitat carrying capacity, visitors carrying capacity, eco tourism / wild life tourism, concept of climax persistence, ecology of perturbation.</li> <li>• Role of national / state statutory bodies on governing wildlife (NBWL, IUCN, CITES, state wildlife boards and forest department).</li> </ul> <p>UNIT 8: Management of critical population</p> <ul style="list-style-type: none"> <li>• Radio- telemetry, care of injured and diseased animal, quarantine, common diseases of wild animals, capture and translocation of wildlife.</li> <li>• Captive management – a brief idea.</li> </ul>	15

<b>PRACTICAL COMPONENT OF WILDLIFE BIOLOGY</b>		
<b>ZOO-VI-C-8: ( DURATION: 30 HOURS – 02hrs/WEEK)</b>		
<b>SR. NO</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1)	Study of butterflies and their host plants on the campus / molluscs/ ants/ spiders / birds	02
2)	Acquainting oneself with basic equipment needed in wildlife studies; use, care and maintenance (compass, binoculars, spotting scope, range finders, Global Positioning System, various types of cameras and lenses)	02
3)	Familiarization and study of species specific evidences in the field; Identification of animals through pug marks, hoof marks, scats, pellet groups, nest, antlers, feathers, etc. – case study	02
4)	Demonstration of various field techniques for flora and fauna: PCQ, Ten tree method, Circular, Square and rectangular plots, Parker's 2 Step and other methods for ground cover assessment, Tree canopy cover assessment, Shrub cover assessment	03
5)	Trail / transect-quadrante monitoring for abundance and diversity estimation of mammals and birds (direct and indirect evidences) (on campus or fieldtrip)	03

**REFERENCE BOOKS:**

1. Caughley, G., and Sinclair, A.R.E. (1994). Wildlife Ecology and Management. Blackwell Science.
2. Woodroffe R., Thirgood, S. and Rabinowitz, A. (2005). People and Wildlife, Conflict or Co-existence. Cambridge University.
3. Bookhout, T.A. (1996). Research and Management Techniques for Wildlife and Habitats, 5<sup>th</sup> edition. The Wildlife Society, Allen Press.
4. Sutherland, W.J. (2000). The Conservation Handbook: Research, Management and Policy. Blackwell Sciences
5. Hunter M.L., Gibbs, J.B. and Sterling, E.J. (2008). Problem-Solving in Conservation Biology and Wildlife Management: Exercises for Class, Field, and Laboratory. Blackwell Publishing.

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**PARVATIBAI CHOWGULE COLLEGE OF ARTS AND SCIENCE**  
**(Autonomous)**  
**PROGRAMME BSC ZOOLOGY**  
**COURSE CURRICULUM - ELECTIVE COURSES**

	<b>SEMESTER</b>	<b>COURSE CODE</b>	<b>CORE COURSES</b>
<b>ODD SEMESTER</b>	<b>III</b>	ZOO-III.E-1	Vertebrate Endocrinology
		ZOO-III.E-2	Basic microbiology and Fundamentals of Animal Biotechnology
		ZOO-III.E-3	Environmental Toxicology
		ZOO-III.E-4	Parasitology
	<b>V</b>	ZOO-V.E-9	Molecular Genetics and Forensic Science
		ZOO-V.E-10	Economic Zoology
		ZOO-V.E-11	Ecology and Ethology
		ZOO-V.E-12	Fish Preservation and Processing
<b>EVEN SEMESTER</b>	<b>IV</b>	ZOO-IV.E-5	Animal cell culture and Applications
		ZOO-IV.E-6	Aquaculture and Fisheries
		ZOO-IV.E-7	Immunology
		ZOO-IV.E-8	Evolutionary Biology
	<b>VI</b>	ZOO-VI.E-13	Health and Nutrition
		ZOO-VI.E-14	Basic and Applied Entomology
		ZOO-VI.E-15	Laboratory Techniques in Pathology
		ZOO-VI.E-16	Bio Entrepreneurship

## ODD SEMESTER

### SEMESTER – III

<b>ELECTIVE COURSE: ENDOCRINOLOGY</b>	
<b>COURSE CODE:</b>	ZOO-III.E-1
<b>MARKS:</b>	100 [ 75 –Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 –Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	<ul style="list-style-type: none"><li>• To study the endocrine organs of vertebrates</li><li>• To understand the underlying principles of hormone functions</li><li>• To gain an insight into the current and important issues in endocrinology</li></ul>
<b>LEARNING OUTCOME:</b>	At the end of the course, the students will be familiar with all the endocrine organs and their functions in body growth, metabolism, reproduction and development. They will be able to appreciate better the contemporary issues in endocrinology.

## ZOO-III.E-1: ENDOCRINOLOGY

MODULE	TOPICS	CONTACT HOURS
<b>MODULE 1:</b>  <b>Anatomy and histology</b>	Unit 1: 1.1 Aim and scope of endocrinology, 1.2 techniques in endocrinology - histology, histochemistry, immunocytochemistry, in situ hybridisation, radio immune assay, surgical techniques, 1.3 regulation of hormone secretion: feedback mechanisms - positive, negative, short loop, long loop	15
	Unit 2: 2.1 Anatomy and histology of endocrine glands- Pituitary, Pineal gland, Thyroid, Parathyroid, Thymus, Adrenal, Endocrine pancreas, GI tract, Endocrine hypothalamus, Gonads, Placenta	
<b>MODULE 2:</b>  <b>Hormones</b>	Unit 3: 3.1 Classification of hormones 3.2 Hormone structure 3.3 Biological actions of hormones	15
	Unit 4: 4.1 Mechanisms of hormone action 4.2 Receptor and its regulation 4.3 Steroid and peptide hormones actions	
	Unit 5: 5.1 Hormones and Homeostasis - Calcium and glucose	
<b>MODULE 3:</b>  <b>Pathological conditions</b>	Unit 6: 6.1 Biosynthesis and secretion of hormones - steroid hormones, thyroid hormones	15
	Unit 7: 7.1 Growth factors - neurotropic growth factors, hematopoietic growth factors, other peptide growth factors	
	Unit 8: 8.1 Endocrine disorders - goitre, gigantism, dwarfism, cretinism, diabetes mellitus, insipidus	

<b>PRACTICAL COMPONENT OF ZOO-II.C-3: Vertebrate Endocrinology ( DURATION -02 HRS /WEEK)</b>		
<b>Sr. No</b>	<b>Practical</b>	<b>No. of Practicals</b>
1)	Histological slides of Endocrine hypothalamus, Gonads, Placenta pituitary, Pineal gland, thyroid gland, Parathyroid, Thymus, adrenal gland, pancreas, ovary, testis	04
2)	Display of Pituitary and gonads in fishes/chick	03
3)	Preparation of histological slides using microtomy	05

#### REFERENCE BOOKS:

1. David, N.O. and J.A. Carr (2013) Vertebrate Endocrinology. Academic press publications 5<sup>th</sup> edition.
2. Hadley, M. and Levine, J (2006) Endocrinology. Benjamin Cummings 6<sup>th</sup> edition.
3. Kovacs, J.W. and S.R. Ojeda (2011) Textbook of endocrine physiology 6<sup>th</sup> edition. Oxford university press.
4. Yadav, P.R. (2004) Endocrinology. Discovery Publishing House, New Delhi.

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**ELECTIVE COURSE: BASIC MICROBIOLOGY AND  
FUNDAMENTALS OF ANIMAL BIOTECHNOLOGY**

<b>COURSE CODE:</b>	ZOO-III-E-2
<b>MARKS:</b>	100 [ 75 -Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 -Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	To provide a comprehensive survey of microbiology with basic information on bacteria and learn the fundamentals of biotechnological techniques.
<b>LEARNING OUTCOME:</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• Gain working knowledge of basic bacterial laboratory techniques, as well as the foundations of biotechnological tools.</li><li>• Students will also master the basic laboratory skills and techniques necessary to work efficiently in a microbiology laboratory and perform techniques of gene insertion and selection of recombinant plasmids.</li></ul>



## ZOO-III-E-2: BASIC MICROBIOLOGY AND FUNDAMENTALS OF ANIMAL BIOTECHNOLOGY

MODULE	TOPICS	CONTACT HOURS
<b>MODULE 1: Microbiology (15 hrs)</b>	1: Introduction to Microorganisms-Bacteria <ul style="list-style-type: none"> <li>○ Structure and Identification of bacteria(morphological types)</li> <li>○ Nutritional types</li> <li>○ Nutritional requirements</li> </ul>	08
	2: Isolation and Culture of Bacteria: <ul style="list-style-type: none"> <li>○ Cultivation of bacteria</li> <li>○ Different methods of isolation and maintenance of pure cultures</li> <li>○ Culture characteristics</li> </ul>	04
	3: Use of microorganisms in biotechnology-An overview: <ul style="list-style-type: none"> <li>○ Production of valuable substances</li> <li>○ Fuel Production, recovery of minerals and oils</li> <li>○ Microorganisms in bioassays</li> <li>○ Food and agriculture sector</li> <li>○ Medicine and health</li> </ul>	03
<b>MODULE 2: Tools in Biotechnology (15 hrs)</b>	4: Scope and importance of Biotechnology <ul style="list-style-type: none"> <li>○ Definition</li> <li>○ Contribution and importance of biotechnology</li> </ul>	03
	5: Nucleic Acid Enzymology: <ul style="list-style-type: none"> <li>○ Restriction enzymes, Ligases, Alkaline phosphatase</li> <li>○ Polynucleotide kinase, Terminal Transferases, S1 Nuclease</li> <li>○ Polymerases, Reverse transcriptase</li> </ul>	07
	6: Gene Cloning vectors: <ul style="list-style-type: none"> <li>○ Plasmids, Bacteriophage, cosmids</li> <li>○ Shuttle and expression vectors</li> </ul>	05
<b>MODULE 3: Genetic Engineering (15 hrs)</b>	7: Techniques in genetic engineering: <ul style="list-style-type: none"> <li>○ Gene transfer methods</li> <li>○ Methods of Labeling Nucleic acids</li> <li>○ Nucleic acid Hybridization</li> <li>○ Polymerase chain reaction</li> </ul>	05
	8: Recombinant DNA technology: <ul style="list-style-type: none"> <li>○ Procedure / Technique</li> </ul>	04
	9: Blotting Techniques: <ul style="list-style-type: none"> <li>○ Southern Blotting</li> <li>○ Northern Blotting</li> <li>○ Western Blotting</li> </ul>	03
	10: DNA sequencing techniques: <ul style="list-style-type: none"> <li>○ Chemical Degradation method</li> <li>○ Chain termination method</li> <li>○ Automated Sequencing</li> </ul>	03

**PRACTICAL COMPONENT OF ZOO-III-E-2: DURATION - 02 HRS /WEEK  
BASIC MICROBIOLOGY & FUNDAMENTALS OF ANIMAL BIOTECHNOLOGY**

SR. NO	PRACTICAL	NO. OF PRACTICALS
1)	Preparation of culture media for bacteria (Plates, Slants, deeps, Broth).	02
2)	Staining of Microorganisms (Gram staining, negative staining).	02
3)	Isolation of pure colonies of Bacteria (streak plate method – 3 Quadrant And 5 Quadrant methods)	02
4)	Identification of Products of metabolic pathways of microbial cells.	01
5)	Bacteriological testing of Milk.	01
6)	DNA sequencing - Analysis of prints.	01
7)	Isolation of Plasmid DNA (Demonstration)	02
8)	Transformation of bacteria (Selection by blue-white colony method – demonstration practical	02

**REFERENCE BOOKS:**

*Essential books:*

- 1) Pelczar MJ, Chan ECS, Krieg NR(2009). *Microbiology*. Tata Mc Graw Hill, New York.
- 2) Dubey RC and Maheshwari DK (2012). *A test book of Microbiology*. S Chand Publishers, New Delhi.
- 3) Prave P, Faust U, Sittig W and Sukatsh DA(2004). *Fundamentals of Biotechnology*.
- 4) Purohit SS(2008). *Biotechnology Fundamentals and applications*. Agrobios, Jodhpur India.
- 5) Ranga MM(2012): *Animal Biotechnology*. Agrobios, Jodhpur India.

*Supplementary reading:*

- 6) Black JG(2005). *Microbiology principles and explorations*. John Wiley and sons Inc.
- 7) Sullia SB and Shantharam S(2006). *General Microbiology*. Oxford and IBH Publishing Co Pvt Ltd, NewDelhi.

**REFERENCE BOOKS FOR PRACTICALS:**

- 1) Gunasekaran P(2009). *Lab Manual in Microbiology*. New Age International Ltd. Publishers, New Delhi.

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**ELECTIVE COURSE: ENVIRONMENTAL TOXICOLOGY**

<b>COURSE CODE:</b>	ZOO-III-E-3
<b>MARKS:</b>	100 [ 75 -Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 -Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	<ul style="list-style-type: none"><li>• To study the different environmental pollutants and their toxicity.</li><li>• To know the physiological effects of toxicant exposure.</li></ul>
<b>LEARNING OUTCOME:</b>	After completion of the course students are expected to be able to: <ul style="list-style-type: none"><li>• Distinguish, classify and characterize a variety of environmental pollutants based on their biological and physical properties.</li><li>• Identify the main sources and types of environmental pollutants and assess their potential environmental fate.</li><li>• Will learn mechanisms of detoxification of various varieties of toxicants.</li><li>• Will learn bio-indicators of exposure to specific environmental contaminants.</li><li>• Identify potential solutions to anthropogenic pollution</li></ul>

## ZOO-III-E-3: ENVIRONMENTAL TOXICOLOGY

MODULE	TOPIC	CONTACT HOURS
<b>MODULE 1: INTRODUCTION TO TOXICOLOGY</b>	<p><b>1.1 Introduction To Toxicology:</b></p> <ul style="list-style-type: none"> <li>○ Definition and History of Toxicology and Toxicity</li> <li>○ Disciplines of Toxicology</li> <li>○ Biouptake, Bioaccumulation, Biotransfer and Biological Magnification, Relationship to Other Sciences, Scope and importance of Toxicology</li> </ul> <p><b>1.2: Classes Of Toxicant:</b></p> <ul style="list-style-type: none"> <li>• Define Toxicant and Toxins, their classification</li> <li>• Toxicants in Air, Water and Soil</li> <li>• Toxicants in Domestic and Occupational Settings</li> <li>• Synthetic drugs: Solvents; Therapeutic drugs, Drugs of abuse, Combustion products, Cosmetics</li> <li>• Movement and fate of Toxicants in the environment</li> </ul>	<b>15</b>
<b>MODULE 2: ENVIRONMENTAL IMPACT MITIGATION</b>	<p><b>2.1: Toxicity Of Heavy Metals:</b></p> <ul style="list-style-type: none"> <li>• Toxicity of Arsenic, Lead, Mercury,</li> <li>• Cadmium, Copper, Zinc, Aluminium, Iron and Manganese; Sources and portals of heavy metal pollutants; Toxicity of substances on Human and Animals</li> </ul> <p><b>2.2: Agro-Chemical Pesticides And Their Environmental Impact Mitigation</b></p> <ul style="list-style-type: none"> <li>• Definition and Classification</li> <li>• Organochlorine Insecticides, Organophosphate Insecticides, Carbamates, Pyrethroid Insecticides, Dinitrophenols, Herbicides, Fungicide</li> <li>• Control of Pesticide Pollution; Integrated Pest management</li> </ul>	<b>15</b>
<b>MODULE 3: TOXINS AND FOOD ADDITIVES</b>	<p><b>3.1: Toxins:</b></p> <ul style="list-style-type: none"> <li>• History, Classes of Toxicants: Microbial, Mycotoxins, Algaltoxins, Planttoxins, Animaltoxins,</li> </ul> <p><b>3.2: Food Additives:</b></p> <ul style="list-style-type: none"> <li>• General account of Food Additives:</li> <li>• Incidental or Indirect additives</li> <li>• Intentional or Direct additives: a. Antioxidants b. Emulsifiers c. Enzymes d. Flavouring agents e. Colour and preservatives f. Artificial sweetening agents i) Saccharine ii) Urea derivatives</li> </ul>	<b>15</b>

<b>PRACTICAL COMPONENT OF ZOO-III.E-3:ENVIRONMENTAL TOXICOLOGY ( DURATION-02 HRS/WEEK)</b>		
<b>Sr.No.</b>	<b>Practical</b>	<b>No.of Practicals</b>
1.	To determine the effect of temperature on the toxicity of a pollutant	01
2.	To determine the effect of pH on the toxicity of a pollutant.	01
3.	To Separate and analyse the residues of carbamate pesticides by thin layer chromatography.	01
4.	To evaluate qualitatively the presence of pesticide residues in vegetable samples.	01
5.	Estimation of total dissolved solids in given water sample.	01
6.	To determine Lc <sup>50</sup> of a pollutant on mosquito larvae .	02
7.	Effect of pesticides on Oxygen consumption in fish	01
8.	Estimation of Phosphorus in given water sample by Spectrophotometer	01
9.	Estimation of Boron from given water/soil sample by spectrophotometer	01
10.	Estimation of Primary Productivity by Light and Dark bottle method.	02
11.	Estimation of Fluorides in given water sample	01
12.	Determination of Nitrates from given water sample.	<b>01</b>

#### **REFERENCE BOOKS FOR THEORY:**

1. Ernst Hodgson(2004) A Text Book of Modern Toxicology ,A John Wiley and sons Inc,Publication.
2. Gupta P.K.(2010) Modern Toxicology, Pharma Med Press, Hyderabad.
3. Omkar(2007) Concepts of Toxicology ,Vishal Publishing Co, Jalandhar
4. Pandey K,Shukla J.P. and Trivedi S.P. (2011)Fundamentals of Toxicology,New Central Book Agency(P) Ltd.
5. P.D.Sharma (2011)Environmental Biology and Toxicology (Third edition),Rastogi Publications,Meerut-250002.

#### **REFERENCE BOOKS FOR PRACTICALS:**

1. Adam Wooley (2008) A Guide to Practical Toxicology:Evaluation,Prediction,and Risk IIInd Edition,Informa Healthcare U.S.A.,Inc. New York.
2. Rao K.S. (1998) Practical Ecology,Anmol Publications Pvt. Ltd. New Delhi.

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## **ELECTIVE COURSE: PARASITOLOGY**

<b>PAPER CODE:</b>	ZOO-III.E-4
<b>MARKS:</b>	100 [ 75 -Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 -Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	<ul style="list-style-type: none"><li>• To be familiar with the parasite host interactions.</li><li>• To gain knowledge on diagnosis of parasite infections and also to learn about the preventive measures.</li></ul>
<b>LEARNING OUTCOME:</b>	At the end of the course the learner will be acquainted with dimensions of public health viz a viz parasitic diversity, epidemiology and community prophylaxis

## ZOO-III.E-4: PARASITOLOGY

MODULE	TOPICS	CONTACT HOURS
<b>MODULE 1:</b>  <b>Basic Principles of Parasitology and parasitic protozoans</b>	1.1 Parasite systematics, Ecology and Evolution 1.2 Immunology and Pathology 1.3 Symbiosis and parasitism 1.4 Parasite host interactions Form, function, classification, life cycle, diagnosis and preventive measures 1.5 <i>Trypanosomagambiens</i> 1.6 Amoebas - <i>Entamoebahistolytica</i> 1.7 Malaria organisms - <i>Plasmodium vivax</i> 1.8 Sexually transmitted parasite - <i>Trichomonasvaginalis</i>	<b>15</b>
<b>MODULE 2:</b>  <b>Parasitic Platyhelminthes and Nematodes</b>	Form, function, classification, life cycle, diagnosis and preventive measures 2.1 Trematoda(liver fluke - <i>Fasciola hepatica</i> , intestinal fluke - <i>Fasciolopsisbuski</i> , lung fluke - <i>Paragonimuswestermani</i> ); 2.2 Cestoda (Tape worm - <i>Taeniasolium</i> ) 2.3 Hook worms- <i>Ancylostoma duodena</i> 2.4Guinea worm- <i>Dracanculusmedinensis</i> 2.5Round worm <i>Ascarislumbricoids</i> , <i>Enterobiasvermicularis</i> 2.6 <i>Wuchereriabancrofti</i>	<b>15</b>
<b>MODULE 3:</b>  <b>Parasitic arthropods and Parasites of domestic livestock</b>	Form, function, classification , life cycle, diagnosis and preventive measures: Copepods, Barnacles, Amphipods, Isopods, Flea, Ticks, Mites, Head and pubic lice	<b>15</b>

**PRACTICAL COMPONENT OF ZOO-III.E-4: PARASITOLOGY  
( DURATION -02 HRS /WEEK)**

<b>Sr. No</b>	<b>Practical</b>	<b>No. of Practicals</b>
1)	Study of <i>Trypanosoma gambiense</i> , <i>Entamoeba histolytica</i> , <i>Plasmodium vivax</i> , <i>Trichomonas vaginalis</i> , <i>Fasciola hepatica</i> , <i>Taenia solium</i> , <i>Ancylostoma duodenale</i> , <i>Dracunculus medinensis</i> , <i>Ascaris lumbricoides</i> , <i>Wuchereria bancrofti</i> , copepod, barnacle, amphipod, isopod from permanent slides with respect to parasitic adaptations.	06
2)	Preparation of peripheral blood smear from the perspective of detection of haemoparasites	01
3)	Study of parasites of domestic livestock (parasite, pathogenicity)	04
4)	Study of fish parasites	01

**REFERENCE BOOKS:**

1. Chatterjee, K.D. (2009) Parasitology (Protozoology and Helminthology) with two hundred fourteen illustrations. CBS, 13<sup>th</sup> edition.
2. Dey, N.C., Dey, T.K. and D.M. Sinha (1995) Medical Parasitology. New Central book agency private limited, Calcutta.
3. Paniker, J.C.K. (2007) Textbook of medical parasitology. Jaypee Brothers, New Delhi.
4. Schmidt, G.D. (1990) Essentials of Parasitology. Universal Book Stall, New Delhi.

**REFERENCE BOOK FOR PRACTICALS:**

1. Halton, D.W., Behnke, J.M. and I. Marshall (2005) Practical exercises in parasitology. Cambridge University Press.

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## SEMESTER – V

<b>ELECTIVE COURSE: MOLECULAR GENETICS AND FORENSIC SCIENCE</b>	
<b>COURSE CODE</b>	ZOO-V.E-9
<b>MARKS</b>	100 [75 – Theory; 25 – Practicals]
<b>CREDITS</b>	04 [03 – Theory; 01 – Practical]
<b>CONTACT HOURS</b>	THEORY : 45 HOURS (03 LECTURE/WEEK) PRACTICALS : 30 HOURS (01 PRACTICAL/WEEK)
<b>COURSE OBJECTIVES</b>	This course will elucidate the functional aspects of the genetic material at molecular level, focusing on gene expression and gene regulation. It will also expose students to the basics of forensic science and understand diagnostic genetics.
<b>LEARNING OUTCOME</b>	Upon successful completion of the course, students will be able to understand: <ul style="list-style-type: none"><li>▪ The process of replication, transcription and translation</li><li>▪ Difference between the gene expression in prokaryotes and eukaryotes</li><li>▪ Branches of forensic science</li><li>▪ The molecular tools used in genetic diagnosis</li></ul>

## ZOO-V.E-9: MOLECULAR GENETICS AND FORENSIC SCIENCE

MODULE	TOPICS	CONTACT HOURS
<b>MODULE 1 : Gene Expression and Gene Regulation</b>	1.1 : DNA Replication: DNA Replication in prokaryotes and eukaryotes, mechanism of DNA replication	2
	1.2: Transcription: transcription Unit, mechanism of transcription in prokaryotes and eukaryotes, synthesis of rRNA and mRNA, transcription factors	5
	1.3 : Translation: Genetic code, Process of protein synthesis, Difference between prokaryotic and eukaryotic translation, Post Transcriptional Modifications and Processing of Eukaryotic RNA	4
	1.4: Transcription regulation in prokaryotes: Principles of transcriptional regulation with examples from lac-operon and trp-operon; Transcription regulation in eukaryotes: Activators, repressors, enhancers, silencers elements; Gene silencing	4
<b>MODULE 2 : Basics of Forensic Science</b>	2.1 : Definition, overview of Disciplines of Forensic science	3
	2.2: Crime and Crime Scene management: Types of crime scenes – indoor and outdoor. Securing and isolating the crime scene. Crime scene search methods. Safety measures at crime scenes. Legal considerations at crime scenes. Documentation of crime scenes – photography, videography, sketching and recording notes.	6
<b>MODULE 3 : Diagnostic Genetics</b>	2.3: Forms of forensic evidences: -Biological evidence: Bloodstains, hair, semen, DNA -Physical and trace evidence –pattern of blood stains, fingerprints, fibres, weapons - Documents- types of forensic documents (genuine /forged), methods of detecting forged documents(handwriting analysis, Analysis of paper and inks)	6
	3.1 : Cytogenetics/ Molecular Cytogenetics/ Biochemical/ Molecular methods of detecting genetic disorders - Adult and Newborn screening	6
	3.2: Cytogenetics/ Molecular Cytogenetics/ Molecular methods of detecting genetic disorders – Prenatal and Preimplantation screening	5
	3.3: Forensic testing - DNA fingerprinting, paternity testing, personal /individual identification	4

**PRACTICAL COMPONENT OF ZOO-V.E-9: MOLECULAR GENETICS AND  
FORENSIC SCIENCE  
( DURATION -02 HRS /WEEK)**

<b>SR.NO.</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1	Isolation of DNA from peripheral blood/tissue (chick liver).	01
2	Microscopic examination of Hair a. Human scalp Hair b. Animal Hair	02
3	Sketching and Photography of various type of crime scene.	02
4	Presumptive Tests for Blood a. Phenolphthalin Assay b. Benzidine c. Leucomalachite Green (L.M.G.) d. Luminol Test	02
5	Examination of ink by TLC method	01
6	To perform ridge tracings and ridge counting	01
7	Analysis of DNA fingerprints	03

**REFERENCE BOOKS :**

- 1) *J. Prahlow (2010); Forensic Pathology for Police, Death Investigators, Attorneys, 17 and Forensic Scientists, DOI 10.1007/978-1-59745-404-9\_2, C Springer Science + Business Media, LLC (Ebook available)*
- 2) *Robert Schleif (1993). Genetics and Molecular Biology. S E C O N D E D I T I O N. Department of Biology, The Johns Hopkins University, Baltimore, Maryland. The Johns Hopkins University Press 2715 North Charles Street Baltimore, Maryland 21218-4319, The Johns Hopkins Press Ltd., London (Ebook available)*
- 3) *Richard Saferstein (2011); Forensic Science, II Edition, Prentice Hall publishers, Sanfrancisco*
- 4) *Griffith A, Wessler S, Lewontin R Gelbart W, Suzuki D and Miller J(2000). Introduction to Genetic Analysis. Eighth Edition.( Ebook available)*
- 5) *Tom Strachan and Read A (2010): Human Molecular Genetics. Fourth Edition. Garland Science Publisher, New York, NY 10017*

**REFERENCES BOOKS FOR PRACTICALS:**

- 1) *Hikmet Geckil ().Molecular Biology Lab manual. UMBC. ( Ebook available).*
- 2) *J. Prahlow (2010); Forensic Pathology for Police, Death Investigators, Attorneys, 17 and Forensic Scientists, DOI 10.1007/978-1-59745-404-9\_2, C Springer Science+Business Media, LLC (Ebook available.)*

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**ELECTIVE COURSE: ECONOMIC ZOOLOGY**

<b>COURSE CODE</b>	ZOO-V.E-10
<b>MARKS</b>	100 [75 – Theory; 25 – Practicals]
<b>CREDITS</b>	04 [03 – Theory; 01 – Practical]
<b>CONTACT HOURS</b>	THEORY : 45 HOURS (03 LECTURE/WEEK) PRACTICALS : 30 HOURS (01 PRACTICAL/WEEK)
<b>COURSE OBJECTIVES</b>	To study the various aspects of economic zoology To study the species of economic importance, classification To gain an insight whether own business can be started based on studying the zoological species and their products
<b>LEARNING OUTCOME</b>	How zoological species contribute to economic sources can be learned. Students will learn the techniques of rearing and maintenance of the species, harvesting their products and selling of species and the products

## ZOO-V.E- 10 : ECONOMIC ZOOLOGY

MODULE	TOPICS	CONTACT HOURS
<b>MODULE 1 : Scope of Economic Zoology</b>	1.1 : Economic Zoology, History, Scope,	3
	1.2 : Species of bionomic importance (Honey bee, Silkworm, lac insect, mackerel, domestic fowl, goat, sheep, cow, buffalo, pig, rats, mice)	3
	1.3 : Source, properties, constituents and nutritive value of products of bionomic importance: eggs of poultry, milk, meat, honey, medicinal value of synthetic insulin (recombinant), significance of wool, silk, lac	5
	1.4 : Organizations and their functions: agricultural and processed food products export development authority (APEDA), the marine products exports developmental authority (MPEDA), central silk board (CSB), central bee research and training institute (CBRTI), pharmaceutical and biotechnology industries (Lupin) and contract research organizations (Intox), and research institutes (NIN, Hyderabad)	4
<b>MODULE 2 : Models in Economic Zoology</b>	2.1 : Insects, products and applications : lac insects, honey bees, silkworms	3
	2.2 : Vermiculture: Rearing and maintenance of earthworms	2
	2.3 : Aquaculture : rearing and maintenance of prawns, oysters, edible and ornamental fishes	3
	2.4 : Poultry : rearing and maintenance of domestic fowl, applications and products	3
	2.5 : Business models of apiculture, sericulture, aquaculture and poultry	4
<b>MODULE 3 : Pharma products and biological control</b>	3.1 : Pharmaceuticals from animals and their Applications (antiserum), from transgenic animals (malaria vaccine, alpha 1 antitrypsin, lactoferrin, fibrinogen)	5
	3.2 : Species used in biological control : <i>Casnoidea indica</i> , <i>Trichogramma</i> , <i>Poecilia reticulata</i> / <i>Gambusia affinis</i>	5
	3.3 : Maintenance and breeding of animals for research: mice, rats, guinea pigs, rabbits, marmosets, guidelines given by committee for the purpose of control and supervision of experiments on animals (CPCSEA)	5

<b>PRACTICAL COMPONENT OF ZOO-V.E-10 ( DURATION - 02 HRS /WEEK)</b>		
<b>SR.N O.</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1	Vermicomposting	05
2	Preparation of dairy products from milk : cheese and butter	02
3	Laboratory observations of insects – Honeybee, Silk moth, Lac insect	01
4	Visit to dairy industry/poultry/ piggery/apiary/silk industry/ biotechnology industry/pharmaceutical industry/research institute	04

#### **REFERENCE BOOKS :**

- 1) G. S. Shukla, V. B. Upadhyay (2008) *Economic Zoology*, Rastogi Publications, Meerut
- 2) H. Osborn (1908) *Economic Zoology an introductory text book in zoology with special reference to its applications in agriculture, commerce and medicine* The Macmillan Company
- 3) K. P. Shrivastava, Gs Dhaliwal (2015) *Text Book of Applied Entomology* Kalyani Publishers
- 4) P. K. Gupta (2011) *Vermicomposting for Sustainable Agriculture*, Agrobios India Ltd
- 5) S. Singh (1962) *Bee-Keeping in India* ICAR New Delhi p. 214

#### **REFERENCE BOOKS FOR PRACTICALS:**

- 1) A. K. Tripathi(2009) *Mulberry Sericulture: Problems And Prospects* Aph Publishing Corporation
- 2) C.L. Metcalf and W.P Flint (1962) *Destructive and Useful Insects* New York, N.Y. : McGraw-Hill

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**ELECTIVE COURSE: ECOLOGY AND ETHOLOGY**

<b>COURSE CODE</b>	ZOO-V.E-11
<b>MARKS</b>	100 [75 – Theory; 25 – Practicals]
<b>CREDITS</b>	04 [03 – Theory; 01 – Practical]
<b>CONTACT HOURS</b>	THEORY : 45 HOURS (03 LECTURE/WEEK) PRACTICALS : 30 HOURS (01 PRACTICAL/WEEK)
<b>COURSE OBJECTIVES</b>	<ul style="list-style-type: none"><li>• To study the distribution of organisms, their interrelations in populations and communities and interactions between biotic and abiotic components</li><li>• To study impact of anthropogenic activities on ecosystem and study behaviour of organisms under natural conditions</li></ul>
<b>LEARNING OUTCOME</b>	<ul style="list-style-type: none"><li>• The student will gain better understanding in ecology and ethology</li><li>• This course also has applied value towards conservation of biodiversity and sustainable development</li></ul>

## ZOO-V.E- 11 : ECOLOGY AND ETHOLOGY

MODULE	TOPICS	CONTACT HOURS
<b>MODULE 1 : Basic Ecology</b>	1.1 :Introduction to Ecology : What is Ecology? History of ecology, ecology today, scope of ecology, objective of study,subdivisions of ecology	03
	1.2 : Ecosystem Ecology:kinds of ecosystem (marine, fresh water, terrestrial),Gaia hypothesis, deep ecology, energy flow within the Ecosystem,food chains and energy flow,ecological pyramids, ecological niche nutrient and Cycling of trace elements: Cobalt (Co), Molybdenum (Mo) and Lead.	06
	1.3: Population Ecology:population density,natality, mortality,survivorship curve and life tables,age distribution,biotic potential of population, growth models, population dispersal, regulation of population, co-operative and disoperative coactions and carrying capacity,predator –prey relationships,symbiosis	06
<b>MODULE 2 : Conservation Ecology and Basic Ethology</b>	2.1: Community Ecology:characters of a community, classification of a community,community periodism, community stratification,community succession	03
	2.2: Biodiversity and conservation: application of ecology in biodiversity conservation	04
	2.3:Introduction to Ethology: the history of ethology,approaches to study of behavior, types of behavior – instinct and learning,economic and social aspect of behaviour, ethologists and their work – Lorenz, Tinbergen, Goodall, M.K. Chandrashekar, animal behaviour :an evolutionary approach	04
	2.4: Concept of Ethology:stimulus –response concept,reflexes, innate releasing mechanisms,fixed action pattern,ethogram releaser,motivation or drive with respect to hunger and sexual behaviour	04
<b>MODULE 3 : Advanced Ethology</b>	3.1 : Approaches to studying behaviour, methods associated with neurophysiological approach,psychological and ethological approach.	03
	3.2: Pheromones :introduction,types of pheromones,the primer pheromones,the imprinting pheromones	03
	3.3:Hormones: effect of hormones on sexual behaviour,maternal behaviour,territorial marking, learning and memory	03
	3.4:Patterns of behavior :feeding, aggressive and reproductive behavior, biological clocks	03
	3.5:Communication behavior :introduction,communication signals,communication among bees: Honeybee dances	03



<b>PRACTICAL COMPONENT OF ZOO-V.E-11: ECOLOGY AND ETHOLOGY ( DURATION -02 HRS /WEEK)</b>		
<b>SR.NO.</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1	Determination of population density in a natural/hypothetical community by Quadrats method and calculation of Shannon-Weiner diversity Index for the same community	02
2	Study of an aquatic/mangrove ecosystem: Measurement of the area, temperature, turbidity, determination of pH, and dissolved oxygen content (Winkler's method), and free CO <sub>2</sub>	04
3	To study the habituation to light stimulus in earthworm/crabs/snails/ spider web	01
4	To demonstrate phototactic and geotactic responses of the animal provided earthworm/crabs	01
5	Study of Life Tables and plotting of survivorship curves of different types from the hypothetical/real data provided.	01
6	Report on a visit to National Parks/Biodiversity Parks/Wild life sanctuary	03

**REFERENCE BOOKS :**

1. Arora, Mohan. P. (2004) : *Ecology* , Himalaya Publishing House
2. Aubrey Manning and stamp Dawkins (1997) : *An Introduction to Animal behaviour (fourth edition)*, Cambridge University Press.
3. Dash M. C. (2001) : *Fundamental of Ecology* , Tata Mc Graw – Hill publishing Company Limited New Delhi
4. Felicity Huntingford (1984) : *The study of Animal behaviour* , Chapman and Hall.
5. Hoshang S. Gundevia and Hare Govind Singh (2006) : *A Text Book of Animal Behaviour*, S. Chand & Company LTD. New Delhi-110055.
6. Juneja Kavita (2002) : *Ecology* , Anmol Publications PVT. LTD. New Delhi-110002 (India)
7. Mathur Reena (1994) : *Animal Behaviour*, Rastogi and Company, Meerut-250002 India.
8. Rana, S. V. S.(2003) : *Essentials of Ecology and Environmental Science* ,Prentice- Hall of India Private Limited , New Delhi-110001
9. Ranga, M. M.(2002) : *Animal Behaviour Second Enlarged Edition* , Agrobios (India)
10. Robert A. Wallace (1938) : *Animal Behaviour Its Development, Ecology and Evolution* , Goodyear Publishing Company, Inc. Santa Monica, California.
11. Sharma P.D.(2014-15) : *Ecology and Environment*, Rastogi Publications. Meerut (12<sup>th</sup> revised edition) -25002.
12. W.H. Thorpe (1979) : *The Origins and rise of Ethology*, Praeger Publishers.

<b>ELECTIVE COURSE:</b> <b>FISH PRESERVATION AND PROCESSING</b>	
<b>COURSE CODE</b>	ZOO-V.E-12
<b>MARKS</b>	100 [75 – Theory; 25 – Practicals]
<b>CREDITS</b>	04 [03 – Theory; 01 – Practical]
<b>CONTACT HOURS</b>	THEORY : 45 HOURS (03 LECTURE/WEEK) PRACTICALS : 30 HOURS (01 PRACTICAL/WEEK)
<b>COURSE OBJECTIVES</b>	<ul style="list-style-type: none"> <li>• To familiarize the students with different methods of fish preservation and processing</li> <li>• To acquaint them with techniques and precautions for hygienic fish handling</li> <li>• The course content is locally relevant and prepares students for entrepreneurship and self employment</li> </ul>
<b>LEARNING OUTCOME</b>	By the end of the course, the students will be familiar with the economic benefits of fishes. They will also be able to understand the nutritional values of the fishes and to identify some of the fish pathogens

## ZOO-V.E- 12 : FISH PRESERVATION AND PROCESSING

MODULE	TOPICS	CONTACT HOURS
<b>MODULE 1: Fishery Development</b>	1.1 : Status of Development of the fishery and seafood processing industry.	05
	1.2: Empowerment through Aquatic Products: (Background, Nutritional security, Role of Fisheries Sector, Role of Tifac in Fisheries Sector, Objectives, Integrated Fisheries Project (IFP), Indian national centre for ocean information services (INCOIS), Catch per unit effort (CPUE), Maximum sustainable yield (MSY)	10
<b>MODULE 2: Fish Handling and preservation</b>	2.1: Recent Scenario: Quality Changes and Shelf life of Chilled Fish, The effect of Hygiene during handling	04
	2.2: Fish Handling Methods: Organoleptic test, Assessment of Fish Quality, Quality assessment of Fresh Fish, Quality Assessment of Fish Products, Physical methods, Assurance of Fresh Fish Quality, Post harvest Changes in Fish, How does a Fish Lose its Quality, fish as vectors of zoonotic diseases	08
	2.3: Fish Preservation: Reasons for Spoilage of Fishes, Methods of Fish.	03
<b>MODULE 3: Value of Fish</b>	3.1: Economic Importance of Fish: Food value, Fish By-Products, surimi, Goan fish para, balchao	05
	3.2: Postmortem changes in Fish, Bacteriological Changes, Lipid Oxidation and Hydrolysis, Chemical Composition, Lipids, Proteins, N- containing Extractives, Vitamins and Minerals,	05
	3.3: Aquatic Resources and their utilization, value added product: chitin	05

<b>PRACTICAL COMPONENT OF ZOO-V.E-12: FISH PRESERVATION AND PROCESSING ( DURATION -02 HRS /WEEK)</b>		
<b>SR.NO.</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1	Estimation of Proteins and Lipids form fish tissue	02
2	Determination of moisture and ash content from the fish	01
3	Preparation of fish Fillet	01
4	Study of Fish Parasites – ectoparasites (gills); endoparasites (gut)	02
5	Method of fish preservation (salting, pickling)	02
6	Visit to Fish Processing Centre/Fishing Co-operative Society /Fishery Institute/Fishery survey of India, Vasco (FSI)	04

#### **REFERENCE BOOKS :**

- 1) *Braj Kishore Singh (2008) Applied Fisheries and Aquaculture Swastik Publishers and Distributers  
Delhi,India*
- 2) *Pandey and Shukla (2015) Fish and Fisheries, IIIrd Revised Edition, Rastogi Publications Meerut, India*

#### **REFERENCE BOOKS FOR PRACTICALS:**

- 1) *Braj Kishore Singh (2008) Applied Fisheries and Aquaculture Swastik Publishers and Distributers  
Delhi,India*
- 2) *Pandey and Shukla (2015) Fish and Fisheries, IIIrd Revised Edition, Rastogi Publications Meerut, India*

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## EVEN SEMESTER

### SEMESTER – IV

<b>ELECTIVE COURSE:</b> <b>ANIMAL CELL CULTURE AND APPLICATIONS</b>	
<b>COURSE CODE:</b>	ZOO-IV-E-5
<b>MARKS:</b>	100 [ 75 –Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 –Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	This course is an introduction to the theory, standard practices, and methodologies of animal cell culture. The laboratory emphasizes the principles and practices of initiation, cultivation, maintenance of cell lines.
<b>LEARNING OUTCOME:</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>▪ operate, calibrate, and maintain standard equipment found in an animal cell culture laboratory;</li><li>▪ Prepare and sterilize media and solutions used in cell culture.</li><li>▪ Demonstrate an understanding of the concepts and applications of mammalian cell culture.</li><li>▪ Recognize and employ biosafety guidelines and practices.</li></ul>

## ZOO-IV-E-5: ANIMAL CELL CULTURE AND APPLICATIONS

MODULE	TOPICS	CONTACT HOURS
MODULE 1: LAB REQUIREMENTS FOR CELL CULTURE (15 hrs)	1: Historical background of Cell culture:	01
	2: Biology of cells in culture: Origin and characteristics, Differentiation, kinetics of cell growth, Genetics of Cultured cells, Problems associated with cell culture	04
	3: Lab requirements for animal cell culture: <ul style="list-style-type: none"> <li>○ Lab facilities and setup for cell culture</li> <li>○ Major and minor equipments</li> <li>○ Environmental conditions</li> <li>○ Substrates for Culturing and sub culturing</li> </ul>	05
	4: Animal tissue culture media <ul style="list-style-type: none"> <li>○ Natural media – biological fluids, tissue extracts</li> <li>○ Chemically defined media- characteristic and composition</li> <li>○ Media supplements – L Glutamine, serum. Advantages and disadvantages of serum in media / serum free media</li> </ul>	05
MODULE 2: CELL CULTURE TECHNIQUES(15 hrs)	5: Primary cell culture: <ul style="list-style-type: none"> <li>○ Mechanical disaggregation</li> <li>○ Enzymatic disaggregation</li> <li>○ Protocol for primary cell culture</li> </ul>	06
	6: Secondary cell culture/ Sub culturing: <ul style="list-style-type: none"> <li>○ Protocol for sub culturing of suspension culture</li> <li>○ Protocol for sub culturing of adherent</li> <li>○ Established cell lines</li> </ul>	06
	7: Scale up of animal cell culture: <ul style="list-style-type: none"> <li>○ Techniques of Scale up of suspension cultures</li> <li>○ Techniques of Scale up of Monolayer cultures</li> </ul>	03
MODULE 3: CELL CULTURE APPLICATIONS(15 hrs)	8: Cell Hybridoma Technology : <ul style="list-style-type: none"> <li>○ Steps of cell Hybridoma technology</li> <li>○ Procedure</li> <li>○ Production of monoclonal antibodies</li> <li>○ Applications of monoclonal antibodies</li> </ul>	05
	9: Valuable Products through cultured cells: Production of Tissue plasminogen, growth factor, Erythropoietin, Factor VIII, Interferons.	05
	10: Other Application: Vaccines through cultured cells, Cytotoxicity testing, Fluorescent In-Situ Hybridization for disease detection, Cell culture in biomedical research.	05

<b>PRACTICAL COMPONENT OF ZOO-IV-E-5: DURATION -02 HRS /WEEK ANIMAL CELL CULTURE AND APPLICATIONS</b>		
<b>Sr. No</b>	<b>Practical</b>	<b>No. of Practicals</b>
<b>4)</b>	Packing and sterilization of glass and plastic wares for cell culture & Lab Precautions and Biosafety measures	02
<b>5)</b>	Preparation of reagents and media for cell culture. ▪ Reagents ▪ Media / Buffers	02
<b>6)</b>	Quantification of cells (Viable cell count) by trypan blue exclusion dye.	01
<b>7)</b>	Methods used for cell disaggregation – Mechanical and Enzymatic	02
<b>8)</b>	Setting up of primary cell culture ▪ Suspension culture ▪ Adherent cell culture	02
<b>9)</b>	Setting up of chicken embryo fibroblast culture (cold trypsinization / warm trypsinisation)	02
<b>10)</b>	Biological waste disposal methods	01

#### **REFERENCE BOOKS:**

- 1) Ranga MM(2012). *Animal Biotechnology*. Agrobios India Ltd. Jodhpur.
- 2) Mathur S(2006 ). *Animal Cell and Tissue Culture*. Agrobios India Ltd. Jodhpur.
- 3) Masters W(2005). *Animal Cell Culture*. Oxford University Press Inc., NewYork
- 4) Gangal S(2010). *Principles and practices of Animal Tissue Culture*. Second Edition. University Press PVT. LTD., Hyderabad India.
- 5) Freshney I R( 2007). *Culture of animal Cells: A manual of Basic Techniques*. 5<sup>th</sup> edition, John Wiley & Sons Inc Pte Ltd

#### **REFERENCE BOOKS FOR PRACTICALS:**

- 1) E Book- Fletcher L, Goss E. Phelps P and Wheeler A(2014). *Introduction to Biotechnology – Laboratory Manual*.
- 2) Harisson M A and Rae IF(1997):*General Techniques of Cell Culture Handbook in Practical animal cell biology*. Cambridge University Press.
- 3) Ebook- Cell Culture basics. From [www.invitrogen.com/cellculture\\_basics](http://www.invitrogen.com/cellculture_basics).

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**ELECTIVE COURSE : AQUACULTURE AND FISHERIES**

<b>COURSE CODE:</b>	ZOO-IV.E-6
<b>MARKS:</b>	100[75- Theory; 25- Practicals]
<b>CREDITS:</b>	04 [03-Theory;01- Practical)
<b>CONTACT HOURS</b>	: Theory :45 Hours(03 LEC/WEEK) Practicals: 30 Hours(01 PRACTICAL/WEEK)
<b>COURSE OBJECTIVES:</b>	<ul style="list-style-type: none"><li>• To improve the understanding of conservation and sustainability of living resources</li><li>• To improve the social and economic benefits derived from aquaculture and fisheries.</li><li>• To study the role of aquaculture in rural development in solving nutritional security and unemployment.</li><li>• Empowerment of fishery and entrepreneurship development</li></ul>
<b>LEARNING OUTCOMES:</b>	<ul style="list-style-type: none"><li>• The student may become future aqua culturist, entrepreneur who will provide employment to others.</li><li>• Optimum utilization of unutilized and underutilized aquatic resources for fisheries and aquaculture, enhance the fish production, employment generation and even to earn the foreign exchange.</li></ul>



## ZOO-IV.E-6: AQUACULTURE AND FISHERIES

MODULE	TOPIC	CONTACT HOURS
<b>MODULE 1:</b>	<p><b>1.1: Inland Fisheries:</b></p> <ul style="list-style-type: none"> <li>• fisheries: Fisheries of Ganga and Brahmaputra river system</li> <li>• Reservoir fisheries</li> <li>• Lakesterine fisheries: Cat fish, Murrels, Mulletts, Major carps</li> <li>• Cold water fisheries: Mahaseer fishery</li> </ul> <p><b>1.2: Marine Fisheries:</b></p> <ul style="list-style-type: none"> <li>• Estuarine fisheries: The catadromous fishes (<i>Polynemous indicus</i>, <i>P.tetradactylus</i>) and anadromous fishes (<i>Hilsa ilisha</i>, <i>Pama pama</i>, <i>Polynemous paradiseus</i>)</li> <li>• Coastal fisheries or Inshore fisheries: Elasmobranch fishery and Teleost fishery</li> <li>• Offshore and Deep sea fisheries: Pomfrets (<i>Pampus</i>, <i>Stromateus</i>) <i>Eleutheronema tetradactylus</i> (rava), <i>Polydactylus indicus</i> (dara), ghol (<i>Pseudosciaena diacanthus</i>), scianids (Kurtus)</li> </ul> <p><b>1.3: Crustacean And Molluscan Fisheries:</b></p> <ul style="list-style-type: none"> <li>• Prawn fisheries in Goa: Penaeid and Palaemonid groups.</li> <li>• Crab fisheries in Goa</li> <li>• Edible oyster fisheries in Goa</li> <li>• Mussel fisheries in Goa</li> </ul> <p><b>1.4 :Fishing Methods In India:</b></p> <ul style="list-style-type: none"> <li>• Marine Fishing Crafts and Gears used in Goa</li> <li>• Inland Fishing Crafts and Gears used in Goa</li> </ul>	<b>15</b>
<b>MODULE 2:</b>	<p><b>2.1: Integrated Fish Farming Systems:</b></p> <ul style="list-style-type: none"> <li>• Principle of integrated Fish farming</li> <li>• Integration with animal husbandry</li> <li>• Integration with farming systems.</li> </ul> <p><b>2.2: Induced Breeding:</b></p> <ul style="list-style-type: none"> <li>• Selection of site</li> <li>• Design and Layout of fish farm</li> <li>• Freshwater and brackish water pond construction</li> <li>• Pond maintenance</li> <li>• Prevention of fish diseases</li> <li>• Control of aquatic weeds</li> <li>• Control of predatory and Weed fishes</li> <li>• Control of Aquatic insect</li> <li>• Harvesting</li> </ul>	<b>15</b>

<b>MODULE 3:</b>	<p><b>3.1: Fish Culture System:</b></p> <ul style="list-style-type: none"> <li>• Mono culture, polyculture, composite culture, raceway culture, extensive, semi intensive, intensive, zero water exchange</li> <li>• Objective of fish culture</li> <li>• Pond preparation</li> <li>• Selection of species</li> <li>• Stocking of seed</li> <li>• Feed and feeding</li> <li>• Harvesting</li> <li>• Bionomics of fish culture</li> </ul> <p><b>3.2: Cage And Pen Culture:</b></p> <ul style="list-style-type: none"> <li>• Advantage of Fish culture in cages</li> <li>• Selection of species for cage culture</li> <li>• Installation of cage - shape ,size and types of cages</li> <li>• Pen culture</li> <li>• Maintenance of cage and pen</li> </ul> <p><b>3.3: Preservation And Processing:</b></p> <ul style="list-style-type: none"> <li>• Fish marketing</li> <li>• Transportation</li> <li>• Reasons for spoilage of Fishes</li> <li>• Methods of fish preservation-Freeze-drying,</li> <li>• Salting, Refrigeration, Deep Freezing,</li> </ul>	<b>15</b>
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<b>PRACTICAL COMPONENT OF ZOO-IV.E-6: AQUACULTURE AND FISHERIES (DURATION – 02 HRS/ WEEK)</b>		
<b>Sr. No.</b>	<b>Practical</b>	<b>No. of Practicals</b>
1.	Morphometric and Meristic study : a key for fish Identification	03
2.	Identification of important edible shrimps and crabs( any two)	01
3.	Identification of important Freshwater and Marine edible fishes (five fishes each from different families)	02
4.	Methods of Measuring gonosomatic index of Fish	01
5.	Estimation of Fecundity by Frequency Polygon method from a Marine Fish	01
6.	Food and Feeding of Fish by analysis of gut content	01
7.	Visit to a Fish Landing Center to study different Types of Gear and Craft	01
8.	Visit to Fish breeding Center to study Induced Breeding in Indian Carps	01
9.	Visit to ICAR/NIMR( National Institute of Malaria Research) Old Goa for Study of Aquarium and Larvivorous Fishes	01

**REFERENCE BOOKS FOR THEORY:**

1. Bal D.V., Rao Virbhadr, K (1984) Marine Fisheries, Tata McGraw- Hill Publishing Company Ltd. New Delhi.
2. Cushing D.H. (1975) Marine Ecology and Fisheries, Cambridge University Press.
3. Day, F. (1889) The Fauna of British India including Ceylon and Burma. Fishes. 2 Vols., Taylor and Francis London.
4. Khanna S.S. (1984) An Introduction to Fishes, Central Book Depot Allahabad.
5. Pandey K and Shukla J.P. (2015) Fish and Fisheries. Rastogi Publications Meerut-250002
6. Sakhare B. Viswas (2007) Applied Fisheries. Daya Publishing House Delhi-110035
7. Santhanam R (1990) Fisheries Science, Daya Publishing House Delhi.
8. Santhanam R, Ramanathan N and Jagatheesan G (1990) Coastal Aquaculture in India, CBS Publishers and distributors, Delhi.
9. Shrivastava C.B.L. (1996) A Text Book of Fishery Science and Indian Fisheries. Kitab Mahal 22 A, S.N. Marg, Allahabad.
10. Singh B.K. (2008) Applied Fisheries and Aquaculture. Swastik Publishers and distributors, Delhi.

**REFERENCE BOOKS FOR PRACTICALS:**

1. Chandy. M (1970) Fishes, National Book Trust, India, New Delhi.
2. Day. F. (1889) The Fauna of British India including Ceylon and Burma. Fishes. 2 Vols., Taylor and Francis London.
3. R.J. Ranjit Daniels (2002) Freshwater Fishes of Peninsular India, Universities Press (India) Pvt. Ltd. Hyderabad.
4. Sakhare Viswas B. (2007) Applied Fisheries, Daya Publishing House Delhi.
5. Sharma U and S.P. Grover (1982) An Introduction to Indian Fisheries, Dehradun India.
6. Srivastava C.B.L. (1986) A Text Book of Fishery Science and Indian Fisheries, Kitab Mahal Allahabad.

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**ELECTIVE COURSE: IMMUNOLOGY**

<b>COURSE CODE:</b>	ZOO-IV.E-7
<b>MARKS:</b>	100 [ 75 -Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 -Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	Familiarize students and make them learn about the structural features of the components of the immune system as well as their functions, and understand the mechanisms involved in immune system development and responsiveness.
<b>LEARNING OUTCOME:</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• Understand the components of the immune system and their function.</li><li>• Be able to explain the mechanisms of immune response.</li><li>• Perform immunoassays to detect the presence of antigens or antibodies(disease detection).</li></ul>

## ZOO-IV-E-7: IMMUNOLOGY

MODUL E	TOPICS	CONTAC T HOURS
MODUL E 1: INTROD UCTION TO IMMUN OLOGY	1: OVERVIEW OF IMMUNE SYSTEM: <ul style="list-style-type: none"> <li>• Basic concepts in immunology</li> <li>• Components of the immune system</li> </ul>	05
	2: INNATE AND ADAPTIVE IMMUNITY. <ul style="list-style-type: none"> <li>• Innate immunity-Anatomical barriers/ layers of defense, cells and molecules involved in innate immunity</li> <li>• Adaptive immunity-cell mediated and humoral immunity, passive immunity (artificial and natural), Active(artificial and natural), Immune dysfunction</li> </ul>	10
MODUL E 2: ANTIGE NS AND IMMUN OGLOB ULINS	3: ANTIGENS. <ul style="list-style-type: none"> <li>• Antigenicity and immunogenicity, Immunogens, adjuvants and haptens</li> <li>• Factors influencing immunogenicity</li> <li>• B and T cell epitopes</li> </ul>	05
	4: IMMUNOGLOBULINS <ul style="list-style-type: none"> <li>• Structure and function of different classes of Immunoglobulin.</li> <li>• Antigen-Antibody interactions</li> <li>• Immunoassays, monoclonal &amp; polyclonal antibodies</li> </ul>	07
	5: MAJOR HISTOCOMPATIBILITY COMPLEX. <ul style="list-style-type: none"> <li>• Structure and function of endogenous and exogenous pathways of antigen presentation</li> </ul>	03
MODUL E 3: IMMUNE RESPON SE	6: CYTOKINES AND COMPLEMENT SYSTEM <ul style="list-style-type: none"> <li>• Properties and functions of cytokines, cytokine based therapies</li> <li>• Components and pathways of complement activation</li> </ul>	05
	7: HYPERSENSITIVITIES, AUTOIMMUNITY AND TRANSPLANTATION <ul style="list-style-type: none"> <li>• Gell and coombs' classification, types of hypersensitivities(overview)</li> <li>• Autoimmune responses against self antigens (SLEs), responses to alloantigens and transplant rejection (graft rejection, types and mechanisms of transplant rejection)</li> </ul>	07
	8: VACCINES <ul style="list-style-type: none"> <li>• Types of vaccines -inactivated, attenuated, toxoid, subunit, conjugate, experimental (DNA and recombinant vaccine), monovalent/polyvalent vaccines</li> </ul>	03

<b>PRACTICAL COMPONENT OF ZOO-IV-E-7: IMMUNOLOGY ( DURATION -02 hrs/WEEK)</b>		
<b>Sr. No</b>	<b>Practical</b>	<b>No. of Practicals</b>
1	Preparation of serum from goat blood.	02
2	Slide Agglutination Reaction(blood groups – A / AB / O with Rh)	02
3	Differential count of leukocytes	01
4	Detection of presence of antigen / antibody - Simple immunodiffusion	01
5	Antibody Titre determination - Ouchterlony immunodiffusion	02
5	Antigen –antibody reaction by immunoelectrophoresis	02
6	Elisa TEST- pregnancy test	01
7	Phagocytosis – WBC (demonstration)	01

#### **REFERENCE BOOKS:**

*Essential books:*

- 1) Abbas KA, Lechtman HA(2007). *Basic Immunology, Updated Edition 2006-2007: with STUDENT CONSULT. Access (Paperback).*
- 2) David M, Jonathan B, David RB and Ivan R(2006). *Immunology. VII Edition, Mosby, Elsevier Publication.*
- 3) Abbas KA, Lechtman HA(2003). *Cellular and Molecular Immunology. Saunders Publication.*
- 4) Kindt TJ, Goldsby RA, Osborne BA and Kuby J(2006). *Immunology. VI edition. W H Freeman and company.*

*Ebooks:*

- 5) Frank SA(2002). *Immunology and evolution of infectious diseases. Princeton University Press, Princeton and Oxford.*
- 6) Zabriskie JB(2009). *Essential Clinical Immunology. Cambridge University Press.*

#### **REFERENCE BOOKS FOR PRACTICALS:**

- 1) Talwar GP and Gupta SK(2012). *A handbook of practical and Clinical Immunology, CBS publishers.*

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## **ELECTIVE COURSE : **EVOLUTIONARY BIOLOGY****

<b>COURSE CODE:</b>	ZOO-IV.E-8
<b>MARKS:</b>	100 [75-Theory; 25 –Practicals ]
<b>CREDITS:</b>	04[ 03 – Theory; 01 – Practical
<b>CONTACT HOUR :</b>	Theory : 45 Hours( 03 Lec./Week) Practicals: 30 Hours(01Practical/Week)
<b>COURSE OBJECTIVE:</b>	<ul style="list-style-type: none"><li>• The study aims to discover the history of life and the causes of the diversity and characteristics of organisms.</li><li>• To show the important contributions of evolutionary biology to other biological disciplines such as medicine</li></ul>
<b>LEARNING OUTCOME:</b>	<ul style="list-style-type: none"><li>• The study will give detail knowledge about many unsolved hypothetical issues to solve it.</li><li>• The student will learn that evolution is not a speculation , but a thoroughly supported hypothesis that explains the process of evolution</li></ul>

## ZOO-IV.E-8: EVOLUTIONARY BIOLOGY

MODULE	TOPICS	CONTACT HOURS
<b>MODULE 1:</b>	<p><b>1.1: EVOLUTIONARY BIOLOGY:AN OVERVIEW</b></p> <ul style="list-style-type: none"> <li>• What Is Evolution, History Of Evolutionary Biology, Pre Darwinian, Darwin’s Evolutionary Theory, Evolutionary Theories After Darwin</li> <li>• Famous contributions to evolutionary Biology: CarlLinneaus,Lamarck,Malthus,Darwin,Thomas Huxley,R.A.Fisher,Haldane,sewall Wright, G.G.Simpson, Dobzanhasky,Ernst Mayr, M.Kimura.</li> </ul> <p><b>1.2: THE NATURAL SELECTION:</b></p> <ul style="list-style-type: none"> <li>• The Nature of Natural Selection</li> <li>• Postulates of natural selection</li> <li>• Evidences of Natural selection</li> <li>• Types of natural selection(Stabilizing,Directional and Disruptive selection)</li> <li>• Natural Selection in action(Darwin’s finches, Endler’s guppies examples)</li> <li>• Sexual Selection</li> </ul> <p><b>1.3: RANDOM PROCESS IN EVOLUTION:</b></p> <ul style="list-style-type: none"> <li>• mutation :types of mutation</li> <li>• genetic drift(bottle neck effect,founder’s effect)</li> <li>• gene flow(migration/emmigration)</li> </ul> <p><b>1.4: SYNTHETIC THEORY OF EVOLUTION</b></p> <ul style="list-style-type: none"> <li>• Neo-Darwinis</li> </ul>	<b>20</b>
<b>MODULE 2:</b>	<p><b>2.1: NON- DARWINISM</b></p> <ul style="list-style-type: none"> <li>• Neutral theory of evolution</li> <li>• Molecular polymorphism-nucleic acids and proteins</li> <li>• Molecular clocks</li> </ul> <p><b>2.2: SPECIATION</b></p> <ul style="list-style-type: none"> <li>• different concepts of speciation</li> <li>• Concept Of Biological Speciation( Allopatric/Sympatric)</li> <li>• Consequence Of Speciation</li> <li>• Factors involved in Biological Speciation(pre and post- zygotic mechanisms)</li> </ul> <p><b>2.3: POPULATION GENETICS</b></p> <ul style="list-style-type: none"> <li>• Hardy-Weinberg’s Law(H-W)</li> <li>• Genes And Genotype Frequencies</li> <li>• Factors Affecting H-W</li> </ul> <p><b>2.4:ADAPTATIONS :</b></p> <ul style="list-style-type: none"> <li>• Definition and kinds of adaptations with some examples.</li> <li>• Pre , Post adaptations</li> </ul>	<b>10</b>



	<ul style="list-style-type: none"> <li>• Coadaptations and Parallel adaptations</li> </ul>	
<b>MODULE 3:</b>	<p><b>3.1: PATTERNS OF EVOLUTION:</b></p> <ul style="list-style-type: none"> <li>• Sequential and Convergent Evolution</li> <li>• Microevolution</li> <li>• Macroevolution(Adaptive radiation)</li> <li>• Megaevolution</li> <li>• Gradualism And Punctuated Equilibrium</li> </ul> <p><b>3.2: EVOLUTION AND HUMAN HEALTH AND DISEASES</b></p> <ul style="list-style-type: none"> <li>• Design defects</li> <li>• Defence mechanisms-Allergy,morning sickness</li> <li>• Evolution of antibiotic resistance</li> <li>• Evolution of behaviour,Anxiety,fear and depression.</li> </ul>	<b>15</b>

**PRACTICAL COMPONENT OF ZOO-IV.E-8: EVOLUTIONARY BIOLOGY  
(DURATION -02 HRS/WEEK)**

<b>Sr.No.</b>	<b>Practical</b>	<b>No.of Practicals</b>
1.	Study of homology and analogy from suitable specimens	01
2	Serial homology	01
3	Variations are basis for evolution	01
4	To demonstrate the role of Natural Selection in Fixing Favoured Adaptation and Eliminating Maladaptation.	02
5	Problems based on Population Genetics (PTC /blood group)	04
6.	An exercise to illustrate the concepts of Genetic drift	02
7.	Vestigial organs or Vestiges in animals and humans.	01

**REFERENCE BOOKS:**

1. Bipin Kumar(2001) Organic Evolution; Campus Books International, New Delhi.
2. Charlotte J. Avers (1989)Process and pattern in Evolution ; New York Oxford University Press.
3. Douglas J. Futuyma(2013) Evolution III<sup>rd</sup> edition; Sinaue Associates,Inc.Publishers Sunderland , Massachusetts U.S.A.
4. E.Peter Volpe(1989) Understanding Evolution V<sup>th</sup> edition Universal Book Stall.
5. S.Osawa ,T.Honjo(Eds.)(1991) Evolution of life,Springer-Verlag Tokyo .
6. Savage Jay M (1969) Evolution , Amerind Publishing Co-Pvt. Ltd. New Delhi.
7. Veer Bala Rastogi (2004) Organic Evolution ,Eleventh revised edition; Kedarnath Ramnath Delhi.
8. Pranab K. Banerjee (2011) Problems on Genetics,Molecular Genetics and Evolutionary Genetics, New Central Book Agency (P) Ltd. Delhi

## SEMESTER – VI

### ELECTIVE COURSE: **HEALTH AND NUTRITION**

<b>COURSE CODE</b>	<b>ZOO-VI-E-13</b>
<b>MARKS</b>	100 [75 -Theory ; 25- Practical]
<b>CREDITS</b>	04 [03 -Theory; 01- Practical]
<b>CONTACT HOURS</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES</b>	This course is an introduction to the nutrients, their functions and role in maintaining good health of humans.
<b>LEARNING OUTCOME</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>▪ Know about nutrients and their function</li><li>▪ Understand nutritional biochemistry and role of lifestyle and food habits in causing diseases</li></ul>

## ZOO-VI-E-13: HEALTH AND NUTRITION

MODULE	TOPICS	CONTACT HOURS
<p>MODULE 1: BASIC CONCEPT OF FOOD AND NUTRITION</p>	<p>UNIT 1: Overview of health and nutrition</p> <ul style="list-style-type: none"> <li>• Definition of health and nutrition</li> <li>• Scope of nutrition, food as a source of nutrients</li> <li>• Nutrients and energy</li> <li>• Adequate, optimum and balanced diet</li> <li>• Malnutrition and health.</li> </ul> <p>UNIT 2: Nutritional Biochemistry</p> <ul style="list-style-type: none"> <li>• Carbohydrates, lipids, proteins - definition, classification, structure and properties</li> <li>• Significance of acid value, iodine value and saponification value of lipids</li> <li>• Essential and non-essential amino acids</li> <li>• Enzymes- definition, classification, properties(overview).</li> <li>• Coenzymes, vitamins (fat soluble and water soluble), structure and properties</li> <li>• Minerals- iron, calcium, phosphorus, iodine, selenium and zinc and their properties</li> </ul>	<p><b>15</b></p>
<p>MODULE 2: NUTRIENTS AND DIETARY PATTERN FOR HUMANS</p>	<p>UNIT 3: Functions of food components of food-nutrients</p> <ul style="list-style-type: none"> <li>• Biochemical role and dietary sources of macro and micronutrients (carbohydrates, lipids and proteins, fat soluble vitamins-A, D, E and K , water soluble vitamins – thiamin, riboflavin, niacin, pyridoxine, folate, vitamin B12 and vitamin - C Minerals – calcium, iron and iodine).</li> <li>• Changes of nutrient value during cooking of the following food groups: cereals, pulses and vegetables. Nutrient loss - dry, moist, frying and microwave cooking.</li> </ul> <p>UNIT 4: Nutrition and dietetics</p> <ul style="list-style-type: none"> <li>• Physiological considerations, nutrient needs and dietary pattern for various groups- adults, pregnant and nursing mothers, infants, pre-school and school children, adolescents and geriatric nutrition.</li> </ul>	<p><b>15</b></p>

<p><b>MODULE 3:</b> DIET RELATED DISEASES</p>	<p><b>UNIT 5:Health and diseases</b></p> <ul style="list-style-type: none"> <li>• Major nutritional deficiency diseases- protein energy malnutrition, Vitamin deficiency, iron deficiency anaemia, iodine deficiency disorders, their causes, symptoms, treatment, prevention and government programmes, if any.</li> <li>• Life style related diseases- obesity, hypertension, hyperurecimia, diabetes mellitus, polycystic ovarian disease (PCOD) - their causes and prevention through dietary/lifestyle modifications.</li> <li>• Social health problems: smoking, alcoholism, drug dependence and Acquired Immune Deficiency Syndrome (AIDS);</li> <li>• Common ailments- irritable bowel disease (IBD), constipation: causes and dietary management</li> </ul> <p><b>UNIT 6: Food hygiene</b></p> <ul style="list-style-type: none"> <li>• Potable water- sources and methods of purification at consumer level</li> <li>• Food and water borne infections: bacterial infection: cholera, typhoid, dysentery; viral infection: hepatitis, poliomyelitis, protozoan infection: Amoebiasis, Giardiasis; Parasitic infection: Taeniasis and Ascariasis their causative agent, symptoms, transmission and prevention.</li> <li>• Brief account of food spoilage: Causes and preventive measures</li> </ul>	<p><b>15</b></p>
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<p align="center"><b>PRACTICAL COMPONENT OF 'HEALTH AND NUTRITION ZOO-VI-E-13: DURATION (30 HOURS – 02hrs/WEEK)</b></p>		
<p><b>SR. NO</b></p>	<p align="center"><b>PRACTICAL</b></p>	<p><b>NO. OF PRACTICALS</b></p>
<p>11)</p>	<p>To detect adulteration in a) Ghee b) Sugars c) Tea leaves and d) Turmeric</p>	<p>02</p>
<p>12)</p>	<p>To determine absorbed oil content in fried foods</p>	<p>02</p>
<p>13)</p>	<p>Estimation of lactose in milk</p>	<p>02</p>
<p>14)</p>	<p>Ascorbic acid estimation in food by titrimetry</p>	<p>01</p>
<p>15)</p>	<p>Estimation of calcium in foods by titrimetry</p>	<p>01</p>
<p>16)</p>	<p>Observation of any two grain pests</p>	<p>01</p>
<p>17)</p>	<p>Project based:</p> <ul style="list-style-type: none"> <li>• Identify nutrient rich sources of foods, their seasonal availability and price</li> <li>• Study of nutrition labeling on selected foods</li> </ul>	<p>03</p>

**REFERENCE BOOKS:**

- 1) Mudambi, SR and Rajagopal, MV. (2007). Fundamentals of Foods, Nutrition and Diet Therapy; Fifth Ed; New Age International Publishers.
- 2) Srilakshmi B. (2002). Nutrition Science; New Age International (P) Ltd.
- 3) Srilakshmi B. (2007). Food Science; Fourth Ed; New Age International (P) Ltd.
- 4) Swaminathan M. (2009). Handbook of Foods and Nutrition; Fifth Ed; 1986; BAPPCO.
- 5) Bamji MS, Rao NP, and Reddy V. Text Book of Human Nutrition; Oxford & IBH Publishing Co. Pvt Ltd.
- 6) Wardlaw GM, Hampl JS. (2007). Perspectives in Nutrition; Seventh Ed; McGraw Hill.
- 7) Lakra P, Singh MD. (2008). Textbook of Nutrition and Health; First Ed; Academic Excellence.

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**ELECTIVE COURSE: BASIC AND APPLIED  
ENTOMOLOGY**

<b>COURSE CODE</b>	ZOO-VI.E-14
<b>MARKS</b>	100 [75 -Theory; 25-Practical]
<b>CREDITS</b>	04 [03- Theory; 01- Practical]
<b>CONTACT HOURS</b>	Theory: 45 HOURS [03 Lectures Per Week] Practical: 30 HOURS [01 Practical Per Week]
<b>COURSE OBJECTIVE</b>	<ul style="list-style-type: none"><li>• To develop a strong foundation in entomology, including understanding of the importance of insects to the human society.</li><li>• To review important areas in insect biology such as morphology, physiology, ecology, behaviour, genetics, phylogeny, ontogeny and population biology.</li><li>• To develop a sufficient background for advanced entomology.</li></ul>
<b>LEARNING OUTCOME</b>	<ul style="list-style-type: none"><li>• The students will achieve entrepreneurial opportunities in entomology.</li><li>• They will gain knowledge on bionomically important insects and their products, insect pests of public health and veterinary importance and their management.</li></ul>

## ZOO-VI.E-14: BASIC AND APPLIED ENTOMOLOGY

MODULE	TOPIC	CONTACT HOURS
<p>MODULE 1 Fundamentals of Entomology</p>	<p>Unit 1: Class Insecta:</p> <ul style="list-style-type: none"> <li>• Salient features</li> <li>• Classification of insects up to orders – an overview</li> </ul> <p>Unit 2: Morphological studies:</p> <ul style="list-style-type: none"> <li>• of antenna,</li> <li>• wings,</li> <li>• legs</li> <li>• Mouth parts</li> </ul> <p>Unit 3: Techniques:</p> <ul style="list-style-type: none"> <li>• Collection of insects</li> <li>• Preservation of insects</li> </ul>	15
<p>MODULE 2 Bionomics and control of crop pests and medically important pests</p>	<p>Unit 4: Pest of agricultural importance:</p> <ul style="list-style-type: none"> <li>• Paddy pests, cashew pests, coconut pests, areca nut pests, pulse pests, sugarcane pests, vegetable pests, fruit pests (two pests from each of the above)</li> </ul> <p>Unit 5: Insects of medicinal importance:</p> <ul style="list-style-type: none"> <li>• mosquitoes, housefly, sand fly, cockroaches, human lice, bed bug, rat fleas</li> </ul> <p>Unit 6: Termites:</p> <ul style="list-style-type: none"> <li>• social organization, termitaria and termite control measures</li> </ul>	15
<p>MODULE 3 Useful insects and pest management</p>	<p>Unit 7: Useful insects:</p> <ul style="list-style-type: none"> <li>• Honeybees (Apiculture); Mulberry silk worm (sericulture); lac insects (lac culture)</li> </ul> <p>Unit 8: Insect pest control methods:</p> <ul style="list-style-type: none"> <li>• biological, chemical (attractants, pheromones and hormones),</li> </ul> <p>Integrated Pest Management (IPM)</p> <p>Unit 9: Role of insects in ecosystem services</p>	15

<b>PRACTICAL COMPONENT OF BASIC AND APPLIED ENTOMOLOGY ZOO-VI.E-14 PRACTICAL (DURATION: 30 HOURS – 02hrs/WEEK)</b>		
<b>SR. NO</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS (12)</b>
1.	Collection techniques of Insects – light traps, sweep net, Berlese funnel	02
2.	Identification and study of economically important insects.	02
3.	Field trips to ICAR Old Goa / Govt. of Goa agriculture department/ National Malaria Research Institute (NMRI).	02
4.	Study of insects of college campus dragon fly/ pests of different plants.	03
5.	Study of local insect pests of agriculture.	03

**REFERENCE BOOKS:**

- 1) Aitwal, A.S (1993): Agricultural pests of India and South East Asia. Kalyani publication, New Delhi.
- 2) Awasthi, V.B (2007): Introduction to general and applied entomology, 2<sup>nd</sup> edition. Scientific publishers India Jodhpur.
- 3) David, B.V. and Ananthakrishnan, T.N (2006): General and applied entomology, 2<sup>nd</sup> edition Tata McGraw hill, New Delhi.
- 4) Reddy, D.S (2010) Applied entomology, 2<sup>nd</sup> edition New Vishal publications

**REFERENCE BOOKS FOR PRACTICALS:**

1. Fenemore, P.G. and Prakash, A. (1995): Applied Entomology, Wiley Eastern Limited new age international.
2. Varasi, M.S. (1992): Text book of entomology, Himalaya Publishing House, 1<sup>st</sup> edition.

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**ELECTIVE COURSE: LABORATORY TECHNIQUES IN  
PATHOLOGY**

<b>COURSE CODE</b>	ZOO-VI.E-15
<b>MARKS</b>	100 [75 -Theory; 25- Practical]
<b>CREDITS</b>	04 [03 -Theory; 01- Practical]
<b>CONTACT HOURS</b>	THEORY : 45 HOURS (03 LEC / WEEK) PRACTICAL: 30 HOURS (01 PRACTICAL / WEEK)
<b>COURSE OBJECTIVES</b>	This course is an introduction to the various techniques used in pathological diagnosis.
<b>LEARNING OUTCOME</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>▪ Know the tests done for disease detection of various body fluids and tissues.</li><li>▪ Understand the clinical implication of the pathological tests.</li></ul>

## ZOO-VI.E-15: LABORATORY TECHNIQUES IN PATHOLOGY

MODULE	TOPICS	CONTACT HOURS
MODULE 1: BLOOD ANALYSIS	UNIT 1: Introduction to medical lab techniques and its importance UNIT 2: : Analyses of human Blood: <ul style="list-style-type: none"><li>• Ways of obtaining blood samples, precautions and complications.</li><li>• Methods of estimation and clinical significance of: hemoglobin, Packed Cell Volume (PCV), RBC count, WBC count, Complete Blood Count (CBC), platelets, Erythrocyte Sedimentary Rate (ESR), Differential Leucocyte Count (DLC).</li></ul>	15
MODULE 2: EVALUATION OF EXCRETORY MATERIAL AND GAMETES	UNIT 3: Urine Analyses <ul style="list-style-type: none"><li>• Physical characteristics, preservation of urine sample</li><li>• Gross examination, chemical examination, abnormal constituents and its clinical implications.</li><li>• Microscopy of urinary sediments</li></ul> UNIT 4: Stool Analyses <ul style="list-style-type: none"><li>• Stool tests for protozoan parasites and helminth eggs.</li><li>• Clinical significance.</li></ul> UNIT 5: Semen analyses: <ul style="list-style-type: none"><li>• Constituents of semen</li><li>• Gross and microscopic, cytochemical examination, clinical implications.</li></ul>	15
MODULE 3: LIVER FUNCTION CYTOLOGY IMAGING	UNIT 6: Clinical status of liver function - <ul style="list-style-type: none"><li>• Function of liver.</li><li>• Tests of excretion by liver, evaluation of synthesis in liver, evaluation of enzyme activity.</li></ul> UNIT 7: Clinical cytological studies <ul style="list-style-type: none"><li>• Fine Needle Aspiration Cytology (FNAC), Ultrasound guided FNAC, aspiration of intra thoracic masses,<ul style="list-style-type: none"><li>• Techniques of preparing cell smears, staining techniques</li></ul></li></ul> UNIT 8: Medical imaging <ul style="list-style-type: none"><li>• X-Ray, PET, CT Scan, MRI, Dexa Scan, Ultrasound, Doppler's Test (using photographs/reports etc).</li></ul>	15

<b>PRACTICAL COMPONENT OF: LABORATORY TECHNIQUES IN PATHOLOGY ZOO-VI.E-15 - (30 HOURS – 02hrs/WEEK)</b>		
<b>SR. NO</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1.	Preparation of blood smears and staining techniques ( Leishman’s staining, Giemsa staining, Field’s staining).	02
2.	Use of different types of anticoagulants, obtaining serum from blood, preparation of cell suspension (blood cells).	01
3.	RBC Count, WBC Count, Differential WBC Count	03
4.	Urine analysis – normal and abnormal constituents	02
5.	Blood sugar estimation using glucometer	01
6.	Estimation of hemoglobin (Sahli’s method)	01
7.	Estimation of PCV	01
8.	Estimation of ESR (Wintrobe’s / Westergreen method)	01

**REFERENCE BOOKS:**

1. Sood R (1999). Medical laboratory techniques, Jaypee publishers, New Delhi.
2. Park, K. (2007), Preventive and Social Medicine, B.B. Publishers
3. Godkar P.B. and Godkar D.P (2007). Textbook of Medical Laboratory Technology, II Edition, Bhalani Publishing House.
4. Cheesbrough M (2002)., A Laboratory Manual for Rural Tropical Hospitals, A Basis for Training Courses
5. Prakash, G. (2012), Lab Manual on Blood Analysis and Medical Diagnostics, S. Chand and Co. Ltd. New Delhi.

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**ELECTIVE COURSE: BIOENTREPRENEURSHIP**

<b>COURSE CODE</b>	ZOO-VI.E- 16
<b>MARKS</b>	100 [75 –Theory; 25- Practical]
<b>CREDITS</b>	04 [03 –Theory; 01- Practical]
<b>CONTACT HOURS</b>	THEORY : 45 HOURS (03 LEC / WEEK) PRACTICAL: 30 HOURS (01 PRACTICAL / WEEK)
<b>COURSE OBJECTIVES</b>	<ul style="list-style-type: none"><li>• To help students recognize the opportunities of enterprises in the field of life sciences</li><li>• To encourage students to think independently and explore new vistas</li><li>• To familiarise them with the basic skills required for a start-up</li></ul>
<b>LEARNING OUTCOME</b>	At the end of the course, <ul style="list-style-type: none"><li>• Students will be exposed to various opportunities available in life science for start-ups.</li><li>• They will be familiar with the methodologies and regulations required to start an enterprise.</li><li>• It will also help the student to develop independent thinking skill required at the time of crucial decision making.</li></ul>

## ZOO-VI.E- 16: BIOENTREPRENEURSHIP

UNIT	TOPICS	CONTACT HOURS
MODULE 1: Entrepreneurship Development	Unit 1: Introduction to entrepreneurship: <ul style="list-style-type: none"><li>entrepreneurial competencies and goal setting, bio entrepreneurship, building a bio-enterprise : balance management, capital, technology</li></ul> Unit 2: Introduction to innovation: <ul style="list-style-type: none"><li>identifying business opportunities</li></ul> Unit 3: Raising funds: public and private	15
MODULE 2: Business plan And Guidelines and regulations for entrepreneurship in life sciences	Unit 4: Business model canvas Unit 5: Guidelines and regulations: <ul style="list-style-type: none"><li>Certification and licensing, acts, regulations and guidelines, marketing and export process, accessing university technology, research and development agencies in India</li></ul> Unit 6: Role of micro, medium and small scale industry sector Unit 7: Innovations in research: <ul style="list-style-type: none"><li>writing project proposals to various funding bodies such as MHRD, UGC, DST, DBT, etc.</li></ul>	15
MODULE 3:  Start -up, quality, safety and procedural compliances in a bio enterprise	Unit 8: Intellectual Property Rights and trademark of biological resources Unit 9: quality, safety and procedural compliances <ul style="list-style-type: none"><li>Bio safety and its implementations</li><li>Quality control in entrepreneurship</li><li>WHO Guidelines for setting up of a contract research organization.</li><li>Starting a research laboratory in India – guidelines and permits required</li></ul>	15

<b>PRACTICAL COMPONENT OF BIOENTREPRENEURSHIP ZOO-VI.E-16 (30 HOURS – 02hrs/WEEK)</b>		
<b>SR. NO.</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICAL</b>
1.	Exercises on lateral thinking	01
2.	Testing entrepreneurial competencies	01
3.	Online search for patented technologies	01
4.	Identifying Business Opportunities	02
5.	Business Model Canvas	03
6.	Presentation of Business Model Canvas by students	01
7.	Interaction with successful entrepreneur	02
8.	Interaction with Banker/ Angel Investor	01

**REFERENCES:**

1. Garg, M.C. (2015) Entrepreneurial development. Guset User.
2. Kolchinsky, P. (2004) The entrepreneurs guide to a biotech startup. 4<sup>th</sup> edition. www.evelexa.com

**Additional reading:**

1. Simon, S. 2009. Start with why: How great leaders inspire everyone to take action. Penguin Group (USA) Inc .
2. Welch, J. and Byrne, J.A. 2003. Straight from the gut. Business plus publishers.

**WEBLIOGRAPHY:**

1. <http://www.creativeboom.com/resources/10-free-brain-teasing-puzzle-resources-for-team-building-games-and-getting-your-creative-juices-flowing/>
2. <https://www.scribd.com/document/60183753/39034324-Test-for-Personal-Entrepreneurial-Competencies>
3. [http://www.wipo.int/edocs/pubdocs/en/patents/434/wipo\\_pub\\_1434\\_02.pdf](http://www.wipo.int/edocs/pubdocs/en/patents/434/wipo_pub_1434_02.pdf)
4. <https://ipindiaonline.gov.in/patentsearch/Granted%20Search%20Engine%20Help%20file.pdf>
5. <https://canvanizer.com/new/business-model-canvas>

**PARVATIBAI CHOWGULE COLLEGE OF ARTS AND SCIENCE**  
**(Autonomous)**  
**PROGRAMME BSC ZOOLOGY**  
**CORE AND ELECTIVES COURSES**

SEMESTER	COURSE CODE	CORE COURSES	COURSE CODE	ELECTIVE COURSES
<b>I</b>	ZOO-I.C-1	Animal Diversity : Non Chordates		
	ZOO-I.C-2	Cell and Molecular Biology		
<b>II</b>	ZOO-II.C-3	Diversity and Biological Systems of Chordates		
	ZOO-II.C-4	Fundamentals of Animal and Human Genetics		
<b>III</b>	ZOO-III.C-5	Human Physiology	ZOO-III.E-1	Vertebrate Endocrinology
			ZOO-III.E-2	Basic microbiology and Fundamentals of Animal Biotechnology
			ZOO-III.E-3	Environmental Toxicology
			ZOO-III.E-4	Parasitology
<b>IV</b>	ZOO-IV.C-6	Biochemistry and Metabolic Regulation	ZOO-IV.E-5	Animal cell culture and Applications
			ZOO-IV.E-6	Aquaculture and Fisheries
			ZOO-IV.E-7	Immunology
			ZOO-IV.E-8	Evolutionary Biology
<b>V</b>	ZOO-V.C-7	Developmental Biology	ZOO-V.E-9	Molecular Genetics and Forensic Science
			ZOO-V.E-10	Economic Zoology
			ZOO-V.E-11	Ecology and Ethology
			ZOO-V.E-12	Fish Preservation and Processing
<b>VI</b>	ZOO-VI.C-8	Wildlife Biology	ZOO-VI.E-13	Health and Nutrition
			ZOO-VI.E-14	Basic and Applied Entomology
			ZOO-VI.E-15	Laboratory Techniques in Pathology
			ZOO-VI.E-16	Bio Entrepreneurship

## PROGRAMME: BSC ZOOLOGY CORE COURSES

<b>CORE COURSES FOR ZOOLOGY SINGLE MAJOR / DOUBLE MAJOR</b>		
<b>SEMESTER</b>	<b>COURSE CODE</b>	<b>COURSE TITLE</b>
1	ZOO-I.C-1	Animal Diversity : Non Chordates
1	ZOO-I.C-2	Cell and Molecular Biology
2	ZOO-II.C-3	Diversity and Biological Systems of Chordates
2	ZOO-I.C-4	Fundamentals of Animal and Human Genetics
3	ZOO-III.C-5	Human Physiology
4	ZOO-IV.C-6	Biochemistry and Metabolic Regulation
5	ZOO-V.C-7	Developmental Biology
6	ZOO-VI.C-8	Wildlife Biology

<b>CORE COURSES FOR ZOOLOGY MAJOR - MINOR</b>		
<b>SEMESTER</b>	<b>COURSE CODE</b>	<b>COURSE TITLE</b>
1	ZOO-I.C-1	Animal Diversity : Non Chordates
2	ZOO-II.C-3	Diversity and Biological Systems of Chordates
3	ZOO-III.C-5	Human Physiology
4	ZOO-IV.C-6	Biochemistry and Metabolic Regulation
5	ZOO-V.C-7	Developmental Biology
6	ZOO-VI.C-8	Wildlife Biology

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**PROGRAMME: BSC ZOOLOGY  
ELECTIVE COURSES**

<b>ELECTIVE COURSES FOR BSc ZOOLOGY</b>		
<b>SEMESTER</b>	<b>COURSE CODE</b>	<b>COURSE TITLE</b>
<b>Odd semester</b>	ZOO-III.E-1	Vertebrate Endocrinology
	ZOO-III.E-2	Basic microbiology and Fundamentals of Animal Biotechnology
	ZOO-III.E-3	Environmental Toxicology
	ZOO-III.E-4	Parasitology
	ZOO-V.E-9	Molecular Genetics and Forensic Science
	ZOO-V.E-10	Economic Zoology
	ZOO-V.E-11	Ecology and Ethology
	ZOO-V.E-12	Fish Preservation and Processing
<b>Even semester</b>	ZOO-IV.E-5	Animal cell culture and Applications
	ZOO-IV.E-6	Aquaculture and Fisheries
	ZOO-IV.E-7	Immunology
	ZOO-IV.E-8	Evolutionary Biology
	ZOO-VI.E-13	Health and Nutrition
	ZOO-VI.E-14	Basic and Applied Entomology
	ZOO-VI.E-15	Laboratory Techniques in Pathology
	ZOO-VI.E-16	Bio Entrepreneurship



## COURSE STRUCTURE FOR PROGRAMME: BSC ZOOLOGY

STRUCTURE		CREDITS	SUBJECTS & PAPERS	CC Major + Project	CC Minor	Elective	
Component A (84 Credits)	<b>CHOICE – 1 Single Major</b>	<b>32+4</b>	8 Core Papers (Major) + Project Paper	8 + 1			
		<b>48</b>	12 Elective Papers (Major)		--	12	
	<b>CHOICE – 2 Major and Minor</b>	<b>32+4</b>	8 Core Papers (Major) + Project Paper	8 + 1			
		<b>24</b>	6 Core Papers (Minor)		6		
		<b>24</b>	6 Elective Papers (Major)				6
	<b>CHOICE – 3 Double Majors</b>	<b>32+4</b>	8 Core Papers (Major 1) + Project Paper	8 + 1	--		
		<b>32</b>	8 Core Papers (Major 2)	8	--		
<b>16</b>		2+2 Elective Papers (Major 1 / Major 2)				4	
<b>STRUCTURE</b>		<b>CREDITS</b>	<b>GENERAL SUBJECTS &amp; PAPERS</b>	Compulsory		Elective	
Component B (36 Credits)	Compulsory Subjects	<b>8</b>	A. Languages (Two Papers of 4 Credits each)	2			
		<b>8</b>	B. (1) Academic Writing (2) Cyber Security	2			
		<b>2 + 2</b>	C. EVS (Two papers of 2 Credits each)	2			
		<b>8</b>	D. (1) Statistical Methods (2) Research Writing	2			
		<b>8</b>	E. Interdisciplinary (Arts / Science) (Two Papers of 4 Credits each)			2	
Component C (6 Credits)	Extra-curricular	<b>2</b>	Music, Arts (2 Credits)			1	
		<b>2</b>	Sports (2 Credits)			1	
		<b>2</b>	NCC, NSS (2 Credits)			1	
Component D (4 Credits)	Internship	<b>4</b>	Internship (Minimum 1 Month)	1			
Abbreviations:		CC – Core Compulsory CE – Core Electives CP – Core Project CM – Core Minor GC – General Compulsory GE – General Electives I – Internship					

## COURSE DISTRIBUTION FOR PROGRAMME: BSC ZOOLOGY

Distribution of courses (Single Major)						
Semesters	I	II	III	IV	V	VI
Courses	2CC	2CC	CC	CC	CC	CC
	GC - B	GC - B	3CE	3CE	3CE	3CE
	LANG	LANG	GC - D	GC - D	GC - E	GC - E
	EVS	EVS			PROJ	PROJ
Total	4.5	4.5	5	5	5.5	5.5

Distribution of Courses (Major - Minor)						
Semesters	I	II	III	IV	V	VI
Courses	2CC	2CC	CC	CC	CC	CC
	GC - B	GC - B	CE	CE	2CE	2CE
	LANG	LANG	GC - D	GC - D	GC - E	GC - E
	CCm	CCm	CCm	CCm	CCm	CCm
			EVS	EVS	PROJ	PROJ
Total	5	5	4.5	4.5	5.5	5.5

Distribution of Courses (Double Majors)						
Semesters	I	II	III	IV	V	VI
Courses	2CC - 1	2CC - 1	CC - 1	CC - 1	CC - 1	CC - 1
			CE	CE	CE	CE
	LANG	LANG	2GC - B, D	2GC - B, D	GC - E	GC - E
	2CC - 2	2CC - 2	CC - 2	CC - 2	CC - 2	CC - 2
					EVS	EVS
					PROJ	PROJ
Total	5	5	5	5	5	5

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**PARVATIBAI CHOWGULE COLLEGE OF ARTS AND SCIENCE**  
**(Autonomous)**  
**PROGRAMME BSC ZOOLOGY**  
**COURSE CURRICULUM - CORE COURSES**

<b>SEMESTER</b>	<b>COURSE CODE</b>	<b>CORE COURSES</b>
<b>I</b>	ZOO-I.C-1	Animal Diversity : Non Chordates
	ZOO-I.C-2	Cell and Molecular Biology
<b>II</b>	ZOO-II.C-3	Diversity and Biological Systems of Chordates
	ZOO-II.C-4	Fundamentals of Animal and Human Genetics
<b>III</b>	ZOO-III.C-5	Human Physiology
<b>IV</b>	ZOO-IV.C-6	Biochemistry and Metabolic Regulation
<b>V</b>	ZOO-V.C-7	Developmental Biology
<b>VI</b>	ZOO-VI.C-8	Wildlife Biology

## SEMESTER -I:

### CORE COURSE : **ANIMAL DIVERSITY: NON CHORDATES**

<b>COURSE CODE:</b>	ZOO-I.C-1
<b>MARKS:</b>	100 [ 75 -Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 -Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	<ul style="list-style-type: none"><li>• To be familiar with the different non-chordate phyla.</li><li>• To know the general and distinguishing characters of each of them.</li><li>• To study how the different systems evolved in their complexity.</li><li>• To compare and contrasts the life processes in different phyla.</li></ul>
<b>LEARNING OUTCOME:</b>	At the end of the course, the students will be familiar with the non-chordate world that surrounds us. They will be able to appreciate the process of evolution and see how it progressed from simple, unicellular cells to complex, multicellular organisms. Students will be able to identify the invertebrates and classify them upto the class level. Students will understand the basis of life processes in the non-chordates.

## **ZOO-I.C-1: ANIMAL DIVERSITY: NON CHORDATES**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
<b>Module 1: Evolution of Animal Diversity and Diversity of lower non chordates</b>	1.1 Non chordate evolution and diversity 1.2 Taxonomy and phylogeny of animals 1.3 Invertebrate cladogram 1.4 Protista Classification and general characters upto class for the following phyla: 1.5 Porifera 1.6 Cnidaria 1.7 Platyhelminthes 1.8 Aschelminthes 1.9 Annelida	15
<b>Module 2: Diversity of higher Non Chordates And Biological systems of non chordates 1</b>	Classification and general characters upto class for the following phyla: 3.1: Onychophora 3.2: Arthropoda 3.3: Mollusca 3.4: Echinodermata 3.5: Hemichordata Comparison of life processes such as nutrition, sensory and neural control and coordination, sense organs	15
<b>Module 3: Biological systems of Non Chordates 2</b>	Comparison of life processes (Phylum Porifera to hemichordate) such as: <ul style="list-style-type: none"><li>• blood vascular system,</li><li>• exoskeleton,</li><li>• endoskeleton,</li><li>• locomotion and muscular system,</li><li>• respiration,</li><li>• excretion,</li><li>• Reproduction and development.</li></ul>	15

<b>PRACTICAL COMPONENT OF ZOO-I.C-1: ANIMAL DIVERSITY: NON CHORDATES</b>		
<b>( DURATION -02 HRS /WEEK)</b>		
Sr. No	Practical	No. of Practicals
1.	Identification of organisms from phylum protozoa to phylum Hemichordata	06
2.	Observation of permanent slides	03
3.	Mountings: Cockroach mouth parts, prawn appendages	02
4.	Field trip to terrestrial environment to study the invertebrates in their natural habitats	01

**REFERENCE BOOKS:**

1. Barnes R.D. (2000). Invertebrate Zoology.Hall Saunders International Edition, London.
2. Barrington E.J.W. 1979. Invertebrate structure and Function.John Wiley and Sons Inc.
3. Jordan, E. L. and Verma, P.S. (2000). Invertebrate Zoology. S. Chand & Co. Pvt. Ltd. New Delhi.
4. Marshall A.J.and W.D. Williams. 1974. Textbook of Zoology. Macmillan.
5. Pechenik J.A.( 2002). Biology of the invertebrates. Tata McGraw hill Publishing company limited, New Delhi .

**REFERENCE BOOKS FOR PRACTICALS:**

- 1) Ziser. W.S (2014) Biology 1413 Introductory Zoology Lab Manual.Morton Publishing Co. Austin Community College.
  - 2) Lal S.S. (2004) A textbook of practical zoology vertebrate. Rastogi publications, Meerut India.
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**ZOO-I.C-2 : CELL AND MOLECULAR BIOLOGY****CORE COURSE : CELL AND MOLECULAR BIOLOGY**

<b>COURSE CODE:</b>	ZOO-I.C-2
<b>MARKS:</b>	100 [ 75 -Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [03 -Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	This course will give firm and rigorous foundation in the principles of modern molecular and cellular biology. It discusses the fundamental processes that enable cells to grow, move and communicate and will cover topics such as cell architecture, cell chemistry, cell division, functions and cell cycle. Students will also learn current molecular biological techniques that are used to study cell biology. Laboratories will focus both on exercises that help illustrate cellular phenomena, as well as on the introduction of techniques and procedures commonly utilized in modern cell and molecular biology research.
<b>LEARNING OUTCOME:</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• Develop deeper understanding of what life is and how it functions at cellular level.</li><li>• Describe cellular membrane structure and function, fine structure and function of cell organelles.</li><li>• Perform a variety of molecular and cellular biology techniques.</li></ul>



<b>MODULE</b>	<b>TOPICS</b>	<b>CONT ACT HOUR S</b>
<b>MODULE 1: TECHNIQUES OF CELL STUDY AND CELL CHEMISTRY (15 Hrs)</b>	Unit 1: MICROSCOPY <ul style="list-style-type: none"> <li>• Light Microscopy</li> <li>• Electron Microscopy (SEM, TEM, IEM,STEM).</li> </ul>	04
	Unit 2: CELL STUDY METHODS <ul style="list-style-type: none"> <li>• Cell Fractionation, Chromatography and electrophoresis</li> <li>• X-ray diffraction and NMR spectroscopy</li> <li>• Radioisotope tracer technique, Autoradiography, intracellular electrodes</li> </ul>	04
	Unit 3: MOLECULES IN CELL. <ul style="list-style-type: none"> <li>• Micromolecules in cells: Sugars, Fatty acids, aminoacids, Nucleotides.</li> <li>• Macromolecules in cells: Nucleic acids, proteins, Polysaccharides, glycogen, fats.</li> </ul>	05
	Unit 4: CHEMICAL BONDS IN BIOMOLECULES <ul style="list-style-type: none"> <li>• covalent bonds, ionic bonds, noncovalent interactions</li> </ul>	02
<b>MODULE 2: CELL ARCHITECTURE (15 Hrs)</b>	Unit 5: MEMBRANE STRUCTURE AND MEMBRANE PROTEINS <ul style="list-style-type: none"> <li>• lipid bilayer – composition and structural organization (amphipathic phospholipids, Fluidity of cell membrane)</li> <li>• Membrane Proteins –structure and function (transmembrane proteins, peripheral membrane proteins)</li> <li>• Phospholipids, sphingolipids, Cholesterol in cell membrane.</li> </ul>	06
	Unit 6: MOLECULAR STRUCTURE AND FUNCTION <ul style="list-style-type: none"> <li>• Plasma Membrane</li> <li>• Cell matrix: Physical nature and Properties.</li> <li>• Nucleus: Ultra Structure and function</li> <li>• Mitochondria: Ultra Structure and functions</li> <li>• Endoplasmic Reticulum: ultra structure, modifications, functions</li> </ul>	06
	UNIT 7: MOLECULAR STRUCTURE AND FUNCTION <ul style="list-style-type: none"> <li>• Golgi Complex: detailed structure and function</li> <li>• Ribosomes- Structure and function</li> <li>• Microsomes: Lysosome-morphology and function, Microbodies</li> <li>• Cytoskeleton – Microtubules, Microfilaments, intermediate filaments</li> </ul>	03
<b>MODULE 3: CELLULAR TRANSPORT OF PROTEINS AND VESICLES (15 Hrs)</b>	Unit 8: TRANSPORT ACROSS CELL MEMBRANES <ul style="list-style-type: none"> <li>• Principle of transmembrane transport (transporters and channels, active and passive transport, osmosis)</li> <li>• Transporters and their function- passive transporters, Pumps ( Na<sup>+</sup>, K<sup>+</sup>, Ca<sup>++</sup>), functions of transporters.</li> <li>• Ion Channels - ion channels activities, regulation of opening and closing of channels.</li> <li>• Protein transport into organelles (nucleus, mitochondria,ER).</li> </ul>	10
	Unit 9: VESICULAR TRANSPORT. <ul style="list-style-type: none"> <li>• Vesicular transport – transport of soluble proteins, vesicle budding, vesicle docking, endocytic pathways</li> <li>• General principles of cell signaling, G-Protein coupled receptors, enzyme coupled receptors</li> </ul>	05

<b>PRACTICAL COMPONENT OF ZOO-I.C-2: CELL AND MOLECULAR BIOLOGY ( DURATION -02 HRS /WEEK)</b>		
<b>Sr. No</b>	<b>Practical</b>	<b>No. of Practicals</b>
1)	Introduction to Lab techniques – Pipetting, preparation of buffers and solutions, Lab equipments (use and maintenance), acquaintance with general laboratory practices	02
2)	Cytochemistry: Localisation of Proteins, Carbohydrates & fats using different stains.	03
3)	Comparison of membrane permeability – Cellophane and Chick intestine.	01
4)	Osmotic studies – Using Human Red blood cells.	01
5)	Permanent slides: <ul style="list-style-type: none"> <li>- Mitotic stages</li> <li>- Meiotic stages (mounting from grasshopper testes)</li> <li>- Histology - Study of different cell types (animal cells)</li> </ul>	03
6)	Technique of Agarose gel electrophoresis (Observation of technique)	01
7)	Protein study – SDS-PAGE (Observation of technique)	01

#### **REFERENCE BOOKS:**

##### **Essential books:**

- 1) *Alberts B, Hopkins, Lewis J, Raff M, Robertis K, Walter P (2014): Essential Cell Biology, Fourth Edition, Garland Science Taylor & Francis Group, UK.*
- 2) *Lodish H, Berk A, Kaiser CA, Krieger M, Scott MP, Anthony, Bretscher A, Amon A. Scott MP (2013): Molecular Cell Biology, Seventh Edition, W. H. Freeman and Company New York.*

##### **Supplementary Reading:**

- 3) *Gupta PK (2003): Cell and Molecular Biology, Second Edition, Rakesh Kumar Rastogi for Rastogi Publications, Meerut, New Delhi, India.*
- 4) *Bolsover SR, Shephard EA, Hugh AW, Hyams JS (2011): Cell Biology, Third Edition, Wiley Blackwell, A John Wiley & Sons, Inc., Publications.*
- 5) *Verma PS and Agarwal VK (2007): Cell Biology Genetics Molecular Biology Evolution & Ecology. S Chand and Company PVT LTD, New Delhi.*

#### **REFERENCE BOOKS FOR PRACTICALS:**

- 1) *Alberts B, Hopkins, Lewis J, Raff M, Robertis K, Walter P (2014): Essential Cell Biology, Fourth Edition, Garland Science Taylor & Francis Group, UK.*
- 2) *Bolsover SR, Shephard EA, Hugh AW, Hyams JS (2011): Cell Biology, Third Edition, Wiley Blackwell, A John Wiley & Sons, Inc., Publications.*
- 3) *Verma PS and Agarwal VK (2007): Cell Biology Genetics Molecular Biology Evolution & Ecology. S Chand and Company PVT LTD, New Delhi.*
- 4) *Alberts B, Johnson A, Lewis J, Raff M, Robertis K, Walter P (2008): Molecular Biology of the Cell, Fifth Edition, Published by Garland Science, Taylor & Francis Group, UK.*

## SEMESTER – II

<b>CORE COURSE:</b> <b>DIVERSITY AND BIOLOGICAL SYSTEMS OF CHORDATES</b>	
<b>COURSE CODE:</b>	ZOO-II.C-3
<b>MARKS:</b>	100 [ 75 -Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 -Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	<ul style="list-style-type: none"><li>• To be familiar with the different Chordate phyla.</li><li>• To know the general and distinguishing characters of each of them.</li><li>• To compare and contrast the major biological systems amongst them.</li></ul>
<b>LEARNING OUTCOME:</b>	At the end of the course, the students will be familiar with the chordate world that surrounds us. They would be able to identify the different chordates upto the order. They will understand the functioning and mechanism of the various biological systems in the chordates.

<b>ZOO-II.C-3: DIVERSITY AND BIOLOGICAL SYSTEMS OF CHORDATES</b>		
<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
<b>MODULE 1: Diversity of chordates(upto order)</b>	1.1: Chordata: General plan of organization and Outline classification 1.2: General characters and classification of Protochordates 1.3: General characters and classification of Agnatha 1.4: General characters and classification of Pisces 1.5: General characters and classification of Amphibia 1.6: General characters and classification of Reptilia 1.7: General characters and classification of Aves 1.8: General characters and classification of Mammalia	<b>15</b>
<b>MODULE 2: Biological Systems I</b>	3.1: Integument: Pisces, Amphibia, Reptilia, Aves, Mammalia 3.2: Locomotory apparatus: Pisces , Amphibia, Reptilia , Aves, Mammalia 3.3: Digestive system: Pisces , Amphibia, Reptilia , Aves, Mammalia 3.4: Respiratory system: Pisces , Lungs in Amphibia, Reptilia , Aves, Mammalia	<b>15</b>
<b>MODULE 3: Biological systems - II</b>	3.1: Circulatory system: Pisces , Amphibia, Reptilia , Aves, Mammalia 3.2: Brain and cranial nerves: Pisces , Amphibia, Reptilia , Aves, Mammalia 3.3: Reproductive system: Pisces , Amphibia, Reptilia , Aves, Mammalia	<b>15</b>

<b>PRACTICAL COMPONENT OF ZOO-II.C-3: DIVERSITY OF CHORDATES ( DURATION -02 HRS /WEEK)</b>		
<b>Sr. No</b>	<b>Practical</b>	<b>No. of Practicals</b>
1.	Identification and Systematic classification of organisms from protochordates to mammalia	05
2.	Mounting of scales and chromatophores in fishes	01
3.	Observation of general viscera of chordate phyla	01
4.	Observation and study of nests of birds- crow, baya weaver, munia, sun bird (any three)	01
5.	Identification of Indian venomous and non venomous snakes with the help of keys provided (four each)	01
6.	Mounting of pecten of eye (chick)	01
7.	Mounting of hyoid apparatus of chick; observation of hyoid apparatus of reptiles and mammals	01
8.	Overview of skull from fish to mammals	01
9.	Observation of permanent slides (amphioxus, doliolum, salpa)	01
10.	Field trip to fish landing site and wild life sanctuary	02

#### **REFERENCE BOOKS:**

1. Cleveland Hickman Jr., Roberts Larry, Susan Keen, Allan Larson and Eisenhour D (2014). Animal Diversity. McGraw Hill Science.
2. Kardong K(2011). Vertebrates: Comparative anatomy, evolution, function. McGraw-Hill Higher Education.
3. Kent G.C. and Carr R.K. (2000). Comparative anatomy of the vertebrates. McGraw-Hill Higher Education.
4. Young J.Z. (2006). The life of vertebrates. Radha Press Delhi, Indian Edition.

#### **REFERENCE BOOKS FOR PRACTICALS:**

- 1) Ziser. W.S (2014) Biology 1413 Introductory Zoology Lab Manual. Morton Publishing Co. Austin Community College.
- 2) Lal S.S. (2004) A textbook of practical zoology vertebrate. Rastogi publications, Meerut India.

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## **ZOO-II.C-4: FUNDAMENTALS OF ANIMAL AND HUMAN GENETICS**

### **FUNDAMENTALS OF ANIMAL AND HUMAN GENETICS**

<b>COURSE CODE:</b>	ZOO-II.C-4
<b>MARKS:</b>	100 [ 75 –Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 –Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	This course is intended to provide solid understanding of concepts and principles of genetics as it applies to animals and humans. Students will receive good foundation of chromosome structure, its aberrations and inheritance patterns of traits and disease which will help one to develop conceptual skills to address questions in genetic research.
<b>LEARNING OUTCOME:</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• Describe the basic structure of genes and chromosomes.</li><li>• Relate an organism’s genotype and phenotype and explain the role of genes in inheritance.</li><li>• Understand the reason why a given genotype does not always result in the same phenotype</li><li>• Demonstrate knowledge of genetic principles and their application in society</li><li>• Construct and analyze pedigrees to determine mode of inheritance of disorders and traits.</li></ul>

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
MODULE 1: TRANSMISSION GENETICS	UNIT 1: MODES OF INHERITANCE <ul style="list-style-type: none"> <li>• Mendel's laws of inheritance, test cross, back cross</li> <li>• Gene interactions: 9:3:3:1/12:3:1 / 9:3:4 / 9:6:1 / 9:7 / 15:1 / 13:3. lethal genes, penetrance.</li> <li>• Inheritance of Multiple Alleles and Multiple genes</li> </ul>	06
	UNIT 2: PATTERN OF INHERITANCE BY PEDIGREES <ul style="list-style-type: none"> <li>• Construction of Pedigrees</li> <li>• Analysis of Pedigree analysis : autosomal dominant, autosomal recessive, X-Linked dominant, X-linked recessive, Y-linked, Mitochondrial inheritance</li> <li>• Sex limited and Sex influenced and multifactorial inheritance disorders in humans</li> </ul>	09
MODULE 2: CHROMOSOME STRUCTURE AND ABNORMALITIES	UNIT 3: CHROMOSOME STRUCTURE <ul style="list-style-type: none"> <li>• Chromosome morphology- chromatid, Centromere, secondary constriction, chromomere</li> <li>• Heterochromatin and euchromatin</li> <li>• Chromosome structure and organization.</li> <li>• Human chromosomes and karyotype.</li> </ul>	06
	UNIT 4: CHROMOSOMAL ABERRATION <ul style="list-style-type: none"> <li>• Numerical aberrations: Types- Aneuploidies and Euploidies, Mosaicism, Numerical aberrations in humans</li> <li>• Structural Abnormalities: Types-Deletions, inversions, Translocations, duplications. Structural aberrations in humans.</li> </ul>	09
MODULE 3: GENE MUTATIONS, SEX DETERMINATION.	UNIT 5: GENETIC MUTATIONS. <ul style="list-style-type: none"> <li>• characteristics of mutations</li> <li>• classification of mutations (Spontaneous, Induced)</li> <li>• molecular basis of mutations</li> <li>• Mutagens – physical and chemical</li> </ul>	08
	UNIT 6: SEX DETERMINATION. <ul style="list-style-type: none"> <li>• Environmental Sex Determination – hormonal, egg size, incubation temperature.</li> <li>• Chromosomal sex determination - <math>XX^{\ominus}</math> and <math>XO^{\sigma}</math>, <math>XO^{\ominus}</math> and <math>XX^{\sigma}</math>, <math>ZW^{\ominus}</math> and <math>ZZ^{\sigma}</math>, <math>XX^{\ominus}</math> and <math>XY^{\sigma}</math>, Diploid female and Haploid male, single gene effect.</li> <li>• Molecular basis of sex determination: Geneic imbalance, Sex index, Intersex and gynandomorphs, X/A Ratio.</li> <li>• Sex determination by Y linked genes, Dosage compensation, X-inactivation</li> </ul>	07

<b>PRACTICAL COMPONENT OF ZOO-II.C-4: FUNDAMENTALS OF ANIMAL AND HUMAN GENETICS. DURATION - 02 HRS /WEEK</b>		
Sr. No	Practical	No. of Practicals
1)	Verification of Mendel's laws - monohybrid cross	01
2)	Verification of Mendel's laws - dihybrid cross	01
3)	Manual Karyotyping of human chromosome plates: 1) Normal Male and Female 2) Downs syndrome 3) Turners Syndrome	04
4)	Drosophila Culture technique	01
5)	Study of Mutants of Drosophila	01
6)	Exercises for Multiple alleles and Multiple genes	02
7)	Construction of pedigrees	01
8)	Analysis and interpretation of Pedigrees	01

#### **REFERENCE BOOKS FOR THEORY:**

- 1) Gardner EJ, Simmons MJ and Snustad DP (2013): Principles of Genetics, Eighth Edition, John Wiley Publication, Singapore.
- 2) De Robertis EDP, De Robertis EMF (2012): Cell and Molecular Biology, Eighth Edition. Wolter Kluwer Publication, Philadelphia.
- 3) Singh BD (2014): Fundamentals of Genetics. Second Edition, Kalyani Publishers, New Delhi.
- 4) Lewis R (2009): Human Genetics, Concepts and Applications, Seventh Edition. McGraw-Hill International Edition, New York.
- 5) Gangane SD (2009): Human genetics, Third Edition, Reed Elsevier India Pvt Ltd., Haryana India.
- 6) Gardner A, Davies T (2010): Human Genetics, Second Edition, Scion Publishing Ltd, UK.
- 7) Marcus A(2011): Genetics, MJP Publishers, Chennai.
- 8) Verma PS and Agarwal VK (2014): Cell Biology Genetics Molecular Biology Evolution & Ecology. S Chand and Company PVT LTD, New Delhi.
- 9) Kothari ML, Mehta L, Roychoudhury SS (2009): Essentials of Human Genetics, Fifth edition, University Press Pvt. Ltd. Hyderabad.

#### **REFERENCE BOOKS FOR PRACTICALS:**

- 1) Gangane SD (2009): Human genetics, Third Edition, Reed Elsevier India Pvt Ltd., Haryana India.
- 2) Marcus A(2011): Genetics, MJP Publishers, Chennai.
- 3) Gardner A, Davies T (2010): Human Genetics, Second Edition, Scion Publishing Ltd, UK.
- 4) Lewis R (2009): Human Genetics, Concepts and Applications, Seventh Edition. McGraw-Hill International Edition, New York.

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## SEMESTER –III

### CORE COURSE :HUMAN PHYSIOLOGY

<b>COURSE CODE:</b>	ZOO-III.C-5
<b>MARKS:</b>	100 [75 –Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [03 –Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	The primary goal of this course is to offer an in-depth presentation of the function of the major organs and organ systems of the human body. The course is designed to expand physiological concepts presented in prerequisite courses.
<b>LEARNING OUTCOME:</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• describe and explain the normal function of the cells, tissues, organs, and organ systems of the human body</li><li>• develop understanding of the functional relationships of anatomical structures to one another</li></ul>

## ZOO-III.C-5: HUMAN PHYSIOLOGY

MODULE	TOPICS	CONTACT HOURS
<b>MODULE 1: PHYSIOLOGY OF DIGESTION AND RESPIRATION (15 Hrs)</b>	UNIT 1: <i>DIGESTIVE SYSTEM</i> <ul style="list-style-type: none"> <li>• Structural organization, histology and functions of gastrointestinal tract and its associated glands;</li> <li>• Mechanical and chemical digestion of food; Absorptions of carbohydrates, lipids, proteins, water, minerals and vitamins.</li> <li>• Role of gastrointestinal hormones on the secretion and control of enzymes of Gastrointestinal tract</li> </ul>	08
	UNIT 2: <i>RESPIRATORY SYSTEM</i> <ul style="list-style-type: none"> <li>• Histology of trachea and lung;</li> <li>• Mechanism of respiration, Pulmonary ventilation; Respiratory volumes and capacities;</li> <li>• Transport of oxygen in the blood oxygen- hemoglobin &amp; myoglobin , dissociation curve and the factors influencing it Carbon monoxide poisoning; Carbon dioxide transport in the blood;</li> <li>• Buffering action of blood and haemoglobin Control of respiration</li> </ul>	07
<b>MODULE 2: PHYSIOLOGY OF EXCRETION AND CIRCULATION (15 Hrs)</b>	UNIT 3: <i>EXCRETORY SYSTEM</i> <ul style="list-style-type: none"> <li>• Structure of kidney and its histological details, Renal blood supply; Mechanism urine</li> <li>• Formation and its regulation, Regulation of acid-base balance.</li> </ul>	05
	UNIT 4: <i>CIRCULATORY SYSTEM</i> <ul style="list-style-type: none"> <li>• An outline structure of heart; Coronary circulation; structure of conducting and working</li> <li>• Myocardial fibers. Origin and conduction of cardiac impulses functions of AV node; Cardiac cycle; Cardiac output and its regulation-Frank-Starling Law of the heart, nervous and chemical regulation of heart rate; Blood pressure and its regulation; Electrocardiogram</li> <li>• Components of blood and their functions; Structure and functions of haemoglobin; Haemopoiesis; Haemostasis and Coagulation of blood; Disorders of blood.</li> </ul>	10
<b>MODULE 3: PHYSIOLOGY OF NERVOUS SYSTEM, MUSCLES AND REPRODUCTIVE SYSTEM (15 hrs)</b>	UNIT 5: <i>NERVOUS SYSTEM</i> <ul style="list-style-type: none"> <li>• Structure of neuron, resting membrane potential , Origin of action potential and its propagation across the myelinated and unmyelinated nerve fibers;</li> <li>• types of synapsis, Synaptic transmission and, Neuromuscular junction; Reflex action &amp; its types -reflex arc</li> <li>• Physiology of hearing and vision</li> </ul>	06
	UNIT 6: <i>MUSCLE</i> <ul style="list-style-type: none"> <li>• Histology of different types of muscle;</li> <li>• Ultra structure of skeletal muscle;</li> <li>• Molecular and chemical basis of muscle contraction;</li> <li>• Characteristics of muscle twitch; Motor Unit, summation &amp; tetanus</li> </ul>	04
	UNIT 7: <i>REPRODUCTIVE SYSTEM</i> <ul style="list-style-type: none"> <li>• Histology of male and female reproductive systems.</li> <li>• Puberty, Physiology of male and female reproduction.</li> </ul>	05

<b>PRACTICAL COMPONENT OF ZOO-III.C-5: HUMAN PHYSIOLOGY ( DURATION -02 HRS /WEEK)</b>		
<b>SR. NO</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1)	Enumeration of red blood cells / WBC using haemocytometer	02
2)	Estimation of haemoglobin using Sahli's haemoglobinometer	01
3)	Determination of activities of digestive enzymes (Amylase, Pepsin, Trypsin and Lipase)	02
4)	Temporary preparation of Striated muscle fibers and nerve cells.	02
5)	Urine analysis (for organic, inorganic and abnormal components)	03
6)	Examination of sections of mammalian tissues: Lung, Kidney, Gonads, Intestine, Muscles, Spinal cord, Bone and cartilage	02

#### **REFERENCE BOOKS:**

##### *Essential books:*

1. Singh HD(2011):*Textbook of Human Physiology, S Chand Publishers, New Delhi.*
2. Widmaier, Raff, & Strang(2008), *Vander's Human Physiology: The Mechanisms of Body Function, 12th edition, McGraw Hill,. ISBN 978-0-07-337810-7*
3. Tortara G J and Derrickson BH(2009). *Principles of Anatomy and physiology, 12<sup>th</sup> Edition. John Wiley & sons, Inc.*
4. Guyton Ac and Hall JE(2011). *Testbook of Medical Physiology, 12<sup>th</sup> Edition, Harcourt Asia Pvt Ltd, WB Saunders Company.*

##### *Supplementary Reading:*

5. Openstax College (2013). *Anatomy and Physiology. Vol II. Mainstreet MS, Houston Texas(Ebook)*
6. Forciea B (2012). *An eText of Human Anatomy and Physiology(Ebook).*
7. Wingerd B(2008). *The Human Body, Essential Anatomy and Physiology. University Readers, SanDiego CA.*

#### **REFERENCE BOOKS FOR PRACTICALS:**

1. Openstax College (2013). *Anatomy and Physiology. Vol II. Mainstreet MS, Houston Texas(Ebook)*
2. Forciea B (2012). *An eText of Human Anatomy and Physiology(Ebook).*
3. Wingerd B(2008). *The Human Body, Essential Anatomy and Physiology. University Readers, SanDiego CA.*

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## SEMESTER - IV

<b>CORE COURSE: BIOCHEMISTRY AND METABOLIC REGULATION</b>	
COURSE CODE:	ZOO-IV.C-6
MARKS:	100 [ 75 -Theory ; 25- Practicals]
CREDITS:	04 [ 03 -Theory; 01- Practical]
CONTACT HOURS:	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
COURSE OBJECTIVES:	<ul style="list-style-type: none"><li>• To understand the basic principles that govern the functioning of living systems</li><li>• To know the structure of biomolecules and the role they play in governing life processes through the pathways</li><li>• To be familiar with enzymes and their activities</li></ul>
LEARNING OUTCOME:	At the end of the course, the students will be able to understand better the chemical basis in life. They will appreciate better the interactions between the biological molecules.

## ZOO-IV.C-6: BIOCHEMISTRY AND METABOLIC REGULATION

MODULE	TOPICS	CONTACT HOURS
<b>MODULE 1:</b>  <b>Fundamentals of biochemistry and Carbohydrate metabolism</b>	1.1 Principles of pH, buffer, thermodynamics 1.2 Enzymes: classification, properties of enzyme, enzyme kinetics, Michaelis-Menten Equation, enzyme inhibition 1.3 Carbohydrate structure, aerobic and anaerobic glycolysis, Citric acid cycle, glycogenesis, glycogenolysis, Pentose phosphate pathway, 1.4 Diabetes mellitus	<b>15</b>
<b>MODULE 2:</b> <b>Lipid and Protein metabolism</b>	2.1: Lipid: -structure and classification, -fatty acid synthesis -fatty acid oxidation (saturated and unsaturated), - metabolism of glycerophospholipids, sphingolipids, cholesterol - disorders: fatty liver types (NAFL, AFL)  2.2 Protein: - structure (primary, secondary, tertiary) and classification -amino acid biosynthesis, nucleotide biosynthesis, - amino acid catabolism, urea cycle, Fate of carbamoyl P, - Hyper uricemia	<b>15</b>
<b>MODULE 3:</b> <b>Nucleotide metabolism and integration of metabolism</b>	3.1 Biosynthesis of purine and pyrimidine (de novo and salvage pathway) 3.2 Degradation of purine and pyrimidine 3.3 Interconversions between the three principal components 3.4 Metabolism in starvation: Carbohydrate, lipid, proteins (The feed/fast cycle)	<b>15</b>

<b>PRACTICAL COMPONENT OF ZOO-IV.C-6: BIOCHEMISTRY AND METABOLIC REGULATION ( DURATION -02 HRS /WEEK)</b>		
Sr. No	Practical	No. of Practicals
1)	Principle and working of spectrophotometer	01
2)	Estimation of reducing sugars DNSA method	01
3)	Estimation of protein – Folin Lowry’s method	01
4)	Estimation of fatty acids by titration method	01
5)	Separation of lipids by thin layer chromatography	02
6)	Colorimetric estimation of liver glycogen of chick by Anthrone method	02
7)	Effect of substrate concentration on amylase activity	01
8)	Estimation of DNA by DPA method	01
9)	Isolation of lecithin and cholesterol from yolk	02

#### **REFERENCE BOOKS:**

1. David, L.N. and Cox, M. Michael (2008) Lehninger principles of biochemistry. W.H. Freeman and Company, New York.
2. Delvin, T.M. (1997). Textbook of biochemistry with clinical correlations. Wiley liss.
3. Harvey, A.R. and Ferrier, D. (2011). Lippincott’s Illustrated Reviews Biochemistry. Wolters Kluwer, Lippincott Williams and Wilkins. 5<sup>th</sup> Edition.
4. Pratt, W.C. and K. Cornely 2003 Essential Biochemistry Wiley Publications third edition.

#### **REFERENCE BOOKS FOR PRACTICALS:**

Plummer, M. and D.T. Plummer (1988) Introduction to practical biochemistry. Tata McGraw Hill Education ,UK.

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## SEMESTER – V

<b>CORE COURSE:DEVELOPMENTAL BIOLOGY</b>	
<b>COURSE CODE:</b>	ZOO-V.C-7
<b>MARKS:</b>	100 [ 75 –Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 –Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	<ul style="list-style-type: none"><li>• To understand the processes of fertilization, polyspermy and activation of egg metabolism</li><li>• To know the basics of animal development, specifically in sea urchin and chick</li><li>• To be familiar with the processes that help in the establishment of basic plan of development</li></ul>
<b>LEARNING OUTCOME:</b>	<ul style="list-style-type: none"><li>• At the end of the course, the students will be able to understand the basic plan of animal development. They will be familiar with the processes which occur during the course of development in invertebrates and vertebrates. This paper will provide the basic knowledge of developmental biology.</li></ul>

## ZOO-V.C-7: CORE COURSE:DEVELOPMENTAL BIOLOGY

MODULE	TOPICS	CONTACT HOURS
<b>MODULE 1:</b> <b>Early embryonic development and early development of model organism: sea urchin</b>	1.1: Introduction to cell division: mitosis and meiosis	} 05
	1.2: Fertilization: structure of the gametes	
	1.3: Species recognition specificity of egg and sperm	} 04
	1.4: Gamete fusion and the prevention of polyspermy	
	1.5: The activation of egg metabolism	} 06
	1.6: Fusion of the genetic material	
	1.7: Rearrangement of the egg cytoplasm	
	1.8: Sea Urchin: cleavage, gastrulation, blastula formation	
	1.9: Fate maps and the determination of sea urchin blastomeres, gastrulation	
	1.10: Embryonic stem cells: Pluripotency and totipotency	
<b>MODULE 2:</b> <b>Early development of model organism: chick</b>	2.1: Chick: cleavage, gastrulation, primitive streak, epiboly	} 05
	2.2: Axis formation in the chick embryo	07
	2.3: Development upto three days of incubation	03
	2.4: Extra embryonic membranes of chick development, structure and functions of yolk sac, amnion, chorion and allantois	
<b>MODULE 3:</b> <b>Growth and regeneration</b>	3.1: Nuclear transplantations and embryonic inductions	04
	3.2: Size and proportion, aging, theories of ageing, postnatal disorders of growth and differentiation	06
	3.3: Distribution of regenerative capacity, Planarian regeneration, regeneration of limb and tail in vertebrates	05
	3.4: Hejmadi Mohanty's experiment	



<b>PRACTICAL COMPONENT OF ZOO-V.C-7 ( DURATION -02 HRS /WEEK)</b>		
<b>SR. NO.</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1)	Observation of developmental stages of sea urchin: cleavage, blastula, gastrula (permanent slides)	01
2)	Study of morphogenetic movement <i>in vivo</i> in hens egg using vital staining technique by preparing window opening	01
3)	<i>In vitro</i> observation of different extra embryonic membrane in a six days old chick embryo	01
4)	Preparation of permanent slides of chick embryo: 24 hours, 36 hours, 48 hours, 72 hours	06
5)	Effect of retinoic acid on regeneration of fin in fish	01
6)	Mounting of eye vesicles and limb buds of six day old chick embryo	01
7)	Effect of lead acetate / mercuric chloride on the neural tube development of chick embryo	01

**REFERENCE BOOKS:**

1. Gilberts, S.F. (2013). *Developmental Biology*, Sinauer Associates, Sunderland.
2. Jain, P.C. (2013). *Elements of developmental biology*, Vishal Publications, Jalandhar
3. Slack, J.M.W. (2006). *Essential developmental biology*. Blackwell Publishing, U.K.

**REFERENCE BOOKS FOR PRACTICALS:**

1. Beffa – Mari, M. And J. Knight (2005) *Key experiments in practical developmental biology*. Cambridge University Press.
2. Tyler, M.S. (2000) *Developmental biology, a guide for experimental study*. Sinauer Associates, Inc. Publishers, Sunderland, MA.

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## SEMESTER – VI

<b>CORE COURSE: WILDLIFE BIOLOGY</b>	
<b>COURSE CODE</b>	<b>ZOO-VI-C-8</b>
<b>MARKS</b>	100 [75 –Theory ; 25- Practical]
<b>CREDITS</b>	04 [03 –Theory; 01- Practical]
<b>CONTACT HOURS</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES</b>	This course is designed to enable students to understand the basics of wildlife status, conservation, assessment and management.
<b>LEARNING OUTCOME</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>▪ Know the techniques used in assessment and monitoring of wildlife.</li><li>▪ Know about the diversity, extent, range of wildlife population dynamics.</li></ul>

## ZOO-VI-C-8: WILDLIFE BIOLOGY

MODULE	TOPICS	CONTACT HOURS
<b>MODULE 1: INTRODUCTION TO WILDLIFE</b>	<p>UNIT 1: Introduction to wildlife</p> <ul style="list-style-type: none"> <li>• Values of wildlife - Conservation ethics, Importance of conservation, Causes of depletion, World conservation strategies.</li> </ul> <p>UNIT 2: Evaluation and management of wildlife</p> <ul style="list-style-type: none"> <li>• Habitat analyses, Physical parameters: Topography, Geology, Soil and water.</li> <li>• Biological Parameters: food, cover, forage, browse and ground cover estimation.</li> <li>• Standard evaluation procedures: remote sensing and GIS.</li> </ul>	15
<b>MODULE 2: POPULATION ESTIMATION AND PROTECTED AREAS</b>	<p>UNIT 3: Population estimation</p> <ul style="list-style-type: none"> <li>• Population density, natality, mortality, fertility schedules and sex ratio computation.</li> <li>• Analysis of scat and dropping of ungulates and carnivores.</li> <li>• Trichotaxonomy, pug marks and census method based on indirect evidences.</li> </ul> <p>UNIT 4: Protected areas</p> <ul style="list-style-type: none"> <li>• Protected Area network (PAN): National parks and wildlife sanctuaries.</li> <li>• Biogeographical features of important features of protected areas in India (any 3).</li> <li>• Tiger conservation - tiger reserves in India, challenges and management of tiger reserves.</li> </ul>	15
<b>MODULE 3: MANAGEMENT OF WILDLIFE</b>	<p>UNIT 5: Management of habitats</p> <ul style="list-style-type: none"> <li>• Setting back succession, grazing logging, mechanical treatment, advancing the succession process, artificial feeding grounds.</li> <li>• Cover construction, preservation of general genetic diversity, restoration of degraded habitats,</li> </ul> <p>UNIT 6: Management planning of wildlife in protected areas</p> <ul style="list-style-type: none"> <li>• Habitat carrying capacity, visitors carrying capacity, eco tourism / wild life tourism, concept of climax persistence, ecology of perturbation.</li> <li>• Role of national / state statutory bodies on governing wildlife (NBWL, IUCN, CITES, state wildlife boards and forest department).</li> </ul> <p>UNIT 8: Management of critical population</p> <ul style="list-style-type: none"> <li>• Radio- telemetry, care of injured and diseased animal, quarantine, common diseases of wild animals, capture and translocation of wildlife.</li> <li>• Captive management – a brief idea.</li> </ul>	15

<b>PRACTICAL COMPONENT OF WILDLIFE BIOLOGY</b>		
<b>ZOO-VI-C-8: ( DURATION: 30 HOURS – 02hrs/WEEK)</b>		
<b>SR. NO</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1)	Study of butterflies and their host plants on the campus / molluscs/ ants/ spiders / birds	02
2)	Acquainting oneself with basic equipment needed in wildlife studies; use, care and maintenance (compass, binoculars, spotting scope, range finders, Global Positioning System, various types of cameras and lenses)	02
3)	Familiarization and study of species specific evidences in the field; Identification of animals through pug marks, hoof marks, scats, pellet groups, nest, antlers, feathers, etc. – case study	02
4)	Demonstration of various field techniques for flora and fauna: PCQ, Ten tree method, Circular, Square and rectangular plots, Parker’s 2 Step and other methods for ground cover assessment, Tree canopy cover assessment, Shrub cover assessment	03
5)	Trail / transect-quadrante monitoring for abundance and diversity estimation of mammals and birds (direct and indirect evidences) (on campus or fieldtrip)	03

**REFERENCE BOOKS:**

1. Caughley, G., and Sinclair, A.R.E. (1994). Wildlife Ecology and Management. Blackwell Science.
2. Woodroffe R., Thirgood, S. and Rabinowitz, A. (2005). People and Wildlife, Conflict or Co-existence. Cambridge University.
3. Bookhout, T.A. (1996). Research and Management Techniques for Wildlife and Habitats, 5<sup>th</sup> edition. The Wildlife Society, Allen Press.
4. Sutherland, W.J. (2000). The Conservation Handbook: Research, Management and Policy. Blackwell Sciences
5. Hunter M.L., Gibbs, J.B. and Sterling, E.J. (2008). Problem-Solving in Conservation Biology and Wildlife Management: Exercises for Class, Field, and Laboratory. Blackwell Publishing.

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**PARVATIBAI CHOWGULE COLLEGE OF ARTS AND SCIENCE  
(Autonomous)  
PROGRAMME BSC ZOOLOGY  
COURSE CURRICULUM - ELECTIVE COURSES**

	<b>SEMESTER</b>	<b>COURSE CODE</b>	<b>CORE COURSES</b>
<b>ODD SEMESTER</b>	<b>III</b>	ZOO-III.E-1	Vertebrate Endocrinology
		ZOO-III.E-2	Basic microbiology and Fundamentals of Animal Biotechnology
		ZOO-III.E-3	Environmental Toxicology
		ZOO-III.E-4	Parasitology
	<b>V</b>	ZOO-V.E-9	Molecular Genetics and Forensic Science
		ZOO-V.E-10	Economic Zoology
		ZOO-V.E-11	Ecology and Ethology
		ZOO-V.E-12	Fish Preservation and Processing
<b>EVEN SEMESTER</b>	<b>IV</b>	ZOO-IV.E-5	Animal cell culture and Applications
		ZOO-IV.E-6	Aquaculture and Fisheries
		ZOO-IV.E-7	Immunology
		ZOO-IV.E-8	Evolutionary Biology
	<b>VI</b>	ZOO-VI.E-13	Health and Nutrition
		ZOO-VI.E-14	Basic and Applied Entomology
		ZOO-VI.E-15	Laboratory Techniques in Pathology
		ZOO-VI.E-16	Bio Entrepreneurship

## ODD SEMESTER

### SEMESTER – III

<b>ELECTIVE COURSE: ENDOCRINOLOGY</b>	
<b>COURSE CODE:</b>	ZOO-III.E-1
<b>MARKS:</b>	100 [ 75 –Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 –Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	<ul style="list-style-type: none"><li>• To study the endocrine organs of vertebrates</li><li>• To understand the underlying principles of hormone functions</li><li>• To gain an insight into the current and important issues in endocrinology</li></ul>
<b>LEARNING OUTCOME:</b>	At the end of the course, the students will be familiar with all the endocrine organs and their functions in body growth, metabolism, reproduction and development. They will be able to appreciate better the contemporary issues in endocrinology.

## ZOO-III.E-1: ENDOCRINOLOGY

MODULE	TOPICS	CONTACT HOURS
<b>MODULE 1:</b>  <b>Anatomy and histology</b>	Unit 1: 1.1 Aim and scope of endocrinology, 1.2 techniques in endocrinology - histology, histochemistry, immunocytochemistry, in situ hybridisation, radio immune assay, surgical techniques, 1.3 regulation of hormone secretion: feedback mechanisms - positive, negative, short loop, long loop	15
	Unit 2: 2.1 Anatomy and histology of endocrine glands- Pituitary, Pineal gland, Thyroid, Parathyroid, Thymus, Adrenal, Endocrine pancreas, GI tract, Endocrine hypothalamus, Gonads, Placenta	
<b>MODULE 2:</b>  <b>Hormones</b>	Unit 3: 3.1 Classification of hormones 3.2 Hormone structure 3.3 Biological actions of hormones	15
	Unit 4: 4.1 Mechanisms of hormone action 4.2 Receptor and its regulation 4.3 Steroid and peptide hormones actions	
	Unit 5: 5.1 Hormones and Homeostasis - Calcium and glucose	
<b>MODULE 3:</b>  <b>Pathological conditions</b>	Unit 6: 6.1 Biosynthesis and secretion of hormones - steroid hormones, thyroid hormones	15
	Unit 7: 7.1 Growth factors - neurotropic growth factors, hematopoietic growth factors, other peptide growth factors	
	Unit 8: 8.1 Endocrine disorders - goitre, gigantism, dwarfism, cretinism, diabetes mellitus, insipidus	

<b>PRACTICAL COMPONENT OF ZOO-II.C-3: Vertebrate Endocrinology ( DURATION -02 HRS /WEEK)</b>		
<b>Sr. No</b>	<b>Practical</b>	<b>No. of Practicals</b>
1)	Histological slides of Endocrine hypothalamus, Gonads, Placenta pituitary, Pineal gland, thyroid gland, Parathyroid, Thymus, adrenal gland, pancreas, ovary, testis	04
2)	Display of Pituitary and gonads in fishes/chick	03
3)	Preparation of histological slides using microtomy	05

#### REFERENCE BOOKS:

1. David, N.O. and J.A. Carr (2013) Vertebrate Endocrinology. Academic press publications 5<sup>th</sup> edition.
2. Hadley, M. and Levine, J (2006) Endocrinology. Benjamin Cummings 6<sup>th</sup> edition.
3. Kovacs, J.W. and S.R. Ojeda (2011) Textbook of endocrine physiology 6<sup>th</sup> edition. Oxford university press.
4. Yadav, P.R. (2004) Endocrinology. Discovery Publishing House, New Delhi.

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**ELECTIVE COURSE: BASIC MICROBIOLOGY AND  
FUNDAMENTALS OF ANIMAL BIOTECHNOLOGY**

<b>COURSE CODE:</b>	ZOO-III-E-2
<b>MARKS:</b>	100 [ 75 -Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 -Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	To provide a comprehensive survey of microbiology with basic information on bacteria and learn the fundamentals of biotechnological techniques.
<b>LEARNING OUTCOME:</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• Gain working knowledge of basic bacterial laboratory techniques, as well as the foundations of biotechnological tools.</li><li>• Students will also master the basic laboratory skills and techniques necessary to work efficiently in a microbiology laboratory and perform techniques of gene insertion and selection of recombinant plasmids.</li></ul>

## ZOO-III-E-2: BASIC MICROBIOLOGY AND FUNDAMENTALS OF ANIMAL BIOTECHNOLOGY

MODULE	TOPICS	CONTACT HOURS
<b>MODULE 1: Microbiology (15 hrs)</b>	1: Introduction to Microorganisms-Bacteria <ul style="list-style-type: none"> <li>○ Structure and Identification of bacteria(morphological types)</li> <li>○ Nutritional types</li> <li>○ Nutritional requirements</li> </ul>	08
	2: Isolation and Culture of Bacteria: <ul style="list-style-type: none"> <li>○ Cultivation of bacteria</li> <li>○ Different methods of isolation and maintenance of pure cultures</li> <li>○ Culture characteristics</li> </ul>	04
	3: Use of microorganisms in biotechnology-An overview: <ul style="list-style-type: none"> <li>○ Production of valuable substances</li> <li>○ Fuel Production, recovery of minerals and oils</li> <li>○ Microorganisms in bioassays</li> <li>○ Food and agriculture sector</li> <li>○ Medicine and health</li> </ul>	03
<b>MODULE 2: Tools in Biotechnology (15 hrs)</b>	4: Scope and importance of Biotechnology <ul style="list-style-type: none"> <li>○ Definition</li> <li>○ Contribution and importance of biotechnology</li> </ul>	03
	5: Nucleic Acid Enzymology: <ul style="list-style-type: none"> <li>○ Restriction enzymes, Ligases, Alkaline phosphatase</li> <li>○ Polynucleotide kinase, Terminal Transferases, S1 Nuclease</li> <li>○ Polymerases, Reverse transcriptase</li> </ul>	07
	6: Gene Cloning vectors: <ul style="list-style-type: none"> <li>○ Plasmids, Bacteriophage, cosmids</li> <li>○ Shuttle and expression vectors</li> </ul>	05
<b>MODULE 3: Genetic Engineering (15 hrs)</b>	7: Techniques in genetic engineering: <ul style="list-style-type: none"> <li>○ Gene transfer methods</li> <li>○ Methods of Labeling Nucleic acids</li> <li>○ Nucleic acid Hybridization</li> <li>○ Polymerase chain reaction</li> </ul>	05
	8: Recombinant DNA technology: <ul style="list-style-type: none"> <li>○ Procedure / Technique</li> </ul>	04
	9: Blotting Techniques: <ul style="list-style-type: none"> <li>○ Southern Blotting</li> <li>○ Northern Blotting</li> <li>○ Western Blotting</li> </ul>	03
	10: DNA sequencing techniques: <ul style="list-style-type: none"> <li>○ Chemical Degradation method</li> <li>○ Chain termination method</li> <li>○ Automated Sequencing</li> </ul>	03

**PRACTICAL COMPONENT OF ZOO-III-E-2: DURATION - 02 HRS /WEEK  
BASIC MICROBIOLOGY & FUNDAMENTALS OF ANIMAL BIOTECHNOLOGY**

SR. NO	PRACTICAL	NO. OF PRACTICALS
1)	Preparation of culture media for bacteria (Plates, Slants, deeps, Broth).	02
2)	Staining of Microorganisms (Gram staining, negative staining).	02
3)	Isolation of pure colonies of Bacteria (streak plate method – 3 Quadrant And 5 Quadrant methods)	02
4)	Identification of Products of metabolic pathways of microbial cells.	01
5)	Bacteriological testing of Milk.	01
6)	DNA sequencing - Analysis of prints.	01
7)	Isolation of Plasmid DNA (Demonstration)	02
8)	Transformation of bacteria (Selection by blue-white colony method – demonstration practical	02

**REFERENCE BOOKS:**

*Essential books:*

- 1) Pelczar MJ, Chan ECS, Krieg NR(2009). *Microbiology*. Tata Mc Graw Hill, New York.
- 2) Dubey RC and Maheshwari DK (2012). *A test book of Microbiology*. S Chand Publishers, New Delhi.
- 3) Prave P, Faust U, Sittig W and Sukatsh DA(2004). *Fundamentals of Biotechnology*.
- 4) Purohit SS(2008). *Biotechnology Fundamentals and applications*. Agrobios, Jodhpur India.
- 5) Ranga MM(2012): *Animal Biotechnology*. Agrobios, Jodhpur India.

*Supplementary reading:*

- 6) Black JG(2005). *Microbiology principles and explorations*. John Wiley and sons Inc.
- 7) Sullia SB and Shantharam S(2006). *General Microbiology*. Oxford and IBH Publishing Co Pvt Ltd, NewDelhi.

**REFERENCE BOOKS FOR PRACTICALS:**

- 1) Gunasekaran P(2009). *Lab Manual in Microbiology*. New Age International Ltd. Publishers, New Delhi.

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**ELECTIVE COURSE: ENVIRONMENTAL TOXICOLOGY**

<b>COURSE CODE:</b>	ZOO-III-E-3
<b>MARKS:</b>	100 [ 75 -Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 -Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	<ul style="list-style-type: none"><li>• To study the different environmental pollutants and their toxicity.</li><li>• To know the physiological effects of toxicant exposure.</li></ul>
<b>LEARNING OUTCOME:</b>	After completion of the course students are expected to be able to: <ul style="list-style-type: none"><li>• Distinguish, classify and characterize a variety of environmental pollutants based on their biological and physical properties.</li><li>• Identify the main sources and types of environmental pollutants and assess their potential environmental fate.</li><li>• Will learn mechanisms of detoxification of various varieties of toxicants.</li><li>• Will learn bio-indicators of exposure to specific environmental contaminants.</li><li>• Identify potential solutions to anthropogenic pollution</li></ul>

## ZOO-III-E-3: ENVIRONMENTAL TOXICOLOGY

MODULE	TOPIC	CONTACT HOURS
<b>MODULE 1: INTRODUCTION TO TOXICOLOGY</b>	<p><b>1.1 Introduction To Toxicology:</b></p> <ul style="list-style-type: none"> <li>○ Definition and History of Toxicology and Toxicity</li> <li>○ Disciplines of Toxicology</li> <li>○ Biouptake, Bioaccumulation, Biotransfer and Biological Magnification, Relationship to Other Sciences, Scope and importance of Toxicology</li> </ul> <p><b>1.2: Classes Of Toxicant:</b></p> <ul style="list-style-type: none"> <li>• Define Toxicant and Toxins, their classification</li> <li>• Toxicants in Air, Water and Soil</li> <li>• Toxicants in Domestic and Occupational Settings</li> <li>• Synthetic drugs: Solvents; Therapeutic drugs, Drugs of abuse, Combustion products, Cosmetics</li> <li>• Movement and fate of Toxicants in the environment</li> </ul>	<b>15</b>
<b>MODULE 2: ENVIRONMENTAL IMPACT MITIGATION</b>	<p><b>2.1: Toxicity Of Heavy Metals:</b></p> <ul style="list-style-type: none"> <li>• Toxicity of Arsenic, Lead, Mercury,</li> <li>• Cadmium, Copper, Zinc, Aluminium, Iron and Manganese; Sources and portals of heavy metal pollutants; Toxicity of substances on Human and Animals</li> </ul> <p><b>2.2: Agro-Chemical Pesticides And Their Environmental Impact Mitigation</b></p> <ul style="list-style-type: none"> <li>• Definition and Classification</li> <li>• Organochlorine Insecticides, Organophosphate Insecticides, Carbamates, Pyrethroid Insecticides, Dinitrophenols, Herbicides, Fungicide</li> <li>• Control of Pesticide Pollution; Integrated Pest management</li> </ul>	<b>15</b>
<b>MODULE 3: TOXINS AND FOOD ADDITIVES</b>	<p><b>3.1: Toxins:</b></p> <ul style="list-style-type: none"> <li>• History, Classes of Toxicants: Microbial, Mycotoxins, Algaltoxins, Planttoxins, Animaltoxins,</li> </ul> <p><b>3.2: Food Additives:</b></p> <ul style="list-style-type: none"> <li>• General account of Food Additives:</li> <li>• Incidental or Indirect additives</li> <li>• Intentional or Direct additives: a. Antioxidants b. Emulsifiers c. Enzymes d. Flavouring agents e. Colour and preservatives f. Artificial sweetening agents i) Saccharine ii) Urea derivatives</li> </ul>	<b>15</b>

<b>PRACTICAL COMPONENT OF ZOO-III.E-3:ENVIRONMENTAL TOXICOLOGY ( DURATION-02 HRS/WEEK)</b>		
<b>Sr.No.</b>	<b>Practical</b>	<b>No.of Practicals</b>
1.	To determine the effect of temperature on the toxicity of a pollutant	01
2.	To determine the effect of pH on the toxicity of a pollutant.	01
3.	To Separate and analyse the residues of carbamate pesticides by thin layer chromatography.	01
4.	To evaluate qualitatively the presence of pesticide residues in vegetable samples.	01
5.	Estimation of total dissolved solids in given water sample.	01
6.	To determine Lc <sup>50</sup> of a pollutant on mosquito larvae .	02
7.	Effect of pesticides on Oxygen consumption in fish	01
8.	Estimation of Phosphorus in given water sample by Spectrophotometer	01
9.	Estimation of Boron from given water/soil sample by spectrophotometer	01
10.	Estimation of Primary Productivity by Light and Dark bottle method.	02
11.	Estimation of Fluorides in given water sample	01
12.	Determination of Nitrates from given water sample.	<b>01</b>

#### **REFERENCE BOOKS FOR THEORY:**

1. Ernst Hodgson(2004) A Text Book of Modern Toxicology ,A John Wiley and sons Inc,Publication.
2. Gupta P.K.(2010) Modern Toxicology, Pharma Med Press, Hyderabad.
3. Omkar(2007) Concepts of Toxicology ,Vishal Publishing Co, Jalandhar
4. Pandey K,Shukla J.P. and Trivedi S.P. (2011)Fundamentals of Toxicology,New Central Book Agency(P) Ltd.
5. P.D.Sharma (2011)Environmental Biology and Toxicology (Third edition),Rastogi Publications,Meerut-250002.

#### **REFERENCE BOOKS FOR PRACTICALS:**

1. Adam Wooley (2008) A Guide to Practical Toxicology:Evaluation,Prediction,and Risk IIInd Edition,Informa Healthcare U.S.A.,Inc. New York.
2. Rao K.S. (1998) Practical Ecology,Anmol Publications Pvt. Ltd. New Delhi.

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## **ELECTIVE COURSE: PARASITOLOGY**

<b>PAPER CODE:</b>	ZOO-III.E-4
<b>MARKS:</b>	100 [ 75 -Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 -Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	<ul style="list-style-type: none"><li>• To be familiar with the parasite host interactions.</li><li>• To gain knowledge on diagnosis of parasite infections and also to learn about the preventive measures.</li></ul>
<b>LEARNING OUTCOME:</b>	At the end of the course the learner will be acquainted with dimensions of public health viz a viz parasitic diversity, epidemiology and community prophylaxis

## ZOO-III.E-4: PARASITOLOGY

MODULE	TOPICS	CONTACT HOURS
<b>MODULE 1:</b>  <b>Basic Principles of Parasitology and parasitic protozoans</b>	1.1 Parasite systematics, Ecology and Evolution 1.2 Immunology and Pathology 1.3 Symbiosis and parasitism 1.4 Parasite host interactions Form, function, classification, life cycle, diagnosis and preventive measures 1.5 <i>Trypanosomagambiens</i> 1.6 Amoebas - <i>Entamoebahistolytica</i> 1.7 Malaria organisms - <i>Plasmodium vivax</i> 1.8 Sexually transmitted parasite - <i>Trichomonasvaginalis</i>	<b>15</b>
<b>MODULE 2:</b>  <b>Parasitic Platyhelminthes and Nematodes</b>	Form, function, classification, life cycle, diagnosis and preventive measures 2.1 Trematoda(liver fluke - <i>Fasciola hepatica</i> , intestinal fluke - <i>Fasciolopsisbuski</i> , lung fluke - <i>Paragonimuswestermani</i> ); 2.2 Cestoda (Tape worm - <i>Taeniasolium</i> ) 2.3 Hook worms- <i>Ancylostoma duodena</i> 2.4Guinea worm- <i>Dracanculusmedinensis</i> 2.5Round worm <i>Ascarislumbricoids</i> , <i>Enterobiasvermicularis</i> 2.6 <i>Wuchereriabancrofti</i>	<b>15</b>
<b>MODULE 3:</b>  <b>Parasitic arthropods and Parasites of domestic livestock</b>	Form, function, classification , life cycle, diagnosis and preventive measures: Copepods, Barnacles, Amphipods, Isopods, Flea, Ticks, Mites, Head and pubic lice	<b>15</b>



**PRACTICAL COMPONENT OF ZOO-III.E-4: PARASITOLOGY  
( DURATION -02 HRS /WEEK)**

<b>Sr. No</b>	<b>Practical</b>	<b>No. of Practicals</b>
1)	Study of <i>Trypanosoma gambiense</i> , <i>Entamoeba histolytica</i> , <i>Plasmodium vivax</i> , <i>Trichomonas vaginalis</i> , <i>Fasciola hepatica</i> , <i>Taenia solium</i> , <i>Ancylostoma duodenale</i> , <i>Dracunculus medinensis</i> , <i>Ascaris lumbricoides</i> , <i>Wuchereria bancrofti</i> , copepod, barnacle, amphipod, isopod from permanent slides with respect to parasitic adaptations.	06
2)	Preparation of peripheral blood smear from the perspective of detection of haemoparasites	01
3)	Study of parasites of domestic livestock (parasite, pathogenicity)	04
4)	Study of fish parasites	01

**REFERENCE BOOKS:**

1. Chatterjee, K.D. (2009) Parasitology (Protozoology and Helminthology) with two hundred fourteen illustrations. CBS, 13<sup>th</sup> edition.
2. Dey, N.C., Dey, T.K. and D.M. Sinha (1995) Medical Parasitology. New Central book agency private limited, Calcutta.
3. Paniker, J.C.K. (2007) Textbook of medical parasitology. Jaypee Brothers, New Delhi.
4. Schmidt, G.D. (1990) Essentials of Parasitology. Universal Book Stall, New Delhi.

**REFERENCE BOOK FOR PRACTICALS:**

1. Halton, D.W., Behnke, J.M. and I. Marshall (2005) Practical exercises in parasitology. Cambridge University Press.

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## SEMESTER – V

<b>ELECTIVE COURSE: MOLECULAR GENETICS AND FORENSIC SCIENCE</b>	
<b>COURSE CODE</b>	ZOO-V.E-9
<b>MARKS</b>	100 [75 – Theory; 25 – Practicals]
<b>CREDITS</b>	04 [03 – Theory; 01 – Practical]
<b>CONTACT HOURS</b>	THEORY : 45 HOURS (03 LECTURE/WEEK) PRACTICALS : 30 HOURS (01 PRACTICAL/WEEK)
<b>COURSE OBJECTIVES</b>	This course will elucidate the functional aspects of the genetic material at molecular level, focusing on gene expression and gene regulation. It will also expose students to the basics of forensic science and understand diagnostic genetics.
<b>LEARNING OUTCOME</b>	Upon successful completion of the course, students will be able to understand: <ul style="list-style-type: none"><li>▪ The process of replication, transcription and translation</li><li>▪ Difference between the gene expression in prokaryotes and eukaryotes</li><li>▪ Branches of forensic science</li><li>▪ The molecular tools used in genetic diagnosis</li></ul>

## ZOO-V.E-9: MOLECULAR GENETICS AND FORENSIC SCIENCE

MODULE	TOPICS	CONTACT HOURS
<b>MODULE 1 : Gene Expression and Gene Regulation</b>	1.1 : DNA Replication: DNA Replication in prokaryotes and eukaryotes, mechanism of DNA replication	2
	1.2: Transcription: transcription Unit, mechanism of transcription in prokaryotes and eukaryotes, synthesis of rRNA and mRNA, transcription factors	5
	1.3 : Translation: Genetic code, Process of protein synthesis, Difference between prokaryotic and eukaryotic translation, Post Transcriptional Modifications and Processing of Eukaryotic RNA	4
	1.4: Transcription regulation in prokaryotes: Principles of transcriptional regulation with examples from lac-operon and trp-operon; Transcription regulation in eukaryotes: Activators, repressors, enhancers, silencers elements; Gene silencing	4
<b>MODULE 2 : Basics of Forensic Science</b>	2.1 : Definition, overview of Disciplines of Forensic science	3
	2.2: Crime and Crime Scene management: Types of crime scenes – indoor and outdoor. Securing and isolating the crime scene. Crime scene search methods. Safety measures at crime scenes. Legal considerations at crime scenes. Documentation of crime scenes – photography, videography, sketching and recording notes.	6
<b>MODULE 3 : Diagnostic Genetics</b>	2.3: Forms of forensic evidences: -Biological evidence: Bloodstains, hair, semen, DNA -Physical and trace evidence –pattern of blood stains, fingerprints, fibres, weapons - Documents- types of forensic documents (genuine /forged), methods of detecting forged documents(handwriting analysis, Analysis of paper and inks)	6
	3.1 : Cytogenetics/ Molecular Cytogenetics/ Biochemical/ Molecular methods of detecting genetic disorders - Adult and Newborn screening	6
	3.2: Cytogenetics/ Molecular Cytogenetics/ Molecular methods of detecting genetic disorders – Prenatal and Preimplantation screening	5
	3.3: Forensic testing - DNA fingerprinting, paternity testing, personal /individual identification	4

**PRACTICAL COMPONENT OF ZOO-V.E-9: MOLECULAR GENETICS AND  
FORENSIC SCIENCE  
( DURATION -02 HRS /WEEK)**

<b>SR.NO.</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1	Isolation of DNA from peripheral blood/tissue (chick liver).	01
2	Microscopic examination of Hair a. Human scalp Hair b. Animal Hair	02
3	Sketching and Photography of various type of crime scene.	02
4	Presumptive Tests for Blood a. Phenolphthalin Assay b. Benzidine c. Leucomalachite Green (L.M.G.) d. Luminol Test	02
5	Examination of ink by TLC method	01
6	To perform ridge tracings and ridge counting	01
7	Analysis of DNA fingerprints	03

**REFERENCE BOOKS :**

- 1) *J. Prahlow (2010); Forensic Pathology for Police, Death Investigators, Attorneys, 17 and Forensic Scientists, DOI 10.1007/978-1-59745-404-9\_2, C Springer Science + Business Media, LLC (Ebook available)*
- 2) *Robert Schleif (1993). Genetics and Molecular Biology. S E C O N D E D I T I O N. Department of Biology, The Johns Hopkins University, Baltimore, Maryland. The Johns Hopkins University Press 2715 North Charles Street Baltimore, Maryland 21218-4319, The Johns Hopkins Press Ltd., London (Ebook available)*
- 3) *Richard Saferstein (2011); Forensic Science, II Edition, Prentice Hall publishers, Sanfrancisco*
- 4) *Griffith A, Wessler S, Lewontin R Gelbart W, Suzuki D and Miller J(2000). Introduction to Genetic Analysis. Eighth Edition.( Ebook available)*
- 5) *Tom Strachan and Read A (2010): Human Molecular Genetics. Fourth Edition. Garland Science Publisher, New York, NY 10017*

**REFERENCES BOOKS FOR PRACTICALS:**

- 1) *Hikmet Geckil ().Molecular Biology Lab manual. UMBC. ( Ebook available).*
- 2) *J. Prahlow (2010); Forensic Pathology for Police, Death Investigators, Attorneys, 17 and Forensic Scientists, DOI 10.1007/978-1-59745-404-9\_2, C Springer Science+Business Media, LLC (Ebook available.)*

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**ELECTIVE COURSE: ECONOMIC ZOOLOGY**

<b>COURSE CODE</b>	ZOO-V.E-10
<b>MARKS</b>	100 [75 – Theory; 25 – Practicals]
<b>CREDITS</b>	04 [03 – Theory; 01 – Practical]
<b>CONTACT HOURS</b>	THEORY : 45 HOURS (03 LECTURE/WEEK) PRACTICALS : 30 HOURS (01 PRACTICAL/WEEK)
<b>COURSE OBJECTIVES</b>	To study the various aspects of economic zoology To study the species of economic importance, classification To gain an insight whether own business can be started based on studying the zoological species and their products
<b>LEARNING OUTCOME</b>	How zoological species contribute to economic sources can be learned. Students will learn the techniques of rearing and maintenance of the species, harvesting their products and selling of species and the products

## ZOO-V.E- 10 : ECONOMIC ZOOLOGY

MODULE	TOPICS	CONTACT HOURS
<b>MODULE 1 : Scope of Economic Zoology</b>	1.1 : Economic Zoology, History, Scope,	3
	1.2 : Species of bionomic importance (Honey bee, Silkworm, lac insect, mackerel, domestic fowl, goat, sheep, cow, buffalo, pig, rats, mice)	3
	1.3 : Source, properties, constituents and nutritive value of products of bionomic importance: eggs of poultry, milk, meat, honey, medicinal value of synthetic insulin (recombinant), significance of wool, silk, lac	5
	1.4 : Organizations and their functions: agricultural and processed food products export development authority (APEDA), the marine products exports developmental authority (MPEDA), central silk board (CSB), central bee research and training institute (CBRTI), pharmaceutical and biotechnology industries (Lupin) and contract research organizations (Intox), and research institutes (NIN, Hyderabad)	4
<b>MODULE 2 : Models in Economic Zoology</b>	2.1 : Insects, products and applications : lac insects, honey bees, silkworms	3
	2.2 : Vermiculture: Rearing and maintenance of earthworms	2
	2.3 : Aquaculture : rearing and maintenance of prawns, oysters, edible and ornamental fishes	3
	2.4 : Poultry : rearing and maintenance of domestic fowl, applications and products	3
	2.5 : Business models of apiculture, sericulture, aquaculture and poultry	4
<b>MODULE 3 : Pharma products and biological control</b>	3.1 : Pharmaceuticals from animals and their Applications (antiserum), from transgenic animals (malaria vaccine, alpha 1 antitrypsin, lactoferrin, fibrinogen)	5
	3.2 : Species used in biological control : <i>Casnoidea indica</i> , <i>Trichogramma</i> , <i>Poecilia reticulata</i> / <i>Gambusia affinis</i>	5
	3.3 : Maintenance and breeding of animals for research: mice, rats, guinea pigs, rabbits, marmosets, guidelines given by committee for the purpose of control and supervision of experiments on animals (CPCSEA)	5

<b>PRACTICAL COMPONENT OF ZOO-V.E-10 ( DURATION - 02 HRS /WEEK)</b>		
<b>SR.N O.</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1	Vermicomposting	05
2	Preparation of dairy products from milk : cheese and butter	02
3	Laboratory observations of insects – Honeybee, Silk moth, Lac insect	01
4	Visit to dairy industry/poultry/ piggery/apiary/silk industry/ biotechnology industry/pharmaceutical industry/research institute	04

#### **REFERENCE BOOKS :**

- 1) G. S. Shukla, V. B. Upadhyay (2008) *Economic Zoology*, Rastogi Publications, Meerut
- 2) H. Osborn (1908) *Economic Zoology an introductory text book in zoology with special reference to its applications in agriculture, commerce and medicine* The Macmillan Company
- 3) K. P. Shrivastava, Gs Dhaliwal (2015) *Text Book of Applied Entomology* Kalyani Publishers
- 4) P. K. Gupta (2011) *Vermicomposting for Sustainable Agriculture*, Agrobios India Ltd
- 5) S. Singh (1962) *Bee-Keeping in India* ICAR New Delhi p. 214

#### **REFERENCE BOOKS FOR PRACTICALS:**

- 1) A. K. Tripathi(2009) *Mulberry Sericulture: Problems And Prospects* Aph Publishing Corporation
- 2) C.L. Metcalf and W.P Flint (1962) *Destructive and Useful Insects* New York, N.Y. : McGraw-Hill

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**ELECTIVE COURSE: ECOLOGY AND ETHOLOGY**

<b>COURSE CODE</b>	ZOO-V.E-11
<b>MARKS</b>	100 [75 – Theory; 25 – Practicals]
<b>CREDITS</b>	04 [03 – Theory; 01 – Practical]
<b>CONTACT HOURS</b>	THEORY : 45 HOURS (03 LECTURE/WEEK) PRACTICALS : 30 HOURS (01 PRACTICAL/WEEK)
<b>COURSE OBJECTIVES</b>	<ul style="list-style-type: none"><li>• To study the distribution of organisms, their interrelations in populations and communities and interactions between biotic and abiotic components</li><li>• To study impact of anthropogenic activities on ecosystem and study behaviour of organisms under natural conditions</li></ul>
<b>LEARNING OUTCOME</b>	<ul style="list-style-type: none"><li>• The student will gain better understanding in ecology and ethology</li><li>• This course also has applied value towards conservation of biodiversity and sustainable development</li></ul>



## ZOO-V.E- 11 : ECOLOGY AND ETHOLOGY

MODULE	TOPICS	CONTACT HOURS
<b>MODULE 1 : Basic Ecology</b>	1.1 :Introduction to Ecology : What is Ecology? History of ecology, ecology today, scope of ecology, objective of study,subdivisions of ecology	03
	1.2 : Ecosystem Ecology:kinds of ecosystem (marine, fresh water, terrestrial),Gaia hypothesis, deep ecology, energy flow within the Ecosystem,food chains and energy flow,ecological pyramids, ecological niche nutrient and Cycling of trace elements: Cobalt (Co), Molybdenum (Mo) and Lead.	06
	1.3: Population Ecology:population density,natality, mortality,survivorship curve and life tables,age distribution,biotic potential of population, growth models, population dispersal, regulation of population, co-operative and disoperative coactions and carrying capacity,predator –prey relationships,symbiosis	06
<b>MODULE 2 : Conservation Ecology and Basic Ethology</b>	2.1: Community Ecology:characters of a community, classification of a community,community periodism, community stratification,community succession	03
	2.2: Biodiversity and conservation: application of ecology in biodiversity conservation	04
	2.3:Introduction to Ethology: the history of ethology,approaches to study of behavior, types of behavior – instinct and learning,economic and social aspect of behaviour, ethologists and their work – Lorenz, Tinbergen, Goodall, M.K. Chandrashekar, animal behaviour :an evolutionary approach	04
	2.4: Concept of Ethology:stimulus –response concept,reflexes, innate releasing mechanisms,fixed action pattern,ethogram releaser,motivation or drive with respect to hunger and sexual behaviour	04
<b>MODULE 3 : Advanced Ethology</b>	3.1 : Approaches to studying behaviour, methods associated with neurophysiological approach,psychological and ethological approach.	03
	3.2: Pheromones :introduction,types of pheromones,the primer pheromones,the imprinting pheromones	03
	3.3:Hormones: effect of hormones on sexual behaviour,maternal behaviour,territorial marking, learning and memory	03
	3.4:Patterns of behavior :feeding, aggressive and reproductive behavior, biological clocks	03
	3.5:Communication behavior :introduction,communication signals,communication among bees: Honeybee dances	03

<b>PRACTICAL COMPONENT OF ZOO-V.E-11: ECOLOGY AND ETHOLOGY ( DURATION -02 HRS /WEEK)</b>		
<b>SR.NO.</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1	Determination of population density in a natural/hypothetical community by Quadrats method and calculation of Shannon-Weiner diversity Index for the same community	02
2	Study of an aquatic/mangrove ecosystem: Measurement of the area, temperature, turbidity, determination of pH, and dissolved oxygen content (Winkler's method), and free CO <sub>2</sub>	04
3	To study the habituation to light stimulus in earthworm/crabs/snails/ spider web	01
4	To demonstrate phototactic and geotactic responses of the animal provided earthworm/crabs	01
5	Study of Life Tables and plotting of survivorship curves of different types from the hypothetical/real data provided.	01
6	Report on a visit to National Parks/Biodiversity Parks/Wild life sanctuary	03

**REFERENCE BOOKS :**

1. Arora, Mohan. P. (2004) : *Ecology* , Himalaya Publishing House
2. Aubrey Manning and stamp Dawkins (1997) : *An Introduction to Animal behaviour (fourth edition)*, Cambridge University Press.
3. Dash M. C. (2001) : *Fundamental of Ecology* , Tata Mc Graw – Hill publishing Company Limited New Delhi
4. Felicity Huntingford (1984) : *The study of Animal behaviour* , Chapman and Hall.
5. Hoshang S. Gundevia and Hare Govind Singh (2006) : *A Text Book of Animal Behaviour*, S. Chand & Company LTD. New Delhi-110055.
6. Juneja Kavita (2002) : *Ecology* , Anmol Publications PVT. LTD. New Delhi-110002 (India)
7. Mathur Reena (1994) : *Animal Behaviour*, Rastogi and Company, Meerut-250002 India.
8. Rana, S. V. S.(2003) : *Essentials of Ecology and Environmental Science* ,Prentice- Hall of India Private Limited , New Delhi-110001
9. Ranga, M. M.(2002) : *Animal Behaviour Second Enlarged Edition* , Agrobios (India)
10. Robert A. Wallace (1938) : *Animal Behaviour Its Development, Ecology and Evolution* , Goodyear Publishing Company, Inc. Santa Monica, California.
11. Sharma P.D.(2014-15) : *Ecology and Environment*, Rastogi Publications. Meerut (12<sup>th</sup> revised edition) -25002.
12. W.H. Thorpe (1979) : *The Origins and rise of Ethology*, Praeger Publishers.

<b>ELECTIVE COURSE:</b> <b>FISH PRESERVATION AND PROCESSING</b>	
<b>COURSE CODE</b>	ZOO-V.E-12
<b>MARKS</b>	100 [75 – Theory; 25 – Practicals]
<b>CREDITS</b>	04 [03 – Theory; 01 – Practical]
<b>CONTACT HOURS</b>	THEORY : 45 HOURS (03 LECTURE/WEEK) PRACTICALS : 30 HOURS (01 PRACTICAL/WEEK)
<b>COURSE OBJECTIVES</b>	<ul style="list-style-type: none"> <li>• To familiarize the students with different methods of fish preservation and processing</li> <li>• To acquaint them with techniques and precautions for hygienic fish handling</li> <li>• The course content is locally relevant and prepares students for entrepreneurship and self employment</li> </ul>
<b>LEARNING OUTCOME</b>	By the end of the course, the students will be familiar with the economic benefits of fishes. They will also be able to understand the nutritional values of the fishes and to identify some of the fish pathogens

## ZOO-V.E- 12 : FISH PRESERVATION AND PROCESSING

MODULE	TOPICS	CONTACT HOURS
<b>MODULE 1: Fishery Development</b>	1.1 : Status of Development of the fishery and seafood processing industry.	05
	1.2: Empowerment through Aquatic Products: (Background, Nutritional security, Role of Fisheries Sector, Role of Tifac in Fisheries Sector, Objectives, Integrated Fisheries Project (IFP), Indian national centre for ocean information services (INCOIS), Catch per unit effort (CPUE), Maximum sustainable yield (MSY)	10
<b>MODULE 2: Fish Handling and preservation</b>	2.1: Recent Scenario: Quality Changes and Shelf life of Chilled Fish, The effect of Hygiene during handling	04
	2.2: Fish Handling Methods: Organoleptic test, Assessment of Fish Quality, Quality assessment of Fresh Fish, Quality Assessment of Fish Products, Physical methods, Assurance of Fresh Fish Quality, Post harvest Changes in Fish, How does a Fish Lose its Quality, fish as vectors of zoonotic diseases	08
	2.3: Fish Preservation: Reasons for Spoilage of Fishes, Methods of Fish.	03
<b>MODULE 3: Value of Fish</b>	3.1: Economic Importance of Fish: Food value, Fish By-Products, surimi, Goan fish para, balchao	05
	3.2: Postmortem changes in Fish, Bacteriological Changes, Lipid Oxidation and Hydrolysis, Chemical Composition, Lipids, Proteins, N- containing Extractives, Vitamins and Minerals,	05
	3.3: Aquatic Resources and their utilization, value added product: chitin	05

<b>PRACTICAL COMPONENT OF ZOO-V.E-12: FISH PRESERVATION AND PROCESSING ( DURATION -02 HRS /WEEK)</b>		
<b>SR.NO.</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1	Estimation of Proteins and Lipids form fish tissue	02
2	Determination of moisture and ash content from the fish	01
3	Preparation of fish Fillet	01
4	Study of Fish Parasites – ectoparasites (gills); endoparasites (gut)	02
5	Method of fish preservation (salting, pickling)	02
6	Visit to Fish Processing Centre/Fishing Co-operative Society /Fishery Institute/Fishery survey of India, Vasco (FSI)	04

#### **REFERENCE BOOKS :**

- 1) *Braj Kishore Singh (2008) Applied Fisheries and Aquaculture Swastik Publishers and Distributers  
Delhi,India*
- 2) *Pandey and Shukla (2015) Fish and Fisheries, IIIrd Revised Edition, Rastogi Publications Meerut, India*

#### **REFERENCE BOOKS FOR PRACTICALS:**

- 1) *Braj Kishore Singh (2008) Applied Fisheries and Aquaculture Swastik Publishers and Distributers  
Delhi,India*
- 2) *Pandey and Shukla (2015) Fish and Fisheries, IIIrd Revised Edition, Rastogi Publications Meerut, India*

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## EVEN SEMESTER

### SEMESTER – IV

<b>ELECTIVE COURSE:</b> <b>ANIMAL CELL CULTURE AND APPLICATIONS</b>	
<b>COURSE CODE:</b>	ZOO-IV-E-5
<b>MARKS:</b>	100 [ 75 –Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 –Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	This course is an introduction to the theory, standard practices, and methodologies of animal cell culture. The laboratory emphasizes the principles and practices of initiation, cultivation, maintenance of cell lines.
<b>LEARNING OUTCOME:</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>▪ operate, calibrate, and maintain standard equipment found in an animal cell culture laboratory;</li><li>▪ Prepare and sterilize media and solutions used in cell culture.</li><li>▪ Demonstrate an understanding of the concepts and applications of mammalian cell culture.</li><li>▪ Recognize and employ biosafety guidelines and practices.</li></ul>

## ZOO-IV-E-5: ANIMAL CELL CULTURE AND APPLICATIONS

MODULE	TOPICS	CONTACT HOURS
MODULE 1: LAB REQUIREMENTS FOR CELL CULTURE (15 hrs)	1: Historical background of Cell culture:	01
	2: Biology of cells in culture: Origin and characteristics, Differentiation, kinetics of cell growth, Genetics of Cultured cells, Problems associated with cell culture	04
	3: Lab requirements for animal cell culture: <ul style="list-style-type: none"> <li>○ Lab facilities and setup for cell culture</li> <li>○ Major and minor equipments</li> <li>○ Environmental conditions</li> <li>○ Substrates for Culturing and sub culturing</li> </ul>	05
	4: Animal tissue culture media <ul style="list-style-type: none"> <li>○ Natural media – biological fluids, tissue extracts</li> <li>○ Chemically defined media- characteristic and composition</li> <li>○ Media supplements – L Glutamine, serum. Advantages and disadvantages of serum in media / serum free media</li> </ul>	05
MODULE 2: CELL CULTURE TECHNIQUES(15 hrs)	5: Primary cell culture: <ul style="list-style-type: none"> <li>○ Mechanical disaggregation</li> <li>○ Enzymatic disaggregation</li> <li>○ Protocol for primary cell culture</li> </ul>	06
	6: Secondary cell culture/ Sub culturing: <ul style="list-style-type: none"> <li>○ Protocol for sub culturing of suspension culture</li> <li>○ Protocol for sub culturing of adherent</li> <li>○ Established cell lines</li> </ul>	06
	7: Scale up of animal cell culture: <ul style="list-style-type: none"> <li>○ Techniques of Scale up of suspension cultures</li> <li>○ Techniques of Scale up of Monolayer cultures</li> </ul>	03
MODULE 3: CELL CULTURE APPLICATIONS(15 hrs)	8: Cell Hybridoma Technology : <ul style="list-style-type: none"> <li>○ Steps of cell Hybridoma technology</li> <li>○ Procedure</li> <li>○ Production of monoclonal antibodies</li> <li>○ Applications of monoclonal antibodies</li> </ul>	05
	9: Valuable Products through cultured cells: Production of Tissue plasminogen, growth factor, Erythropoietin, Factor VIII, Interferons.	05
	10: Other Application: Vaccines through cultured cells, Cytotoxicity testing, Fluorescent In-Situ Hybridization for disease detection, Cell culture in biomedical research.	05

<b>PRACTICAL COMPONENT OF ZOO-IV-E-5: DURATION -02 HRS /WEEK ANIMAL CELL CULTURE AND APPLICATIONS</b>		
<b>Sr. No</b>	<b>Practical</b>	<b>No. of Practicals</b>
<b>4)</b>	Packing and sterilization of glass and plastic wares for cell culture & Lab Precautions and Biosafety measures	02
<b>5)</b>	Preparation of reagents and media for cell culture. ▪ Reagents ▪ Media / Buffers	02
<b>6)</b>	Quantification of cells (Viable cell count) by trypan blue exclusion dye.	01
<b>7)</b>	Methods used for cell disaggregation – Mechanical and Enzymatic	02
<b>8)</b>	Setting up of primary cell culture ▪ Suspension culture ▪ Adherent cell culture	02
<b>9)</b>	Setting up of chicken embryo fibroblast culture (cold trypsinization / warm trypsinisation)	02
<b>10)</b>	Biological waste disposal methods	01

#### **REFERENCE BOOKS:**

- 1) Ranga MM(2012). *Animal Biotechnology*. Agrobios India Ltd. Jodhpur.
- 2) Mathur S(2006 ). *Animal Cell and Tissue Culture*. Agrobios India Ltd. Jodhpur.
- 3) Masters W(2005). *Animal Cell Culture*. Oxford University Press Inc., NewYork
- 4) Gangal S(2010). *Principles and practices of Animal Tissue Culture*. Second Edition. University Press PVT. LTD., Hyderabad India.
- 5) Freshney I R( 2007). *Culture of animal Cells: A manual of Basic Techniques*. 5<sup>th</sup> edition, John Wiley & Sons Inc Pte Ltd

#### **REFERENCE BOOKS FOR PRACTICALS:**

- 1) E Book- Fletcher L, Goss E. Phelps P and Wheeler A(2014). *Introduction to Biotechnology – Laboratory Manual*.
- 2) Harisson M A and Rae IF(1997):*General Techniques of Cell Culture Handbook in Practical animal cell biology*. Cambridge University Press.
- 3) Ebook- Cell Culture basics. From [www.invitrogen.com/cellculture\\_basics](http://www.invitrogen.com/cellculture_basics).

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**ELECTIVE COURSE : AQUACULTURE AND FISHERIES**

<b>COURSE CODE:</b>	ZOO-IV.E-6
<b>MARKS:</b>	100[75- Theory; 25- Practicals]
<b>CREDITS:</b>	04 [03-Theory;01- Practical)
<b>CONTACT HOURS</b>	: Theory :45 Hours(03 LEC/WEEK) Practicals: 30 Hours(01 PRACTICAL/WEEK)
<b>COURSE OBJECTIVES:</b>	<ul style="list-style-type: none"><li>• To improve the understanding of conservation and sustainability of living resources</li><li>• To improve the social and economic benefits derived from aquaculture and fisheries.</li><li>• To study the role of aquaculture in rural development in solving nutritional security and unemployment.</li><li>• Empowerment of fishery and entrepreneurship development</li></ul>
<b>LEARNING OUTCOMES:</b>	<ul style="list-style-type: none"><li>• The student may become future aqua culturist, entrepreneur who will provide employment to others.</li><li>• Optimum utilization of unutilized and underutilized aquatic resources for fisheries and aquaculture, enhance the fish production, employment generation and even to earn the foreign exchange.</li></ul>

## ZOO-IV.E-6: AQUACULTURE AND FISHERIES

MODULE	TOPIC	CONTACT HOURS
<b>MODULE 1:</b>	<p><b>1.1: Inland Fisheries:</b></p> <ul style="list-style-type: none"> <li>• fisheries: Fisheries of Ganga and Brahmaputra river system</li> <li>• Reservoir fisheries</li> <li>• Lakesterine fisheries: Cat fish, Murrels, Mulletts, Major carps</li> <li>• Cold water fisheries: Mahaseer fishery</li> </ul> <p><b>1.2: Marine Fisheries:</b></p> <ul style="list-style-type: none"> <li>• Estuarine fisheries: The catadromous fishes (<i>Polynemous indicus</i>, <i>P. tetradactylus</i>) and anadromous fishes (<i>Hilsa ilisha</i>, <i>Pama pama</i>, <i>Polynemous paradiseus</i>)</li> <li>• Coastal fisheries or Inshore fisheries: Elasmobranch fishery and Teleost fishery</li> <li>• Offshore and Deep sea fisheries: Pomfrets (<i>Pampus</i>, <i>Stromateus</i>) <i>Eleutheronema tetradactylus</i> (rava), <i>Polydactylus indicus</i> (dara), ghol (<i>Pseudosciaena diacanthus</i>), scianids (Kurtus)</li> </ul> <p><b>1.3: Crustacean And Molluscan Fisheries:</b></p> <ul style="list-style-type: none"> <li>• Prawn fisheries in Goa: Penaeid and Palaemonid groups.</li> <li>• Crab fisheries in Goa</li> <li>• Edible oyster fisheries in Goa</li> <li>• Mussel fisheries in Goa</li> </ul> <p><b>1.4 :Fishing Methods In India:</b></p> <ul style="list-style-type: none"> <li>• Marine Fishing Crafts and Gears used in Goa</li> <li>• Inland Fishing Crafts and Gears used in Goa</li> </ul>	<b>15</b>
<b>MODULE 2:</b>	<p><b>2.1: Integrated Fish Farming Systems:</b></p> <ul style="list-style-type: none"> <li>• Principle of integrated Fish farming</li> <li>• Integration with animal husbandry</li> <li>• Integration with farming systems.</li> </ul> <p><b>2.2: Induced Breeding:</b></p> <ul style="list-style-type: none"> <li>• Selection of site</li> <li>• Design and Layout of fish farm</li> <li>• Freshwater and brackish water pond construction</li> <li>• Pond maintenance</li> <li>• Prevention of fish diseases</li> <li>• Control of aquatic weeds</li> <li>• Control of predatory and Weed fishes</li> <li>• Control of Aquatic insect</li> <li>• Harvesting</li> </ul>	<b>15</b>

<b>MODULE 3:</b>	<p><b>3.1: Fish Culture System:</b></p> <ul style="list-style-type: none"> <li>• Mono culture, polyculture, composite culture, raceway culture, extensive, semi intensive, intensive, zero water exchange</li> <li>• Objective of fish culture</li> <li>• Pond preparation</li> <li>• Selection of species</li> <li>• Stocking of seed</li> <li>• Feed and feeding</li> <li>• Harvesting</li> <li>• Bionomics of fish culture</li> </ul> <p><b>3.2: Cage And Pen Culture:</b></p> <ul style="list-style-type: none"> <li>• Advantage of Fish culture in cages</li> <li>• Selection of species for cage culture</li> <li>• Installation of cage - shape ,size and types of cages</li> <li>• Pen culture</li> <li>• Maintenance of cage and pen</li> </ul> <p><b>3.3: Preservation And Processing:</b></p> <ul style="list-style-type: none"> <li>• Fish marketing</li> <li>• Transportation</li> <li>• Reasons for spoilage of Fishes</li> <li>• Methods of fish preservation-Freeze-drying,</li> <li>• Salting, Refrigeration, Deep Freezing,</li> </ul>	<b>15</b>
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<b>PRACTICAL COMPONENT OF ZOO-IV.E-6: AQUACULTURE AND FISHERIES (DURATION – 02 HRS/ WEEK)</b>		
<b>Sr. No.</b>	<b>Practical</b>	<b>No. of Practicals</b>
1.	Morphometric and Meristic study : a key for fish Identification	03
2.	Identification of important edible shrimps and crabs( any two)	01
3.	Identification of important Freshwater and Marine edible fishes (five fishes each from different families)	02
4.	Methods of Measuring gonosomatic index of Fish	01
5.	Estimation of Fecundity by Frequency Polygon method from a Marine Fish	01
6.	Food and Feeding of Fish by analysis of gut content	01
7.	Visit to a Fish Landing Center to study different Types of Gear and Craft	01
8.	Visit to Fish breeding Center to study Induced Breeding in Indian Carps	01
9.	Visit to ICAR/NIMR( National Institute of Malaria Research) Old Goa for Study of Aquarium and Larvivorous Fishes	01

### **REFERENCE BOOKS FOR THEORY:**

1. Bal D.V., Rao Virbhadra, K (1984) Marine Fisheries, Tata McGraw- Hill Publishing Company Ltd. New Delhi.
2. Cushing D.H. (1975) Marine Ecology and Fisheries, Cambridge University Press.
3. Day, F. (1889) The Fauna of British India including Ceylon and Burma. Fishes. 2 Vols., Taylor and Francis London.
4. Khanna S.S. (1984) An Introduction to Fishes, Central Book Depot Allahabad.
5. Pandey K and Shukla J.P. (2015) Fish and Fisheries. Rastogi Publications Meerut-250002
6. Sakhare B. Viswas (2007) Applied Fisheries. Daya Publishing House Delhi-110035
7. Santhanam R (1990) Fisheries Science, Daya Publishing House Delhi.
8. Santhanam R, Ramanathan N and Jagatheesan G (1990) Coastal Aquaculture in India, CBS Publishers and distributors, Delhi.
9. Shrivastava C.B.L. (1996) A Text Book of Fishery Science and Indian Fisheries. Kitab Mahal 22 A, S.N. Marg, Allahabad.
10. Singh B.K. (2008) Applied Fisheries and Aquaculture. Swastik Publishers and distributors, Delhi.

### **REFERENCE BOOKS FOR PRACTICALS:**

1. Chandy. M (1970) Fishes, National Book Trust, India, New Delhi.
2. Day. F. (1889) The Fauna of British India including Ceylon and Burma. Fishes. 2 Vols., Taylor and Francis London.
3. R.J. Ranjit Daniels (2002) Freshwater Fishes of Peninsular India, Universities Press (India) Pvt. Ltd. Hyderabad.
4. Sakhare Viswas B. (2007) Applied Fisheries, Daya Publishing House Delhi.
5. Sharma U and S.P. Grover (1982) An Introduction to Indian Fisheries, Dehradun India.
6. Srivasava C.B.L. (1986) A Text Book of Fishery Science and Indian Fisheries, Kitab Mahal Allahabad.

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**ELECTIVE COURSE: IMMUNOLOGY**

<b>COURSE CODE:</b>	ZOO-IV.E-7
<b>MARKS:</b>	100 [ 75 -Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 -Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	Familiarize students and make them learn about the structural features of the components of the immune system as well as their functions, and understand the mechanisms involved in immune system development and responsiveness.
<b>LEARNING OUTCOME:</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• Understand the components of the immune system and their function.</li><li>• Be able to explain the mechanisms of immune response.</li><li>• Perform immunoassays to detect the presence of antigens or antibodies(disease detection).</li></ul>

## ZOO-IV-E-7: IMMUNOLOGY

MODUL E	TOPICS	CONTA CT HOURS
MODUL E 1: INTROD UCTION TO IMMUN OLOGY	1: OVERVIEW OF IMMUNE SYSTEM: <ul style="list-style-type: none"> <li>• Basic concepts in immunology</li> <li>• Components of the immune system</li> </ul>	05
	2: INNATE AND ADAPTIVE IMMUNITY. <ul style="list-style-type: none"> <li>• Innate immunity-Anatomical barriers/ layers of defense, cells and molecules involved in innate immunity</li> <li>• Adaptive immunity-cell mediated and humoral immunity, passive immunity (artificial and natural), Active(artificial and natural), Immune dysfunction</li> </ul>	10
MODUL E 2: ANTIGE NS AND IMMUN OGLOB ULINS	3: ANTIGENS. <ul style="list-style-type: none"> <li>• Antigenicity and immunogenicity, Immunogens, adjuvants and haptens</li> <li>• Factors influencing immunogenicity</li> <li>• B and T cell epitopes</li> </ul>	05
	4: IMMUNOGLOBULINS <ul style="list-style-type: none"> <li>• Structure and function of different classes of Immunoglobulin.</li> <li>• Antigen-Antibody interactions</li> <li>• Immunoassays, monoclonal &amp; polyclonal antibodies</li> </ul>	07
	5: MAJOR HISTOCOMPATIBILITY COMPLEX. <ul style="list-style-type: none"> <li>• Structure and function of endogenous and exogenous pathways of antigen presentation</li> </ul>	03
MODUL E 3: IMMUNE RESPON SE	6: CYTOKINES AND COMPLEMENT SYSTEM <ul style="list-style-type: none"> <li>• Properties and functions of cytokines, cytokine based therapies</li> <li>• Components and pathways of complement activation</li> </ul>	05
	7: HYPERSENSITIVITIES, AUTOIMMUNITY AND TRANSPLANTATION <ul style="list-style-type: none"> <li>• Gell and coombs' classification, types of hypersensitivities(overview)</li> <li>• Autoimmune responses against self antigens (SLEs), responses to alloantigens and transplant rejection (graft rejection, types and mechanisms of transplant rejection)</li> </ul>	07
	8: VACCINES <ul style="list-style-type: none"> <li>• Types of vaccines -inactivated, attenuated, toxoid, subunit, conjugate, experimental (DNA and recombinant vaccine), monovalent/polyvalent vaccines</li> </ul>	03

<b>PRACTICAL COMPONENT OF ZOO-IV-E-7: IMMUNOLOGY ( DURATION -02 hrs/WEEK)</b>		
<b>Sr. No</b>	<b>Practical</b>	<b>No. of Practicals</b>
1	Preparation of serum from goat blood.	02
2	Slide Agglutination Reaction(blood groups – A / AB / O with Rh)	02
3	Differential count of leukocytes	01
4	Detection of presence of antigen / antibody - Simple immunodiffusion	01
5	Antibody Titre determination - Ouchterlony immunodiffusion	02
5	Antigen –antibody reaction by immunoelectrophoresis	02
6	Elisa TEST- pregnancy test	01
7	Phagocytosis – WBC (demonstration)	01

#### **REFERENCE BOOKS:**

*Essential books:*

- 1) Abbas KA, Lechtman HA(2007). *Basic Immunology, Updated Edition 2006-2007: with STUDENT CONSULT. Access (Paperback).*
- 2) David M, Jonathan B, David RB and Ivan R(2006). *Immunology. VII Edition, Mosby, Elsevier Publication.*
- 3) Abbas KA, Lechtman HA(2003). *Cellular and Molecular Immunology. Saunders Publication.*
- 4) Kindt TJ, Goldsby RA, Osborne BA and Kuby J(2006). *Immunology. VI edition. W H Freeman and company.*

*Ebooks:*

- 5) Frank SA(2002). *Immunology and evolution of infectious diseases. Princeton University Press, Princeton and Oxford.*
- 6) Zabriskie JB(2009). *Essential Clinical Immunology. Cambridge University Press.*

#### **REFERENCE BOOKS FOR PRACTICALS:**

- 1) Talwar GP and Gupta SK(2012). *A handbook of practical and Clinical Immunology, CBS publishers.*

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## **ELECTIVE COURSE : **EVOLUTIONARY BIOLOGY****

<b>COURSE CODE:</b>	ZOO-IV.E-8
<b>MARKS:</b>	100 [75-Theory; 25 –Practicals ]
<b>CREDITS:</b>	04[ 03 – Theory; 01 – Practical
<b>CONTACT HOUR :</b>	Theory : 45 Hours( 03 Lec./Week) Practicals: 30 Hours(01Practical/Week)
<b>COURSE OBJECTIVE:</b>	<ul style="list-style-type: none"><li>• The study aims to discover the history of life and the causes of the diversity and characteristics of organisms.</li><li>• To show the important contributions of evolutionary biology to other biological disciplines such as medicine</li></ul>
<b>LEARNING OUTCOME:</b>	<ul style="list-style-type: none"><li>• The study will give detail knowledge about many unsolved hypothetical issues to solve it.</li><li>• The student will learn that evolution is not a speculation , but a thoroughly supported hypothesis that explains the process of evolution</li></ul>



## ZOO-IV.E-8: EVOLUTIONARY BIOLOGY

MODULE	TOPICS	CONTACT HOURS
<b>MODULE 1:</b>	<p><b>1.1: EVOLUTIONARY BIOLOGY:AN OVERVIEW</b></p> <ul style="list-style-type: none"> <li>• What Is Evolution, History Of Evolutionary Biology, Pre Darwinian, Darwin’s Evolutionary Theory, Evolutionary Theories After Darwin</li> <li>• Famous contributions to evolutionary Biology: CarlLinneaus,Lamarck,Malthus,Darwin,Thomas Huxley,R.A.Fisher,Haldane,sewall Wright, G.G.Simpson, Dobzanhasky,Ernst Mayr, M.Kimura.</li> </ul> <p><b>1.2: THE NATURAL SELECTION:</b></p> <ul style="list-style-type: none"> <li>• The Nature of Natural Selection</li> <li>• Postulates of natural selection</li> <li>• Evidences of Natural selection</li> <li>• Types of natural selection(Stabilizing,Directional and Disruptive selection)</li> <li>• Natural Selection in action(Darwin’s finches, Endler’s guppies examples)</li> <li>• Sexual Selection</li> </ul> <p><b>1.3: RANDOM PROCESS IN EVOLUTION:</b></p> <ul style="list-style-type: none"> <li>• mutation :types of mutation</li> <li>• genetic drift(bottle neck effect,founder’s effect)</li> <li>• gene flow(migration/emmigration)</li> </ul> <p><b>1.4: SYNTHETIC THEORY OF EVOLUTION</b></p> <ul style="list-style-type: none"> <li>• Neo-Darwinis</li> </ul>	<b>20</b>
<b>MODULE 2:</b>	<p><b>2.1: NON- DARWINISM</b></p> <ul style="list-style-type: none"> <li>• Neutral theory of evolution</li> <li>• Molecular polymorphism-nucleic acids and proteins</li> <li>• Molecular clocks</li> </ul> <p><b>2.2: SPECIATION</b></p> <ul style="list-style-type: none"> <li>• different concepts of speciation</li> <li>• Concept Of Biological Speciation( Allopatric/Sympatric)</li> <li>• Consequence Of Speciation</li> <li>• Factors involved in Biological Speciation(pre and post- zygotic mechanisms)</li> </ul> <p><b>2.3: POPULATION GENETICS</b></p> <ul style="list-style-type: none"> <li>• Hardy-Weinberg’s Law(H-W)</li> <li>• Genes And Genotype Frequencies</li> <li>• Factors Affecting H-W</li> </ul> <p><b>2.4:ADAPTATIONS :</b></p> <ul style="list-style-type: none"> <li>• Definition and kinds of adaptations with some examples.</li> <li>• Pre , Post adaptations</li> </ul>	<b>10</b>

	<ul style="list-style-type: none"> <li>• Coadaptations and Parallel adaptations</li> </ul>	
<b>MODULE 3:</b>	<p><b>3.1: PATTERNS OF EVOLUTION:</b></p> <ul style="list-style-type: none"> <li>• Sequential and Convergent Evolution</li> <li>• Microevolution</li> <li>• Macroevolution(Adaptive radiation)</li> <li>• Megaevolution</li> <li>• Gradualism And Punctuated Equilibrium</li> </ul> <p><b>3.2: EVOLUTION AND HUMAN HEALTH AND DISEASES</b></p> <ul style="list-style-type: none"> <li>• Design defects</li> <li>• Defence mechanisms-Allergy,morning sickness</li> <li>• Evolution of antibiotic resistance</li> <li>• Evolution of behaviour,Anxiety,fear and depression.</li> </ul>	<b>15</b>

**PRACTICAL COMPONENT OF ZOO-IV.E-8: EVOLUTIONARY BIOLOGY  
(DURATION -02 HRS/WEEK)**

<b>Sr.No.</b>	<b>Practical</b>	<b>No.of Practicals</b>
1.	Study of homology and analogy from suitable specimens	01
2	Serial homology	01
3	Variations are basis for evolution	01
4	To demonstrate the role of Natural Selection in Fixing Favoured Adaptation and Eliminating Maladaptation.	02
5	Problems based on Population Genetics (PTC /blood group)	04
6.	An exercise to illustrate the concepts of Genetic drift	02
7.	Vestigial organs or Vestiges in animals and humans.	01

**REFERENCE BOOKS:**

1. Bipin Kumar(2001) Organic Evolution; Campus Books International, New Delhi.
2. Charlotte J. Avers (1989)Process and pattern in Evolution ; New York Oxford University Press.
3. Douglas J. Futuyma(2013) Evolution III<sup>rd</sup> edition; Sinaue Associates,Inc.Publishers Sunderland , Massachusetts U.S.A.
4. E.Peter Volpe(1989) Understanding Evolution V<sup>th</sup> edition Universal Book Stall.
5. S.Osawa ,T.Honjo(Eds.)(1991) Evolution of life,Springer-Verlag Tokyo .
6. Savage Jay M (1969) Evolution , Amerind Publishing Co-Pvt. Ltd. New Delhi.
7. Veer Bala Rastogi (2004) Organic Evolution ,Eleventh revised edition; Kedarnath Ramnath Delhi.
8. Pranab K. Banerjee (2011) Problems on Genetics,Molecular Genetics and Evolutionary Genetics, New Central Book Agency (P) Ltd. Delhi

## SEMESTER – VI

### ELECTIVE COURSE: **HEALTH AND NUTRITION**

<b>COURSE CODE</b>	<b>ZOO-VI-E-13</b>
<b>MARKS</b>	100 [75 -Theory ; 25- Practical]
<b>CREDITS</b>	04 [03 -Theory; 01- Practical]
<b>CONTACT HOURS</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES</b>	This course is an introduction to the nutrients, their functions and role in maintaining good health of humans.
<b>LEARNING OUTCOME</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>▪ Know about nutrients and their function</li><li>▪ Understand nutritional biochemistry and role of lifestyle and food habits in causing diseases</li></ul>

## ZOO-VI-E-13: HEALTH AND NUTRITION

MODULE	TOPICS	CONTACT HOURS
<p>MODULE 1: BASIC CONCEPT OF FOOD AND NUTRITION</p>	<p>UNIT 1: Overview of health and nutrition</p> <ul style="list-style-type: none"> <li>• Definition of health and nutrition</li> <li>• Scope of nutrition, food as a source of nutrients</li> <li>• Nutrients and energy</li> <li>• Adequate, optimum and balanced diet</li> <li>• Malnutrition and health.</li> </ul> <p>UNIT 2: Nutritional Biochemistry</p> <ul style="list-style-type: none"> <li>• Carbohydrates, lipids, proteins - definition, classification, structure and properties</li> <li>• Significance of acid value, iodine value and saponification value of lipids</li> <li>• Essential and non-essential amino acids</li> <li>• Enzymes- definition, classification, properties(overview).</li> <li>• Coenzymes, vitamins (fat soluble and water soluble), structure and properties</li> <li>• Minerals- iron, calcium, phosphorus, iodine, selenium and zinc and their properties</li> </ul>	<p><b>15</b></p>
<p>MODULE 2: NUTRIENTS AND DIETARY PATTERN FOR HUMANS</p>	<p>UNIT 3: Functions of food components of food-nutrients</p> <ul style="list-style-type: none"> <li>• Biochemical role and dietary sources of macro and micronutrients (carbohydrates, lipids and proteins, fat soluble vitamins-A, D, E and K , water soluble vitamins – thiamin, riboflavin, niacin, pyridoxine, folate, vitamin B12 and vitamin - C Minerals – calcium, iron and iodine).</li> <li>• Changes of nutrient value during cooking of the following food groups: cereals, pulses and vegetables. Nutrient loss - dry, moist, frying and microwave cooking.</li> </ul> <p>UNIT 4: Nutrition and dietetics</p> <ul style="list-style-type: none"> <li>• Physiological considerations, nutrient needs and dietary pattern for various groups- adults, pregnant and nursing mothers, infants, pre-school and school children, adolescents and geriatric nutrition.</li> </ul>	<p><b>15</b></p>

<p>MODULE 3: DIET RELATED DISEASES</p>	<p>UNIT 5:Health and diseases</p> <ul style="list-style-type: none"> <li>• Major nutritional deficiency diseases- protein energy malnutrition, Vitamin deficiency, iron deficiency anaemia, iodine deficiency disorders, their causes, symptoms, treatment, prevention and government programmes, if any.</li> <li>• Life style related diseases- obesity, hypertension, hyperurecimia, diabetes mellitus, polycystic ovarian disease (PCOD) - their causes and prevention through dietary/lifestyle modifications.</li> <li>• Social health problems: smoking, alcoholism, drug dependence and Acquired Immune Deficiency Syndrome (AIDS);</li> <li>• Common ailments- irritable bowel disease (IBD), constipation: causes and dietary management</li> </ul> <p>UNIT 6: Food hygiene</p> <ul style="list-style-type: none"> <li>• Potable water- sources and methods of purification at consumer level</li> <li>• Food and water borne infections: bacterial infection: cholera, typhoid, dysentery; viral infection: hepatitis, poliomyelitis, protozoan infection: Amoebiasis, Giardiasis; Parasitic infection: Taeniasis and Ascariasis their causative agent, symptoms, transmission and prevention.</li> <li>• Brief account of food spoilage: Causes and preventive measures</li> </ul>	<p><b>15</b></p>
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<p align="center"><b>PRACTICAL COMPONENT OF 'HEALTH AND NUTRITION ZOO-VI-E-13: DURATION (30 HOURS – 02hrs/WEEK)</b></p>		
<p><b>SR. NO</b></p>	<p><b>PRACTICAL</b></p>	<p><b>NO. OF PRACTICALS</b></p>
<p>11)</p>	<p>To detect adulteration in a) Ghee b) Sugars c) Tea leaves and d) Turmeric</p>	<p>02</p>
<p>12)</p>	<p>To determine absorbed oil content in fried foods</p>	<p>02</p>
<p>13)</p>	<p>Estimation of lactose in milk</p>	<p>02</p>
<p>14)</p>	<p>Ascorbic acid estimation in food by titrimetry</p>	<p>01</p>
<p>15)</p>	<p>Estimation of calcium in foods by titrimetry</p>	<p>01</p>
<p>16)</p>	<p>Observation of any two grain pests</p>	<p>01</p>
<p>17)</p>	<p>Project based:</p> <ul style="list-style-type: none"> <li>• Identify nutrient rich sources of foods, their seasonal availability and price</li> <li>• Study of nutrition labeling on selected foods</li> </ul>	<p>03</p>

**REFERENCE BOOKS:**

- 1) Mudambi, SR and Rajagopal, MV. (2007). Fundamentals of Foods, Nutrition and Diet Therapy; Fifth Ed; New Age International Publishers.
- 2) Srilakshmi B. (2002). Nutrition Science; New Age International (P) Ltd.
- 3) Srilakshmi B. (2007). Food Science; Fourth Ed; New Age International (P) Ltd.
- 4) Swaminathan M. (2009). Handbook of Foods and Nutrition; Fifth Ed; 1986; BAPPCO.
- 5) Bamji MS, Rao NP, and Reddy V. Text Book of Human Nutrition; Oxford & IBH Publishing Co. Pvt Ltd.
- 6) Wardlaw GM, Hampl JS. (2007). Perspectives in Nutrition; Seventh Ed; McGraw Hill.
- 7) Lakra P, Singh MD. (2008). Textbook of Nutrition and Health; First Ed; Academic Excellence.

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**ELECTIVE COURSE: BASIC AND APPLIED  
ENTOMOLOGY**

<b>COURSE CODE</b>	ZOO-VI.E-14
<b>MARKS</b>	100 [75 -Theory; 25-Practical]
<b>CREDITS</b>	04 [03- Theory; 01- Practical]
<b>CONTACT HOURS</b>	Theory: 45 HOURS [03 Lectures Per Week] Practical: 30 HOURS [01 Practical Per Week]
<b>COURSE OBJECTIVE</b>	<ul style="list-style-type: none"><li>• To develop a strong foundation in entomology, including understanding of the importance of insects to the human society.</li><li>• To review important areas in insect biology such as morphology, physiology, ecology, behaviour, genetics, phylogeny, ontogeny and population biology.</li><li>• To develop a sufficient background for advanced entomology.</li></ul>
<b>LEARNING OUTCOME</b>	<ul style="list-style-type: none"><li>• The students will achieve entrepreneurial opportunities in entomology.</li><li>• They will gain knowledge on bionomically important insects and their products, insect pests of public health and veterinary importance and their management.</li></ul>

## ZOO-VI.E-14: BASIC AND APPLIED ENTOMOLOGY

MODULE	TOPIC	CONTACT HOURS
MODULE 1 Fundamentals of Entomology	Unit 1: Class Insecta: <ul style="list-style-type: none"> <li>• Salient features</li> <li>• Classification of insects up to orders – an overview</li> </ul> Unit 2: Morphological studies: <ul style="list-style-type: none"> <li>• of antenna,</li> <li>• wings,</li> <li>• legs</li> <li>• Mouth parts</li> </ul> Unit 3: Techniques: <ul style="list-style-type: none"> <li>• Collection of insects</li> <li>• Preservation of insects</li> </ul>	15
MODULE 2 Bionomics and control of crop pests and medically important pests	Unit 4: Pest of agricultural importance: <ul style="list-style-type: none"> <li>• Paddy pests, cashew pests, coconut pests, areca nut pests, pulse pests, sugarcane pests, vegetable pests, fruit pests (two pests from each of the above)</li> </ul> Unit 5: Insects of medicinal importance: <ul style="list-style-type: none"> <li>• mosquitoes, housefly, sand fly, cockroaches, human lice, bed bug, rat fleas</li> </ul> Unit 6: Termites: <ul style="list-style-type: none"> <li>• social organization, termitaria and termite control measures</li> </ul>	15
MODULE 3 Useful insects and pest management	Unit 7: Useful insects: <ul style="list-style-type: none"> <li>• Honeybees (Apiculture); Mulberry silk worm (sericulture); lac insects (lac culture)</li> </ul> Unit 8: Insect pest control methods: <ul style="list-style-type: none"> <li>• biological, chemical (attractants, pheromones and hormones),</li> </ul> Integrated Pest Management (IPM) Unit 9: Role of insects in ecosystem services	15



<b>PRACTICAL COMPONENT OF BASIC AND APPLIED ENTOMOLOGY ZOO-VI.E-14 PRACTICAL (DURATION: 30 HOURS – 02hrs/WEEK)</b>		
<b>SR. NO</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS (12)</b>
1.	Collection techniques of Insects – light traps, sweep net, Berlese funnel	02
2.	Identification and study of economically important insects.	02
3.	Field trips to ICAR Old Goa / Govt. of Goa agriculture department/ National Malaria Research Institute (NMRI).	02
4.	Study of insects of college campus dragon fly/ pests of different plants.	03
5.	Study of local insect pests of agriculture.	03

**REFERENCE BOOKS:**

- 1) Aitwal, A.S (1993): Agricultural pests of India and South East Asia. Kalyani publication, New Delhi.
- 2) Awasthi, V.B (2007): Introduction to general and applied entomology, 2<sup>nd</sup> edition. Scientific publishers India Jodhpur.
- 3) David, B.V. and Ananthakrishnan, T.N (2006): General and applied entomology, 2<sup>nd</sup> edition Tata McGraw hill, New Delhi.
- 4) Reddy, D.S (2010) Applied entomology, 2<sup>nd</sup> edition New Vishal publications

**REFERENCE BOOKS FOR PRACTICALS:**

1. Fenemore, P.G. and Prakash, A. (1995): Applied Entomology, Wiley Eastern Limited new age international.
2. Varasi, M.S. (1992): Text book of entomology, Himalaya Publishing House, 1<sup>st</sup> edition.

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**ELECTIVE COURSE: LABORATORY TECHNIQUES IN  
PATHOLOGY**

<b>COURSE CODE</b>	ZOO-VI.E-15
<b>MARKS</b>	100 [75 -Theory; 25- Practical]
<b>CREDITS</b>	04 [03 -Theory; 01- Practical]
<b>CONTACT HOURS</b>	THEORY : 45 HOURS (03 LEC / WEEK) PRACTICAL: 30 HOURS (01 PRACTICAL / WEEK)
<b>COURSE OBJECTIVES</b>	This course is an introduction to the various techniques used in pathological diagnosis.
<b>LEARNING OUTCOME</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>▪ Know the tests done for disease detection of various body fluids and tissues.</li><li>▪ Understand the clinical implication of the pathological tests.</li></ul>

## ZOO-VI.E-15: LABORATORY TECHNIQUES IN PATHOLOGY

MODULE	TOPICS	CONTACT HOURS
MODULE 1: BLOOD ANALYSIS	UNIT 1: Introduction to medical lab techniques and its importance UNIT 2: : Analyses of human Blood: <ul style="list-style-type: none"><li>• Ways of obtaining blood samples, precautions and complications.</li><li>• Methods of estimation and clinical significance of: hemoglobin, Packed Cell Volume (PCV), RBC count, WBC count, Complete Blood Count (CBC), platelets, Erythrocyte Sedimentary Rate (ESR), Differential Leucocyte Count (DLC).</li></ul>	15
MODULE 2: EVALUATION OF EXCRETORY MATERIAL AND GAMETES	UNIT 3: Urine Analyses <ul style="list-style-type: none"><li>• Physical characteristics, preservation of urine sample</li><li>• Gross examination, chemical examination, abnormal constituents and its clinical implications.</li><li>• Microscopy of urinary sediments</li></ul> UNIT 4: Stool Analyses <ul style="list-style-type: none"><li>• Stool tests for protozoan parasites and helminth eggs.</li><li>• Clinical significance.</li></ul> UNIT 5: Semen analyses: <ul style="list-style-type: none"><li>• Constituents of semen</li><li>• Gross and microscopic, cytochemical examination, clinical implications.</li></ul>	15
MODULE 3: LIVER FUNCTION CYTOLOGY IMAGING	UNIT 6: Clinical status of liver function - <ul style="list-style-type: none"><li>• Function of liver.</li><li>• Tests of excretion by liver, evaluation of synthesis in liver, evaluation of enzyme activity.</li></ul> UNIT 7: Clinical cytological studies <ul style="list-style-type: none"><li>• Fine Needle Aspiration Cytology (FNAC), Ultrasound guided FNAC, aspiration of intra thoracic masses,<ul style="list-style-type: none"><li>• Techniques of preparing cell smears, staining techniques</li></ul></li></ul> UNIT 8: Medical imaging <ul style="list-style-type: none"><li>• X-Ray, PET, CT Scan, MRI, DEXA Scan, Ultrasound, Doppler's Test (using photographs/reports etc).</li></ul>	15

<b>PRACTICAL COMPONENT OF: LABORATORY TECHNIQUES IN PATHOLOGY ZOO-VI.E-15 - (30 HOURS – 02hrs/WEEK)</b>		
<b>SR. NO</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1.	Preparation of blood smears and staining techniques ( Leishman’s staining, Giemsa staining, Field’s staining).	02
2.	Use of different types of anticoagulants, obtaining serum from blood, preparation of cell suspension (blood cells).	01
3.	RBC Count, WBC Count, Differential WBC Count	03
4.	Urine analysis – normal and abnormal constituents	02
5.	Blood sugar estimation using glucometer	01
6.	Estimation of hemoglobin (Sahli’s method)	01
7.	Estimation of PCV	01
8.	Estimation of ESR (Wintrobe’s / Westergreen method)	01

**REFERENCE BOOKS:**

1. Sood R (1999). Medical laboratory techniques, Jaypee publishers, New Delhi.
2. Park, K. (2007), Preventive and Social Medicine, B.B. Publishers
3. Godkar P.B. and Godkar D.P (2007). Textbook of Medical Laboratory Technology, II Edition, Bhalani Publishing House.
4. Cheesbrough M (2002)., A Laboratory Manual for Rural Tropical Hospitals, A Basis for Training Courses
5. Prakash, G. (2012), Lab Manual on Blood Analysis and Medical Diagnostics, S. Chand and Co. Ltd. New Delhi.

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**ELECTIVE COURSE: BIOENTREPRENEURSHIP**

<b>COURSE CODE</b>	ZOO-VI.E- 16
<b>MARKS</b>	100 [75 –Theory; 25- Practical]
<b>CREDITS</b>	04 [03 –Theory; 01- Practical]
<b>CONTACT HOURS</b>	THEORY : 45 HOURS (03 LEC / WEEK) PRACTICAL: 30 HOURS (01 PRACTICAL / WEEK)
<b>COURSE OBJECTIVES</b>	<ul style="list-style-type: none"><li>• To help students recognize the opportunities of enterprises in the field of life sciences</li><li>• To encourage students to think independently and explore new vistas</li><li>• To familiarise them with the basic skills required for a start-up</li></ul>
<b>LEARNING OUTCOME</b>	At the end of the course, <ul style="list-style-type: none"><li>• Students will be exposed to various opportunities available in life science for start-ups.</li><li>• They will be familiar with the methodologies and regulations required to start an enterprise.</li><li>• It will also help the student to develop independent thinking skill required at the time of crucial decision making.</li></ul>

## ZOO-VI.E- 16: BIOENTREPRENEURSHIP

UNIT	TOPICS	CONTACT HOURS
MODULE 1: Entrepreneurship Development	Unit 1: Introduction to entrepreneurship: <ul style="list-style-type: none"><li>entrepreneurial competencies and goal setting, bio entrepreneurship, building a bio-enterprise : balance management, capital, technology</li></ul> Unit 2: Introduction to innovation: <ul style="list-style-type: none"><li>identifying business opportunities</li></ul> Unit 3: Raising funds: public and private	15
MODULE 2: Business plan And Guidelines and regulations for entrepreneurship in life sciences	Unit 4: Business model canvas Unit 5: Guidelines and regulations: <ul style="list-style-type: none"><li>Certification and licensing, acts, regulations and guidelines, marketing and export process, accessing university technology, research and development agencies in India</li></ul> Unit 6: Role of micro, medium and small scale industry sector Unit 7: Innovations in research: <ul style="list-style-type: none"><li>writing project proposals to various funding bodies such as MHRD, UGC, DST, DBT, etc.</li></ul>	15
MODULE 3:  Start -up, quality, safety and procedural compliances in a bio enterprise	Unit 8: Intellectual Property Rights and trademark of biological resources Unit 9: quality, safety and procedural compliances <ul style="list-style-type: none"><li>Bio safety and its implementations</li><li>Quality control in entrepreneurship</li><li>WHO Guidelines for setting up of a contract research organization.</li><li>Starting a research laboratory in India – guidelines and permits required</li></ul>	15

<b>PRACTICAL COMPONENT OF BIOENTREPRENEURSHIP ZOO-VI.E-16 (30 HOURS – 02hrs/WEEK)</b>		
<b>SR. NO.</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICAL</b>
1.	Exercises on lateral thinking	01
2.	Testing entrepreneurial competencies	01
3.	Online search for patented technologies	01
4.	Identifying Business Opportunities	02
5.	Business Model Canvas	03
6.	Presentation of Business Model Canvas by students	01
7.	Interaction with successful entrepreneur	02
8.	Interaction with Banker/ Angel Investor	01

**REFERENCES:**

1. Garg, M.C. (2015) Entrepreneurial development. Guset User.
2. Kolchinsky, P. (2004) The entrepreneurs guide to a biotech startup. 4<sup>th</sup> edition. www.evelexa.com

**Additional reading:**

1. Simon, S. 2009. Start with why: How great leaders inspire everyone to take action. Penguin Group (USA) Inc .
2. Welch, J. and Byrne, J.A. 2003. Straight from the gut. Business plus publishers.

**WEBLIOGRAPHY:**

1. <http://www.creativeboom.com/resources/10-free-brain-teasing-puzzle-resources-for-team-building-games-and-getting-your-creative-juices-flowing/>
2. <https://www.scribd.com/document/60183753/39034324-Test-for-Personal-Entrepreneurial-Competencies>
3. [http://www.wipo.int/edocs/pubdocs/en/patents/434/wipo\\_pub\\_1434\\_02.pdf](http://www.wipo.int/edocs/pubdocs/en/patents/434/wipo_pub_1434_02.pdf)
4. <https://ipindiaonline.gov.in/patentsearch/Granted%20Search%20Engine%20Help%20file.pdf>
5. <https://canvanizer.com/new/business-model-canvas>

**PARVATIBAI CHOWGULE COLLEGE OF ARTS AND SCIENCE**  
**(Autonomous)**  
**PROGRAMME BSC ZOOLOGY**  
**COURSE CURRICULUM**

<b>COURSE STRUCTURE: PROGRAMME BSC ZOOLOGY</b>						
<b>SEMESTER</b>	<b>CORE</b>		<b>ELECTIVE</b>			
I	<b>ZOO-I.C-1</b> Animal Diversity : Non Chordates	<b>ZOO-I.C-2</b> Cell and Molecular Biology	-----	-----	-----	-----
II	<b>ZOO-II.C-3</b> Diversity and Biological Systems of Chordates	<b>ZOO-II.C-4</b> Fundamentals of Animal and Human Genetics	-----	-----	-----	-----
III	<b>ZOO-III.C-5</b> Human Physiology		<b>ZOO-III.E-1</b> Vertebrate Endocrinology	<b>ZOO-III.E-2</b> Basic microbiology and Fundamentals of Animal Biotechnology	<b>ZOO-III.E-3</b> Environmental Toxicology	<b>ZOO-III.E-4</b> Parasitology
IV	<b>ZOO-IV.C-6</b> Biochemistry and Metabolic Regulation		<b>ZOO-IV.E-5</b> Animal cell culture and Applications	<b>ZOO-IV.E-6</b> Aquaculture and Fisheries	<b>ZOO-IV.E-7</b> Immunology	<b>ZOO-IV.E-8</b> Evolutionary Biology
V	<b>ZOO-V.C-7</b> Developmental Biology		<b>ZOO-V.E-9</b> Molecular Genetics and Forensic Science	<b>ZOO-V.E-10</b> Economic Zoology	<b>ZOO-VI.E-11</b> Basic and Applied Entomology	<b>ZOO-V.E-12</b> Fish Preservation and Processing
VI	<b>ZOO-VI.C-8</b> Wildlife Biology		<b>ZOO-VI.E-13</b> Health and Nutrition	<b>ZOO-V.E-14</b> Ecology and Ethology	<b>ZOO-VI.E-15</b> Laboratory Techniques in Pathology	<b>ZOO-VI.E-16</b> Bio Entrepreneurship



**SEMESTER I and II:**

<b>SEMESTER</b>	<b>COURSE CODE</b>	<b>CORE COURSES</b>	<b>NUMBER OF CREDITS</b>	<b>CONTACT HOURS</b>
<b>Semester I</b>	ZOO-I.C-1	Animal Diversity : Non Chordates	Theory = 03 Practicals =01	Theory = 45 Practicals =30
	ZOO-I.C-2	Cell and Molecular Biology	Theory = 03 Practicals =01	Theory = 45 Practicals =30
<b>Semester II</b>	ZOO-II.C-3	Diversity and Biological Systems of Chordates	Theory = 03 Practicals =01	Theory = 45 Practicals =30
	ZOO-II.C-4	Fundamentals of Animal and Human Genetics	Theory = 03 Practicals =01	Theory = 45 Practicals =30

## SEMESTER I

<b>CORE COURSE : ANIMAL DIVERSITY: NON CHORDATES</b>	
COURSE CODE:	ZOO-I.C-1
MARKS:	100 [ 75 -Theory ; 25- Practicals]
CREDITS:	04 [ 03 -Theory; 01- Practical]
CONTACT HOURS:	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
COURSE OBJECTIVES:	<ul style="list-style-type: none"><li>• To be familiar with the different non-chordate phyla.</li><li>• To know the general and distinguishing characters of each of them.</li><li>• To study how the different systems evolved in their complexity.</li><li>• To compare and contrasts the life processes in different phyla.</li></ul>
LEARNING OUTCOME:	At the end of the course, the students will be familiar with the non-chordate world that surrounds us. They will be able to appreciate the process of evolution and see how it progressed from simple, unicellular cells to complex, multicellular organisms. Students will be able to identify the invertebrates and classify them upto the class level. Students will understand the basis of life processes in the non-chordates.

<b>ZOO-I.C-1: ANIMAL DIVERSITY: NON CHORDATES</b>		
<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
<b>Module 1:</b> Evolution of Animal Diversity and Diversity of lower non chordates	<ul style="list-style-type: none"> <li>• Non chordate evolution and diversity</li> <li>• Taxonomy and phylogeny of animals</li> <li>• Invertebrate cladogram</li> <li>• Protista</li> </ul> Classification and general characters upto class for the following phyla: <ul style="list-style-type: none"> <li>• Porifera</li> <li>• Cnidaria</li> <li>• Platyhelminthes</li> <li>• Aschelminthes</li> <li>• Annelida</li> </ul>	15
<b>Module 2:</b> Diversity of higher Non Chordates	Classification and general characters upto class for the following phyla: <ul style="list-style-type: none"> <li>• Onycophora</li> <li>• Arthropoda</li> <li>• Mollusca</li> <li>• Echinodermata</li> <li>• Hemichordata</li> </ul>	15
<b>Module 3:</b> Biological systems of Non Chordates 2	<ul style="list-style-type: none"> <li>• Comparison of life processes such as nutrition, sensory and neural control and coordination, blood vascular system, exoskeleton, endoskeleton, locomotion and muscular system, respiration, excretion, reproduction and development of phylum Porifera to Hemichordata.</li> </ul>	15

<b>PRACTICAL COMPONENT OF ZOO-I.C-1: ANIMAL DIVERSITY: NON CHORDATES</b> <b>( DURATION -02 HRS /WEEK)</b>		
Sr. No	Practical	No. of Practicals
1.	Identification of organisms from phylum protozoa to phylum Hemichordata	06
2.	Observation of permanent slides	03
3.	Mountings: Cockroach mouth parts, prawn appendages	02
4.	Field trip to terrestrial environment to study the invertebrates in their natural habitats	01

**REFERENCE BOOKS:**

1. Barnes R.D. (2000). Invertebrate Zoology.Hall Saunders International Edition, London.
2. Barrington E.J.W. 1979. Invertebrate structure and Function.John Wiley and Sons Inc.
3. Jordan, E. L. and Verma, P.S. (2000). Invertebrate Zoology. S. Chand & Co. Pvt. Ltd. New Delhi.
4. Marshall A.J.and W.D. Williams. 1974. Textbook of Zoology. Macmillan.
5. Pechenik J.A.( 2002). Biology of the invertebrates. Tata McGraw hill Publishing company limited, New Delhi .

**REFERENCE BOOKS FOR PRACTICALS:**

- 1) Ziser. W.S (2014) Biology 1413 Introductory Zoology Lab Manual.Morton Publishing Co. Austin Community College.
  - 2) Lal S.S. (2004) A textbook of practical zoology vertebrate. Rastogi publications, Meerut India.
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**CORE COURSE : CELL AND MOLECULAR BIOLOGY**

<b>COURSE CODE:</b>	ZOO-I.C-2
<b>MARKS:</b>	100 [ 75 –Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [03 –Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	This course will give firm and rigorous foundation in the principles of modern molecular and cellular biology. It discusses the fundamental processes that enable cells to grow, move and communicate and will cover topics such as cell architecture, cell chemistry, cell division, functions and cell cycle. Students will also learn current molecular biological techniques that are used to study cell biology. Laboratories will focus both on exercises that help illustrate cellular phenomena, as well as on the introduction of techniques and procedures commonly utilized in modern cell and molecular biology research.
<b>LEARNING OUTCOME:</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• Develop deeper understanding of what life is and how it functions at cellular level.</li><li>• Describe cellular membrane structure and function, fine structure and function of cell organelles.</li><li>• Perform a variety of molecular and cellular biology techniques.</li></ul>

**ZOO-I.C-2 : CELL AND MOLECULAR BIOLOGY**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
<b>MODULE 1:</b> TECHNIQUES OF CELL STUDY AND CELL CHEMISTRY (15 Hrs)	Unit 1: MICROSCOPY <ul style="list-style-type: none"> <li>• Light Microscopy</li> <li>• Electron Microscopy.</li> </ul>	15
	Unit 2: CELL STUDY METHODS <ul style="list-style-type: none"> <li>• Cell Fractionation, Chromatography and electrophoresis.</li> </ul>	
	Unit 3: MOLECULES IN CELL. <ul style="list-style-type: none"> <li>• Micromolecules in cells: Sugars, Fatty acids, aminoacids, Nucleotides.</li> <li>• Macromolecules in cells: Nucleic acids, proteins, Polysaccharides, glycogen, fats.</li> </ul>	
	Unit 4: CHEMICAL BONDS IN BIOMOLECULES <ul style="list-style-type: none"> <li>• covalent bonds, ionic bonds, noncovalent interactions</li> </ul>	
<b>MODULE 2:</b> CELL ARCHITECTURE (15 Hrs)	Unit 5: MEMBRANE STRUCTURE AND MEMBRANE PROTEINS <ul style="list-style-type: none"> <li>• lipid bilayer – composition and structural organization (amphipathic phospholipids, Fluidity of cell membrane)</li> <li>• Membrane Proteins –structure and function (transmembrane proteins, peripheral membrane proteins)</li> <li>• Phospholipids, sphingolipids, Cholesterol in cell membrane.</li> </ul>	15
	Unit 6: MOLECULAR STRUCTURE AND FUNCTION <ul style="list-style-type: none"> <li>• Plasma Membrane</li> <li>• Cell matrix: Physical nature and Properties.</li> <li>• Nucleus: Ultra Structure and function</li> <li>• Mitochondria: Ultra Structure and functions</li> <li>• Endoplasmic Reticulum: ultra structure, modifications, functions</li> </ul>	
	UNIT 7: MOLECULAR STRUCTURE AND FUNCTION <ul style="list-style-type: none"> <li>• Golgi Complex, Ribosomes, Microsomes, Cytoskeleton</li> </ul>	
<b>MODULE 3:</b> CELLULAR TRANSPORT OF PROTEINS AND VESICLES (15 Hrs)	Unit 8: TRANSPORT ACROSS CELL MEMBRANES <ul style="list-style-type: none"> <li>• Principle of transmembrane transport (transporters and channels, active and passive transport, osmosis)</li> <li>• Transporters and their function- passive transporters, Pumps ( Na<sup>+</sup>, K<sup>+</sup>, Ca<sup>+</sup>)</li> <li>• Ion Channels - ion channels activities, regulation of opening and closing of channels.</li> <li>• Protein transport into organelles (nucleus, mitochondria,ER).</li> </ul>	15
	Unit 9: VESICULAR TRANSPORT. <ul style="list-style-type: none"> <li>• Vesicular transport – transport of soluble proteins, vesicle budding, vesicle docking, endocytic pathways.</li> </ul>	

<b>PRACTICAL COMPONENT OF ZOO-I.C-2: CELL AND MOLECULAR BIOLOGY ( DURATION -02 HRS /WEEK)</b>		
<b>Sr. No</b>	<b>Practical</b>	<b>No. of Practicals</b>
1)	Introduction to Lab techniques – Pipetting, preparation of buffers and solutions, Lab equipments (use and maintenance), acquaintance with general laboratory practices	02
2)	Cytochemistry: Localisation of Proteins, Carbohydrates & fats using different stains.	03
3)	Comparison of membrane permeability – Cellophane and Chick intestine.	02
4)	Osmotic studies – Using Human Red blood cells.	01
5)	Permanent slides: <ul style="list-style-type: none"> <li>- Mitotic stages</li> <li>- Meiotic stages (mounting from grasshopper testes)</li> <li>- Histology - Study of different cell types (animal cells)</li> </ul>	03
6)	Technique of Agarose gel electrophoresis (Observation of technique)	01

#### **REFERENCE BOOKS:**

##### **Essential books:**

- 1) *Alberts B, Hopkins, Lewis J, Raff M, Robertis K, Walter P (2014): Essential Cell Biology, Fourth Edition, Garland Science Taylor & Francis Group, UK.*
- 2) *Lodish H, Berk A, Kaiser CA, Krieger M, Scott MP, Anthony, Bretscher A, Amon A. Scott MP (2013): Molecular Cell Biology, Seventh Edition, W. H. Freeman and Company New York.*

##### **Supplementary Reading:**

- 3) *Gupta PK (2003): Cell and Molecular Biology, Second Edition, Rakesh Kumar Rastogi for Rastogi Publications, Meerut, New Delhi, India.*
- 4) *Verma PS and Agarwal VK (2007): Cell Biology Genetics Molecular Biology Evolution & Ecology. S Chand and Company PVT LTD, New Delhi.*

#### **REFERENCE BOOKS FOR PRACTICALS:**

- 1) *Alberts B, Hopkins, Lewis J, Raff M, Robertis K, Walter P (2014): Essential Cell Biology, Fourth Edition, Garland Science Taylor & Francis Group, UK.*
- 2) *Bolsover SR, Shephard EA, Hugh AW, Hyams JS (2011): Cell Biology, Third Edition, Wiley Blackwell, A John Wiley & Sons, Inc., Publications.*
- 3) *Verma PS and Agarwal VK (2007): Cell Biology Genetics Molecular Biology Evolution & Ecology. S Chand and Company PVT LTD, New Delhi.*

**SEMESTER – II**

<b>CORE COURSE:</b> <b>DIVERSITY AND BIOLOGICAL SYSTEMS OF CHORDATES</b>	
<b>COURSE CODE:</b>	ZOO-II.C-3
<b>MARKS:</b>	100 [ 75 -Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 -Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	<ul style="list-style-type: none"><li>• To be familiar with the different Chordate phyla.</li><li>• To know the general and distinguishing characters of each of them.</li><li>• To compare and contrast the major biological systems amongst them.</li></ul>
<b>LEARNING OUTCOME:</b>	At the end of the course, the students will be familiar with the chordate world that surrounds us. They would be able to identify the different chordates upto the order. They will understand the functioning and mechanism of the various biological systems in the chordates.



<b>ZOO-II.C-3: DIVERSITY AND BIOLOGICAL SYSTEMS OF CHORDATES</b>		
<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
<b>MODULE 1:</b> Diversity of chordates (upto order)	1.1: Chordata: General plan of organization and Outline classification 1.2: General characters and classification of Protochordates 1.3: General characters and classification of Agnatha (upto class) 1.4: General characters and classification of Pisces, Amphibia, Reptilia, Aves, Mammalia upto orders	15
<b>MODULE 2:</b> Biological Systems I	3.1: Integument: Pisces, Amphibia, Reptilia, Aves, Mammalia 3.2: Locomotory apparatus: Pisces, Amphibia, Reptilia, Aves, Mammalia 3.3: Digestive system: Pisces, Amphibia, Reptilia, Aves, Mammalia 3.4: Respiratory system: Pisces, Lungs in Amphibia, Reptilia, Aves, Mammalia	15
<b>MODULE 3:</b> Biological systems - II	3.1: Circulatory system: Pisces, Amphibia, Reptilia, Aves, Mammalia 3.2: Brain and cranial nerves: Pisces, Amphibia, Reptilia, Aves, Mammalia 3.3: Reproductive system: Pisces, Amphibia, Reptilia, Aves, Mammalia	15

<b>PRACTICAL COMPONENT OF ZOO-II.C-3: DIVERSITY OF CHORDATES ( DURATION -02 HRS /WEEK)</b>		
<b>Sr. No</b>	<b>Practical</b>	<b>No. of Practicals</b>
1.	Identification and Systematic classification of organisms from protochordates to mammalia	05
2.	Mounting of scales and chromatophores in fishes	01
3.	Observation of general viscera of chordate phyla	01
4.	Identification of Indian venomous and non venomous snakes with the help of keys provided (four each)	01
5.	Observation of pecten of eye (chick), skulls of representatives of pisces, amphibian, aves and mammals.	01
6.	Observation of permanent slides (amphioxus, doliolum, salpa) and observation of hyoid apparatus of chick; reptiles and mammals	01
7.	Field trip to wild life sanctuary	02

### **REFERENCE BOOKS:**

1. Cleveland Hickman Jr., Roberts Larry, Susan Keen, Allan Larson and Eisenhour D (2014). Animal Diversity. McGraw Hill Science.
2. Kardong K(2011). Vertebrates: Comparative anatomy, evolution, function. McGraw-Hill Higher Education.
3. Kent G.C. and Carr R.K. (2000). Comparative anatomy of the vertebrates. McGraw-Hill Higher Education.
4. Young J.Z. (2006). The life of vertebrates. Radha Press Delhi, Indian Edition.

### **REFERENCE BOOKS FOR PRACTICALS:**

- 1) Ziser. W.S (2014) Biology 1413 Introductory Zoology Lab Manual. Morton Publishing Co. Austin Community College.
- 2) Lal S.S. (2004) A textbook of practical zoology vertebrate. Rastogi publications, Meerut India.

**CORE COURSE:**  
**FUNDAMENTALS OF ANIMAL AND HUMAN GENETICS**

<b>COURSE CODE:</b>	ZOO-II.C-4
<b>MARKS:</b>	100 [ 75 –Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 –Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	This course is intended to provide solid understanding of concepts and principles of genetics as it applies to animals and humans. Students will receive good foundation of chromosome structure, its aberrations and inheritance patterns of traits and disease which will help one to develop conceptual skills to address questions in genetic research.
<b>LEARNING OUTCOME:</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• Describe the basic structure of genes and chromosomes.</li><li>• Relate an organism’s genotype and phenotype and explain the role of genes in inheritance.</li><li>• Understand the reason why a given genotype does not always result in the same phenotype</li><li>• Demonstrate knowledge of genetic principles and their application in society</li><li>• Construct and analyze pedigrees to determine mode of inheritance of disorders and traits.</li></ul>

## ZOO-II.C-4: FUNDAMENTALS OF ANIMAL AND HUMAN GENETICS

MODULE	TOPICS	CONTACT HOURS
MODULE 1: Transmission Genetics	UNIT 1: MODES OF INHERITANCE <ul style="list-style-type: none"> <li>• Mendel's laws of inheritance, test cross, back cross</li> <li>• Gene interactions: 9:3:3:1/12:3:1 / 9:3:4 /9:6:1 / 9:7 / 15:1 / 13:3. lethal genes, penetrance.</li> <li>• Inheritance of Multiple Alleles and Multiple genes</li> </ul>	15
	UNIT 2: PATTERN OF INHERITANCE BY PEDIGREES <ul style="list-style-type: none"> <li>• Construction of Pedigrees</li> <li>• Analysis of Pedigree analysis : autosomal dominant, autosomal recessive, X-Linked dominant, X-linked recessive, Y-linked, Mitochondrial inheritance</li> <li>• Sex limited and Sex influenced and multifactorial inheritance disorders in humans</li> </ul>	
MODULE 2: Chromosome Structure and Abnormalities in Humans	UNIT 3: CHROMOSOME STRUCTURE <ul style="list-style-type: none"> <li>• Chromosome morphology- chromatid, Centromere, secondary constriction, chromomere</li> <li>• Heterochromatin and euchromatin</li> <li>• Chromosome structure and organization.</li> <li>• Human chromosomes and karyotype.</li> </ul>	15
	UNIT 4: CHROMOSOMAL ABERRATION <ul style="list-style-type: none"> <li>• Numerical aberrations: Types- Aneuploidies and Euploidies, Mosaicism,</li> <li>• Structural Abnormalities: Types-Deletions, inversions, Translocations, duplications.</li> </ul>	
MODULE 3: Gene Mutations, Sex Determination	UNIT 5: GENETIC MUTATIONS. <ul style="list-style-type: none"> <li>• characteristics of mutations</li> <li>• classification of mutations (Spontaneous, Induced) molecular basis of mutations</li> <li>• Mutagens – physical and chemical</li> </ul>	15
	UNIT 6: SEX DETERMINATION. <ul style="list-style-type: none"> <li>• Environmental Sex Determination – hormonal, egg size, incubation temperature.</li> <li>• Chromosomal sex determination - XX ♀ and XO ♂, XO ♀ and XX ♂, ZW ♀ and ZZ ♂, XX ♀ and XY ♂, Diploid female and Haploid male, single gene effect.</li> <li>• Molecular basis of sex determination: Geneic imbalance, Sex index, Intersex and gynandomorphs, X/A Ratio.</li> <li>• Sex determination by Y linked genes, Dosage compensation, X-inactivation</li> </ul>	

<b>PRACTICAL COMPONENT OF ZOO-II.C-4: FUNDAMENTALS OF ANIMAL AND HUMAN GENETICS. DURATION - 02 HRS /WEEK</b>		
Sr. No	Practical	No. of Practicals
1)	Verification of Mendel's laws - monohybrid cross	01
2)	Verification of Mendel's laws - dihybrid cross	01
3)	Manual Karyotyping of human chromosome plates: 1) Normal Male and Female 2) Downs syndrome	03
4)	Drosophila Culture technique	01
5)	Study of Mutants of Drosophila	01
6)	Exercises for Multiple alleles and Multiple genes	02
7)	Construction and analysis of pedigrees	03

#### **REFERENCE BOOKS FOR THEORY:**

- 1) Gardner EJ, Simmons MJ and Snustad DP (2013): Principles of Genetics, Eighth Edition, John Wiley Publication, Singapore.
- 2) De Robertis EDP, De Robertis EMF (2012): Cell and Molecular Biology, Eighth Edition. Wolter Kluwer Publication, Philadelphia.
- 3) Singh BD (2014): Fundamentals of Genetics. Second Edition, Kalyani Publishers, New Delhi.
- 4) Lewis R (2009): Human Genetics, Concepts and Applications, Seventh Edition. McGraw-Hill International Edition, New York.
- 5) Gangane SD (2009): Human genetics, Third Edition, Reed Elsevier India Pvt Ltd., Haryana India.
- 6) Gardner A, Davies T (2010): Human Geentics, Second Edition, Scion Publishing Ltd, UK.
- 7) Marcus A(2011): Genetics, MJP Publishers, Chennai.
- 8) Verma PS and Agarwal VK (2014): Cell Biology Genetics Molecular Biology Evolution & Ecology. S Chand and Company PVT LTD, New Delhi.
- 9) Kothari ML, Mehta L, Roychoudhury SS (2009): Essentials of Human Genetics, Fifth edition, University Press Pvt. Ltd. Hyderabad.

#### **REFERENCE BOOKS FOR PRACTICALS:**

- 1) Gangane SD (2009): Human genetics, Third Edition, Reed Elsevier India Pvt Ltd., Haryana India.
- 2) Marcus A(2011): Genetics, MJP Publishers, Chennai.
- 3) Gardner A, Davies T (2010): Human Genetics, Second Edition, Scion Publishing Ltd, UK.
- 4) Lewis R (2009): Human Genetics, Concepts and Applications, Seventh Edition. McGraw-Hill International Edition, New York.

**SEMESTER –III and IV**

<b>SEMESTER</b>	<b>COURSE CODE</b>	<b>COURSES</b>	<b>CREDITS</b>	<b>CONTACT HOURS</b>
<b>Semester III</b>	ZOO-III.C-5	Human Physiology	Theory = 03 Practicals =01	Theory = 45 Practicals =30
	ZOO-III.E-1	Vertebrate Endocrinology	Theory = 03 Practicals =01	Theory = 45 Practicals =30
	ZOO-III.E-2	Basic microbiology and Fundamentals of Animal Biotechnology	Theory = 03 Practicals =01	Theory = 45 Practicals =30
	ZOO-III.E-3	Environmental Toxicology	Theory = 03 Practicals =01	Theory = 45 Practicals =30
<b>Semester IV</b>	ZOO-IV.C-6	Biochemistry and Metabolic Regulation	Theory = 03 Practicals =01	Theory = 45 Practicals =30
	ZOO-IV.E-5	Animal cell culture and Applications	Theory = 03 Practicals =01	Theory = 45 Practicals =30
	ZOO-IV.E-6	Aquaculture and Fisheries	Theory = 03 Practicals =01	Theory = 45 Practicals =30
	ZOO-IV.E-7	Immunology	Theory = 03 Practicals =01	Theory = 45 Practicals =30

## SEMESTER -III

<b>CORE COURSE :HUMAN PHYSIOLOGY</b>	
<b>COURSE CODE:</b>	ZOO-III.C-5
<b>MARKS:</b>	100 [75 -Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [03 -Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	The primary goal of this course is to offer an in-depth presentation of the function of the major organs and organ systems of the human body. The course is designed to expand physiological concepts presented in prerequisite courses.
<b>LEARNING OUTCOME:</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• describe and explain the normal function of the cells, tissues, organs, and organ systems of the human body</li><li>• develop understanding of the functional relationships of anatomical structures to one another</li></ul>

**ZOO-III.C-5: HUMAN PHYSIOLOGY**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
<b>MODULE 1:</b> Physiology Of Digestion And Respiration	<b>UNIT 1: DIGESTIVE SYSTEM</b> <ul style="list-style-type: none"> <li>• Structural organization, histology and functions of gastrointestinal tract and its associated glands;</li> <li>• Mechanical and chemical digestion of food; Absorptions of carbohydrates, lipids, proteins, water, minerals and vitamins.</li> </ul>	15
	<b>UNIT 2: RESPIRATORY SYSTEM</b> <ul style="list-style-type: none"> <li>• Histology of trachea and lung;</li> <li>• Mechanism of respiration, Pulmonary ventilation; Respiratory volumes and capacities;</li> <li>• Transport of oxygen in the blood oxygen- hemoglobin &amp; myoglobin , dissociation curve and the factors influencing it Carbon monoxide poisoning; Carbon dioxide transport in the blood;</li> <li>• Buffering action of blood and haemoglobin Control of respiration</li> </ul>	
<b>MODULE 2:</b> Physiology Of Excretion And Circulation	<b>UNIT 3: EXCRETORY SYSTEM</b> <ul style="list-style-type: none"> <li>• Structure of kidney and its histological details, Renal blood supply; Mechanism urine</li> <li>• Formation and its regulation, Regulation of acid-base balance.</li> </ul>	15
	<b>UNIT 4: CIRCULATORY SYSTEM</b> <ul style="list-style-type: none"> <li>• An outline structure of heart and working of heart.</li> <li>• Origin and conduction of cardiac impulses functions of AV node; Cardiac cycle; nervous and chemical regulation of heart rate; Blood pressure and its regulation; Electrocardiogram</li> <li>• Components of blood and their functions; Haemopoiesis.</li> </ul>	
<b>MODULE 3:</b> Physiology Of Nervous System, Muscles And Reproductive System	<b>UNIT 5: NERVOUS SYSTEM</b> <ul style="list-style-type: none"> <li>• Structure of neuron, resting membrane potential , Origin of action potential and its propagation across the myelinated and unmyelinated nerve fibers;</li> <li>• types of synapsis, Synaptic transmission and, Neuromuscular junction; Reflex action &amp; its types - reflex arc</li> <li>• Physiology of hearing and vision</li> </ul>	15
	<b>UNIT 6: MUSCLE</b> <ul style="list-style-type: none"> <li>• Histology of different types of muscle;</li> <li>• Ultra structure of skeletal muscle;</li> <li>• Molecular and chemical basis of muscle contraction;</li> <li>• Characteristics of muscle twitch; Motor Unit, summation &amp; tetanus</li> </ul>	
	<b>UNIT 7: REPRODUCTIVE SYSTEM</b> <ul style="list-style-type: none"> <li>• Histology of male and female reproductive systems.</li> <li>• Puberty, Physiology of male and female reproduction.</li> </ul>	



<b>PRACTICAL COMPONENT OF ZOO-III.C-5: HUMAN PHYSIOLOGY ( DURATION -02 HRS /WEEK)</b>		
<b>SR. NO</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1)	Enumeration of red blood cells / WBC using haemocytometer	02
2)	Estimation of haemoglobin using Sahli's haemoglobinometer	01
3)	Determination of activities of digestive enzymes (Amylase, Pepsin, Trypsin and Lipase)	02
4)	Temporary preparation of Striated muscle fibers and nerve cells.	02
5)	Urine analysis (for organic, inorganic and abnormal components)	03
6)	Examination of sections of mammalian tissues: Lung, Kidney, Gonads, Intestine, Muscles, Spinal cord, Bone and cartilage	02

### **REFERENCE BOOKS:**

#### *Essential books:*

1. Singh HD(2011):*Textbook of Human Physiology*, S Chand Publishers, New Delhi.
2. Widmaier, Raff, & Strang(2008), *Vander's Human Physiology: The Mechanisms of Body Function*, 12th edition, McGraw Hill,. ISBN 978-0-07-337810-7
3. Tortara G J and Derrickson BH(2009). *Principles of Anatomy and physiology*, 12<sup>th</sup> Edition. John Wiley & sons, Inc.
4. Guyton Ac and Hall JE(2011). *Testbook of Medical Physiology*, 12<sup>th</sup> Edition, Harcourt Asia Pvt Ltd, WB Saunders Company.

#### *Supplementary Reading:*

5. Openstax College (2013). *Anatomy and Physiology. Vol II. Mainstreet MS, Houston Texas(Ebook)*
6. Forciea B (2012). *An eText of Human Anatomy and Physiology(Ebook)*.
7. Wingerd B(2008). *The Human Body, Essential Anatomy and Physiology. University Readers, SanDiego CA.*

### **REFERENCE BOOKS FOR PRACTICALS:**

1. Openstax College (2013). *Anatomy and Physiology. Vol II. Mainstreet MS, Houston Texas(Ebook)*
2. Forciea B (2012). *An eText of Human Anatomy and Physiology(Ebook)*.
3. Wingerd B(2008). *The Human Body, Essential Anatomy and Physiology. University Readers, SanDiego CA.*

**ELECTIVE COURSE: VERTEBRATE ENDOCRINOLOGY**

<b>COURSE CODE:</b>	ZOO-III.E-1
<b>MARKS:</b>	100 [ 75 –Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 –Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	<ul style="list-style-type: none"><li>• To study the endocrine organs of vertebrates</li><li>• To understand the underlying principles of hormone functions</li><li>• To gain an insight into the current and important issues in endocrinology</li></ul>
<b>LEARNING OUTCOME:</b>	At the end of the course, the students will be familiar with all the endocrine organs and their functions in body growth, metabolism, reproduction and development. They will be able to appreciate better the contemporary issues in endocrinology.

### ZOO-III.E-1: VERTEBRATE ENDOCRINOLOGY

MODULE	TOPICS	CONTACT HOURS
<b>MODULE 1:</b>  Anatomy and histology	Unit 1: <ul style="list-style-type: none"> <li>• Aim and scope of endocrinology,</li> <li>• techniques in endocrinology - histology, histochemistry, immunocytochemistry, in situ hybridisation, radio immune assay, surgical techniques,</li> <li>• Regulation of hormone secretion: feedback mechanisms - positive, negative, short loop, long loop</li> </ul>	15
	Unit 2: <ul style="list-style-type: none"> <li>• Anatomy and histology of endocrine glands-</li> <li>• Pituitary, Pineal gland, Thyroid, Parathyroid,</li> <li>• Thymus, Adrenal, Endocrine pancreas, GI tract,</li> <li>• Endocrine hypothalamus, Gonads, Placenta</li> </ul>	
<b>MODULE 2:</b>  Hormones	Unit 3: <ul style="list-style-type: none"> <li>• Classification of hormones</li> <li>• Hormone structure</li> <li>• Biological actions of hormones</li> </ul>	15
	Unit 4: <ul style="list-style-type: none"> <li>• Mechanisms of hormone action</li> <li>• Receptor and it regulation</li> <li>• Steroid and peptide hormones actions</li> </ul>	
	Unit 5: Hormones and Homeostasis - Calcium and glucose	
<b>MODULE 3:</b>  Pathological conditions	Unit 6: Biosynthesis and secretion of hormones - steroid hormones, thyroid hormones	15
	Unit 7: Growth factors - neurotropic growth factors, hematopoietic growth factors, other peptide growth factors	
	Unit 8: Endocrine disorders - goitre, gigantism, dwarfism, cretinism, diabetes mellitus, insepitus	

<b>PRACTICAL COMPONENT OF ZOO-III.E-1: Vertebrate Endocrinology ( DURATION -02 HRS /WEEK)</b>		
<b>Sr. No</b>	<b>Practical</b>	<b>No. of Practicals</b>
1)	Histological slides of Endocrine hypothalamus, Gonads, Placenta pituitary, Pineal gland, thyroid gland, Parathyroid, Thymus, adrenal gland, pancreas, ovary, testis	04
2)	Display of Pituitary and gonads in fishes/chick	03
3)	Preparation of histological slides using microtomy	05

#### REFERENCE BOOKS:

1. David, N.O. and J.A. Carr (2013) Vertebrate Endocrinology. Academic press publications 5<sup>th</sup> edition.
2. Hadley, M. and Levine, J (2006) Endocrinology. Benjamin Cummings 6<sup>th</sup> edition.
3. Kovacs, J.W. and S.R. Ojeda (2011) Textbook of endocrine physiology 6<sup>th</sup> edition. Oxford university press.
4. Yadav, P.R. (2004) Endocrinology. Discovery Publishing House, New Delhi.
5. Hadley, M (1992) Endocrinology, Third edition, prentice Hall, New Jersey.
6. Matsumoto, A. and S. Ishi, (1992 )(eds). Atlas of endocrine organs, vertebrates and Invertebrates springier verlag, Germany.
7. Norris D. O., Vertebrate Endocrinology, Elsevier Academic Press.
8. Turner, C.D and Bagnara, J.T., (1994) General Endocrinology, 6<sup>th</sup> Edition, WB Saunder's company, Philadelphia (Saunder's International Students edition).
9. 5. Wilson J.D and Foster D.W (1992) William's textbook of endocrinology, 8<sup>th</sup> edition, WB saunders company, Philadelphia.
10. Yadav, P.R (2004) Endocrinology. Discovery Publishing House, New Delhi.

**ELECTIVE COURSE: BASIC MICROBIOLOGY AND FUNDAMENTALS OF ANIMAL BIOTECHNOLOGY**

<b>COURSE CODE:</b>	ZOO-III-E-2
<b>MARKS:</b>	100 [ 75 -Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 -Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	To provide a comprehensive survey of microbiology with basic information on bacteria and learn the fundamentals of biotechnological techniques.
<b>LEARNING OUTCOME:</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• Gain working knowledge of basic bacterial laboratory techniques, as well as the foundations of biotechnological tools.</li><li>• Students will also master the basic laboratory skills and techniques necessary to work efficiently in a microbiology laboratory and perform techniques of gene insertion and selection of recombinant plasmids.</li></ul>

**ZOO-III-E-2: BASIC MICROBIOLOGY AND FUNDAMENTALS OF ANIMAL BIOTECHNOLOGY**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
<b>MODULE 1:</b> Microbiology	1: Introduction to Microorganisms-Bacteria <ul style="list-style-type: none"> <li>○ Structure and Identification of bacteria(morphological types)</li> <li>○ Nutritional types</li> <li>○ Nutritional requirements</li> </ul>	15
	2: Isolation and Culture of Bacteria: <ul style="list-style-type: none"> <li>○ Cultivation of bacteria</li> <li>○ Different methods of isolation and maintenance of pure cultures</li> <li>○ Culture characteristics</li> </ul>	
	3: Use of microorganisms in biotechnology-An overview: <ul style="list-style-type: none"> <li>○ Production of valuable substances</li> <li>○ Fuel Production, recovery of minerals and oils</li> <li>○ Microorganisms in bioassays</li> <li>○ Food and agriculture sector</li> <li>○ Medicine and health</li> </ul>	
<b>MODULE 2:</b> Tools in Biotechnology	4: Scope and importance of Biotechnology <ul style="list-style-type: none"> <li>○ Definition</li> <li>○ Contribution and importance of biotechnology</li> </ul>	15
	5: Nucleic Acid Enzymology: <ul style="list-style-type: none"> <li>○ Restriction enzymes, Ligases, Alkaline phosphatase</li> <li>○ Polynucleotide kinase, Terminal Transferases, S1 Nuclease</li> <li>○ Polymerases, Reverse transcriptase</li> </ul>	
	6: Gene Cloning vectors: <ul style="list-style-type: none"> <li>○ Plasmids, Bacteriophage, cosmids</li> <li>○ Shuttle and expression vectors</li> </ul>	
<b>MODULE 3:</b> Genetic Engineering	7: Techniques in genetic engineering: <ul style="list-style-type: none"> <li>○ Gene transfer methods</li> <li>○ Methods of Labeling Nucleic acids</li> <li>○ Nucleic acid Hybridization</li> <li>○ Polymerase chain reaction</li> </ul>	15
	8: Recombinant DNA technology: <ul style="list-style-type: none"> <li>○ Procedure / Technique</li> </ul>	
	9: Blotting Techniques: <ul style="list-style-type: none"> <li>○ Southern Blotting</li> <li>○ Northern Blotting</li> <li>○ Western Blotting</li> </ul>	
	10: DNA sequencing techniques: <ul style="list-style-type: none"> <li>○ Chemical Degradation method</li> <li>○ Chain termination method</li> <li>○ Automated Sequencing</li> </ul>	

<b>PRACTICAL COMPONENT OF ZOO-III-E-2:            BASIC MICROBIOLOGY &amp; FUNDAMENTALS OF ANIMAL BIOTECHNOLOGY            DURATION - 02 HRS /WEEK</b>		
SR. NO	PRACTICAL	NO. OF PRACTICALS
1)	Preparation of culture media for bacteria (Plates, Slants, deeps, Broth).	03
2)	Staining of Microorganisms (Gram staining, negative staining).	02
3)	Isolation of pure colonies of Bacteria (streak plate method – 3 Quadrant And 5 Quadrant methods)	03
4)	Identification of Products of metabolic pathways of microbial cells.	02
5)	Bacteriological testing of Milk.	01
6)	DNA sequencing - Analysis of prints.	01

#### REFERENCE BOOKS:

##### *Essential books:*

- 1) Pelczar MJ, Chan ECS, Krieg NR(2009). *Microbiology*. Tata Mc Graw Hill, New York.
- 2) Dubey RC and Maheshwari DK (2012). *A test book of Microbiology*. S Chand Publishers, New Delhi.
- 3) Prave P, Faust U, Sittig W and Sukatsh DA(2004). *Fundamentals of Biotechnology*.
- 4) Purohit SS(2008). *Biotechnology Fundamentals and applications*. Agrobios, Jodhpur India.
- 5) Ranga MM(2012): *Animal Biotechnology*. Agrobios, Jodhpur India.

##### *Supplementary reading:*

- 6) Black JG(2005). *Microbiology principles and explorations*. John Wiley and sons Inc.
- 7) Sullia SB and Shantharam S(2006). *General Microbiology*. Oxford and IBH Publishing Co Pvt Ltd, NewDelhi.

#### REFERENCE BOOKS FOR PRACTICALS:

- 1) Gunasekaran P(2009). *Lab Manual in Microbiology*. New Age International Ltd. Publishers, New Delhi.

**ELECTIVE COURSE: ENVIRONMENTAL TOXICOLOGY**

<b>COURSE CODE:</b>	ZOO-III-E-3
<b>MARKS:</b>	100 [ 75 –Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 –Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	<ul style="list-style-type: none"><li>• To study the different environmental pollutants and their toxicity.</li><li>• To know the physiological effects of toxicant exposure.</li></ul>
<b>LEARNING OUTCOME:</b>	After completion of the course students are expected to be able to: <ul style="list-style-type: none"><li>• Distinguish, classify and characterize a variety of environmental pollutants based on their biological and physical properties.</li><li>• Identify the main sources and types of environmental pollutants and assess their potential environmental fate.</li><li>• Will learn mechanisms of detoxification of various varieties of toxicants.</li><li>• Will learn bio-indicators of exposure to specific environmental contaminants.</li><li>• Identify potential solutions to anthropogenic pollution</li></ul>



<b>ZOO-III-E-3: ENVIRONMENTAL TOXICOLOGY</b>		
<b>MODULE</b>	<b>TOPIC</b>	<b>CONTACT HOURS</b>
<b>MODULE 1:</b> Introduction To Toxicology	<p><b>1.1 Introduction To Toxicology:</b></p> <ul style="list-style-type: none"> <li>○ Definition and History of Toxicology and Toxicity</li> <li>○ Disciplines of Toxicology</li> <li>○ Biouptake, Bioaccumulation, Biotransfer and Biological Magnification, Relationship to Other Sciences, Scope and importance of Toxicology</li> </ul> <p><b>1.2: Classes Of Toxicant:</b></p> <ul style="list-style-type: none"> <li>• Define Toxicant and Toxins, their classification</li> <li>• Toxicants in Air, Water and Soil</li> <li>• Toxicants in Domestic and Occupational Settings</li> <li>• Synthetic drugs: Solvents; Therapeutic drugs, Drugs of abuse, Combustion products, Cosmetics</li> <li>• Movement and fate of Toxicants in the environment</li> </ul>	15
<b>MODULE 2:</b> Environmental Impact Mitigation	<p><b>2.1: Toxicity Of Heavy Metals:</b></p> <ul style="list-style-type: none"> <li>• Toxicity of Arsenic, Lead, Mercury,</li> <li>• Cadmium, Copper, Zinc, Aluminium, Iron and Manganese; Sources and portals of heavy metal pollutants; Toxicity of substances on Human and Animals</li> </ul> <p><b>2.2: Agro-Chemical Pesticides And Their Environmental Impact Mitigation</b></p> <ul style="list-style-type: none"> <li>• Definition and Classification</li> <li>• Organochlorine Insecticides, Organophosphate Insecticides, Carbamates, Pyrethroid Insecticides, Dinitrophenols, Herbicides, Fungicide</li> <li>• Control of Pesticide Pollution; Integrated Pest management</li> </ul>	15
<b>MODULE 3:</b> Food Additives AND Toxicity tests.	<p><b>3.2: Food Additives:</b></p> <ul style="list-style-type: none"> <li>• General account of Food Additives:</li> <li>• Incidental or Indirect additives</li> <li>• Intentional or Direct additives: a. Antioxidants b. Emulsifiers c. Enzymes d. Flavouring agents e. Colour and preservatives f. Artificial sweetening agents i) Saccharine ii) Urea derivatives</li> <li>• Types of toxicity tests; Test types based on number and species; Test types based on exposure of toxicant; Test types based on length of exposure (acute, sub acute, chronic)</li> </ul>	15

<b>PRACTICAL COMPONENT OF ZOO-III.E-3:ENVIRONMENTAL TOXICOLOGY ( DURATION-02 HRS/WEEK)</b>		
<b>Sr.No.</b>	<b>Practical</b>	<b>No.of Practicals</b>
1.	To determine the effect of temperature on the toxicity of a pollutant	01
2.	To determine the effect of pH on the toxicity of a pollutant.	01
3.	To evaluate qualitatively the presence of pesticide residues in vegetable samples.	02
4.	Estimation of total dissolved solids in given water sample.	01
5.	To determine $Lc^{50}$ of a pollutant on mosquito larvae .	01
6.	Effect of pesticides on Oxygen consumption in fish	02
7.	Estimation of Phosphorus in given water sample by Spectrophotometer	01
8.	Estimation of Boron from given water/soil sample by spectrophotometer	01
9.	Determination of Nitrates from given water sample.	01
10.	Field trip (case study of polluted water body)	01

#### **REFERENCE BOOKS FOR THEORY:**

1. Ernst Hodgson(2004) A Text Book of Modern Toxicology ,A John Wiley and sons Inc,Publication.
2. Gupta P.K.(2010) Modern Toxicology, Pharma Med Press, Hyderabad.
3. Omkar(2007) Concepts of Toxicology ,Vishal Publishing Co, Jalandhar
4. Pandey K,Shukla J.P. and Trivedi S.P. (2011)Fundamentals of Toxicology,New Central Book Agency(P) Ltd.
5. P.D.Sharma (2011)Environmental Biology and Toxicology (Third edition),Rastogi Publications,Meerut-250002.

#### **REFERENCE BOOKS FOR PRACTICALS:**

1. Wooley, A (2008) A Guide to Practical Toxicology: Evaluation, Prediction, and Risk IInd Edition, Informa Healthcare U.S.A.,Inc.New York.
2. Rao K.S. (1998) Practical Ecology, Anmol Publications Pvt. Ltd. New Delhi.
3. Subramanian M.A. (2004) Toxicology Principles and Methods(Second Revised Edition),M.J.P. Publishers, Triplicane Chennai.
4. Sunita Hooda and Sumanjeet Kaur(1999)Laboratory Manual for Environmental Chemistry, S. Chand and Comp. Ltd. New Delhi.

**ELECTIVE COURSE: PARASITOLOGY**

<b>PAPER CODE:</b>	ZOO-III.E-4
<b>MARKS:</b>	100 [ 75 –Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 –Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	<ul style="list-style-type: none"><li>• To be familiar with the parasite host interactions.</li><li>• To gain knowledge on diagnosis of parasite infections and also to learn about the preventive measures.</li></ul>
<b>LEARNING OUTCOME:</b>	At the end of the course the learner will be acquainted with dimensions of public health viz a viz parasitic diversity, epidemiology and community prophylaxis

<b>ZOO-III.E-4: PARASITOLOGY</b>		
<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
<b>MODULE 1:</b> Basic Principles of Parasitology and parasitic protozoans	1.1 Parasite systematics, Ecology and Evolution 1.2 Immunology and Pathology 1.3 Symbiosis and parasitism 1.4 Parasite host interactions Form, function, classification, life cycle, diagnosis and preventive measures 1.5 <i>Trypanosoma gambiens</i> 1.6 Amoebas – <i>Entamoeba histolytica</i> 1.7 Malaria organisms - <i>Plasmodium vivax</i> 1.8 Sexually transmitted parasite – <i>Trichomonas vaginalis</i>	15
<b>MODULE 2:</b> Parasitic Platyhelminthes and Nematodes	Form, function, classification, life cycle, diagnosis and preventive measures 2.1 Trematoda(liver fluke - <i>Fasciola hepatica</i> , intestinal fluke – <i>Fasciolopsis buski</i> , lung fluke – <i>Paragonimus westermani</i> ); 2.2 Cestoda (Tape worm - <i>Taeniasolium</i> ) 2.3 Hook worms- <i>Ancylostoma duodena</i> 2.4Guinea worm- <i>Dracanculus medinensis</i> 2.5Round worm <i>Ascaris lumbricoids</i> , <i>Enterobias vermicularis</i> 2.6 <i>Wuchereria bancrofti</i>	15
<b>MODULE 3:</b> Parasitic arthropods and Parasites of domestic livestock	Form, function, classification , life cycle, diagnosis and preventive measures: Copepods, Barnacles, Amphipods, Isopods, Flea, Ticks, Mites, Head and pubic lice	15

<b>PRACTICAL COMPONENT OF ZOO-III.E-4: PARASITOLOGY ( DURATION -02 HRS /WEEK)</b>		
<b>Sr. No</b>	<b>Practical</b>	<b>No. of Practicals</b>
1)	Study of <i>Trypanosomagambiens</i> , <i>Entamoebahistolytica</i> , <i>Plasmodiumvivax</i> , <i>Trichomonasvaginalis</i> , <i>Fasciola hepatica</i> , <i>Taeniasolium</i> , <i>Ancylostoma duodena</i> , <i>Dracanculusmedinensis</i> , <i>Ascarislumbricoids</i> , <i>Wuchereriabancrofti</i> , copepod, barnacle, amphipod, isopod from permanent slides with respect to parasitic adaptations.	06
2)	Preparation of peripheral blood smear from the perspective of detection of haemoparasites	01
3)	Study of parasites of domestic livestock(parasite, pathogenicity)	04
4)	Study of fish parasites	01

**REFERENCE BOOKS:**

1. Chatterjee, K.D. (2009) Parasitology (Protozoology and Helminthology) with two hundred fourteen illustrations. CBS, 13<sup>th</sup> edition.
2. Dey, N.C., Dey, T.K. and D.M. Sinha (1995) Medical Parasitology. New Central book agency private limited, Calcutta.
3. Paniker, J.C.K. (2007) Textbook of medical parasitology. Jaypee Brothers, New Delhi.
4. Schmidt, G.D. (1990) Essentials of Parasitology. Universal Book Stall, New Delhi.

**REFERENCE BOOK FOR PRACTICALS :**

1. Halton, D.W., Behnke, J.M. and I. Marshall (2005) Practical exercises in parasitology. Cambridge University Press.

**SEMESTER IV:**

<b>CORE COURSE: BIOCHEMISTRY AND METABOLIC REGULATION</b>	
COURSE CODE:	ZOO-IV.C-6
MARKS:	100 [ 75 -Theory ; 25- Practicals]
CREDITS:	04 [ 03 -Theory; 01- Practical]
CONTACT HOURS:	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
COURSE OBJECTIVES:	<ul style="list-style-type: none"><li>• To understand the basic principles that govern the functioning of living systems</li><li>• To know the structure of biomolecules and the role they play in governing life processes through the pathways</li><li>• To be familiar with enzymes and their activities</li></ul>
LEARNING OUTCOME:	At the end of the course, the students will be able to understand better the chemical basis in life. They will appreciate better the interactions between the biological molecules.

**ZOO-IV.C-6: BIOCHEMISTRY AND METABOLIC REGULATION**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
<b>MODULE 1:</b> Fundamentals of biochemistry and Carbohydrate metabolism	1.1 Principles of pH, buffer, thermodynamics 1.2 Enzymes: classification, properties of enzyme, enzyme kinetics, Michaelis-Menten Equation, enzyme inhibition 1.3 Carbohydrate structure, aerobic and anaerobic glycolysis, Citric acid cycle, glycogenesis, glycogenolysis, Pentose phosphate pathway, 1.4 Diabetes mellitus	15
<b>MODULE 2:</b> Lipid and Protein metabolism	2.1: Lipid: -structure and classification, -fatty acid synthesis -fatty acid oxidation (saturated and unsaturated), - metabolism of glycerophospholipids, sphingolipids, cholesterol - disorders: fatty liver types (NAFL, AFL)  2.2 Protein: - structure (primary, secondary, tertiary) and classification - amino acid biosynthesis, nucleotide biosynthesis, - amino acid catabolism, urea cycle, Fate of carbamoyl P, - Hyperuricemia	15
<b>MODULE 3:</b> Nucleotide metabolism and integration of metabolism	3.1 Biosynthesis of purine and pyrimidine (de novo and salvage pathway) 3.2 Degradation of purine and pyrimidine 3.3 Interconversions between the three principal components 3.4 Metabolism in starvation: Carbohydrate, lipid, proteins (The feed/fast cycle)	15

<b>PRACTICAL COMPONENT OF ZOO-IV.C-6: BIOCHEMISTRY AND METABOLIC REGULATION ( DURATION -02 HRS /WEEK</b>		
Sr. No	Practical	No. of Practicals
1)	Principle and working of spectrophotometer	01
2)	Estimation of reducing sugars DNSA method	01
3)	Estimation of protein – Folin Lowry’s method	01
4)	Estimation of fatty acids by titration method	01
5)	Separation of lipids by thin layer chromatography	02
6)	Colorimetric estimation of liver glycogen of chick by Anthrone method	02
7)	Effect of substrate concentration on amylase activity	02
8)	Estimation of DNA by DPA method	02

#### **REFERENCE BOOKS:**

1. David, L.N. and Cox, M. Michael (2008) Lehninger principles of biochemistry. W.H. Freeman and Company, New York.
2. Delvin, T.M. (1997). Textbook of biochemistry with clinical correlations. Wiley liss.
3. Harvey, A.R. and Ferrier, D. (2011). Lippincott’s Illustrated Reviews Biochemistry. Wolters Kluwer, Lippincott Williams and Wilkins. 5<sup>th</sup> Edition.
4. Pratt, W.C. and K. Cornely 2003 Essential Biochemistry Wiley Publications third edition.

#### **REFERENCE BOOKS FOR PRACTICALS:**

Plummer, M. and D.T. Plummer (1988) Introduction to practical biochemistry. Tata McGraw Hill Education ,UK.



**ELECTIVE COURSE:**  
**ANIMAL CELL CULTURE AND APPLICATIONS**

<b>COURSE CODE:</b>	ZOO-IV-E-5
<b>MARKS:</b>	100 [ 75 -Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 -Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	This course is an introduction to the theory, standard practices, and methodologies of animal cell culture. The laboratory emphasizes the principles and practices of initiation, cultivation, maintenance of cell lines.
<b>LEARNING OUTCOME:</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"> <li>▪ operate, calibrate, and maintain standard equipment found in an animal cell culture laboratory;</li> <li>▪ Prepare and sterilize media and solutions used in cell culture.</li> <li>▪ Demonstrate an understanding of the concepts and applications of mammalian cell culture.</li> <li>▪ Recognize and employ biosafety guidelines and practices.</li> </ul>

**ZOO-IV-E-5: ANIMAL CELL CULTURE AND APPLICATIONS**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
MODULE 1: LAB REQUIREMENTS FOR CELL CULTURE	1: Historical background of Cell culture:	15
	2: Biology of cells in culture: Origin and characteristics, Differentiation, kinetics of cell growth, Genetics of Cultured cells, Problems associated with cell culture	
	3: Lab requirements for animal cell culture: <ul style="list-style-type: none"> <li>o Lab facilities and setup for cell culture</li> <li>o Major and minor equipments</li> <li>o Environmental conditions</li> <li>o Substrates for Culturing and sub culturing</li> </ul>	
	4: Animal tissue culture media <ul style="list-style-type: none"> <li>o Natural media – biological fluids, tissue extracts</li> <li>o Chemically defined media- characteristic and composition</li> <li>o Media supplements – L Glutamine, serum. Advantages and disadvantages of serum in media / serum free media</li> </ul>	
MODULE 2: CELL CULTURE TECHNIQUES	5: Primary cell culture: <ul style="list-style-type: none"> <li>o Mechanical disaggregation</li> <li>o Enzymatic disaggregation</li> <li>o Protocol for primary cell culture</li> </ul>	15
	6: Secondary cell culture/ Sub culturing: <ul style="list-style-type: none"> <li>o Protocol for sub culturing of suspension culture</li> <li>o Protocol for sub culturing of adherent</li> <li>o Established cell lines</li> </ul>	
	7: Scale up of animal cell culture: <ul style="list-style-type: none"> <li>o Techniques of Scale up of suspension cultures</li> <li>o Techniques of Scale up of Monolayer cultures</li> </ul>	
MODULE 3: CELL CULTURE APPLICATIONS	8: Cell Hybridoma Technology : <ul style="list-style-type: none"> <li>o Steps of cell Hybridoma technology</li> <li>o Procedure</li> <li>o Production of monoclonal antibodies</li> <li>o Applications of monoclonal antibodies</li> </ul>	15
	9: Valuable Products through cultured cells: Production of Tissue plasminogen, growth factor, Erythropoietin, Factor VIII, Interferons.	
	10: Other Application: Vaccines through cultured cells, Cytotoxicity testing, Fluorescent In-Situ Hybridization for disease detection, Cell culture in biomedical research.	

<b>PRACTICAL COMPONENT OF ZOO-IV-E-5: DURATION -02 HRS /WEEK ANIMAL CELL CULTURE AND APPLICATIONS</b>		
<b>Sr. No</b>	<b>Practical</b>	<b>No. of Practicals</b>
1.	Packing and sterilization of glass and plastic wares for cell culture & Lab Precautions and Biosafety measures	02
2.	Preparation of reagents and media for cell culture. <ul style="list-style-type: none"> <li>▪ Reagents</li> <li>▪ Media / Buffers</li> </ul>	02
3.	Setting up of primary cell culture <ul style="list-style-type: none"> <li>- Methods used for cell disaggregation – Mechanical and Enzymatic</li> <li>- Quantification of cells (Viable cell count) by Tryphan blue exclusion dye.</li> <li>- Suspension culture</li> <li>- Adherent cell culture</li> <li>- Chicken embryo fibroblast culture</li> </ul>	07
4.	Biological waste disposal methods	01

#### **REFERENCE BOOKS:**

- 1) Ranga MM(2012). *Animal Biotechnology*. Agrobios India Ltd. Jodhpur.
- 2) Mathur S(2006 ). *Animal Cell and Tissue Culture*. Agrobios India Ltd. Jodhpur.
- 3) Masters W(2005). *Animal Cell Culture*. Oxford University Press Inc., NewYork
- 4) Gangal S(2010). *Principles and practices of Animal Tissue Culture*. Second Edition. University Press PVT. LTD., Hyderabad India.
- 5) Freshney I R( 2007). *Culture of animal Cells: A manual of Basic Techniques*. 5<sup>th</sup> edition, John Wiley & Sons Inc Pte Ltd

#### **REFERENCE BOOKS FOR PRACTICALS:**

- 1) E Book- Fletcher L, Goss E. Phelps P and Wheeler A(2014). *Introduction to Biotechnology – Laboratory Manual*.
- 2) Harisson M A and Rae IF(1997):*General Techniques of Cell Culture Handbook in Practical animal cell biology*. Cambridge University Press.
- 3) Ebook- Cell Culture basics. From [www.invitrogen.com/cellculture\\_basics](http://www.invitrogen.com/cellculture_basics).

**ELECTIVE COURSE : AQUACULTURE AND FISHERIES**

<b>COURSE CODE:</b>	ZOO-IV.E-6
<b>MARKS:</b>	100[75- Theory; 25- Practicals]
<b>CREDITS:</b>	04 [03-Theory;01- Practical)
<b>CONTACT HOURS</b>	Theory :45 Hours(03 LEC/WEEK) Practicals: 30 Hours(01 PRACTICAL/WEEK)
<b>COURSE OBJECTIVES:</b>	<ul style="list-style-type: none"><li>• To improve the understanding of conservation and sustainability of living resources</li><li>• To improve the social and economic benefits derived from aquaculture and fisheries.</li><li>• To study the role of aquaculture in rural development in solving nutritional security and unemployment.</li><li>• Empowerment of fishery and entrepreneurship development</li></ul>
<b>LEARNING OUTCOMES:</b>	<ul style="list-style-type: none"><li>• The student may become future aqua culturist, entrepreneur who will provide employment to others.</li><li>• Optimum utilization of unutilized and underutilized aquatic resources for fisheries and aquaculture, enhance the fish production, employment generation and even to earn the foreign exchange.</li></ul>

**ZOO-IV.E-6: AQUACULTURE AND FISHERIES**

<b>MODULE</b>	<b>TOPIC</b>	<b>CONTACT HOURS</b>
<b>MODULE 1:</b>	<p><b>1.1: Inland Fisheries:</b></p> <ul style="list-style-type: none"> <li>• Riverine ;Reservoir fisheries; Lakesterine fisheries; Cold water fisheries</li> </ul> <p><b>1.2: Marine Fisheries:</b></p> <ul style="list-style-type: none"> <li>• Estuarine fisheries:The catadromous fishes (<i>Polynemous indicus,P.tetradactylus</i>) and anadromous fishes(<i>Hilsa ilisha,Pama pama,Polynemous paradiseus</i>)</li> <li>• Coastal fisheries or Inshore fisheries: Elasmobranch fishery and Teleost fishery</li> <li>• Offshore and Deep sea fisheries: Pomfrets(<i>Pampus,Stromateus</i>) <i>Eleutheronema tetradactylus</i>(rava).</li> </ul> <p><b>1.3: Crustacean And Molluscan Fisheries:</b></p> <ul style="list-style-type: none"> <li>• Prawn fisheries in Goa: Penaeid and Palaemonid groups.</li> <li>• Crab fisheries in Goa</li> <li>• Edible oyster fisheries in Goa</li> <li>• Mussel fisheries in Goa</li> </ul>	15
<b>MODULE 2:</b>	<p><b>2.1: Integrated Fish Farming Systems:</b></p> <ul style="list-style-type: none"> <li>• Principle of integrated Fish farming; Integration with animal husbandry and farming systems.</li> </ul> <p><b>2.2: Induced Breeding:</b></p> <ul style="list-style-type: none"> <li>• Selection of site; Design and Layout of fish farm; Freshwater and brackish water; pond construction; Pond maintenance; Prevention of fish diseases; Control of aquatic weeds, predatory and Weed fishes, Aquatic insect; Harvesting.</li> </ul> <p><b>.4 :Fishing Methods:</b></p> <ul style="list-style-type: none"> <li>• Marine Fishing Crafts and Gears used in Goa.</li> <li>• Inland Fishing Crafts and Gears used in Goa</li> </ul>	15
<b>MODULE 3:</b>	<p><b>3.1: Fish Culture System:</b></p> <ul style="list-style-type: none"> <li>• Overview of Mono culture, polyculture, composite culture, raceway culture, extensive, semi intensive, intensive, zero water exchange, Objective of fish culture, Pond preparation, Selection of species, Stocking of seed, Feed and feeding, Harvesting, Bionomics of fish culture</li> </ul> <p><b>3.2: Cage And Pen Culture:</b></p> <ul style="list-style-type: none"> <li>• Advantage of Fish culture in cages, Selection of species for cage culture, Installation of cage - shape ,size and types of cages, Pen culture, Maintenance of cage and pen</li> </ul>	15

**PRACTICAL COMPONENT OF ZOO-IV.E-6: AQUACULTURE AND FISHERIES  
(DURATION – 02 HRS/ WEEK)**

<b>Sr. No.</b>	<b>Practical</b>	<b>No. of Practicals</b>
1.	Morphometric and Meristic study : a key for fish Identification	04
2.	Identification of : -Important edible prawns, shrimps and crabs( anytwo) - Important Freshwater and Marine edible fishes- oil sardine, sole fish, white sardine,mullet,Scianera	03
5.	Estimation of Fecundity by Frequency Polygon method from a Marine Fish	01
6.	Food and Feeding of Fish by analysis of gut content	01
7.	Field based: • To study different types of gear and craft • To study fish breeding • Study of aquarium and larvivorous fishes	03

**REFERENCE BOOKS FOR THEORY:**

1. Bal D.V.,RaoVirbhadra,K (1984) Marine Fisheries, Tata McGraw- Hill Publishing Company Ltd.New Delhi.
2. Cushing D.H. (1975) Marine Ecology and Fisheries , Cambridge University Press.
3. Day,F. (1889) The Fauna of British India including Ceylon and Burma. Fishes. 2Vols., Taylor and Francis London.
4. Khanna S.S.(1984) An Introduction to Fishes, Central Book Depot Allahabad.
5. Pandey K and Shukla J.P.(2015) Fish and Fisheries. Rastogi Publications Meerut-250002
6. Sakhare B. Viswas (2007) Applied Fisheries.Daya Publishing House Delhi- 110035
7. Santhanam R (1990) Fisheries Science,Daya Publishing House Delhi.
8. SanthanamR,Ramanathan N and Jagatheesan G(1990) Coastal Aquaculture in India,CBS Publishers and distributors,Delhi.
9. Shrivastava C.B.L.(1996) A Text Book of Fishery Science and Indian Fisheries. KitabMahal22 A,S.N.Marg, Allahabad.
10. Singh B.K.(2008) Applied Fisheries and Aquaculture.Swastik Publishers and distributors,Delhi.

**REFERENCE BOOKS FOR PRACTICALS:**

1. Chandy.M (1970) Fishes,National Book Trust,India,New Delhi.
2. Day.F. (1889) The Fauna of British India including Ceylon and Burma. Fishes. 2Vols.,Taylor and Francis London.
3. R.J.Ranjit Daniels (2002) Freshwater Fishes of Peninsular India, Universities Press (India )Pvt.Ltd. Hyderabad.
4. SakhareViswasB. (2007) Applied Fisheries ,Daya Publishing House Delhi.
5. Sharma U and S.P.Grover (1982) An Introduction to Indian Fisheries,Dehradun India.
6. Srivasava C.B.L.(1986) A Text Book of Fishery Science and Indian Fisheries ,KitabMahal Allahabad.

**ELECTIVE COURSE: IMMUNOLOGY**

<b>COURSE CODE:</b>	ZOO-IV.E-7
<b>MARKS:</b>	100 [ 75 -Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 -Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	Familiarize students and make them learn about the structural features of the components of the immune system as well as their functions, and understand the mechanisms involved in immune system development and responsiveness.
<b>LEARNING OUTCOME:</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• Understand the components of the immune system and their function.</li><li>• Be able to explain the mechanisms of immune response.</li><li>• Perform immunoassays to detect the presence of antigens or antibodies(disease detection).</li></ul>

**ZOO-IV-E-7: IMMUNOLOGY**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
MODULE 1: Introduction To Immunology	1: OVERVIEW OF IMMUNE SYSTEM: <ul style="list-style-type: none"> <li>• Basic concepts in immunology</li> <li>• Components of the immune system</li> </ul>	15
	2: INNATE AND ADAPTIVE IMMUNITY. <ul style="list-style-type: none"> <li>• Innate immunity-Anatomical barriers/ layers of defense, cells and molecules involved in innate immunity</li> <li>• Adaptive immunity-cell mediated and humoral immunity, passive immunity (artificial and natural), Active(artificial and natural), Immune dysfunction</li> </ul>	
MODULE 2: Antigens And Immunoglobulins	3: ANTIGENS. <ul style="list-style-type: none"> <li>• Antigenicity and immunogenicity, Immunogens, adjuvants and haptens</li> <li>• Factors influencing immunogenicity</li> <li>• B and T cell epitopes</li> </ul>	15
	4: IMMUNOGLOBULINS <ul style="list-style-type: none"> <li>• Structure and function of different classes of Immunoglobulin.</li> <li>• Antigen-Antibody interactions</li> <li>• Immunoassays, monoclonal &amp; polyclonal antibodies</li> </ul>	
	5: MAJOR HISTOCOMPATIBILITY COMPLEX. <ul style="list-style-type: none"> <li>• Structure and function of endogenous and exogenous pathways of antigen presentation</li> </ul>	
MODULE 3: Immune Response	6: CYTOKINES AND COMPLEMENT SYSTEM <ul style="list-style-type: none"> <li>• Properties and functions of cytokines, cytokine based therapies</li> <li>• Components and pathways of complement activation</li> </ul>	15
	7: HYPERSENSITIVITIES, AUTOIMMUNITY AND TRANSPLANTATION <ul style="list-style-type: none"> <li>• Gell and coombs' classification, types of hypersensitivities(overview)</li> <li>• Autoimmune responses against self antigens (SLEs), responses to alloantigens and transplant rejection (graft rejection, types and mechanisms of transplant rejection)</li> </ul>	
	8: VACCINES <ul style="list-style-type: none"> <li>• Types of vaccines -inactivated, attenuated, toxoid, subunit, conjugate, experimental (DNA and recombinant vaccine), monovalent/polyvalent vaccines</li> </ul>	



<b>PRACTICAL COMPONENT OF ZOO-IV-E-7: IMMUNOLOGY ( DURATION -02 hrs/WEEK)</b>		
<b>Sr. No</b>	<b>Practical</b>	<b>No. of Practicals</b>
1	Preparation of serum from goat blood.	02
2	Slide Agglutination Reaction(blood groups – A / AB / O with Rh)	02
3	Differential count of leukocytes	01
4	Detection of presence of antigen / antibody - Simple immunodiffusion	01
5	Antibody Titre determination - Ouchterlony immunodiffusion	02
5	Antigen –antibody reaction by immunoelectrophoresis	02
6	Elisa TEST- pregnancy test	01
7	Phagocytosis – WBC (demonstration)	01

#### **REFERENCE BOOKS:**

##### *Essential books:*

- 1) Abbas KA, Lechtman HA(2007). *Basic Immunology, Updated Edition 2006-2007: with STUDENT CONSULT. Access (Paperback).*
- 2) David M, Jonathan B, David RB and Ivan R(2006). *Immunology. VII Edition, Mosby, Elsevier Publication.*
- 3) Abbas KA, Lechtman HA(2003). *Cellular and Molecular Immunology. Saunders Publication.*
- 4) Kindt TJ, Goldsby RA, Osborne BA and Kuby J(2006). *Immunology. VI edition. W H Freeman and company.*

##### *Ebooks:*

- 5) Frank SA(2002). *Immunology and evolution of infectious diseases. Princeton University Press, Princeton and Oxford.*
- 6) Zabriskie JB(2009). *Essential Clinical Immunology. Cambridge University Press.*

#### **REFERENCE BOOKS FOR PRACTICALS:**

- 1) Talwar GP and Gupta SK(2012). *A handbook of practical and Clinical Immunology, CBS publishers.*

**ELECTIVE COURSE : EVOLUTIONARY BIOLOGY**

<b>COURSE CODE:</b>	ZOO-IV.E-8
<b>MARKS:</b>	100 [75-Theory; 25 -Practicals ]
<b>CREDITS:</b>	04[ 03 – Theory; 01 – Practical
<b>CONTACT HOUR :</b>	Theory : 45 Hours( 03 Lec./Week) Practicals: 30 Hours(01Practical/Week)
<b>COURSE OBJECTIVE:</b>	<ul style="list-style-type: none"><li>• The study aims to discover the history of life and the causes of the diversity and characteristics of organisms.</li><li>• To show the important contributions of evolutionary biology to other biological disciplines such as medicine</li></ul>
<b>LEARNING OUTCOME:</b>	<ul style="list-style-type: none"><li>• The study will give detail knowledge about many unsolved hypothetical issues to solve it.</li><li>• The student will learn that evolution is not a speculation , but a thoroughly supported hypothesis that explains the process of evolution</li></ul>

**ZOO-IV.E-8: EVOLUTIONARY BIOLOGY**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
<b>MODULE 1:</b>	<p><b>1.1: EVOLUTIONARY BIOLOGY:AN OVERVIEW</b></p> <ul style="list-style-type: none"> <li>• What Is Evolution, History Of Evolutionary Biology, Pre Darwinian, Darwin's Evolutionary Theory, Evolutionary Theories After Darwin</li> <li>• Famous contributions to evolutionary Biology: CarlLinneaus,Lamarck,Malthus,Darwin,Thomas Huxley,R.A.Fisher,Haldane,sewall Wright, G.G.Simpson, Dobzanhasky,Ernst Mayr, M.Kimura.</li> </ul> <p><b>1.2: THE NATURAL SELECTION:</b></p> <ul style="list-style-type: none"> <li>• Natural Selection: Nature; Postulates;Evidences; Types of natural selection(Stabilizing,Directional and Disruptive selection)</li> <li>• Natural Selection in action(Darwin's finches, Endler's guppies examples); Sexual Selection</li> </ul> <p><b>1.3: RANDOM PROCESS IN EVOLUTION:</b></p> <ul style="list-style-type: none"> <li>• types of mutation, genetic drift, gene flow(migration/emmigration)</li> </ul>	15
<b>MODULE 2:</b>	<p><b>2.1: NON- DARWINISM</b></p> <ul style="list-style-type: none"> <li>• Neutral theory of evolution</li> <li>• Molecular polymorphism-nucleic acids and proteins, Molecular clocks</li> </ul> <p><b>2.2: SPECIATION</b></p> <ul style="list-style-type: none"> <li>• Concepts of speciation; Concept Of Biological Speciation( Allopatric/Sympatric); Consequence Of Speciation; Factors involved in Biological Speciation(pre and post- zygotic mechanisms)</li> </ul> <p><b>2.3: POPULATION GENETICS</b></p> <ul style="list-style-type: none"> <li>• Hardy-Weinberg's Law(H-W); Genes And Genotype Frequencies; Factors Affecting H-W</li> </ul> <p><b>2.4:ADAPTATIONS :</b></p> <ul style="list-style-type: none"> <li>• Definition and kinds of adaptations with some examples, Pre , Post adaptations ; Coadaptations and Parallel adaptations</li> </ul>	15
<b>MODULE 3:</b>	<p><b>3.1: PATTERNS OF EVOLUTION:</b></p> <ul style="list-style-type: none"> <li>• Sequential and Convergent Evolution; Microevolution; Macroevolution(Adaptive radiation); Megaevolution; Gradualism And Punctuated Equilibrium</li> </ul> <p><b>3.2: EVOLUTION AND HUMAN HEALTH AND DISEASES</b></p> <ul style="list-style-type: none"> <li>• Design defects; Defence mechanisms- Allergy,morning sickness; Evolution of antibiotic resistance; Evolution of behaviour,Anxiety,fear and depression.</li> </ul>	15

**PRACTICAL COMPONENT OF ZOO-IV.E-8: EVOLUTIONARY BIOLOGY  
(DURATION -02 HRS/WEEK)**

<b>Sr.No.</b>	<b>Practical</b>	<b>No.of Practicals</b>
1.	Study of homology and analogy from suitable specimens	01
2	Serial homology	01
3	Variations are basis for evolution	01
4	To demonstrate the role of Natural Selection in Fixing Favoured Adaptation and Eliminating Maladaptation.	02
5	Problems based on Population Genetics (PTC /blood group)	04
6.	An exercise to illustrate the concepts of Genetic drift	02
1.	Vestigial organs or Vestiges in animals and humans.	01

**REFERENCE BOOKS:**

1. Bipin Kumar(2001) Organic Evolution; Campus Books International, New Delhi.
2. Charlotte J. Avers (1989)Process and pattern in Evolution ; New York Oxford University Press.
3. Douglas J. Futuyma(2013) Evolution III<sup>rd</sup> edition; Sinaue Associates,Inc.Publishers Sunderland , Massachusetts U.S.A.
4. E.Peter Volpe(1989) Understanding Evolution V<sup>th</sup> edition Universal Book Stall.
5. S.Osawa ,T.Honjo(Eds.)(1991) Evolution of life,Springer-Verlag Tokyo .
6. Savage Jay M (1969) Evolution , Amerind Publishing Co-Pvt. Ltd. New Delhi.
7. Veer Bala Rastogi (2004) Organic Evolution ,Eleventh revised edition; Kedarnath Ramnath Delhi.
8. Pranab K. Banerjee (2011) Problems on Genetics,Molecular Genetics and Evolutionary Genetics, New Central Book Agency (P) Ltd. Delhi

## SEMESTER V AND VI

SEMESTER	COURSE CODE	COURSES	CREDITS	CONTACT HOURS
<b>SEMESTER V</b>	ZOO-V.C-7	Developmental Biology	Theory = 03 Practicals =01	Theory = 45 Practicals =30
	ZOO-V.E-9	Molecular Genetics and Forensic Science	Theory = 03 Practicals =01	Theory = 45 Practicals =30
	ZOO-V.E-11	Basic and Applied Entomology	Theory = 04	Theory = 60
	*ZOO-V.E-12	Fish Preservation and Processing	Theory = 04	Theory = 60
SEMESTER VI	ZOO-VI.C-8	Wildlife Biology	Theory = 04	Theory = 60
	ZOO-VI.E-13	Health and Nutrition	Theory = 03 Practicals =01	Theory = 45 Practicals =30
	ZOO-VI.E-14	Ecology and Ethology	Theory = 03 Practicals =01	Theory = 45 Practicals =30
	ZOO-VI.E-16	Bio Entrepreneurship	Theory = 04	Theory = 60

**SEMESTER V:**

<b>CORE COURSE: DEVELOPMENTAL BIOLOGY</b>	
<b>COURSE CODE:</b>	ZOO-V.C-7
<b>MARKS:</b>	100 [ 75 -Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 -Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	<ul style="list-style-type: none"><li>• To understand the processes of fertilization, polyspermy and activation of egg metabolism</li><li>• To know the basics of animal development, specifically in sea urchin and chick</li><li>• To be familiar with the processes that help in the establishment of basic plan of development</li></ul>
<b>LEARNING OUTCOME:</b>	<ul style="list-style-type: none"><li>• At the end of the course, the students will be able to understand the basic plan of animal development. They will be familiar with the processes which occur during the course of development in invertebrates and vertebrates. This paper will provide the basic knowledge of developmental biology.</li></ul>

**ZOO-V.C-7: CORE COURSE:DEVELOPMENTAL BIOLOGY**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
<b>MODULE 1:</b> Early embryonic development and early development of model organism: sea urchin	1.1: Introduction to cell division: mitosis and meiosis 1.2: Fertilization: structure of the gametes 1.3: Species recognition specificity of egg and sperm 1.4: Gamete fusion and the prevention of polyspermy 1.5: The activation of egg metabolism 1.6: Fusion of the genetic material 1.7: Rearrangement of the egg cytoplasm 1.8: Sea Urchin: cleavage, gastrulation, blastula formation 1.9: Fate maps and the determination of sea urchin blastomeres, gastrulation 1.10: Embryonic stem cells: Pluripotency and totipotency	15
<b>MODULE 2:</b> Early development of model organism: chick	2.1: Chick: cleavage, gastrulation, primitive streak, epiboly 2.2: Development upto three days of incubation 2.3: Extra embryonic membranes of chick development, structure and functions of yolk sac, amnion, chorion and allantois	15
<b>MODULE 3:</b> Growth and regeneration	3.1: Nuclear transplantations and embryonic inductions 3.2: Size and proportion, aging, theories of ageing, postnatal disorders of growth and differentiation 3.3: Distribution of regenerative capacity, Planarian regeneration, regeneration of limb and tail in vertebrates 3.4: Hejmadi Mohanty's experiment	15

<b>PRACTICAL COMPONENT OF ZOO-V.C-7 ( DURATION -02 HRS /WEEK)</b>		
<b>SR. NO.</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1)	Observation of developmental stages of sea urchin: cleavage, blastula, gastrula (permanent slides)	01
2)	Study of morphogenetic movement <i>in vivo</i> in hens egg using vital staining technique by preparing window opening	02
3)	<i>In vitro</i> observation of different extra embryonic membrane in a six days old chick embryo	01
4)	Preparation of permanent slides of chick embryo: 24 hours, 36 hours, 48 hours, 72 hours	06
5)	Effect of retinoic acid on regeneration of fin in fish	01
6)	Mounting of eye vesicles and limb buds of six day old chick embryo	01

#### **REFERENCE BOOKS:**

1. Gilberts, S.F. (2013). *Developmental Biology*, Sinauer Associates, Sunderland.
2. Jain, P.C. (2013). *Elements of developmental biology*, Vishal Publications, Jalandhar
3. Slack, J.M.W. (2006). *Essential developmental biology*. Blackwell Publishing, U.K.

#### **REFERENCE BOOKS FOR PRACTICALS:**

1. Beffa – Mari, M. And J. Knight (2005) *Key experiments in practical developmental biology*. Cambridge University Press.
2. Tyler, M.S. (2000) *Developmental biology, a guide for experimental study*. Sinauer Associates, Inc. Publishers, Sunderland, MA.



**ELECTIVE COURSE: MOLECULAR GENETICS AND FORENSIC SCIENCE**

<b>COURSE CODE</b>	ZOO-V.E-9
<b>MARKS</b>	100 [75 – Theory; 25 – Practicals]
<b>CREDITS</b>	04 [03 – Theory; 01 – Practical]
<b>CONTACT HOURS</b>	THEORY : 45 HOURS (03 LECTURE/WEEK) PRACTICALS : 30 HOURS (01 PRACTICAL/WEEK)
<b>COURSE OBJECTIVES</b>	This course will elucidate the functional aspects of the genetic material at molecular level, focusing on gene expression and gene regulation. It will also expose students to the basics of forensic science and understand diagnostic genetics.
<b>LEARNING OUTCOME</b>	Upon successful completion of the course, students will be able to understand: <ul style="list-style-type: none"><li>▪ The process of replication, transcription and translation</li><li>▪ Difference between the gene expression in prokaryotes and eukaryotes</li><li>▪ Branches of forensic science</li><li>▪ The molecular tools used in genetic diagnosis</li></ul>

**ZOO-V.E-9: MOLECULAR GENETICS AND FORENSIC SCIENCE**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
<b>MODULE 1 :</b> Gene Expression and Gene Regulation	1.1 : DNA Replication: DNA Replication in prokaryotes and eukaryotes, mechanism of DNA replication 1.2: Transcription: transcription Unit, mechanism of transcription in prokaryotes and eukaryotes, synthesis of rRNA and mRNA, transcription factors 1.3 : Translation: Genetic code, Process of protein synthesis, Difference between prokaryotic and eukaryotic translation, Post Transcriptional Modifications and Processing of Eukaryotic RNA 1.4: Transcription regulation in prokaryotes: Principles of transcriptional regulation with examples from lac-operon and trp-operon; Transcription regulation in eukaryotes: Activators, repressors, enhancers, silencers elements; Gene silencing	15
<b>MODULE 2 :</b> Basics of Forensic Science	2.1 : Definition, overview of Disciplines of Forensic science 2.2: Crime and Crime Scene management: Types of crime scenes – indoor and outdoor. Securing and isolating the crime scene. Crime scene search methods. Safety measures at crime scenes. Legal considerations at crime scenes. Documentation of crime scenes – photography, videography, sketching and recording notes. 2.3: Forms of forensic evidences: -Biological evidence: Bloodstains, hair, semen, DNA -Physical and trace evidence –pattern of blood stains, fingerprints, fibres, weapons - Documents- types of forensic documents (genuine /forged), methods of detecting forged documents(handwriting analysis, Analysis of paper and inks)	15
<b>MODULE 3 :</b> Diagnostic Genetics	3.1 : Cytogenetics/ Molecular Cytogenetics/ Biochemical/ Molecular methods of detecting genetic disorders - Adult and Newborn screening 3.2: Cytogenetics/ Molecular Cytogenetics/ Molecular methods of detecting genetic disorders – Prenatal and Preimplantation screening 3.3: Forensic testing - DNA fingerprinting, paternity testing, personal /individual identification	15

<b>PRACTICAL COMPONENT OF ZOO-V.E-9: MOLECULAR GENETICS AND FORENSIC SCIENCE ( DURATION -02 HRS /WEEK)</b>		
<b>SR.NO.</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1	Isolation of DNA from peripheral blood/tissue (chick liver).	01
2	Microscopic examination of Hair a. Human scalp Hair b. Animal Hair	03
3	Sketching and Photography of various type of crime scene.	03
4	Presumptive Tests for Blood a. Phenolphthalin Assay	01
6	To perform ridge tracings and ridge counting	01
7	Analysis of DNA fingerprints	03

#### **REFERENCE BOOKS :**

- 1) *J. Prahlow (2010); Forensic Pathology for Police, Death Investigators, Attorneys, 17 and Forensic Scientists, DOI 10.1007/978-1-59745-404-9\_2, C Springer Science + Business Media, LLC (Ebook available)*
- 2) *Robert Schleif (1993). Genetics and Molecular Biology. S E C O N D E D I T I O N. Department of Biology, The Johns Hopkins University, Baltimore, Maryland. The Johns Hopkins University Press 2715 North Charles Street Baltimore, Maryland 21218-4319, The Johns Hopkins Press Ltd., London (Ebook available)*
- 3) *Richard Saferstein (2011); Forensic Science, II Edition, Prentice Hall publishers, Sanfrancisco*
- 4) *Griffith A, Wessler S, Lewontin R Gelbart W, Suzuki D and Miller J(2000). Introduction to Genetic Analysis. Eighth Edition.( Ebook available)*
- 5) *Tom Strachan and Read A (2010): Human Molecular Genetics. Fourth Edition. Garland Science Publisher, New York, NY 10017*

#### **REFERENCES BOOKS FOR PRACTICALS:**

- 1) *J. Prahlow (2010); Forensic Pathology for Police, Death Investigators, Attorneys, 17 and Forensic Scientists, DOI 10.1007/978-1-59745-404-9\_2, C Springer Science+Business Media, LLC (Ebook available.)*

**ELECTIVE COURSE: ECONOMIC ZOOLOGY**

<b>COURSE CODE</b>	ZOO-V.E-10
<b>MARKS</b>	100 [75 – Theory; 25 – Practicals]
<b>CREDITS</b>	04 [03 – Theory; 01 – Practical]
<b>CONTACT HOURS</b>	THEORY : 45 HOURS (03 LECTURE/WEEK) PRACTICALS : 30 HOURS (01 PRACTICAL/WEEK)
<b>COURSE OBJECTIVES</b>	To study the various aspects of economic zoology To study the species of economic importance, classification To gain an insight whether own business can be started based on studying the zoological species and their products
<b>LEARNING OUTCOME</b>	How zoological species contribute to economic sources can be learned. Students will learn the techniques of rearing and maintenance of the species, harvesting their products and selling of species and the products

## ZOO-V.E- 10 : ECONOMIC ZOOLOGY

MODULE	TOPICS	CONTACT HOURS
<b>MODULE 1 :</b> Scope of Economic Zoology	<p>1.1 : Economic Zoology, History, Scope,</p> <p>1.2 : Species of bionomic importance (Honey bee, Silkworm, lac insect, mackerel, domestic fowl, goat, sheep, cow, buffalo, pig, rats, mice)</p> <p>1.3 : Source, properties, constituents and nutritive value of products of bionomic importance: eggs of poultry, milk, meat, honey, medicinal value of synthetic insulin (recombinant), significance of wool, silk, lac</p> <p>1.4 : Organizations and their functions: agricultural and processed food products export development authority (APEDA), the marine products exports developmental authority (MPEDA), central silk board (CSB), central bee research and training institute (CBRTI), pharmaceutical and biotechnology industries (Lupin) and contract research organizations (Intox), and research institutes (NIN, Hyderabad)</p>	15
<b>MODULE 2 :</b> Models in Economic Zoology	<p>2.1 : Insects, products and applications : lac insects, honey bees, silkworms</p> <p>2.2 : Vermiculture: Rearing and maintenance of earthworms</p> <p>2.3 : Aquaculture : rearing and maintenance of prawns,oysters, edible and ornamental fishes</p> <p>2.4 : Poultry : rearing and maintenance of domestic fowl, applications and products</p> <p>2.5 : Business models of apiculture, sericulture, aquaculture and poultry</p>	15
<b>MODULE 3 :</b> Pharma products and biological control	<p>3.1 : Pharmaceuticals from animals and their Applications (antiserum), from transgenic animals (malaria vaccine, alpha 1 antitrypsin, lactoferrin, fibrinogen)</p> <p>3.2 : Species used in biological control : <i>Casnoidea indica</i>, <i>Trichogramma</i>, <i>Poecilia reticulata</i> / <i>Gambusia affinis</i></p> <p>3.3 : Maintenance and breeding of animals for research: mice, rats, guinea pigs, rabbits, marmosets, guidelines given by committee for the purpose of control and supervision of experiments on animals (CPCSEA)</p>	15

<b>PRACTICAL COMPONENT OF ZOO-V.E-10 ECONOMIC ZOOLOGY ( DURATION - 02 HRS /WEEK)</b>		
<b>SR.N O.</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1	Vermicomposting	05
2	Preparation of dairy products from milk : cheese and butter	02
3	Laboratory observations of insects – Honeybee, Silk moth, Lac insect	01
4	Visit to dairy industry/poultry/ piggery/apiary/silk industry/ biotechnology industry/pharmaceutical industry/research institute	04

#### **REFERENCE BOOKS :**

- 1) G. S. Shukla, V. B. Upadhyay (2008) *Economic Zoology*, Rastogi Publications, Meerut
- 2) H. Osborn (1908) *Economic Zoology an introductory text book in zoology with special reference to its applications in agriculture, commerce and medicine* The Macmillan Company
- 3) K. P. Shrivastava, Gs Dhaliwal (2015) *Text Book of Applied Entomology* Kalyani Publishers
- 4) P. K. Gupta (2011) *Vermicomposting for Sustainable Agriculture*, Agrobios India Ltd
- 5) S. Singh (1962) *Bee-Keeping in India* ICAR New Delhi p. 214

#### **REFERENCE BOOKS FOR PRACTICALS:**

- 1) A. K. Tripathi(2009) *Mulberry Sericulture: Problems And Prospects* Aph Publishing Corporation
- 2) C.L. Metcalf and W.P Flint (1962) *Destructive and Useful Insects* New York, N.Y. : McGraw-Hill

**ELECTIVE COURSE: BASIC AND APPLIED ENTOMOLOGY**

<b>COURSE CODE</b>	ZOO-VI.E-14
<b>MARKS</b>	100 [75 -Theory; 25- Fieldbased report]
<b>CREDITS</b>	04
<b>CONTACT HOURS</b>	Theory: 45 HOURS [03 Lectures Per Week] Fieldbased work: 15 HOURS.
<b>COURSE OBJECTIVE</b>	<ul style="list-style-type: none"><li>• To develop a strong foundation in entomology, including understanding of the importance of insects to the human society.</li><li>• To review important areas in insect biology such as morphology, physiology, ecology, behaviour, genetics, phylogeny, ontogeny and population biology.</li><li>• To develop a sufficient background for advanced entomology.</li></ul>
<b>LEARNING OUTCOME</b>	<ul style="list-style-type: none"><li>• The students will achieve entrepreneurial opportunities in entomology.</li><li>• They will gain knowledge on bionomically important insects and their products, insect pests of public health and veterinary importance and their management.</li></ul>

## ZOO-VI.E-14: BASIC AND APPLIED ENTOMOLOGY

MODULE	TOPIC	CONTACT HOURS
<b>MODULE 1</b> Fundamentals of Entomology	Unit 1: Class Insecta: <ul style="list-style-type: none"> <li>• Salient features</li> <li>• Classification of insects up to orders – an overview</li> </ul> Unit 2: Morphological studies: <ul style="list-style-type: none"> <li>• of antenna, wings, legs, Mouth parts</li> </ul> Unit 3: Techniques: <ul style="list-style-type: none"> <li>• Collection of insects</li> <li>• Preservation of insects</li> </ul>	15
<b>MODULE 2</b> Bionomics and control of crop pests and medically important pests	Unit 4: Pest of agricultural importance: <ul style="list-style-type: none"> <li>• Paddy pests, cashew pests, coconut pests, areca nut pests, stored grain pest, sugarcane pests, vegetable pests, fruit pests (two pests from each of the above)</li> </ul> Unit 5: Insects of medicinal importance: <ul style="list-style-type: none"> <li>• mosquitoes, housefly, sand fly, cockroaches, human lice, bed bug, rat fleas</li> </ul> Unit 6: Termites: <ul style="list-style-type: none"> <li>• social organization, termitaria and termite control measures</li> </ul>	15
<b>MODULE 3</b> Useful insects and pest management	Unit 7: Useful insects: <ul style="list-style-type: none"> <li>• Honeybees (Apiculture); Mulberry silk worm (sericulture); lac insects (lac culture)</li> </ul> Unit 8: Insect pest control methods: <ul style="list-style-type: none"> <li>• biological, chemical (attractants, pheromones and hormones),</li> </ul> Integrated Pest Management (IPM) Unit 9: Role of insects in ecosystem services	15
<b>MODULE 4</b> Field based Study	<u>Field based study report:</u> <ul style="list-style-type: none"> <li>• Identification and study of agricultural pests / pest of fruits / vegetables.</li> <li>• Insect collection techniques: light traps, sweep net, Berlese funnel.</li> <li>• Study of insects of college campus dragon fly/ pests of different plants</li> <li>• Visit to ICAR old Goa/ Gov.t of Goa agriculture department/national Malaria research Institute</li> </ul>	15



**REFERENCE BOOKS:**

- 1) Aitwal, A.S (1993): Agricultural pests of India and South East Asia. Kalyani publication, New Delhi.
- 2) Awasthi,V.B (2007):Introduction to general and applied entomology ,2<sup>nd</sup> edition. Scientific publishers India Jodhpur.
- 3) David, B.V. and Ananthakrishnan, T.N (2006): General and applied entomology, 2<sup>nd</sup> edition Tata McGraw hill, New Delhi.
- 4) Reddy,D.S(2010) Applied entomology,2<sup>nd</sup> edition New Vishal publications

**REFERENCE BOOKS FOR PRACTICALS:**

1. Fenemore, P.G. and Prakash, A. (1995): Applied Entomology, Wiley Eastern Limited new age international.
2. Varasi, M.S. (1992): Text book of entomology, Himalaya Publishing House, 1<sup>st</sup> edition.

**ELECTIVE COURSE:**

**FISH PRESERVATION AND PROCESSING**

<b>COURSE CODE</b>	ZOO-V.E-12
<b>MARKS</b>	100 [75 -Theory; 25- Fieldbased report]
<b>CREDITS</b>	04
<b>CONTACT HOURS</b>	Theory: 45 HOURS [03 Lectures Per Week] Fieldbased work: 15 HOURS.
<b>COURSE OBJECTIVES</b>	<ul style="list-style-type: none"><li>• To familiarize the students with different methods of fish preservation and processing</li><li>• To acquaint them with techniques and precautions for hygienic fish handling</li><li>• The course content is locally relevant and prepares students for entrepreneurship and self employment</li></ul>
<b>LEARNING OUTCOME</b>	By the end of the course, the students will be familiar with the economic benefits of fishes. They will also be able to understand the nutritional values of the fishes and to identify some of the fish pathogens

## ZOO-V.E- 12 : FISH PRESERVATION AND PROCESSING

MODULE	TOPICS	CONTACT HOURS
<b>MODULE 1:</b> Fishery Development	1.1 : Status of Development of the fishery and seafood processing industry. 1.2: Empowerment through Aquatic Products: (Background,Nutritional security,Role of Fisheries Sector,Role of Tifac in Fisheries Sector,Objectives,Integrated Fisheries Project(IFP),Indian national centre for ocean information services (INCOIS), Catch per unit effort (CPUE), Maximum sustainable yield (MSY	15
<b>MODULE 2:</b> Fish Handling and preservation	2.1: Recent Scenario: Quality Changes and Shelf life of Chilled Fish,Theeffect of Hygiene during handling 2.2: Fish Handling Methods: Organoleptic test, Assessment of Fish Quality,Quality assessment of Fresh Fish,Quality Assessment of Fish Products,Physical methods,Assurance of Fresh Fish Quality, Post harvest Changes in Fish,How does a Fish Lose its Quality, fish as vectors of zoonotic diseases 2.3: Fish Preservation: Reasons for Spoilage of Fishes,Methods of Fish.	15
<b>MODULE 3:</b> Value of Fish	3.1:Economic Importance of Fish:Food value,Fish By-Products, surimi, Goan fish para, balchao 3.2: Postmortem changes in Fish,Bacteriological Changes, Lipid Oxidation and Hydrolysis, Chemical Composition,Lipids,Proteins,N- containing Extractives,Vitamins and Minerals, 3.3: Aquatic Resources and their utilization, value added product: chitin	15
<b>MODULE 4</b> Field based Study	Field Based study: Visit to Fish Processing Centre/ Fishing Co-operative Society / Fishery Institute/Fishery survey of India, Vasco (FSI) to study the following: 1) Quality control of fishes 2) Fish parasites (ecto and endo) 3) Fish filleting, 4) Fish preservation (salting/ pickling)	15

**REFERENCE BOOKS :**

- 1) *Braj Kishore Singh (2008) Applied Fisheries and Aquaculture Swastik Publishers and Distributers  
Delhi,India*
- 2) *Pandey and Shukla (2015) Fish and Fisheries, IIIrd Revised Edition, Rastogi Publications Meerut, India*

**REFERENCE BOOKS FOR PRACTICALS:**

- 1) *Braj Kishore Singh (2008) Applied Fisheries and Aquaculture Swastik Publishers and Distributers  
Delhi,India*
- 2) *Pandey and Shukla (2015) Fish and Fisheries, IIIrd Revised Edition, Rastogi Publications Meerut, India*

**SEMESTER VI:**

<b>CORE COURSE: WILDLIFE BIOLOGY</b>	
<b>COURSE CODE</b>	<b>ZOO-VI-C-8</b>
<b>MARKS</b>	100 [75 -Theory; 25- Fieldbased report]
<b>CREDITS</b>	04
<b>CONTACT HOURS</b>	Theory: 45 HOURS [03 Lectures Per Week] Fieldbased work: 15 HOURS.
<b>COURSE OBJECTIVES</b>	This course is designed to enable students to understand the basics of wildlife status, conservation, assessment and management.
<b>LEARNING OUTCOME</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>▪ Know the techniques used in assessment and monitoring of wildlife.</li><li>▪ Know about the diversity, extent, range of wildlife population dynamics.</li></ul>

## ZOO-VI-C-8: WILDLIFE BIOLOGY

MODULE	TOPICS	CONT ACT HOUR S
<b>MODULE 1:</b> Introduction To Wildlife	UNIT 1: Introduction to wildlife <ul style="list-style-type: none"> <li>• Values of wildlife - Conservation ethics, Importance of conservation, Causes of depletion, World conservation strategies.</li> </ul> UNIT 2: Evaluation and management of wildlife <ul style="list-style-type: none"> <li>• Habitat analyses, Physical parameters: Topography, Geology, Soil and water.</li> <li>• Biological Parameters: food, cover, forage, browse and ground cover estimation.</li> <li>• Standard evaluation procedures: remote sensing and GIS.</li> </ul>	15
<b>MODULE 2:</b> Population Estimation And Protected Areas	UNIT 3: Population estimation <ul style="list-style-type: none"> <li>• Population density, natality, mortality, fertility schedules and sex ratio computation.</li> <li>• Analysis of scat and dropping of ungulates and carnivores.</li> <li>• Trichotaxonomy, pug marks and census method based on indirect evidences.</li> </ul> UNIT 4: Protected areas <ul style="list-style-type: none"> <li>• Protected Area network (PAN): National parks and wildlife sanctuaries.</li> <li>• Biogeographical features of important features of protected areas in India (any 3).</li> <li>• Tiger conservation - tiger reserves in India, challenges and management of tiger reserves.</li> </ul>	15
<b>MODULE 3:</b> Managemen t Of Wildlife	UNIT 5: Management of habitats <ul style="list-style-type: none"> <li>• Setting back succession, grazing logging, mechanical treatment, advancing the succession process, artificial feeding grounds.</li> <li>• Cover construction, preservation of general genetic diversity, restoration of degraded habitats,</li> </ul> UNIT 6: Management planning of wildlife in protected areas <ul style="list-style-type: none"> <li>• Habitat carrying capacity, visitors carrying capacity, eco tourism / wild life tourism, concept of climax persistence, ecology of perturbation.</li> <li>• Role of national / state statutory bodies on governing wildlife (NBWL, IUCN, CITES, state wildlife boards and forest department).</li> </ul> UNIT 8: Management of critical population <ul style="list-style-type: none"> <li>• Radio- telemetry, care of injured and diseased animal, quarantine, common diseases of wild animals, capture and translocation of wildlife.</li> <li>• Captive management – a brief idea.</li> </ul>	15

<p><b>MODULE 4:</b></p> <p>Field based Study</p>	<p>Field based study report on:</p> <ul style="list-style-type: none"> <li>• Study of butterflies and their host plants on the campus / molluscs/ ants/ spiders / birds</li> <li>• Any two biodiversity monitoring by various field techniques for flora and fauna:</li> <li>• Trail / transect-quadrant monitoring for abundance and diversity estimation of mammals and birds (direct and indirect evidences) (on campus or fieldtrip)</li> <li>• Identification of animals through pug marks, hoofmarks, scats, pellet groups, nest, antlers, feathers, etc.</li> <li>• Local case study report of wild life conflict</li> </ul> <p>Use of compass, binoculars, spotting scope, range finders, Global Positioning System on field.</p>	<p>15</p>
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**REFERENCE BOOKS:**

1. Caughley, G., and Sinclair, A.R.E. (1994). Wildlife Ecology and Management. Blackwell Science.
2. Woodroffe R., Thirgood, S. and Rabinowitz, A. (2005). People and Wildlife, Conflict or Co-existence. Cambridge University.
3. Bookhout, T.A. (1996). Research and Management Techniques for Wildlife and Habitats, 5<sup>th</sup> edition. The Wildlife Society, Allen Press.
4. Sutherland, W.J. (2000). The Conservation Handbook: Research, Management and Policy. Blackwell Sciences
5. Hunter M.L., Gibbs, J.B. and Sterling, E.J. (2008). Problem-Solving in Conservation Biology and Wildlife Management: Exercises for Class, Field, and Laboratory. Blackwell Publishing.

**ELECTIVE COURSE: HEALTH AND NUTRITION**

<b>COURSE CODE</b>	<b>ZOO-VI-E-13</b>
<b>MARKS</b>	100 [75 -Theory ; 25- Practical]
<b>CREDITS</b>	04 [03 -Theory; 01- Practical]
<b>CONTACT HOURS</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES</b>	This course is an introduction to the nutrients, their functions and role in maintaining good health of humans.
<b>LEARNING OUTCOME</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>▪ Know about nutrients and their function</li><li>▪ Understand nutritional biochemistry and role of lifestyle and food habits in causing diseases</li></ul>



**ZOO-VI-E-13: HEALTH AND NUTRITION**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
MODULE 1: BASIC CONCEPT OF FOOD AND NUTRITION	UNIT 1: Overview of health and nutrition <ul style="list-style-type: none"> <li>• Definition of health and nutrition</li> <li>• Scope of nutrition, food as a source of nutrients</li> <li>• Nutrients and energy</li> <li>• Adequate, optimum and balanced diet</li> <li>• Malnutrition and health.</li> </ul> UNIT 2: Nutritional Biochemistry <ul style="list-style-type: none"> <li>• Carbohydrates, lipids, proteins - definition, classification, structure and properties</li> <li>• Significance of acid value, iodine value and saponification value of lipids</li> <li>• Essential and non-essential amino acids</li> <li>• Enzymes- definition, classification, properties(overview).</li> <li>• Coenzymes, vitamins (fat soluble and water soluble), structure and properties</li> <li>• Minerals- iron, calcium, phosphorus, iodine, selenium and zinc and their properties</li> </ul>	<b>15</b>
MODULE 2: NUTRIENTS AND DIETARY PATTERN FOR HUMANS	UNIT 3: Functions of food components of food-nutrients <ul style="list-style-type: none"> <li>• Biochemical role and dietary sources of macro and micronutrients (carbohydrates, lipids and proteins, fat soluble vitamins-A, D, E and K , water soluble vitamins – thiamin, riboflavin, niacin, pyridoxine, folate, vitamin B12 and vitamin - C Minerals – calcium, iron and iodine).</li> <li>• Changes of nutrient value during cooking of the following food groups: cereals, pulses and vegetables. Nutrient loss - dry, moist, frying and microwave cooking.</li> </ul> UNIT 4: Nutrition and dietetics <ul style="list-style-type: none"> <li>• Physiological considerations, nutrient needs and dietary pattern for various groups- adults, pregnant and nursing mothers, infants, pre-school and school children, adolescents and geriatric nutrition.</li> </ul>	<b>15</b>

<p><b>MODULE 3: DIET RELATED DISEASES</b></p>	<p><b>UNIT 5:Health and diseases</b></p> <ul style="list-style-type: none"> <li>• Major nutritional deficiency diseases- protein energy malnutrition, Vitamin deficiency, iron deficiency anaemia, iodine deficiency disorders, their causes, symptoms, treatment, prevention and government programmes, if any.</li> <li>• Life style related diseases- obesity, hypertension, hyperurecimia, diabetes mellitus, polycystic ovarian disease (PCOD) - their causes and prevention through dietary/lifestyle modifications.</li> <li>• Social health problems: smoking, alcoholism, drug dependence and Acquired Immune Deficiency Syndrome (AIDS);</li> <li>• Common ailments- irritable bowel disease (IBD), constipation: causes and dietary management</li> </ul> <p><b>UNIT 6: Food hygiene</b></p> <ul style="list-style-type: none"> <li>• Potable water- sources and methods of purification at consumer level</li> <li>• Food and water borne infections: bacterial infection: cholera, typhoid, dysentery; viral infection: hepatitis, poliomyelitis, protozoan infection: Amoebiasis, Giardiasis; Parasitic infection: Taeniasis and Ascariasis their causative agent, symptoms, transmission and prevention.</li> <li>• Brief account of food spoilage: Causes and preventive measures</li> </ul>	<p><b>15</b></p>
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<p align="center"><b>PRACTICAL COMPONENT OF ‘HEALTH AND NUTRITION ZOO-VI-E-13: DURATION (30 HOURS – 02hrs/WEEK)</b></p>		
<p><b>SR. NO</b></p>	<p align="center"><b>PRACTICAL</b></p>	<p align="center"><b>NO. OF PRACTICAL S</b></p>
<p>1.</p>	<p>To detect adulteration in a) Ghee b) Sugars c) Tea leaves and d) Turmeric</p>	<p>03</p>
<p>2.</p>	<p>Estimation of lactose in milk</p>	<p>02</p>
<p>3.</p>	<p>Titrametic estimation of:</p> <ul style="list-style-type: none"> <li>• Ascorbic acid estimation in food</li> <li>• Calcium in food</li> </ul>	<p>02</p>
<p>4.</p>	<p>Observation of any two grain pests</p>	<p>01</p>
<p>5.</p>	<p>Project based:</p> <ul style="list-style-type: none"> <li>• Identify nutrient rich sources of foods, their seasonal availability and price</li> <li>• Study of nutrition labeling on selected foods</li> </ul>	<p>04</p>

**REFERENCE BOOKS:**

- 1) Mudambi, SR and Rajagopal, MV. (2007). Fundamentals of Foods, Nutrition and Diet Therapy; Fifth Ed; New Age International Publishers.
- 2) Srilakshmi B. (2002). Nutrition Science; New Age International (P) Ltd.
- 3) Srilakshmi B. (2007). Food Science; Fourth Ed; New Age International (P) Ltd.
- 4) Swaminathan M. (2009). Handbook of Foods and Nutrition; Fifth Ed; 1986; BAPPCO.
- 5) Bamji MS, Rao NP, and Reddy V. Text Book of Human Nutrition; Oxford & IBH Publishing Co. Pvt Ltd.
- 6) Wardlaw GM, Hampl JS. (2007). Perspectives in Nutrition; Seventh Ed; McGraw Hill.
- 7) Lakra P, Singh MD. (2008). Textbook of Nutrition and Health; First Ed; Academic Excellence.

**ELECTIVE COURSE: ECOLOGY AND ETHOLOGY**

<b>COURSE CODE</b>	ZOO-V.E-14
<b>MARKS</b>	100 [75 – Theory; 25 – Practicals]
<b>CREDITS</b>	04 [03 – Theory; 01 – Practical]
<b>CONTACT HOURS</b>	THEORY : 45 HOURS (03 LECTURE/WEEK) PRACTICALS : 30 HOURS (01 PRACTICAL/WEEK)
<b>COURSE OBJECTIVES</b>	<ul style="list-style-type: none"><li>• To study the distribution of organisms, their interrelations in populations and communities and interactions between biotic and abiotic components</li><li>• To study impact of anthropogenic activities on ecosystem and study behaviour of organisms under natural conditions</li></ul>
<b>LEARNING OUTCOME</b>	<ul style="list-style-type: none"><li>• The student will gain better understanding in ecology and Ethology</li><li>• This course also has applied value towards conservation of biodiversity and sustainable development.</li></ul>

**ZOO-V.E- 11 : ECOLOGY AND ETHOLOGY**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
<p><b>MODULE 1 :</b> Basic Ecology</p>	<p>1.1 :Introduction to Ecology : What is Ecology? History of ecology, ecology today, scope of ecology, objective of study,subdivisions of ecology</p> <p>1.2 : Ecosystem Ecology:kinds of ecosystem,Gaia hypothesis, energy flow within the Ecosystem, food chains, ecological pyramids, ecological niche nutrient and Cycling of trace elements: Cobalt (Co), Molybdenum (Mo) and Lead.</p> <p>1.3: Population Ecology: survivorship curve and life tables,age distribution,biotic potential of population, growth models, population dispersal, regulation of population, co-operative and disoperative coactions and carrying capacity,predator –prey relationships,symbiosis</p>	
<p><b>MODULE 2 :</b> Conservation Ecology and Basic Ethology</p>	<p>2.1: Community Ecology:characters of a community, classification of a community,community periodism, community stratification,community succession</p> <p>2.3:Introduction to Ethology: the history of ethology, types of behavior – instinct and learning,economic and social aspect of behaviour, ethologists and their work – Lorenz, Tinbergen, Goodall, M.K. Chandrashekar, animal behaviour :an evolutionary approach</p> <p>2.4: Concept of Ethology:stimulus –response concept,reflexes, innate releasing mechanisms,fixed action pattern,ethogram releaser,motivation or drive with respect to hunger and sexual behaviour</p>	
<p><b>MODULE 3 :</b> Advanced Ethology</p>	<p>3.1 : Approaches to studying behaviour, methods associated with neurophysiological approach,psychological and ethological approach.</p> <p>3.2: Pheromones :introduction,types of pheromones,the primer pheromones,the imprinting pheromones</p> <p>3.3:Hormones: effect of hormones on sexual behaviour,maternal behaviour,territorial marking, learning and memory</p> <p>3.4:Patterns of behavior :feeding, aggressive and reproductive behavior, biological clocks</p> <p>3.5:Communication behavior :introduction,communication signals,</p>	

<b>PRACTICAL COMPONENT OF ZOO-V.E-14: ECOLOGY AND ETHOLOGY ( DURATION -02 HRS /WEEK)</b>		
<b>SR.NO.</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1	Field Based practicals: <ul style="list-style-type: none"> <li>• Determination of population density in a natural/ hypothetical community by Quadrats method in intertidal zone.</li> <li>• Report on a visit to National Parks/ Biodiversity Parks/ Wild life sanctuary</li> <li>• Observation of random subjects for understanding human behaviour.</li> </ul>	05
2	Study of an aquatic/mangrove ecosystem: Measurement of the area, temperature, turbidity, determination of pH, and dissolved oxygen content (Winkler's method), and free CO <sub>2</sub>	03
3	Ethology: <ul style="list-style-type: none"> <li>• To study the habituation to light stimulus in earthworm/crabs/snails/ spider web</li> <li>• To demonstrate phototactic and geotactic responses of the animal provided earthworm/crabs</li> </ul>	02
4	Study of Life Tables and plotting of survivorship curves of different types from the hypothetical/real data provided.	02

**REFERENCE BOOKS :**

1. Arora, Mohan. P. (2004) : *Ecology* , Himalaya Publishing House
2. Aubrey Manning and stamp Dawkins (1997) : *An Introduction to Animal behaviour (fourth edition)*, Cambridge University Press.
3. Dash M. C. (2001) : *Fundamental of Ecology* , Tata Mc Graw – Hill publishing Company Limited New Delhi
4. Felicity Huntingford (1984) : *The study of Animal behaviour* , Chapman and Hall.
5. Hoshang S. Gundevia and Hare Govind Singh (2006) : *A Text Book of Animal Behaviour*, S. Chand & Company LTD. New Delhi-110055.
6. Juneja Kavita (2002) : *Ecology* , Anmol Publications PVT. LTD. New Delhi-110002 (India)
7. Mathur Reena (1994) : *Animal Behaviour*, Rastogi and Company, Meerut-250002 India.
8. Rana, S. V. S.(2003) : *Essentials of Ecology and Environmental Science* ,Prentice- Hall of India Private Limited , New Delhi-110001
9. Ranga, M. M.(2002) : *Animal Behaviour Second Enlarged Edition* , Agrobios (India)
10. Robert A. Wallace (1938) : *Animal Behaviour Its Development, Ecology and Evolution* , Goodyear Publishing Company, Inc. Santa Monica, California.
11. Sharma P.D.(2014-15) : *Ecology and Environment*, Rastogi Publications. Meerut (12<sup>th</sup> revised edition) -25002.
12. W.H. Thorpe (1979) : *The Origins and rise of Ethology*, Praeger Publishers.

**ELECTIVE COURSE: LABORATORY TECHNIQUES IN PATHOLOGY**

<b>COURSE CODE</b>	ZOO-VI.E-15
<b>MARKS</b>	100 [75 -Theory; 25- Practical]
<b>CREDITS</b>	04 [03 -Theory; 01- Practical]
<b>CONTACT HOURS</b>	THEORY : 45 HOURS (03 LEC / WEEK) PRACTICAL: 30 HOURS (01 PRACTICAL / WEEK)
<b>COURSE OBJECTIVES</b>	This course is an introduction to the various techniques used in pathological diagnosis.
<b>LEARNING OUTCOME</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>▪ Know the tests done for disease detection of various body fluids and tissues.</li><li>▪ Understand the clinical implication of the pathological tests.</li></ul>

**ZOO-VI.E-15: LABORATORY TECHNIQUES IN PATHOLOGY**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
MODULE 1: Blood Analysis	UNIT 1: Introduction to medical lab techniques and its importance UNIT 2: : Analyses of human Blood: <ul style="list-style-type: none"> <li>• Ways of obtaining blood samples, precautions and complications.</li> <li>• Methods of estimation and clinical significance of: hemoglobin, Packed Cell Volume (PCV), RBC count, WBC count, Complete Blood Count (CBC), platelets, Erythrocyte Sedimentary Rate (ESR), Differential Leucocyte Count (DLC).</li> </ul>	15
MODULE 2: Evaluation Of Excretory Material And Gametes	UNIT 3: Urine Analyses <ul style="list-style-type: none"> <li>• Physical characteristics, preservation of urine sample</li> <li>• Gross examination, chemical examination, abnormal constituents and its clinical implications.</li> <li>• Microscopy of urinary sediments</li> </ul> UNIT 4: Stool Analyses <ul style="list-style-type: none"> <li>• Stool tests for protozoan parasites and helminth eggs.</li> <li>• Clinical significance.</li> </ul> UNIT 5: Semen analyses: <ul style="list-style-type: none"> <li>• Constituents of semen</li> <li>• Gross and microscopic, cytochemical examination, clinical implications.</li> </ul>	15
MODULE 3: Liver Function Cytology Imaging	UNIT 6: Clinical status of liver function - <ul style="list-style-type: none"> <li>• Function of liver.</li> <li>• Tests of excretion by liver, evaluation of synthesis in liver, evaluation of enzyme activity.</li> </ul> UNIT 7: Clinical cytological studies <ul style="list-style-type: none"> <li>• Fine Needle Aspiration Cytology (FNAC), Ultrasound guided FNAC, aspiration of intra thoracic masses,               <ul style="list-style-type: none"> <li>• Techniques of preparing cell smears, staining techniques</li> </ul> </li> </ul> UNIT 8: Medical imaging <ul style="list-style-type: none"> <li>• X-Ray, PET, CT Scan, MRI, Dexa Scan, Ultrasound, Doppler's Test (using photographs/reports etc).</li> </ul>	15



<b>PRACTICAL COMPONENT OF: LABORATORY TECHNIQUES IN PATHOLOGY ZOO-VI.E-15 - (30 HOURS – 02hrs/WEEK)</b>		
<b>SR. NO</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1.	Preparation of blood smears and staining techniques ( Leishman’s staining, Giemsa staining, Field’s staining).	02
2.	Use of different types of anticoagulants, obtaining serum from blood, preparation of cell suspension (blood cells).	01
3.	RBC Count, WBC Count, Differential WBC Count	03
4.	Urine analysis – normal and abnormal constituents	02
5.	Blood sugar estimation using glucometer	01
6.	Estimation of hemoglobin (Sahli’s method)	01
7.	Estimation of PCV	01
8.	Estimation of ESR (Wintrobe’s / Westergreen method)	01

**REFERENCE BOOKS:**

1. Sood R (1999). Medical laboratory techniques, Jaypee publishers, New Delhi.
2. Park, K. (2007), Preventive and Social Medicine, B.B. Publishers
3. Godkar P.B. and Godkar D.P (2007). Textbook of Medical Laboratory Technology, II Edition, Bhalani Publishing House.
4. Cheesbrough M (2002)., A Laboratory Manual for Rural Tropical Hospitals, A Basis for Training Courses
5. Prakash, G. (2012), Lab Manual on Blood Analysis and Medical Diagnostics, S. Chand and Co. Ltd. New Delhi.

**ELECTIVE COURSE: BIOENTREPRENEURSHIP**

<b>COURSE CODE</b>	ZOO-VI.E- 16
<b>MARKS</b>	100 [75 -Theory; 25- Fieldbased report]
<b>CREDITS</b>	04
<b>CONTACT HOURS</b>	Theory: 45 HOURS [03 Lectures Per Week] Fieldbased work: 15 HOURS.
<b>COURSE OBJECTIVES</b>	<ul style="list-style-type: none"><li>• To help students recognize the opportunities of enterprises in the field of life sciences</li><li>• To encourage students to think independently and explore new vistas</li><li>• To familiarise them with the basic skills required for a start-up</li></ul>
<b>LEARNING OUTCOME</b>	At the end of the course, <ul style="list-style-type: none"><li>• Students will be exposed to various opportunities available in life science for start-ups.</li><li>• They will be familiar with the methodologies and regulations required to start an enterprise.</li><li>• It will also help the student to develop independent thinking skill required at the time of crucial decision making.</li></ul>

**ZOO-VI.E- 16: BIOENTREPRENEURSHIP**

<b>UNIT</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
<p>MODULE 1: Entrepreneurship Development</p>	<p>Unit 1: Introduction to entrepreneurship:  <ul style="list-style-type: none"> <li>• entrepreneurial competencies and goal setting, bio entrepreneurship, building a bio-enterprise : balance management, capital, technology</li> </ul>                     Unit 2: Introduction to innovation:  <ul style="list-style-type: none"> <li>• identifying business opportunities</li> </ul>                     Unit 3: Raising funds: public and private</p>	<p align="center">15</p>
<p>MODULE 2: Business plan And Guidelines and regulations for entrepreneurship in life sciences</p>	<p>Unit 4: Business model canvas                      Unit 5: Guidelines and regulations:  <ul style="list-style-type: none"> <li>• Certification and licensing, acts, regulations and guidelines, marketing and export process, accessing university technology, research and development agencies in India</li> </ul>                     Unit 6: Role of micro, medium and small scale industry sector                      Unit 7: Innovations in research: writing project proposals to various funding bodies such as MHRD, UGC, DST, DBT, etc.</p>	<p align="center">15</p>
<p>MODULE 3: Start -up, quality, safety and procedural compliances in a bio enterprise</p>	<p>Unit 8: Intellectual Property Rights and trademark of biological resources                      Unit 9: quality, safety and procedural compliances  <ul style="list-style-type: none"> <li>• Bio safety and its implementations</li> <li>• Quality control in entrepreneurship</li> <li>• WHO Guidelines for setting up of a contract research organization.</li> <li>• Starting a research laboratory in India – guidelines and permits required</li> </ul> </p>	<p align="center">15</p>
<p>MODULE 4: Field and project based component</p>	<p>Field and project based component:                      -Lateral thinking and testing entrepreneurial competencies of the students                      - Interactions with successful entrepreneur, Banker/ Angel Investor / workshops on entrepreneurship.                      - Visit to a bio-startup/ Formulating and presenting Business model</p>	<p align="center">15</p>

**REFERENCES:**

1. Garg, M.C. (2015) Entrepreneurial development. Guset User.
2. Kolchinsky, P. (2004) The entrepreneurs guide to a biotech startup. 4<sup>th</sup> edition. [www.evelexa.com](http://www.evelexa.com)

**Additional reading:**

1. Simon, S. 2009. Start with why: How great leaders inspire everyone to take action. Penguin Group (USA) Inc .
2. Welch, J. and Byrne, J.A. 2003. Straight from the gut. Business plus publishers.

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**COURSE CURRICULUM**  
**OF**  
**PROGRAMME BSC ZOOLOGY**  
*(Revised w.e.f: June 2020)*

**OF**  
**PARVATIBAI CHOWGULE COLLEGE**  
**OF ARTS AND SCIENCE**  
**(Autonomous)**

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**PROGRAMME BSC ZOOLOGY**  
**COURSE CURRICULUM (Revised w.e.f: June 2020)**

<b>COURSE STRUCTURE: PROGRAMME BSC ZOOLOGY</b>						
<b>SEMESTER</b>	<b>CORE</b>		<b>ELECTIVE</b>			
I	<b>ZOO-I.C-1</b> Animal Diversity : Non Chordates	<b>ZOO-I.C-2</b> Cell and Molecular Biology	-----	-----	-----	-----
II	<b>ZOO-II.C-3</b> Diversity and Biological Systems of Chordates	<b>ZOO-II.C-4</b> Fundamentals of Animal and Human Genetics	-----	-----	-----	-----
III	<b>ZOO-III.C-5</b> Human Physiology		<b>ZOO-III.E-1</b> Vertebrate Endocrinology	<b>ZOO-III.E-2</b> Basic microbiology and Fundamentals of Animal Biotechnology	<b>ZOO-III.E-3</b> Environmental Toxicology	<b>ZOO-III.E-4</b> /**ZOO-III-SE-1 Waste Management techniques (Sem III & IV)
IV	<b>ZOO-IV.C-6</b> Biochemistry and Metabolic Regulation		<b>ZOO-IV.E-5</b> Animal cell culture and Applications	<b>ZOO-IV.E-6</b> Aquaculture and Fisheries	<b>ZOO-IV.E-7</b> Immunology	<b>ZOO-IV.E-8</b> Evolutionary Biology
V	<b>ZOO-V.C-7</b> Developmental Biology		<b>ZOO-V.E-9</b> Molecular Genetics and Forensic Science	<b>ZOO-V.E-10</b> Economic Zoology	<b>ZOO-VI.E-11</b> Basic and Applied Entomology	<b>ZOO-V.E-12</b> Fish Preservation and Processing
VI	<b>ZOO-VI.C-8</b> Wildlife Biology		<b>ZOO-VI.E-13</b> Health and Nutrition <b>*ZOO-VI-GE-1</b> Health and Nutrition	<b>ZOO-V.E-14</b> Ecology and Ethology	<b>ZOO-VI.E-15</b> Laboratory Techniques in Pathology	<b>ZOO-VI.E-16</b> / **ZOO-IV-SE-2 Bio Entrepreneurship

**SEMESTER I and II**

<b>SEMESTER</b>	<b>COURSE CODE</b>	<b>CORE COURSES</b>	<b>NUMBER OF CREDITS</b>	<b>CONTACT HOURS</b>
<b>Semester I</b>	ZOO-I.C-1	Animal Diversity : Non Chordates	Theory = 03 Practicals =01	Theory = 45 Practicals =30
	ZOO-I.C-2	Cell and Molecular Biology	Theory = 03 Practicals =01	Theory = 45 Practicals =30
<b>Semester II</b>	ZOO-II.C-3	Diversity and Biological Systems of Chordates	Theory = 03 Practicals =01	Theory = 45 Practicals =30
	ZOO-II.C-4	Fundamentals of Animal and Human Genetics	Theory = 03 Practicals =01	Theory = 45 Practicals =30

**SEMESTER I**

<b>CORE COURSE : ANIMAL DIVERSITY: NON CHORDATES</b>	
COURSE CODE:	ZOO-I.C-1
MARKS:	100 [ 75 -Theory ; 25- Practicals]
CREDITS:	04 [ 03 -Theory; 01- Practical]
CONTACT HOURS:	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
COURSE OBJECTIVES:	<ul style="list-style-type: none"><li>• To be familiar with the different non-chordate phyla.</li><li>• To know the general and distinguishing characters of each of them.</li><li>• To study how the different systems evolved in their complexity.</li><li>• To compare and contrasts the life processes in different phyla.</li></ul>
COURSE OUTCOME:	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• CO1: Be familiar with identification of the non-chordates from chordates.</li><li>• CO2: Identify the invertebrates and classify them upto the class level.</li><li>• CO3: Understand the basis of life processes in the non-chordates.</li><li>• CO4: Able to appreciate the process of evolution and understand how it progressed from simple, unicellular cells to complex, multicellular organisms.</li></ul>



<b>ZOO-I.C-1: ANIMAL DIVERSITY: NON CHORDATES</b>		
<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
<b>Module 1:</b> Evolution of Animal Diversity and Diversity of lower non chordates	<ul style="list-style-type: none"> <li>• Non chordate evolution and diversity</li> <li>• Taxonomy and phylogeny of animals</li> <li>• Invertebrate cladogram</li> <li>• Protista</li> </ul> Classification and general characters upto class for the following phyla: <ul style="list-style-type: none"> <li>• Porifera</li> <li>• Cnidaria</li> <li>• Platyhelminthes</li> <li>• Aschelminthes</li> <li>• Annelida</li> </ul>	15
<b>Module 2:</b> Diversity of higher Non Chordates	Classification and general characters upto class for the following phyla: <ul style="list-style-type: none"> <li>• Onycophora</li> <li>• Arthropoda</li> <li>• Mollusca</li> <li>• Echinodermata</li> <li>• Hemichordata</li> </ul>	15
<b>Module 3:</b> Biological systems of Non Chordates 2	<ul style="list-style-type: none"> <li>• Comparison of life processes such as nutrition, sensory and neural control and coordination, blood vascular system, exoskeleton, endoskeleton, locomotion and muscular system, respiration, excretion, reproduction and development of phylum Porifera to Hemichordata.</li> </ul>	15

<b>PRACTICAL COMPONENT OF ZOO-I.C-1: ANIMAL DIVERSITY: NON CHORDATES</b> ( DURATION -02 HRS /WEEK)		
Sr. No	Practical	No. of Practicals
1.	Identification of organisms from phylum protozoa to phylum Hemichordata	06
2.	Observation of permanent slides	03
3.	Mountings: Cockroach mouth parts, prawn appendages	02
4.	Field trip to terrestrial environment to study the invertebrates in their natural habitats	01

**REFERENCE BOOKS:**

1. Barnes R.D. (2000). Invertebrate Zoology.Hall Saunders International Edition, London.
2. Barrington E.J.W. 1979. Invertebrate structure and Function.John Wiley and Sons Inc.
3. Jordan, E. L. and Verma, P.S. (2000). Invertebrate Zoology. S. Chand & Co. Pvt. Ltd. New Delhi.
4. Marshall A.J.and W.D. Williams. 1974. Textbook of Zoology. Macmillan.
5. Pechenik J.A.( 2002). Biology of the invertebrates. Tata McGraw hill Publishing company limited, New Delhi .

**REFERENCE BOOKS FOR PRACTICALS:**

- 1) Ziser. W.S (2014) Biology 1413 Introductory Zoology Lab Manual.Morton Publishing Co. Austin Community College.
  - 2) Lal S.S. (2004) A textbook of practical zoology vertebrate. Rastogi publications, Meerut India.
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**CORE COURSE : CELL AND MOLECULAR BIOLOGY**

<b>COURSE CODE:</b>	ZOO-I.C-2
<b>MARKS:</b>	100 [ 75 –Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [03 –Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	<ul style="list-style-type: none"><li>• This course will give firm and rigorous foundation in the principles of modern molecular and cellular biology.</li><li>• It discusses the fundamental processes that enable cells to grow, move and communicate and will cover topics such as cell architecture, cell chemistry, cell division, functions and cell cycle.</li><li>• Students will also learn current molecular biological techniques that are used to study cell biology.</li><li>• Laboratories will focus both on exercises that help illustrate cellular phenomena, as well as on the introduction of techniques and procedures commonly utilized in modern cell and molecular biology research.</li></ul>
<b>COURSE OUTCOME:</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• CO1: Have an understanding of cell, it's organelles and their function.</li><li>• CO2: Demonstrate deeper understanding of what 'life is and how it functions at cellular level.</li><li>• CO3: Contrast cellular membrane structure and function, fine structure and function of cell organelles.</li><li>• CO4: Perform a variety of molecular and cellular biology techniques.</li></ul>

**ZOO-I.C-2 : CELL AND MOLECULAR BIOLOGY**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
<b>MODULE 1:</b> TECHNIQUES OF CELL STUDY AND CELL CHEMISTRY (15 Hrs)	Unit 1: MICROSCOPY <ul style="list-style-type: none"> <li>• Light Microscopy</li> <li>• Electron Microscopy.</li> </ul>	15
	Unit 2: CELL STUDY METHODS <ul style="list-style-type: none"> <li>• Cell Fractionation, Chromatography and electrophoresis.</li> </ul>	
	Unit 3: MOLECULES IN CELL. <ul style="list-style-type: none"> <li>• Micromolecules in cells: Sugars, Fatty acids, aminoacids, Nucleotides.</li> <li>• Macromolecules in cells: Nucleic acids, proteins, Polysaccharides, glycogen, fats.</li> </ul>	
	Unit 4: CHEMICAL BONDS IN BIOMOLECULES <ul style="list-style-type: none"> <li>• covalent bonds, ionic bonds, noncovalent interactions</li> </ul>	
<b>MODULE 2:</b> CELL ARCHITECTURE (15 Hrs)	Unit 5: MEMBRANE STRUCTURE AND MEMBRANE PROTEINS <ul style="list-style-type: none"> <li>• lipid bilayer – composition and structural organization (amphipathic phospholipids, Fluidity of cell membrane)</li> <li>• Membrane Proteins –structure and function (transmembrane proteins, peripheral membrane proteins)</li> <li>• Phospholipids, sphingolipids, Cholesterol in cell membrane.</li> </ul>	15
	Unit 6: MOLECULAR STRUCTURE AND FUNCTION <ul style="list-style-type: none"> <li>• Plasma Membrane</li> <li>• Cell matrix: Physical nature and Properties.</li> <li>• Nucleus: Ultra Structure and function</li> <li>• Mitochondria: Ultra Structure and functions</li> <li>• Endoplasmic Reticulum: ultra structure, modifications, functions</li> </ul>	
	UNIT 7: MOLECULAR STRUCTURE AND FUNCTION <ul style="list-style-type: none"> <li>• Golgi Complex, Ribosomes, Microsomes, Cytoskeleton</li> </ul>	
<b>MODULE 3:</b> CELLULAR TRANSPORT OF PROTEINS AND VESICLES (15 Hrs)	Unit 8: TRANSPORT ACROSS CELL MEMBRANES <ul style="list-style-type: none"> <li>• Principle of transmembrane transport (transporters and channels, active and passive transport, osmosis)</li> <li>• Transporters and their function- passive transporters, Pumps ( Na<sup>+</sup>, K<sup>+</sup>, Ca<sup>+</sup>)</li> <li>• Ion Channels - ion channels activities, regulation of opening and closing of channels.</li> <li>• Protein transport into organelles (nucleus, mitochondria,ER).</li> </ul>	15
	Unit 9: VESICULAR TRANSPORT. <ul style="list-style-type: none"> <li>• Vesicular transport – transport of soluble proteins, vesicle budding, vesicle docking, endocytic pathways.</li> </ul>	

<b>PRACTICAL COMPONENT OF ZOO-I.C-2: CELL AND MOLECULAR BIOLOGY ( DURATION -02 HRS /WEEK)</b>		
<b>Sr. No</b>	<b>Practical</b>	<b>No. of Practicals</b>
1)	Introduction to Lab techniques – Pipetting, preparation of buffers and solutions, Lab equipments (use and maintenance), acquaintance with general laboratory practices	02
2)	Cytochemistry: Localisation of Proteins, Carbohydrates & fats using different stains.	03
3)	Comparison of membrane permeability – Cellophane and Chick intestine.	02
4)	Osmotic studies – Using Human Red blood cells.	01
5)	Permanent slides: <ul style="list-style-type: none"> <li>- Mitotic stages</li> <li>- Meiotic stages (mounting from grasshopper testes)</li> <li>- Histology - Study of different cell types (animal cells)</li> </ul>	03
6)	Technique of Agarose gel electrophoresis (Observation of technique)	01

#### **REFERENCE BOOKS:**

##### **Essential books:**

- 1) *Alberts B, Hopkins, Lewis J, Raff M, Robertis K, Walter P (2014): Essential Cell Biology, Fourth Edition, Garland Science Taylor & Francis Group, UK.*
- 2) *Lodish H, Berk A, Kaiser CA, Krienger M, Scott MP, Anthony, Bretscher A, Amon A. Scott MP (2013): Molecular Cell Biology, Seventh Edition, W. H. Freeman and Company New York.*

##### **Supplementary Reading:**

- 3) *Gupta PK (2003): Cell and Molecular Biology, Second Edition, Rakesh Kumar Rastogi for Rastogi Publications, Meerut, New Delhi, India.*
- 4) *Verma PS and Agarwal VK (2007): Cell Biology Genetics Molecular Biology Evolution & Ecology. S Chand and Company PVT LTD, New Delhi.*

#### **REFERENCE BOOKS FOR PRACTICALS:**

- 1) *Alberts B, Hopkins, Lewis J, Raff M, Robertis K, Walter P (2014): Essential Cell Biology, Fourth Edition, Garland Science Taylor & Francis Group, UK.*
- 2) *Bolsover SR, Shephard EA, Hugh AW, Hyams JS (2011): Cell Biology, Third Edition, Wiley Blackwell, A John Wiley & Sons, Inc., Publications.*
- 3) *Verma PS and Agarwal VK (2007): Cell Biology Genetics Molecular Biology Evolution & Ecology. S Chand and Company PVT LTD, New Delhi.*

**SEMESTER – II**

<b>CORE COURSE:</b> <b>DIVERSITY AND BIOLOGICAL SYSTEMS OF CHORDATES</b>	
<b>COURSE CODE:</b>	ZOO-II.C-3
<b>MARKS:</b>	100 [ 75 -Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 -Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	<ul style="list-style-type: none"><li>• To be familiar with the different Chordate phyla.</li><li>• To know the general and distinguishing characters of each of them.</li><li>• To compare and contrast the major biological systems amongst them.</li></ul>
<b>COURSE OUTCOME:</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• CO1: Be familiar with identification of the non-chordates from chordates with justification.</li><li>• CO2: Identify the different chordates upto the order.</li><li>• CO3: Understand the functioning and mechanism of the various biological systems in the chordates.</li><li>• CO4: Able to appreciate the process of evolution of chordates from nonchordates and understand how it progressed from simple vertebrates to highly complex vertebrates.</li></ul>

<b>ZOO-II.C-3: DIVERSITY AND BIOLOGICAL SYSTEMS OF CHORDATES</b>		
<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
<b>MODULE 1:</b> Diversity of chordates (upto order)	1.1: Chordata: General plan of organization and Outline classification 1.2: General characters and classification of Protochordates 1.3: General characters and classification of Agnatha (upto class) 1.4: General characters and classification of Pisces, Amphibia, Reptilia, Aves, Mammalia upto orders	15
<b>MODULE 2:</b> Biological Systems I	3.1: Integument: Pisces, Amphibia, Reptilia, Aves, Mammalia 3.2: Locomotory apparatus: Pisces, Amphibia, Reptilia, Aves, Mammalia 3.3: Digestive system: Pisces, Amphibia, Reptilia, Aves, Mammalia 3.4: Respiratory system: Pisces, Lungs in Amphibia, Reptilia, Aves, Mammalia	15
<b>MODULE 3:</b> Biological systems - II	3.1: Circulatory system: Pisces, Amphibia, Reptilia, Aves, Mammalia 3.2: Brain and cranial nerves: Pisces, Amphibia, Reptilia, Aves, Mammalia 3.3: Reproductive system: Pisces, Amphibia, Reptilia, Aves, Mammalia	15

<b>PRACTICAL COMPONENT OF ZOO-II.C-3: DIVERSITY OF CHORDATES ( DURATION -02 HRS /WEEK)</b>		
<b>Sr. No</b>	<b>Practical</b>	<b>No. of Practicals</b>
1.	Identification and Systematic classification of organisms from protochordates to mammalia	05
2.	Mounting of scales and chromatophores in fishes	01
3.	Observation of general viscera of chordate phyla	01
4.	Identification of Indian venomous and non venomous snakes with the help of keys provided (four each)	01
5.	Observation of pecten of eye (chick), skulls of representatives of pisces, amphibian, aves and mammals.	01
6.	Observation of permanent slides (amphioxus, doliolum, salpa) and observation of hyoid apparatus of chick; reptiles and mammals	01
7.	Field trip to wild life sanctuary	02

**REFERENCE BOOKS:**

1. Cleveland Hickman Jr., Roberts Larry, Susan Keen, Allan Larson and Eisenhour D (2014). Animal Diversity. McGraw Hill Science.
2. Kardong K(2011). Vertebrates: Comparative anatomy, evolution, function. McGraw-Hill Higher Education.
3. Kent G.C. and Carr R.K. (2000). Comparative anatomy of the vertebrates. McGraw-Hill Higher Education.
4. Young J.Z. (2006). The life of vertebrates. Radha Press Delhi, Indian Edition.

**REFERENCE BOOKS FOR PRACTICALS:**

- 1) Ziser. W.S (2014) Biology 1413 Introductory Zoology Lab Manual. Morton Publishing Co. Austin Community College.
- 2) Lal S.S. (2004) A textbook of practical zoology vertebrate. Rastogi publications, Meerut India.



**CORE COURSE:**  
**FUNDAMENTALS OF ANIMAL AND HUMAN GENETICS**

<b>COURSE CODE:</b>	ZOO-II.C-4
<b>MARKS:</b>	100 [ 75 –Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 –Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	<ul style="list-style-type: none"> <li>• This course is intended to provide solid understanding of concepts and principles of genetics as it applies to animals and humans.</li> <li>• Students will receive good foundation of chromosome structure, its aberrations and inheritance patterns of traits and disease which will help one to develop conceptual skills to address questions in genetic research.</li> </ul>
<b>COURSE OUTCOME:</b>	<p>Upon successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> <li>• CO1: Describe the basic structure of genes and chromosomes.</li> <li>• CO2: Relate an organism’s genotype and phenotype and explain the role of genes in inheritance.</li> <li>• CO3: Associate knowledge of genetic principles to the phenomena which occur in humans with reference to genetic inheritance.</li> <li>• CO4: Construct and analyze pedigrees to determine mode of inheritance of disorders and traits.</li> </ul>

## ZOO-II.C-4: FUNDAMENTALS OF ANIMAL AND HUMAN GENETICS

MODULE	TOPICS	CONTACT HOURS
MODULE 1: Transmission Genetics	UNIT 1: MODES OF INHERITANCE <ul style="list-style-type: none"> <li>• Mendel's laws of inheritance, test cross, back cross</li> <li>• Gene interactions: 9:3:3:1/12:3:1 / 9:3:4 / 9:6:1 / 9:7 / 15:1 / 13:3. lethal genes, penetrance.</li> <li>• Inheritance of Multiple Alleles and Multiple genes</li> </ul>	15
	UNIT 2: PATTERN OF INHERITANCE BY PEDIGREES <ul style="list-style-type: none"> <li>• Construction of Pedigrees</li> <li>• Analysis of Pedigree analysis: autosomal dominant, autosomal recessive, X-Linked dominant, X-linked recessive, Y-linked, Mitochondrial inheritance</li> <li>• Sex limited and Sex influenced and multifactorial inheritance disorders in humans</li> </ul>	
MODULE 2: Chromosome Structure and Abnormalities in Humans	UNIT 3: CHROMOSOME STRUCTURE <ul style="list-style-type: none"> <li>• Chromosome morphology- chromatid, Centromere, secondary constriction, chromomere</li> <li>• Heterochromatin and euchromatin</li> <li>• Chromosome structure and organization.</li> <li>• Human chromosomes and karyotype.</li> </ul>	15
	UNIT 4: CHROMOSOMAL ABERRATION <ul style="list-style-type: none"> <li>• Numerical aberrations: Types- Aneuploidies and Euploidies, Mosaicism,</li> <li>• Structural Abnormalities: Types-Deletions, inversions, Translocations, duplications.</li> </ul>	
MODULE 3: Gene Mutations, Sex Determination	UNIT 5: GENETIC MUTATIONS. <ul style="list-style-type: none"> <li>• characteristics of mutations</li> <li>• classification of mutations (Spontaneous, Induced) molecular basis of mutations</li> <li>• Mutagens – physical and chemical</li> </ul>	15
	UNIT 6: SEX DETERMINATION. <ul style="list-style-type: none"> <li>• Environmental Sex Determination – hormonal, egg size, incubation temperature.</li> <li>• Chromosomal sex determination - XX ♀ and XO ♂, XO ♀ and XX ♂, ZW ♀ and ZZ ♂, XX ♀ and XY ♂, Diploid female and Haploid male, single gene effect.</li> <li>• Molecular basis of sex determination: Geneic imbalance, Sex index, Intersex and gynandromorphs, X/A Ratio.</li> <li>• Sex determination by Y linked genes, Dosage compensation, X-inactivation</li> </ul>	

<b>PRACTICAL COMPONENT OF ZOO-II.C-4: FUNDAMENTALS OF ANIMAL AND HUMAN GENETICS. DURATION - 02 HRS /WEEK</b>		
Sr. No	Practical	No. of Practicals
1)	Verification of Mendel's laws - monohybrid cross	01
2)	Verification of Mendel's laws - dihybrid cross	01
3)	Manual Karyotyping of human chromosome plates: 1) Normal Male and Female 2) Downs syndrome	03
4)	Drosophila Culture technique	01
5)	Study of Mutants of Drosophila	01
6)	Exercises for Multiple alleles and Multiple genes	02
7)	Construction and analysis of pedigrees	03

#### **REFERENCE BOOKS FOR THEORY:**

- 1) Gardner EJ, Simmons MJ and Snustad DP (2013): Principles of Genetics, Eighth Edition, John Wiley Publication, Singapore.
- 2) De Robertis EDP, De Robertis EMF (2012): Cell and Molecular Biology, Eighth Edition. Wolter Kluwer Publication, Philadelphia.
- 3) Singh BD (2014): Fundamentals of Genetics. Second Edition, Kalyani Publishers, New Delhi.
- 4) Lewis R (2009): Human Genetics, Concepts and Applications, Seventh Edition. McGraw-Hill International Edition, New York.
- 5) Gangane SD (2009): Human genetics, Third Edition, Reed Elsevier India Pvt Ltd., Haryana India.
- 6) Gardner A, Davies T (2010): Human Geentics, Second Edition, Scion Publishing Ltd, UK.
- 7) Marcus A(2011): Genetics, MJP Publishers, Chennai.
- 8) Verma PS and Agarwal VK (2014): Cell Biology Genetics Molecular Biology Evolution & Ecology. S Chand and Company PVT LTD, New Delhi.
- 9) Kothari ML, Mehta L, Roychoudhury SS (2009): Essentials of Human Genetics, Fifth edition, University Press Pvt. Ltd. Hyderabad.

#### **REFERENCE BOOKS FOR PRACTICALS:**

- 1) Gangane SD (2009): Human genetics, Third Edition, Reed Elsevier India Pvt Ltd., Haryana India.
- 2) Marcus A(2011): Genetics, MJP Publishers, Chennai.
- 3) Gardner A, Davies T (2010): Human Genetics, Second Edition, Scion Publishing Ltd, UK.
- 4) Lewis R (2009): Human Genetics, Concepts and Applications, Seventh Edition. McGraw-Hill International Edition, New York.

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<b>COURSE STRUCTURE: PROGRAMME BSC ZOOLOGY</b>						
<b>SEMESTER</b>	<b>CORE</b>		<b>ELECTIVE</b>			
I	<b>ZOO-I.C-1</b> Animal Diversity : Non Chordates	<b>ZOO-I.C-2</b> Cell and Molecular Biology	-----	-----	-----	-----
II	<b>ZOO-II.C-3</b> Diversity and Biological Systems of Chordates	<b>ZOO-II.C-4</b> Fundamentals of Animal and Human Genetics	-----	-----	-----	-----
III	<b>ZOO-III.C-5</b> Human Physiology		<b>ZOO-III.E-1</b> Vertebrate Endocrinology	<b>ZOO-III.E-2</b> Basic microbiology and Fundamentals of Animal Biotechnology	<b>ZOO-III.E-3</b> Environmental Toxicology	<b>ZOO-III.E-4</b> /**ZOO-III-SE-1 Waste Management techniques (Sem III & IV)
IV	<b>ZOO-IV.C-6</b> Biochemistry and Metabolic Regulation		<b>ZOO-IV.E-5</b> Animal cell culture and Applications	<b>ZOO-IV.E-6</b> Aquaculture and Fisheries	<b>ZOO-IV.E-7</b> Immunology	<b>ZOO-IV.E-8</b> Parasitology
V	<b>ZOO-V.C-7</b> Developmental Biology		<b>ZOO-V.E-9</b> Molecular Genetics and Forensic Science	<b>ZOO-V.E-10</b> Economic Zoology	<b>ZOO-VI.E-11</b> Basic and Applied Entomology	<b>ZOO-V.E-12</b> Fish Preservation and Processing
VI	<b>ZOO-VI.C-8</b> Wildlife Biology		<b>ZOO-VI.E-13</b> Health and Nutrition <b>*ZOO-VI-GE-1</b> Health and Nutrition	<b>ZOO-V.E-14</b> Ecology and Ethology	<b>ZOO-VI.E-15</b> Laboratory Techniques in Pathology	<b>ZOO-VI.E-16</b> / **ZOO-IV-SE-2 Bio Entrepreneurship

## SEMESTER –III and IV

SEMESTER	COURSE CODE	COURSES	CREDITS	CONTACT HOURS
<b>Semester III</b>	ZOO-III.C-5	Human Physiology	Theory = 03 Practicals =01	Theory = 45 Practicals =30
	ZOO-III.E-1	Vertebrate Endocrinology	Theory = 03 Practicals =01	Theory = 45 Practicals =30
	ZOO-III.E-2	Basic microbiology and Fundamentals of Animal Biotechnology	Theory = 03 Practicals =01	Theory = 45 Practicals =30
	ZOO-III.E-3	Environmental Toxicology	Theory = 03 Practicals =01	Theory = 45 Practicals =30
	ZOO-III.E-4 / **ZOO-III-SE-1 Waste Management techniques (Sem III & IV)	Waste Management techniques	Theory = 01 Practice =03	Theory = 15 Practice =45
<b>Semester IV</b>	ZOO-IV.C-6	Biochemistry and Metabolic Regulation	Theory = 03 Practicals =01	Theory = 45 Practicals =30
	ZOO-IV.E-5	Animal cell culture and Applications	Theory = 03 Practicals =01	Theory = 45 Practicals =30
	ZOO-IV.E-6	Aquaculture and Fisheries	Theory = 03 Practicals =01	Theory = 45 Practicals =30
	ZOO-IV.E-7	Immunology	Theory = 03 Practicals =01	Theory = 45 Practicals =30
	ZOO-IV.E-8	Parasitology	Theory = 03 Practicals =01	Theory = 45 Practicals =30
	**ZOO-III-SE-1 Waste Management techniques (Sem III & IV)	Waste Management techniques	Theory = 01 Practice =03	Theory = 15 Practice =45

## SEMESTER -III

<b>CORE COURSE :HUMAN PHYSIOLOGY</b>	
<b>COURSE CODE:</b>	ZOO-III.C-5
<b>MARKS:</b>	100 [75 -Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [03 -Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	<ul style="list-style-type: none"><li>• The primary goal of this course is to offer an in-depth presentation of the function of the major organs and organ systems of the human body.</li><li>• The course is designed to expand physiological concepts presented in prerequisite courses.</li></ul>
<b>COURSE OUTCOME:</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• CO1: Describe and explain the normal function of the cells, tissues, organs, and organ systems of the human body.</li><li>• CO2: Develop understanding of the functional relationships of anatomical structures to one another.</li><li>• CO3: Know the disorders associated with the different systems.</li><li>• CO4: Understand and associate malfunctions in the body to various organs and organ systems.</li></ul>

**ZOO-III.C-5: HUMAN PHYSIOLOGY**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
<b>MODULE 1:</b> Physiology Of Digestion And Respiration	<b>UNIT 1: DIGESTIVE SYSTEM</b> <ul style="list-style-type: none"> <li>• Structural organization, histology and functions of gastrointestinal tract and its associated glands;</li> <li>• Mechanical and chemical digestion of food; Absorptions of carbohydrates, lipids, proteins, water, minerals and vitamins.</li> </ul>	15
	<b>UNIT 2: RESPIRATORY SYSTEM</b> <ul style="list-style-type: none"> <li>• Histology of trachea and lung;</li> <li>• Mechanism of respiration, Pulmonary ventilation; Respiratory volumes and capacities;</li> <li>• Transport of oxygen in the blood oxygen- hemoglobin &amp; myoglobin, dissociation curve and the factors influencing it Carbon monoxide poisoning; Carbon dioxide transport in the blood;</li> <li>• Buffering action of blood and haemoglobin Control of respiration</li> </ul>	
<b>MODULE 2:</b> Physiology Of Excretion And Circulation	<b>UNIT 3: EXCRETORY SYSTEM</b> <ul style="list-style-type: none"> <li>• Structure of kidney and its histological details, Renal blood supply; Mechanism urine</li> <li>• Formation and its regulation, Regulation of acid-base balance.</li> </ul>	15
	<b>UNIT 4: CIRCULATORY SYSTEM</b> <ul style="list-style-type: none"> <li>• An outline structure of heart and working of heart.</li> <li>• Origin and conduction of cardiac impulses functions of AV node; Cardiac cycle; nervous and chemical regulation of heart rate; Blood pressure and its regulation; Electrocardiogram</li> <li>• Components of blood and their functions; Haemopoiesis.</li> </ul>	
<b>MODULE 3:</b> Physiology Of Nervous System, Muscles And Reproductive System	<b>UNIT 5: NERVOUS SYSTEM</b> <ul style="list-style-type: none"> <li>• Structure of neuron, resting membrane potential, Origin of action potential and its propagation across the myelinated and unmyelinated nerve fibers;</li> <li>• types of synapsis, Synaptic transmission and, Neuromuscular junction; Reflex action &amp; its types - reflex arc</li> <li>• Physiology of hearing and vision</li> </ul>	15
	<b>UNIT 6: MUSCLE</b> <ul style="list-style-type: none"> <li>• Histology of different types of muscle;</li> <li>• Ultra structure of skeletal muscle;</li> <li>• Molecular and chemical basis of muscle contraction;</li> <li>• Characteristics of muscle twitch; Motor Unit, summation &amp; tetanus</li> </ul>	
	<b>UNIT 7: REPRODUCTIVE SYSTEM</b> <ul style="list-style-type: none"> <li>• Histology of male and female reproductive systems.</li> <li>• Puberty, Physiology of male and female reproduction.</li> </ul>	

<b>PRACTICAL COMPONENT OF ZOO-III.C-5: HUMAN PHYSIOLOGY ( DURATION -02 HRS / WEEK)</b>		
<b>SR. NO</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1)	Enumeration of red blood cells / WBC using haemocytometer	02
2)	Estimation of haemoglobin using Sahli's haemoglobinometer	01
3)	Determination of activities of digestive enzymes (Amylase, Pepsin, Trypsin and Lipase)	02
4)	Temporary preparation of Striated muscle fibers and nerve cells.	02
5)	Urine analysis (for organic, inorganic and abnormal components)	03
6)	Examination of sections of mammalian tissues:Lung, Kidney, Gonads, Intestine, Muscles, Spinal cord, Bone and cartilage	02

#### **REFERENCE BOOKS:**

##### *Essential books:*

1. Singh HD(2011):*Textbook of Human Physiology, S Chand Publishers, New Delhi.*
2. Widmaier, Raff, &Strang(2008), *Vander's Human Physiology: The Mechanisms of Body Function, 12thedition, McGraw Hill,. ISBN 978-0-07-337810-7*
3. Tortara G J and DerricksonBH(2009). *Principles of Anatomy and physiology, 12<sup>th</sup> Edition. John Wiley & sons, Inc.*
4. Guyton Ac and Hall JE(2011). *Testbook of Medical Physiology, 12<sup>th</sup> Edition, Harcourt Asia Pvt Ltd, WB Saunders Company.*

##### *Supplementary Reading:*

5. Openstax College (2013). *Anatomy and Physiology. Vol II. Mainstreet MS, Houston Texas(Ebook)*
6. Forciea B (2012). *An eText of Human Anatomy and Physiology(Ebook).*
7. WingerdB(2008). *The Human Body, Essential Anatomy and Physiology. University Readers, SanDiego CA.*

#### **REFERENCE BOOKS FOR PRACTICALS:**

1. Openstax College (2013). *Anatomy and Physiology. Vol II. Mainstreet MS, Houston Texas(Ebook)*
2. Forciea B (2012). *An eText of Human Anatomy and Physiology(Ebook).*
3. WingerdB(2008). *The Human Body, Essential Anatomy and Physiology. University Readers, SanDiego CA.*



**ELECTIVE COURSE: VERTEBRATE ENDOCRINOLOGY**

<b>COURSE CODE:</b>	ZOO-III.E-1
<b>MARKS:</b>	100 [ 75 –Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 –Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	<ul style="list-style-type: none"><li>• To study the endocrine organs of vertebrates</li><li>• To understand the underlying principles of hormone functions</li><li>• To gain an insight into the current and important issues in endocrinology</li></ul>
<b>COURSE OUTCOME:</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• CO1: Be familiar with all the endocrine organs of human body.</li><li>• CO2: Associate hormones to body growth, metabolism, reproduction and development.</li><li>• CO3: To understand the underlying principles and disorders associated with hormone functions</li><li>• CO4: Learn techniques of histology and tissue identification.</li></ul>

### ZOO-III.E-1: VERTEBRATE ENDOCRINOLOGY

MODULE	TOPICS	CONTACT HOURS
<b>MODULE 1:</b>  Anatomy and histology	Unit 1: <ul style="list-style-type: none"> <li>• Aim and scope of endocrinology,</li> <li>• techniques in endocrinology - histology, histochemistry, immunocytochemistry, in situ hybridisation, radio immune assay, surgical techniques,</li> <li>• Regulation of hormone secretion: feedback mechanisms - positive, negative, short loop, long loop</li> </ul>	15
	Unit 2: <ul style="list-style-type: none"> <li>• Anatomy and histology of endocrine glands-</li> <li>• Pituitary, Pineal gland, Thyroid, Parathyroid,</li> <li>• Thymus, Adrenal, Endocrine pancreas, GI tract,</li> <li>• Endocrine hypothalamus, Gonads, Placenta</li> </ul>	
<b>MODULE 2:</b>  Hormones	Unit 3: <ul style="list-style-type: none"> <li>• Classification of hormones</li> <li>• Hormone structure</li> <li>• Biological actions of hormones</li> </ul>	15
	Unit 4: <ul style="list-style-type: none"> <li>• Mechanisms of hormone action</li> <li>• Receptor and it regulation</li> <li>• Steroid and peptide hormones actions</li> </ul>	
	Unit 5: Hormones and Homeostasis - Calcium and glucose	
<b>MODULE 3:</b>  Pathological conditions	Unit 6: Biosynthesis and secretion of hormones - steroid hormones, thyroid hormones	15
	Unit 7: Growth factors - neurotropic growth factors, hematopoietic growth factors, other peptide growth factors	
	Unit 8: Endocrine disorders - goitre, gigantism, dwarfism, cretinism, diabetes mellitus, insepitus	

<b>PRACTICAL COMPONENT OF ZOO-III.E-1: Vertebrate Endocrinology ( DURATION -02 HRS /WEEK)</b>		
<b>Sr. No</b>	<b>Practical</b>	<b>No. of Practicals</b>
1)	Histological slides of Endocrine hypothalamus, Gonads, Placenta pituitary, Pineal gland, thyroid gland, Parathyroid, Thymus, adrenal gland, pancreas, ovary, testis	04
2)	Display of Pituitary and gonads in fishes/chick	03
3)	Preparation of histological slides using microtomy	05

#### REFERENCE BOOKS:

1. David, N.O. and J.A. Carr (2013) Vertebrate Endocrinology. Academic press publications 5<sup>th</sup> edition.
2. Hadley, M. and Levine, J (2006) Endocrinology. Benjamin Cummings 6<sup>th</sup> edition.
3. Kovacs, J.W. and S.R. Ojeda (2011) Textbook of endocrine physiology 6<sup>th</sup> edition. Oxford university press.
4. Yadav, P.R. (2004) Endocrinology. Discovery Publishing House, New Delhi.
5. Hadley, M (1992) Endocrinology, Third edition, prentice Hall, New Jersey.
6. Matsumoto, A. and S. Ishi, (1992 )(eds). Atlas of endocrine organs, vertebrates and Invertebrates springierverlag, Germany.
7. Norris D. O., Vertebrate Endocrinology, Elsevier Academic Press.
8. Turner, C.D and Bagnara, J.T., (1994) General Endocrinology, 6th Edition, WB Saunder's company, Philadelphia (Saunder's International Students edition).
9. 5. Wilson J.D and Foster D.W (1992) William's textbook of endocrinology, 8th edition, WB saunders company, Philadelphia.
10. Yadav, P.R (2004) Endocrinology. Discovery Publishing House, New Delhi.

**ELECTIVE COURSE: BASIC MICROBIOLOGY AND FUNDAMENTALS OF ANIMAL BIOTECHNOLOGY**

<b>COURSE CODE:</b>	ZOO-III-E-2
<b>MARKS:</b>	100 [ 75 -Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 -Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	<ul style="list-style-type: none"><li>• To provide a comprehensive survey of microbiology with basic information on bacteria and learn the fundamentals of biotechnological techniques.</li></ul>
<b>COURSE OUTCOME:</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• CO1: Gain working knowledge of basic bacterial laboratory techniques and use of microorganism in biotechnology.</li><li>• CO2: Perform techniques of bacterial isolation and identification.</li><li>• CO3: Have knowledge about various molecular techniques of gene manipulation.</li><li>• CO4: Should be able to Perform techniques of isolate DNA, bring about transformation and identification of recombinants.</li></ul>

**ZOO-III-E-2: BASIC MICROBIOLOGY AND FUNDAMENTALS OF ANIMAL BIOTECHNOLOGY**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
<b>MODULE 1:</b> Microbiology	1: Introduction to Microorganisms-Bacteria <ul style="list-style-type: none"> <li>○ Structure and Identification of bacteria(morphological types)</li> <li>○ Nutritional types</li> <li>○ Nutritional requirements</li> </ul>	15
	2: Isolation and Culture of Bacteria: <ul style="list-style-type: none"> <li>○ Cultivation of bacteria</li> <li>○ Different methods of isolation and maintenance of pure cultures</li> <li>○ Culture characteristics</li> </ul>	
	3: Use of microorganisms in biotechnology-An overview: <ul style="list-style-type: none"> <li>○ Production of valuable substances</li> <li>○ Fuel Production, recovery of minerals and oils</li> <li>○ Microorganisms in bioassays</li> <li>○ Food and agriculture sector</li> <li>○ Medicine and health</li> </ul>	
<b>MODULE 2:</b> Tools in Biotechnology	4: Scope and importance of Biotechnology <ul style="list-style-type: none"> <li>○ Definition</li> <li>○ Contribution and importance of biotechnology</li> </ul>	15
	5: Nucleic Acid Enzymology: <ul style="list-style-type: none"> <li>○ Restriction enzymes, Ligases, Alkaline phosphatase</li> <li>○ Polynucleotide kinase, Terminal Transferases, S1 Nuclease</li> <li>○ Polymerases, Reverse transcriptase</li> </ul>	
	6: Gene Cloning vectors: <ul style="list-style-type: none"> <li>○ Plasmids, Bacteriophage, cosmids</li> <li>○ Shuttle and expression vectors</li> </ul>	
<b>MODULE 3:</b> Genetic Engineering	7: Techniques in genetic engineering: <ul style="list-style-type: none"> <li>○ Gene transfer methods</li> <li>○ Methods of Labeling Nucleic acids</li> <li>○ Nucleic acid Hybridization</li> <li>○ Polymerase chain reaction</li> </ul>	15
	8: Recombinant DNA technology: <ul style="list-style-type: none"> <li>○ Procedure / Technique</li> </ul>	
	9: Blotting Techniques: <ul style="list-style-type: none"> <li>○ Southern Blotting</li> <li>○ Northern Blotting</li> <li>○ Western Blotting</li> </ul>	
	10: DNA sequencing techniques: <ul style="list-style-type: none"> <li>○ Chemical Degradation method</li> <li>○ Chain termination method</li> <li>○ Automated Sequencing</li> </ul>	

**PRACTICAL COMPONENT OF ZOO-III-E-2:  
BASIC MICROBIOLOGY & FUNDAMENTALS OF ANIMAL BIOTECHNOLOGY  
DURATION - 02 HRS /WEEK**

SR. NO	PRACTICAL	NO. OF PRACTICALS
1)	Preparation of culture media for bacteria (Plates, Slants, deeps, Broth).	03
2)	Staining of Microorganisms (Gram staining, negative staining).	02
3)	Isolation of pure colonies of Bacteria (streak plate method – 3 Quadrant And 5 Quadrant methods)	03
4)	Identification of Products of metabolic pathways of microbial cells.	02
5)	Bacteriological testing of Milk.	01
6)	DNA sequencing - Analysis of prints.	01

**REFERENCE BOOKS:**

*Essential books:*

- 1) Pelczar MJ, Chan ECS, Krieg NR(2009). *Microbiology*. Tata Mc Graw Hill, New York.
- 2) Dubey RC and Maheshwari DK (2012). *A test book of Microbiology*. S Chand Publishers, New Delhi.
- 3) Prave P, Faust U, Sittig W and SukatshDA(2004). *Fundamentals of Biotechnology*.
- 4) Purohit SS(2008). *Biotechnology Fundamentals and applications*. Agrobios, Jodhpur India.
- 5) RangaMM(2012): *Animal Biotechnology*. Agrobios, Jodhpur India.

*Supplementary reading:*

- 6) Black JG(2005). *Microbiology principles and explorations*. John Wiley and sons Inc.
- 7) Sullia SB and ShantharamS(2006). *General Microbiology*. Oxford and IBH Publishing Co Pvt Ltd, NewDelhi.

**REFERENCE BOOKS FOR PRACTICALS:**

- 1) Gunasekaran P(2009). *Lab Manual in Microbiology*. New Age International Ltd. Publishers, New Delhi.

**ELECTIVE COURSE: ENVIRONMENTAL TOXICOLOGY**

<b>COURSE CODE:</b>	ZOO-III-E-3
<b>MARKS:</b>	100 [ 75 –Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 –Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	<ul style="list-style-type: none"><li>• To study the different environmental pollutants and their toxicity.</li><li>• To know the physiological effects of toxicant exposure.</li></ul>
<b>COURSE OUTCOME:</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• CO1: Distinguish, classify and characterize a variety of environmental pollutants based on their biological and physical properties.</li><li>• CO2: Identify the main sources and types of environmental pollutants and assess their potential environmental fate.</li><li>• CO3: Understand mechanisms of detoxification of various varieties of toxicants.</li><li>• CO4: Know the procedures/protocols used to assess physicochemical parameters and environmental contaminants.</li></ul>

**ZOO-III-E-3: ENVIRONMENTAL TOXICOLOGY**

<b>MODULE</b>	<b>TOPIC</b>	<b>CONTACT HOURS</b>
<p><b>MODULE 1:</b> Introduction To Toxicology</p>	<p><b>1.1 Introduction To Toxicology:</b></p> <ul style="list-style-type: none"> <li>○ Definition and History of Toxicology and Toxicity</li> <li>○ Disciplines of Toxicology</li> <li>○ Biouptake, Bioaccumulation, Biotransfer and Biological Magnification, Relationship to Other Sciences, Scope and importance of Toxicology</li> </ul> <p><b>1.2: Classes Of Toxicant:</b></p> <ul style="list-style-type: none"> <li>● Define Toxicant and Toxins, their classification</li> <li>● Toxicants in Air, Water and Soil</li> <li>● Toxicants in Domestic and Occupational Settings</li> <li>● Synthetic drugs: Solvents; Therapeutic drugs, Drugs of abuse, Combustion products, Cosmetics</li> <li>● Movement and fate of Toxicants in the environment</li> </ul>	<p align="center">15</p>
<p><b>MODULE 2:</b> Environmental Impact Mitigation</p>	<p><b>2.1: Toxicity Of Heavy Metals:</b></p> <ul style="list-style-type: none"> <li>● Toxicity of Arsenic, Lead, Mercury,</li> <li>● Cadmium, Copper, Zinc, Aluminium, Iron and Manganese; Sources and portals of heavy metal pollutants; Toxicity of substances on Human and Animals</li> </ul> <p><b>2.2: Agro-Chemical Pesticides And Their Environmental Impact Mitigation</b></p> <ul style="list-style-type: none"> <li>● Definition and Classification</li> <li>● Organochlorine Insecticides, Organophosphate Insecticides, Carbamates, Pyrethroid Insecticides, Dinitrophenols, Herbicides, Fungicide</li> <li>● Control of Pesticide Pollution; Integrated Pest management.</li> </ul>	<p align="center">15</p>
<p><b>MODULE 3:</b> Food Additives AND Toxicity tests.</p>	<p><b>3.2: Food Additives:</b></p> <ul style="list-style-type: none"> <li>● General account of Food Additives:</li> <li>● Incidental or Indirect additives</li> <li>● Intentional or Direct additives: a. Antioxidants b. Emulsifiers c. Enzymes d. Flavouring agents e. Colour and preservatives f. Artificial sweetening agents i) Saccharine ii) Urea derivatives</li> <li>● Types of toxicity tests; Test types based on number and species; Test types based on exposure of toxicant; Test types based on length of exposure (acute, sub acute, chronic)</li> </ul>	<p align="center">15</p>



<b>PRACTICAL COMPONENT OF ZOO-III.E-3:ENVIRONMENTAL TOXICOLOGY ( DURATION-02 HRS/WEEK)</b>		
<b>Sr.No.</b>	<b>Practical</b>	<b>No.ofPracticals</b>
1.	To determine the effect of temperature on the toxicity of a pollutant	01
2.	To determine the effect of pH on the toxicity of a pollutant.	01
3.	To evaluate qualitatively the presence of pesticide residues in vegetable samples.	02
4.	Estimation of total dissolved solids in given water sample.	01
5.	To determine Lc <sup>50</sup> of a pollutant on mosquito larvae .	01
6.	Effect of pesticides on Oxygen consumption in fish	02
7.	Estimation of Phosphorus in given water sample by Spectrophotometer	01
8.	Estimation of Boron from given water/soil sample by spectrophotometer	01
9.	Determination of Nitrates from given water sample.	01
10.	Field trip (case study of polluted water body)	01

#### **REFERENCE BOOKS FOR THEORY:**

1. Ernst Hodgson(2004) A Text Book of Modern Toxicology ,A John Wiley and sons Inc,Publication.
2. Gupta P.K.(2010) Modern Toxicology, Pharma Med Press, Hyderabad.
3. Omkar(2007) Concepts of Toxicology ,Vishal Publishing Co, Jalandhar
4. Pandey K,Shukla J.P. and Trivedi S.P. (2011)Fundamentals of Toxicology,New Central Book Agency(P) Ltd.
5. P.D.Sharma (2011)Environmental Biology and Toxicology (Third edition),Rastogi Publications,Meerut-250002.

#### **REFERENCE BOOKS FOR PRACTICALS:**

1. Wooley, A (2008) A Guide to Practical Toxicology: Evaluation, Prediction, and Risk II nd Edition, Informa Healthcare U.S.A.,Inc.New York.
2. Rao K.S. (1998) Practical Ecology, Anmol Publications Pvt. Ltd. New Delhi.
3. Subramanian M.A. (2004) Toxicology Principles and Methods(Second RevisedEdition),M.J.P. Publishers, Triplicane Chennai.
4. Sunita Hooda and SumanjeetKaur(1999)Laboratory Manual for Environmental Chemistry, S. Chand and Comp. Ltd. New Delhi.

**SKILL ENHANCEMENT COURSE:  
WASTE MANAGEMENT TECHNIQUES**

<b>COURSE CODE</b>	Elective: ZOO-III.E- 4 / Skill Enhancement Course(SEC): ZOO-III-SE-1
<b>MARKS</b>	100 [25 -Theory; 75- Practice Based]
<b>CREDITS</b>	04
<b>CONTACT HOURS</b>	Theory: 15 HOURS [01 Lectures Per Week] Practice based: 45 HOURS.
<b>COURSE OBJECTIVES</b>	<ul style="list-style-type: none"><li>• To familiarize students with the techniques of waste management.</li><li>• To encourage students to get hands on experience on techniques of managing waste.</li><li>• To help students understand the importance of reducing, reusing and recycling</li></ul>
<b>COURSE OUTCOME</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• CO1: Understand concept of types of waste, its transport and disposal.</li><li>• CO2: Perform composting techniques / procedures.</li><li>• CO3: Identify means of reducing waste production.</li><li>• CO4: Plan and conduct research in areas of waste management</li></ul>

**ZOO-III.E- 4: WASTE MANAGEMENT TECHNIQUES (as zoology elective)**  
**ZOO-III-SE-1: WASTE MANAGEMENT TECHNIQUES(as Skill Enhancement Course)**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
MODULE 1: Introduction to waste management	UNIT 1: Overview of types of waste, collection, transport, treatment and disposal of waste. UNIT 2: Waste generated- sources, and management, Storage and collection of different kinds of wastes. UNIT 3: Need for Waste management and effect on the community. UNIT 4: Waste treatment methods:Physicochemical Treatment of Solid and Hazardous Waste, Chemical treatment processes, Biological Treatment of Solid and Hazardous Waste, 3 Rs- Reuse Reduce and Recycle.	05
MODULE 2:Composting Techniques	UNIT 5: Soil structure and its maintenance. UNIT 6: Organic composting- Methods, Procedure - Microorganisms, materials used, design and maintenance, Biogas. UNIT 7: Vermicomposting- Earthworms – biology- life cycle and feeding. Types – morphological and ecological grouping – Epigeic, Anecic and Endogeic species, Nutrient value of worm cast/vermicompost, requirements of vermicomposting.Maintenance of composting – Collection of vermicompost Small Scale Earthworm farming for home gardens. Marketing the products of vermiculture. Predator/pathogen control.	05
MODULE 3:Waste management techniques	UNIT 8: Sewage disposal; Medical waste management. Sources, measures and health effects; disposal options UNIT 9:Bioremediation, ground water contamination and remediation Landfill designing and Incineration. UNIT 10: Radioactive and E- waste management-Sources, measures and health effects. UNIT 11:Relevant Regulations -Municipal solid waste (management and handling) rules(SWM 2000 and amendments of 2016; SO.1357(E) Sec. 3(II). - Hazardous waste (management and handling) rules 2015(Chapter II and IV; schedule I,II,III & IV. -Biomedical waste handling rules, 2016 (GSPCB-Schedule I & II) -Plastics waste management rukes 2016 (Part-II, Sec.-3, sub-sec.(i)]	05
MODULE 4: PRACTICE BASED	Practice of the following: The students of this course are expected to work on these different waste management practice activities: 1) Leaf composting on campus 2) Vermicomposting 3) Awareness on waste segregation. 4) Waste collection Drives. 5) Research on waste management. 6) Case studies/ mini projects. The report of the same will be submitted as portfolio.	45

**REFERENCE BOOKS:**

1. Edwards CA, Hendrix P and Arancon N (2014) *Biology and Ecology of Earthworms*, Springer Publishers.
2. Karaca A (2011) *Soil Biology: Biology of Earthworms*. Springer Publishers.
3. Edwards CA, Arancon NQ and Sherman RL (2011) *Vermiculture Technology: Earthworms, Organic Wastes, and Environmental Management*, CRC Press, USA.
4. Ranganathan LS (2006) *Vermibiotechnology– From Soil Health to Human Health*. Agrobios, India.
5. Ismail SA (2005) *The Earthworm Book*. Edition, Other India Press, Apusa, Goa, India.
6. Ismail SA (1997) *Vermicology: The Biology of Earthworms*. Orient Longman, India.
7. A. D.Bhide and B.B.Sundaresan, “Solid Waste Management –Collection, Processing and disposal” Mudrashilpa Offset Printers, Nagpur, 2001.
8. *Biomedical waste (Management and Handling) Rules*, 1998.

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**SEMESTER IV:**

<b>CORE COURSE: BIOCHEMISTRY AND METABOLIC REGULATION</b>	
COURSE CODE:	ZOO-IV.C-6
MARKS:	100 [ 75 -Theory ; 25- Practicals]
CREDITS:	04 [ 03 -Theory; 01- Practical]
CONTACT HOURS:	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
COURSE OBJECTIVES:	<ul style="list-style-type: none"><li>• To understand the basic principles that govern the functioning of living systems</li><li>• To know the structure of biomolecules and the role they play in governing life processes through the pathways</li><li>• To be familiar with enzymes and their activities</li></ul>
COURSE OUTCOME:	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• CO1: Understand better the chemical basis in life.</li><li>• CO2: Know the basic principles that govern the functioning of living systems</li><li>• CO3: Be familiar with enzymes and their activities</li><li>• CO4: Appreciate better the interactions between the biological molecules.</li></ul>

**ZOO-IV.C-6: BIOCHEMISTRY AND METABOLIC REGULATION**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
<b>MODULE 1:</b> Fundamentals of biochemistry and Carbohydrate metabolism	1.1 Principles of pH, buffer, thermodynamics 1.2 Enzymes: classification, properties of enzyme, enzyme kinetics, Michaelis-Menten Equation, enzyme inhibition 1.3 Carbohydrate structure, aerobic and anaerobic glycolysis, Citric acid cycle, glycogenesis, glycogenolysis, Pentose phosphate pathway, 1.4 Diabetes mellitus	15
<b>MODULE 2:</b> Lipid and Protein metabolism	2.1: Lipid: -structure and classification, -fatty acid synthesis -fatty acid oxidation (saturated and unsaturated), - metabolism of glycerophospholipids, sphingolipids, cholesterol - disorders: fatty liver types (NAFL, AFL)  2.2 Protein: - structure (primary, secondary, tertiary) and classification - amino acid biosynthesis, nucleotide biosynthesis, - amino acid catabolism, urea cycle, Fate of carbamoyl P, - Hyperuricemia	15
<b>MODULE 3:</b> Nucleotide metabolism and integration of metabolism	3.1 Biosynthesis of purine and pyrimidine (de novo and salvage pathway) 3.2 Degradation of purine and pyrimidine 3.3 Interconversions between the three principal components 3.4 Metabolism in starvation: Carbohydrate, lipid, proteins (The feed/fast cycle)	15

<b>PRACTICAL COMPONENT OF ZOO-IV.C-6: BIOCHEMISTRY AND METABOLIC REGULATION ( DURATION -02 HRS /WEEK</b>		
Sr. No	Practical	No. of Practicals
1)	Principle and working of spectrophotometer	01
2)	Estimation of reducing sugars DNSA method	01
3)	Estimation of protein – Folin Lowry’s method	01
4)	Estimation of fatty acids by titration method	01
5)	Separation of lipids by thin layer chromatography	02
6)	Colorimetric estimation of liver glycogen of chick by Anthrone method	02
7)	Effect of substrate concentration on amylase activity	02
8)	Estimation of DNA by DPA method	02

#### **REFERENCE BOOKS:**

1. David, L.N. and Cox, M. Michael (2008) Lehninger principles of biochemistry. W.H. Freeman and Company, New York.
2. Delvin, T.M. (1997). Textbook of biochemistry with clinical correlations. Wiley liss.
3. Harvey, A.R. and Ferrier, D. (2011). Lippincott’s Illustrated Reviews Biochemistry. Wolters Kluwer, Lippincott Williams and Wilkins. 5<sup>th</sup> Edition.
4. Pratt, W.C. and K. Cornely 2003 Essential Biochemistry Wiley Publications third edition.

#### **REFERENCE BOOKS FOR PRACTICALS:**

Plummer, M. and D.T. Plummer (1988) Introduction to practical biochemistry. Tata McGraw Hill Education ,UK.

**ELECTIVE COURSE:**  
**ANIMAL CELL CULTURE AND APPLICATIONS**

<b>COURSE CODE:</b>	ZOO-IV-E-5
<b>MARKS:</b>	100 [ 75 –Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 –Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	<ul style="list-style-type: none"><li>• This course is an introduction to the theory, standard practices, and methodologies of animal cell culture.</li><li>• The laboratory emphasizes the principles and practices of initiation, cultivation, maintenance of cell lines.</li></ul>
<b>COURSE OUTCOME:</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• CO1: Operate, calibrate, and maintain standard equipment found in an animal cell culture laboratory;</li><li>• CO2: Prepare and sterilize media and solutions used in cell culture.</li><li>• CO3: Understand concepts and applications of mammalian cell culture.</li><li>• CO4: Perform primary cell culture of suspension and adherent cells.</li></ul>



**ZOO-IV-E-5: ANIMAL CELL CULTURE AND APPLICATIONS**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
MODULE 1: LAB REQUIREMENTS FOR CELL CULTURE	1: Historical background of Cell culture:	15
	2: Biology of cells in culture: Origin and characteristics, Differentiation, kinetics of cell growth, Genetics of Cultured cells, Problems associated with cell culture	
	3: Lab requirements for animal cell culture: <ul style="list-style-type: none"> <li>○ Lab facilities and setup for cell culture</li> <li>○ Major and minor equipments</li> <li>○ Environmental conditions</li> <li>○ Substrates for Culturing and sub culturing</li> </ul>	
	4: Animal tissue culture media <ul style="list-style-type: none"> <li>○ Natural media – biological fluids, tissue extracts</li> <li>○ Chemically defined media- characteristic and composition</li> <li>○ Media supplements – L Glutamine, serum. Advantages and disadvantages of serum in media / serum free media</li> </ul>	
MODULE 2: CELL CULTURE TECHNIQUES	5: Primary cell culture: <ul style="list-style-type: none"> <li>○ Mechanical disaggregation</li> <li>○ Enzymatic disaggregation</li> <li>○ Protocol for primary cell culture</li> </ul>	15
	6: Secondary cell culture/ Sub culturing: <ul style="list-style-type: none"> <li>○ Protocol for sub culturing of suspension culture</li> <li>○ Protocol for sub culturing of adherent</li> <li>○ Established cell lines</li> </ul>	
	7: Scale up of animal cell culture: <ul style="list-style-type: none"> <li>○ Techniques of Scale up of suspension cultures</li> <li>○ Techniques of Scale up of Monolayer cultures</li> </ul>	
MODULE 3: CELL CULTURE APPLICATIONS	8: Cell Hybridoma Technology : <ul style="list-style-type: none"> <li>○ Steps of cell Hybridoma technology</li> <li>○ Procedure</li> <li>○ Production of monoclonal antibodies</li> <li>○ Applications of monoclonal antibodies</li> </ul>	15
	9: Valuable Products through cultured cells: Production of Tissue plasminogen, growth factor, Erythropoietin, Factor VIII, Interferons.	
	10: Other Application: Vaccines through cultured cells, Cytotoxicity testing, Fluorescent In-Situ Hybridization for disease detection, Cell culture in biomedical research.	

<b>PRACTICAL COMPONENT OF ZOO-IV-E-5: DURATION -02 HRS /WEEK ANIMAL CELL CULTURE AND APPLICATIONS</b>		
<b>Sr. No</b>	<b>Practical</b>	<b>No. of Practicals</b>
1.	Packing and sterilization of glass and plastic wares for cell culture & Lab Precautions and Biosafety measures	02
2.	Preparation of reagents and media for cell culture. <ul style="list-style-type: none"> <li>▪ Reagents</li> <li>▪ Media / Buffers</li> </ul>	02
3.	Setting up of primary cell culture <ul style="list-style-type: none"> <li>- Methods used for cell disaggregation – Mechanical and Enzymatic</li> <li>- Quantification of cells (Viable cell count) by Tryphan blue exclusion dye.</li> <li>- Suspension culture</li> <li>- Adherent cell culture</li> <li>- Chicken embryo fibroblast culture</li> </ul>	07
4.	Biological waste disposal methods	01

#### **REFERENCE BOOKS:**

- 1) RangaMM(2012). *Animal Biotechnology*. Agrobios India Ltd. Jodhpur.
- 2) Mathur S(2006 ). *Animal Cell and Tissue Culture*. Agrobios India Ltd. Jodhpur.
- 3) Masters W(2005). *Animal Cell Culture*. Oxford University Press Inc., NewYork
- 4) GangalS(2010). *Principles and practices of Animal Tissue Culture*. Second Edition. University Press PVT. LTD., Hyderabad India.
- 5) Freshney I R( 2007). *Culture of animal Cells: A manual of Basic Techniques*. 5<sup>th</sup> edition, John Wiley & Sons Inc Pte Ltd

#### **REFERENCE BOOKS FOR PRACTICALS:**

- 1) E Book- Fletcher L, Goss E. Phelps P and Wheeler A(2014). *Introduction to Biotechnology – Laboratory Manual*.
- 2) Harisson M A and Rae IF(1997):*General Techniques of Cell Culture Handbook in Practical animal cell biology*. Cambridge University Press.
- 3) Ebook- *Cell Culture basics*. From [www.invitrogen.com/cellculture\\_basics](http://www.invitrogen.com/cellculture_basics).

**ELECTIVE COURSE : AQUACULTURE AND FISHERIES**

<b>COURSE CODE:</b>	ZOO-IV.E-6
<b>MARKS:</b>	100[75- Theory; 25- Practicals]
<b>CREDITS:</b>	04 [03-Theory;01- Practical)
<b>CONTACT HOURS</b>	Theory :45 Hours(03 LEC/WEEK) Practicals: 30 Hours(01 PRACTICAL/WEEK)
<b>COURSE OBJECTIVES:</b>	<ul style="list-style-type: none"><li>• To improve the understanding of conservation and sustainability of living resources</li><li>• To improve the social and economic benefits derived from aquaculture and fisheries.</li><li>• To study the role of aquaculture in rural development in solving nutritional security and unemployment.</li><li>• Empowerment of fishery and entrepreneurship development</li></ul>
<b>COURSE OUTCOMES:</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• CO1: Understand conservation and sustainability of aquaculture resources.</li><li>• CO2: Acquainted with various techniques of aquaculture.</li><li>• CO3: Know strategies of improving the social and economic benefits derived from aquaculture and fisheries.</li><li>• CO4: Initiate business enterprise in area of aquaculture.</li></ul>

<b>ZOO-IV.E-6: AQUACULTURE AND FISHERIES</b>		
<b>MODULE</b>	<b>TOPIC</b>	<b>CONTACT HOURS</b>
<b>MODULE 1:</b>	<p><b>1.1: Inland Fisheries:</b></p> <ul style="list-style-type: none"> <li>• Riverine ;Reservoir fisheries; Lakesterine fisheries; Cold water fisheries</li> </ul> <p><b>1.2: Marine Fisheries:</b></p> <ul style="list-style-type: none"> <li>• Estuarine fisheries:The catadromous fishes (<i>Polynemous indicus</i>, <i>P.tetradactylus</i>) and anadromous fishes(<i>Hilsa ilisha</i>, <i>Pamapama</i>, <i>Polynemous paradiseus</i>)</li> <li>• Coastal fisheries or Inshore fisheries: Elasmobranch fishery and Teleost fishery</li> <li>• Offshore and Deep sea fisheries: Pomfrets(<i>Pampus</i>, <i>Stromateus</i>) <i>Eleutheronematetradactylus</i>(rava).</li> </ul> <p><b>1.3: Crustacean And Molluscan Fisheries:</b></p> <ul style="list-style-type: none"> <li>• Prawn fisheries in Goa: Penaeid and Palaemonid groups.</li> <li>• Crab fisheries in Goa</li> <li>• Edible oyster fisheries in Goa</li> <li>• Mussel fisheries in Goa</li> </ul>	15
<b>MODULE 2:</b>	<p><b>2.1: Integrated Fish Farming Systems:</b></p> <ul style="list-style-type: none"> <li>• Principle of integrated Fish farming; Integration with animal husbandry and farming systems.</li> </ul> <p><b>2.2: Induced Breeding:</b></p> <ul style="list-style-type: none"> <li>• Selection of site; Design and Layout of fish farm; Freshwater and brackish water; pond construction; Pond maintenance; Prevention of fish diseases; Control of aquatic weeds, predatory and Weed fishes, Aquatic insect; Harvesting.</li> </ul> <p><b>.4 :Fishing Methods:</b></p> <ul style="list-style-type: none"> <li>• Marine Fishing Crafts and Gears used in Goa.</li> <li>• Inland Fishing Crafts and Gears used in Goa</li> </ul>	15
<b>MODULE 3:</b>	<p><b>3.1: Fish Culture System:</b></p> <ul style="list-style-type: none"> <li>• Overview of Mono culture, polyculture, composite culture, raceway culture, extensive, semi intensive, intensive, zero water exchange, Objective of fish culture, Pond preparation, Selection of species, Stocking of seed, Feed and feeding, Harvesting, Bionomics of fish culture</li> </ul> <p><b>3.2: Cage And Pen Culture:</b></p> <ul style="list-style-type: none"> <li>• Advantage of Fish culture in cages, Selection of species for cage culture, Installation of cage - shape ,size and types of cages, Pen culture, Maintenance of cage and pen</li> </ul>	15

**PRACTICAL COMPONENT OF ZOO-IV.E-6: AQUACULTURE AND FISHERIES  
(DURATION – 02 HRS/ WEEK)**

<b>Sr. No.</b>	<b>Practical</b>	<b>No. of Practicals</b>
1.	Morphometric and Meristic study : a key for fish Identification	04
2.	Identification of : -Important edible prawns, shrimps and crabs( anytwo) - Important Freshwaterand Marine edible fishes- oil sardine, sole fish, white sardine,mullet,Scianera	03
5.	Estimation of Fecundity by Frequency Polygon method from a Marine Fish	01
6.	Food and Feeding of Fish by analysis of gut content	01
7.	Field based: <ul style="list-style-type: none"> <li>• To study different types of gear and craft</li> <li>• To study fish breeding</li> <li>• Study of aquarium and larvivorousfishes</li> </ul>	03

**REFERENCE BOOKS FOR THEORY:**

1. Bal D.V.Rao Virbhadrak (1984) Marine Fisheries, Tata McGraw- Hill Publishing Company Ltd. New Delhi.
2. Cushing D.H. (1975) Marine Ecology and Fisheries, Cambridge University Press.
3. Day,F. (1889) The Fauna of British India including Ceylon and Burma. Fishes.2Vols.,Taylor and Francis London.
4. Khanna S.S.(1984) An Introduction to Fishes, Central Book Depot Allahabad.
5. Pandey K and Shukla J.P.(2015) Fish and Fisheries. Rastogi Publications Meerut-250002
6. Sakhare B. Viswas (2007) Applied Fisheries.Daya Publishing House Delhi- 110035
7. Santhanam R (1990) Fisheries Science,Daya Publishing House Delhi.
8. Santhanam R, Ramanathan N and Jagatheesan G(1990) Coastal Aquaculture in India, CBS Publishers and distributors,Delhi.
9. Shrivastava C.B.L.(1996) A Text Book of Fishery Science and Indian Fisheries. KitabMahal22 A,S.N.Marg,Allahabad.
10. Singh B.K.(2008) Applied Fisheries and Aquaculture.Swastik Publishers anddistributers,Delhi.

**REFERENCE BOOKS FOR PRACTICALS:**

1. Chandy.M (1970) Fishes,National Book Trust,India,New Delhi.
2. Day.F. (1889) The Fauna of British India including Ceylon and Burma. Fishes. 2Vols.,Taylor and Francis London.
3. R.J.Ranjit Daniels (2002) Freshwater Fishes of Peninsular India, Universities Press (India )Pvt.Ltd. Hyderabad.
4. SakhareViswasB. (2007) Applied Fisheries ,Daya Publishing House Delhi.
5. Sharma U and S.P.Grover (1982) An Introduction to Indian Fisheries,Dehradun India.
6. SrivasavaC.B.L.(1986) A Text Book of Fishery Science and Indian Fisheries ,KitabMahal Allahabad.

**ELECTIVE COURSE: IMMUNOLOGY**

<b>COURSE CODE:</b>	ZOO-IV.E-7
<b>MARKS:</b>	100 [ 75 -Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 -Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	<ul style="list-style-type: none"><li>• Familiarize students and make them learn about the structural features of the components of the immune system as well as their functions, and understand the mechanisms involved in immune system development and responsiveness.</li></ul>
<b>COURSE OUTCOME:</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• CO1: Understand the components of the immune system and their function.</li><li>• CO2: Explain the mechanisms of immune response.</li><li>• CO3: Know about the techniques used in detecting immunological diagnosis.</li><li>• CO4: Perform immunoassays for disease detection.</li></ul>

**ZOO-IV-E-7: IMMUNOLOGY**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
MODULE 1: Introduction To Immunology	1: OVERVIEW OF IMMUNE SYSTEM: <ul style="list-style-type: none"> <li>• Basic concepts in immunology</li> <li>• Components of the immune system</li> </ul>	15
	2: INNATE AND ADAPTIVE IMMUNITY. <ul style="list-style-type: none"> <li>• Innate immunity-Anatomical barriers/ layers of defense, cells and molecules involved in innate immunity</li> <li>• Adaptive immunity-cell mediated and humoral immunity, passive immunity (artificial and natural), Active(artificial and natural), Immune dysfunction</li> </ul>	
MODULE 2: Antigens And Immunoglobulins	3: ANTIGENS. <ul style="list-style-type: none"> <li>• Antigenicity and immunogenicity, Immunogens, adjuvants and haptens</li> <li>• Factors influencing immunogenicity</li> <li>• B and T cell epitopes</li> </ul>	15
	4: IMMUNOGLOBULINS <ul style="list-style-type: none"> <li>• Structure and function of different classes of Immunoglobulin.</li> <li>• Antigen-Antibody interactions</li> <li>• Immunoassays, monoclonal &amp; polyclonal antibodies</li> </ul>	
	5: MAJOR HISTOCOMPATIBILITY COMPLEX. <ul style="list-style-type: none"> <li>• Structure and function of endogenous and exogenous pathways of antigen presentation</li> </ul>	
MODULE 3: Immune Response	6: CYTOKINES AND COMPLEMENT SYSTEM <ul style="list-style-type: none"> <li>• Properties and functions of cytokines, cytokine based therapies</li> <li>• Components and pathways of complement activation</li> </ul>	15
	7: HYPERSENSITIVITIES, AUTOIMMUNITY AND TRANSPLANTATION <ul style="list-style-type: none"> <li>• Gell and coombs' classification, types of hypersensitivities(overview)</li> <li>• Autoimmune responses against self antigens (SLEs), responses to alloantigens and transplant rejection (graft rejection, types and mechanisms of transplant rejection)</li> </ul>	
	8: VACCINES <ul style="list-style-type: none"> <li>• Types of vaccines -inactivated, attenuated, toxoid, subunit, conjugate, experimental (DNA and recombinant vaccine), monovalent/polyvalent vaccines</li> </ul>	

<b>PRACTICAL COMPONENT OF ZOO-IV-E-7: IMMUNOLOGY ( DURATION -02 hrs/WEEK)</b>		
<b>Sr. No</b>	<b>Practical</b>	<b>No. of Practicals</b>
1	Preparation of serum from goat blood.	02
2	Slide Agglutination Reaction(blood groups – A / AB / O with Rh)	02
3	Differential count of leukocytes	01
4	Detection of presence of antigen / antibody - Simple immunodiffusion	01
5	Antibody Titre determination - Ouchterlony immunodiffusion	02
5	Antigen –antibody reaction by immunoelectrophoresis	02
6	Elisa TEST- pregnancy test	01
7	Phagocytosis – WBC (demonstration)	01

#### **REFERENCE BOOKS:**

##### *Essential books:*

- 1) Abbas KA, LechtmanHA(2007). *Basic Immunology, Updated Edition 2006-2007: with STUDENT CONSULT. Access (Paperback).*
- 2) David M, Jonathan B, David RB and Ivan R(2006). *Immunology. VII Edition, Mosby, Elsevier Publication.*
- 3) Abbas KA, LechtmanHA(2003). *Cellular and Molecular Immunology. Saunders Publication.*
- 4) Kindt TJ, Goldsby RA, Osborne BA and KubyJ(2006). *Immunology. VI edition. W H Freeman and company.*

##### *Ebooks:*

- 5) Frank SA(2002). *Immunology and evolution of infectious diseases. Princeton University Press, Princeton and Oxford.*
- 6) Zabriskie JB(2009). *Essential Clinical Immunology. Cambridge University Press.*

#### **REFERENCE BOOKS FOR PRACTICALS:**

- 1) Talwar GP and Gupta SK(2012). *A handbook of practical and Clinical Immunology, CBS publishers.*



**ELECTIVE COURSE: PARASITOLOGY**

<b>PAPER CODE:</b>	ZOO-IV.E-8
<b>MARKS:</b>	100 [ 75 –Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 –Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	<ul style="list-style-type: none"><li>• To be familiar with the parasite host interactions.</li><li>• To gain knowledge on diagnosis of parasite infections and also to learn about the preventive measures.</li></ul>
<b>COURSE OUTCOME:</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• CO1: Know about the parasites and their lifecycles.</li><li>• CO2: Get acquainted with dimensions of public health viz . a viz. parasitic diversity, epidemiology and community prophylaxis.</li><li>• CO3: Be familiar with the parasite host interactions.</li><li>• CO4: Gain knowledge on diagnosis of parasite infections and preventive measures.</li></ul>

<b>ZOO-IV.E-8: PARASITOLOGY</b>		
<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
<b>MODULE 1:</b> Basic Principles of Parasitology and parasitic protozoans	1.1 Parasite systematics, Ecology and Evolution 1.2 Immunology and Pathology 1.3 Symbiosis and parasitism 1.4 Parasite host interactions Form, function, classification, life cycle, diagnosis and preventive measures 1.5 <i>Trypanosomagambiens</i> 1.6 Amoebas – <i>Entamoebahistolytica</i> 1.7 Malaria organisms - <i>Plasmodium vivax</i> 1.8 Sexually transmitted parasite – <i>Trichomonasvaginalis</i>	15
<b>MODULE 2:</b> Parasitic Platyhelminthes and Nematodes	Form, function, classification, life cycle, diagnosis and preventive measures 2.1 Trematoda(liver fluke - <i>Fasciola hepatica</i> , intestinal fluke – <i>Fasciolopsisbuski</i> , lung fluke – <i>Paragonimuswestermani</i> ); 2.2 Cestoda (Tape worm - <i>Taeniasolium</i> ) 2.3 Hook worms- <i>Ancylostoma duodena</i> 2.4Guinea worm- <i>Dracanculusmedinensis</i> 2.5Round worm <i>Ascarislumbricoids</i> , <i>Enterobiasvermicularis</i> 2.6 <i>Wuchereriabancrofti</i>	15
<b>MODULE 3:</b> Parasitic arthropods and Parasites of domestic livestock	Form, function, classification , life cycle, diagnosis and preventive measures: Copepods, Barnacles, Amphipods, Isopods, Flea, Ticks, Mites, Head and pubic lice	15

<b>PRACTICAL COMPONENT OF ZOO-IV.E-8: PARASITOLOGY ( DURATION -02 HRS /WEEK)</b>		
<b>Sr. No</b>	<b>Practical</b>	<b>No. of Practicals</b>
1)	Study of <i>Trypanosomagambiens</i> , <i>Entamoebahistolytica</i> , <i>Plasmodiumvivax</i> , <i>Trichomonasvaginalis</i> , <i>Fasciolahepatica</i> , <i>Taeniasolium</i> , <i>Ancylostoma duodena</i> , <i>Dracanculusmedinensis</i> , <i>Ascarislumbricoids</i> , <i>Wuchereriabancrofti</i> , copepod, barnacle, amphipod, isopod from permanent slides with respect to parasitic adaptations.	06
2)	Preparation of peripheral blood smear from the perspective of detection of haemoparasites	01
3)	Study of parasites of domestic livestock(parasite, pathogenicity)	04
4)	Study of fish parasites	01

## **REFERENCE BOOKS:**

1. Chatterjee, K.D. (2009) Parasitology (Protozoology and Helminthology) with two hundred fourteen illustrations. CBS, 13<sup>th</sup> edition.
2. Dey, N.C., Dey, T.K. and D.M. Sinha (1995) Medical Parasitology. New Central book agency private limited, Calcutta.
3. Paniker, J.C.K. (2007) Textbook of medical parasitology. Jaypee Brothers, New Delhi.
4. Schmidt, G.D. (1990) Essentials of Parasitology. Universal Book Stall, New Delhi.

## **REFERENCE BOOK FOR PRACTICALS :**

1. Halton, D.W., Behnke, J.M. and I. Marshall (2005) Practical exercises in parasitology. Cambridge University Press.

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**PARVATIBAI CHOWGULE COLLEGE OF ARTS AND SCIENCE**  
**(Autonomous)**  
**PROGRAMME BSC ZOOLOGY**  
**COURSE CURRICULUM(Revised w.e.f: June 2020)**

<b>COURSE STRUCTURE: PROGRAMME BSC ZOOLOGY</b>						
<b>SEMESTER</b>	<b>CORE</b>		<b>ELECTIVE</b>			
I	<b>ZOO-I.C-1</b> Animal Diversity : Non Chordates	<b>ZOO-I.C-2</b> Cell and Molecular Biology	-----	-----	-----	-----
II	<b>ZOO-II.C-3</b> Diversity and Biological Systems of Chordates	<b>ZOO-II.C-4</b> Fundamentals of Animal and Human Genetics	-----	-----	-----	-----
III	<b>ZOO-III.C-5</b> Human Physiology		<b>ZOO-III.E-1</b> Vertebrate Endocrinology	<b>ZOO-III.E-2</b> Basic microbiology and Fundamentals of Animal Biotechnology	<b>ZOO-III.E-3</b> Environmental Toxicology	<b>ZOO-III.E-4</b> /**ZOO-III-SE-1 Waste Management techniques (Sem III & IV)
IV	<b>ZOO-IV.C-6</b> Biochemistry and Metabolic Regulation		<b>ZOO-IV.E-5</b> Animal cell culture and Applications	<b>ZOO-IV.E-6</b> Aquaculture and Fisheries	<b>ZOO-IV.E-7</b> Immunology	<b>ZOO-IV.E-8</b> Parasitology
V	<b>ZOO-V.C-7</b> Developmental Biology		<b>ZOO-V.E-9</b> Molecular Genetics and Forensic Science	<b>ZOO-V.E-10</b> Economic Zoology	<b>ZOO-VI.E-11</b> Basic and Applied Entomology	<b>ZOO-V.E-12</b> Fish Preservation and Processing
VI	<b>ZOO-VI.C-8</b> Wildlife Biology		<b>ZOO-VI.E-13</b> Health and Nutrition <b>*ZOO-VI-GE-1</b> Health and Nutrition	<b>ZOO-V.E-14</b> Ecology and Ethology	<b>ZOO-VI.E-15</b> Laboratory Techniques in Pathology	<b>ZOO-VI.E-16</b> / **ZOO-IV-SE-2 Bio Entrepreneurship

## SEMESTER V AND VI

SEMESTER	COURSE CODE	COURSES	CREDITS	CONTACT HOURS
<b>SEMESTER V</b>	ZOO-V.C-7	Developmental Biology	Theory = 03 Practicals =01	Theory = 45 Practicals =30
	ZOO-V.E-9	Molecular Genetics and Forensic Science	Theory = 03 Practicals =01	Theory = 45 Practicals =30
	ZOO-V.E- 10	Economic Zoology	Theory = 03 Practicals =01	Theory = 45 Practicals =30
	ZOO-V.E-11	Basic and Applied Entomology	Theory = 04	Theory = 60
	*ZOO-V.E-12	Fish Preservation and Processing	Theory = 04	Theory = 60
<b>SEMESTER VI</b>	ZOO-VI.C-8	Wildlife Biology	Theory = 04	Theory = 60
	ZOO-VI.E-13	Health and Nutrition	Theory = 03 Practicals =01	Theory = 45 Practicals =30
	ZOO-VI.E-14	Ecology and Ethology	Theory = 03 Practicals =01	Theory = 45 Practicals =30
	ZOO-V.E-15	Laboratory Techniques In Pathology	Theory = 03 Practicals =01	Theory = 45 Practicals =30
	ZOO-VI.E-16	Bio Entrepreneurship	Theory = 04	Theory = 60

**SEMESTER V:**

<b>CORE COURSE: DEVELOPMENTAL BIOLOGY</b>	
<b>COURSE CODE:</b>	ZOO-V.C-7
<b>MARKS:</b>	100 [ 75 -Theory ; 25- Practicals]
<b>CREDITS:</b>	04 [ 03 -Theory; 01- Practical]
<b>CONTACT HOURS:</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES:</b>	<ul style="list-style-type: none"><li>• To understand the processes of fertilization, polyspermy and activation of egg metabolism</li><li>• To know the basics of animal development, specifically in sea urchin and chick</li><li>• To be familiar with the processes that help in the establishment of basic plan of development</li></ul>
<b>COURSE OUTCOME:</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• CO1: Understand the basic plan of animal development.</li><li>• CO2: Know the processes which occur during the course of development in invertebrates and vertebrates.</li><li>• CO3: Have the basic knowledge of developmental biology.</li><li>• CO4: Know the concepts associated with development of embryo.</li></ul>

**ZOO-V.C-7: CORE COURSE:DEVELOPMENTAL BIOLOGY**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
<p><b>MODULE 1:</b> Early embryonic development and early development of model organism: sea urchin</p>	<p>1.1: Introduction to cell division: mitosis and meiosis                      1.2: Fertilization: structure of the gametes                      1.3: Species recognition specificity of egg and sperm                      1.4: Gamete fusion and the prevention of polyspermy                      1.5: The activation of egg metabolism                      1.6: Fusion of the genetic material                      1.7: Rearrangement of the egg cytoplasm                      1.8: Sea Urchin: cleavage, gastrulation, blastula formation                      1.9: Fate maps and the determination of sea urchin blastomeres, gastrulation                      1.10: Embryonic stem cells: Pluripotency and totipotency</p>	<p align="center">15</p>
<p><b>MODULE 2:</b> Early development of model organism: chick</p>	<p>2.1: Chick: cleavage, gastrulation, primitive streak, epiboly                      2.2: Development upto three days of incubation                      2.3: Extra embryonic membranes of chick development, structure and functions of yolk sac, amnion, chorion and allantois</p>	<p align="center">15</p>
<p><b>MODULE 3:</b> Growth and regeneration</p>	<p>3.1: Nuclear transplantations and embryonic inductions                      3.2: Size and proportion, aging, theories of ageing, postnatal disorders of growth and differentiation                      3.3: Distribution of regenerative capacity, Planarian regeneration, regeneration of limb and tail in vertebrates                      3.4: Hejmadi Mohanty's experiment</p>	<p align="center">15</p>

<b>PRACTICAL COMPONENT OF ZOO-V.C-7 ( DURATION -02 HRS /WEEK)</b>		
<b>SR. NO.</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1)	Observation of developmental stages of sea urchin: cleavage, blastula, gastrula (permanent slides)	01
2)	Study of morphogenetic movement <i>in vivo</i> in hens egg using vital staining technique by preparing window opening	02
3)	<i>In vitro</i> observation of different extra embryonic membrane in a six days old chick embryo	01
4)	Preparation of permanent slides of chick embryo: 24 hours, 36 hours, 48 hours, 72 hours	06
5)	Effect of retinoic acid on regeneration of fin in fish	01
6)	Mounting of eye vesicles and limb buds of six day old chick embryo	01

#### **REFERENCE BOOKS:**

1. Gilberts, S.F. (2013). *Developmental Biology*, Sinauer Associates, Sunderland.
2. Jain, P.C. (2013). *Elements of developmental biology*, Vishal Publications, Jalandhar
3. Slack, J.M.W. (2006). *Essential developmental biology*. Blackwell Publishing, U.K.

#### **REFERENCE BOOKS FOR PRACTICALS:**

1. Beffa – Mari, M. And J. Knight (2005) *Key experiments in practical developmental biology*. Cambridge University Press.
2. Tyler, M.S. (2000) *Developmental biology, a guide for experimental study*. Sinauer Associates, Inc. Publishers, Sunderland, MA.



**ELECTIVE COURSE: MOLECULAR GENETICS AND FORENSIC SCIENCE**

<b>COURSE CODE</b>	ZOO-V.E-9
<b>MARKS</b>	100 [75 – Theory; 25 – Practicals]
<b>CREDITS</b>	04 [03 – Theory; 01 – Practical]
<b>CONTACT HOURS</b>	THEORY : 45 HOURS (03 LECTURE/WEEK) PRACTICALS : 30 HOURS (01 PRACTICAL/WEEK)
<b>COURSE OBJECTIVES</b>	<ul style="list-style-type: none"><li>• This course will elucidate the functional aspects of the genetic material at molecular level, focusing on gene expression and gene regulation.</li><li>• It will also expose students to the basics of forensic science and understand diagnostic genetics.</li></ul>
<b>COURSE OUTCOME</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• CO1: Understand and explain the process of replication, transcription and translation</li><li>• CO2: Differentiate between the gene expression in prokaryotes and eukaryotes</li><li>• CO3: Understand the Branches of forensic science</li><li>• CO4: know the application of molecular tools in genetic diagnosis</li></ul>

**ZOO-V.E-9: MOLECULAR GENETICS AND FORENSIC SCIENCE**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
<b>MODULE 1 :</b> Gene Expression and Gene Regulation	1.1 : DNA Replication: DNA Replication in prokaryotes and eukaryotes, mechanism of DNA replication 1.2: Transcription: transcription Unit, mechanism of transcription in prokaryotes and eukaryotes, synthesis of rRNA and mRNA, transcription factors 1.3 : Translation: Genetic code, Process of protein synthesis, Difference between prokaryotic and eukaryotic translation, Post Transcriptional Modifications and Processing of Eukaryotic RNA 1.4: Transcription regulation in prokaryotes: Principles of transcriptional regulation with examples from lac-operon and trp-operon; Transcription regulation in eukaryotes: Activators, repressors, enhancers, silencers elements; Gene silencing	15
<b>MODULE 2 :</b> Basics of Forensic Science	2.1 : Definition, overview of Disciplines of Forensic science 2.2: Crime and Crime Scene management: Types of crime scenes – indoor and outdoor. Securing and isolating the crime scene. Crime scene search methods. Safety measures at crime scenes. Legal considerations at crime scenes. Documentation of crime scenes – photography, videography, sketching and recording notes. 2.3: Forms of forensic evidences: -Biological evidence: Bloodstains, hair, semen, DNA -Physical and trace evidence –pattern of blood stains, fingerprints, fibres, weapons - Documents- types of forensic documents (genuine /forged), methods of detecting forged documents(handwriting analysis, Analysis of paper and inks)	15
<b>MODULE 3 :</b> Diagnostic Genetics	3.1 : Cytogenetics/ Molecular Cytogenetics/ Biochemical/ Molecular methods of detecting genetic disorders - Adult and Newborn screening 3.2: Cytogenetics/ Molecular Cytogenetics/ Molecular methods of detecting genetic disorders – Prenatal and Preimplantation screening 3.3: Forensic testing - DNA fingerprinting, paternity testing, personal /individual identification	15

<b>PRACTICAL COMPONENT OF ZOO-V.E-9: MOLECULAR GENETICS AND FORENSIC SCIENCE ( DURATION -02 HRS /WEEK)</b>		
<b>SR.NO.</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1	Isolation of DNA from peripheral blood/tissue (chick liver).	01
2	Microscopic examination of Hair a. Human scalp Hair b. Animal Hair	03
3	Sketching and Photography of various type of crime scene.	03
4	Presumptive Tests for Blood a. Phenolphthalin Assay	01
6	To perform ridge tracings and ridge counting	01
7	Analysis of DNA fingerprints	03

#### **REFERENCE BOOKS :**

- 1) *J. Prahlow (2010); Forensic Pathology for Police, Death Investigators, Attorneys, 17 and Forensic Scientists, DOI 10.1007/978-1-59745-404-9\_2, C Springer Science + Business Media, LLC (Ebook available)*
- 2) *Robert Schleif (1993). Genetics and Molecular Biology. S E C O N D E D I T I O N. Department of Biology, The Johns Hopkins University, Baltimore, Maryland. The Johns Hopkins University Press 2715 North Charles Street Baltimore, Maryland 21218-4319, The Johns Hopkins Press Ltd., London (Ebook available)*
- 3) *Richard Saferstein (2011); Forensic Science, II Edition, Prentice Hall publishers, San Francisco*
- 4) *Griffith A, Wessler S, Lewontin R Gelbart W, Suzuki D and Miller J(2000). Introduction to Genetic Analysis. Eighth Edition.( Ebook available)*
- 5) *Tom Strachan and Read A (2010): Human Molecular Genetics. Fourth Edition. Garland Science Publisher, New York, NY 10017*

#### **REFERENCES BOOKS FOR PRACTICALS:**

- 1) *J. Prahlow (2010); Forensic Pathology for Police, Death Investigators, Attorneys, 17 and Forensic Scientists, DOI 10.1007/978-1-59745-404-9\_2, C Springer Science+Business Media, LLC (Ebook available.)*

**ELECTIVE COURSE: ECONOMIC ZOOLOGY**

<b>COURSE CODE</b>	ZOO-V.E-10
<b>MARKS</b>	100 [75 – Theory; 25 – Practicals]
<b>CREDITS</b>	04 [03 – Theory; 01 – Practical]
<b>CONTACT HOURS</b>	THEORY : 45 HOURS (03 LECTURE/WEEK) PRACTICALS : 30 HOURS (01 PRACTICAL/WEEK)
<b>COURSE OBJECTIVES</b>	<ul style="list-style-type: none"><li>• To study the various aspects of economic zoology</li><li>• To study the species of economic importance, classification</li><li>• To gain an insight whether own business can be started based on studying the zoological species and their products</li></ul>
<b>COURSE OUTCOME</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• CO1: Understand how zoological species contribute to economic sources.</li><li>• CO2: Gain working knowledge of techniques of rearing organisms.</li><li>• CO3: Get acquainted with maintenance of the species</li><li>• CO4: Understand the underlying principles of harvesting products from species.</li></ul>

## ZOO-V.E- 10 : ECONOMIC ZOOLOGY

MODULE	TOPICS	CONTACT HOURS
<b>MODULE 1 :</b> Scope of Economic Zoology	1.1 : Economic Zoology, History, Scope, 1.2 : Species of bionomic importance (Honey bee, Silkworm, lac insect, mackerel, domestic fowl, goat, sheep, cow, buffalo, pig, rats, mice) 1.3 : Source, properties, constituents and nutritive value of products of bionomic importance: eggs of poultry, milk, meat, honey, medicinal value of synthetic insulin (recombinant), significance of wool, silk, lac 1.4 : Organizations and their functions: agricultural and processed food products export development authority (APEDA), the marine products exports developmental authority (MPEDA), central silk board (CSB), central bee research and training institute (CBRTI), pharmaceutical and biotechnology industries (Lupin) and contract research organizations (Intox), and research institutes (NIN, Hyderabad)	15
<b>MODULE 2 :</b> Models in Economic Zoology	2.1 : Insects, products and applications : lac insects, honey bees, silkworms 2.2 : Vermiculture: Rearing and maintenance of earthworms 2.3 : Aquaculture : rearing and maintenance of prawns,oysters, edible and ornamental fishes 2.4 : Poultry : rearing and maintenance of domestic fowl, applications and products 2.5 : Business models of apiculture, sericulture, aquaculture and poultry	15
<b>MODULE 3 :</b> Pharma products and biological control	3.1 : Pharmaceuticals from animals and their Applications (antiserum), from transgenic animals (malaria vaccine, alpha 1 antitrypsin, lactoferrin, fibrinogen) 3.2 : Species used in biological control : <i>Casnoidea indica</i> , <i>Trichogramma</i> , <i>Poecilia reticulata</i> / <i>Gambusia affinis</i> 3.3 : Maintenance and breeding of animals for research: mice, rats, guinea pigs, rabbits, marmosets, guidelines given by committee for the purpose of control and supervision of experiments on animals (CPCSEA)	15

<b>PRACTICAL COMPONENT OF ZOO-V.E-10 ECONOMIC ZOOLOGY ( DURATION - 02 HRS /WEEK)</b>		
<b>SR.N O.</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1	Vermicomposting	05
2	Preparation of dairy products from milk : cheese and butter	02
3	Laboratory observations of insects – Honeybee, Silk moth, Lac insect	01
4	Visit to dairy industry/poultry/ piggery/apiary/silk industry/ biotechnology industry/pharmaceutical industry/research institute	04

#### **REFERENCE BOOKS :**

- 1) G. S. Shukla, V. B. Upadhyay (2008) *Economic Zoology*, Rastogi Publications, Meerut
- 2) H. Osborn (1908) *Economic Zoology an introductory text book in zoology with special reference to its applications in agriculture, commerce and medicine* The Macmillan Company
- 3) K. P. Shrivastava, Gs Dhaliwal (2015) *Text Book of Applied Entomology* Kalyani Publishers
- 4) P. K. Gupta (2011) *Vermicomposting for Sustainable Agriculture*, Agrobios India Ltd
- 5) S. Singh (1962) *Bee-Keeping in India* ICAR New Delhi p. 214

#### **REFERENCE BOOKS FOR PRACTICALS:**

- 1) A. K. Tripathi(2009)*Mulberry Sericulture: Problems And Prospects* Aph Publishing Corporation
- 2) C.L. Metcalf and W.P Flint (1962) *Destructive and Useful Insects* New York, N.Y. :McGraw-Hill

**ELECTIVE COURSE: BASIC AND APPLIED ENTOMOLOGY**

<b>COURSE CODE</b>	ZOO-V.E-11
<b>MARKS</b>	100 (60 hrs)
<b>CREDITS</b>	04
<b>CONTACT HOURS</b>	Theory: 45 HOURS [03 Lectures Per Week) and activities of 15 HOURS.
<b>COURSE OBJECTIVE</b>	<ul style="list-style-type: none"><li>• To develop a strong foundation in entomology, including understanding of the importance of insects to the human society.</li><li>• To review important areas in insect biology such as morphology, physiology, ecology, behaviour, genetics, phylogeny, ontogeny and population biology.</li><li>• To develop a sufficient background for advanced entomology.</li></ul>
<b>COURSE OUTCOME</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• CO1: Be familiar with the identification of bio economical species.</li><li>• CO2: Identify entrepreneurial opportunities in entomology.</li><li>• CO3: Important insects and their products.</li><li>• CO4: Insect pests of public health and veterinary importance and their management.</li></ul>

**ZOO-V.E-11: BASIC AND APPLIED ENTOMOLOGY**

<b>MODULE</b>	<b>TOPIC</b>	<b>CONTACT HOURS</b>
<b>MODULE 1</b> Fundamentals of Entomology	Unit 1: Class Insecta: <ul style="list-style-type: none"> <li>• Salient features</li> <li>• Classification of insects up to orders – an overview</li> </ul> Unit 2: Morphological studies: <ul style="list-style-type: none"> <li>• of antenna, wings, legs, Mouth parts</li> </ul> Unit 3: Techniques: <ul style="list-style-type: none"> <li>• Collection of insects</li> <li>• Preservation of insects</li> </ul>	15
<b>MODULE 2</b> Bionomics and control of crop pests and medically important pests	Unit 4: Pest of agricultural importance: <ul style="list-style-type: none"> <li>• Paddy pests, cashew pests, coconut pests, areca nut pests, stored grain pest, sugarcane pests, vegetable pests, fruit pests (two pests from each of the above)</li> </ul> Unit 5: Insects of medicinal importance: <ul style="list-style-type: none"> <li>• mosquitoes, housefly, sand fly, cockroaches, human lice, bed bug, rat fleas</li> </ul> Unit 6: Termites: <ul style="list-style-type: none"> <li>• social organization, termitaria and termite control measures</li> </ul>	15
<b>MODULE 3</b> Useful insects and pest management	Unit 7: Useful insects: <ul style="list-style-type: none"> <li>• Honeybees (Apiculture); Mulberry silk worm (sericulture); lac insects (lac culture)</li> </ul> Unit 8: Insect pest control methods: <ul style="list-style-type: none"> <li>• biological, chemical (attractants, pheromones and hormones),</li> </ul> Integrated Pest Management (IPM) Unit 9: Role of insects in ecosystem services	15
<b>MODULE 4</b> Field based Study	<u>Field based study report:</u> <ul style="list-style-type: none"> <li>• Identification and study of agricultural pests / pest of fruits / vegetables.</li> <li>• Insect collection techniques: light traps, sweep net, Berlese funnel.</li> <li>• Study of insects of college campus dragon fly/ pests of different plants</li> <li>• Visit to ICAR old Goa/ Gov.t of Goa agriculture department/national Malaria research Institute</li> </ul>	15



**REFERENCE BOOKS:**

- 1) Aitwal, A.S (1993): Agricultural pests of India and South East Asia. Kalyani publication, New Delhi.
- 2) Awasthi, V.B (2007): Introduction to general and applied entomology, 2<sup>nd</sup> edition. Scientific publishers India Jodhpur.
- 3) David, B.V. and Ananthakrishnan, T.N (2006): General and applied entomology, 2<sup>nd</sup> edition Tata McGraw hill, New Delhi.
- 4) Reddy, D.S (2010) Applied entomology, 2<sup>nd</sup> edition New Vishal publications

**REFERENCE BOOKS FOR PRACTICALS:**

1. Fenemore, P.G. and Prakash, A. (1995): Applied Entomology, Wiley Eastern Limited new age international.
2. Varasi, M.S. (1992): Text book of entomology, Himalaya Publishing House, 1<sup>st</sup> edition.

<b>ELECTIVE COURSE:</b> <b>FISH PRESERVATION AND PROCESSING</b>	
<b>COURSE CODE</b>	ZOO-V.E-12
<b>MARKS</b>	100 (60 hrs)
<b>CREDITS</b>	04
<b>CONTACT HOURS</b>	Theory: 45 HOURS [03 Lectures Per Week] and activities of 15 HOURS.
<b>COURSE OBJECTIVES</b>	<ul style="list-style-type: none"> <li>• To familiarize the students with different methods of fish preservation and processing</li> <li>• To acquaint them with techniques and precautions for hygienic fish handling</li> <li>• The course content is locally relevant and prepares students for entrepreneurship and self employment</li> </ul>
<b>COURSE OUTCOME</b>	<p>Upon successful completion of the course, students will be able to:</p> <ul style="list-style-type: none"> <li>• CO1: gain understanding of the economic benefits of fishes.</li> <li>• CO2: They will also be able to understand the nutritional values of the fishes</li> <li>• CO3: Perform some protocols of Fish processing and preservation.</li> <li>• CO4: Acquaint oneself with the processes at fish processing industry</li> </ul>

## ZOO-V.E- 12 : FISH PRESERVATION AND PROCESSING

MODULE	TOPICS	CONTACT HOURS
<b>MODULE 1:</b> Fishery Development	1.1 : Status of Development of the fishery and seafood processing industry. 1.2: Empowerment through Aquatic Products: (Background, Nutritional security, Role of Fisheries Sector, Role of Tifac in Fisheries Sector, Objectives, Integrated Fisheries Project (IFP), Indian national centre for ocean information services (INCOIS), Catch per unit effort (CPUE), Maximum sustainable yield (MSY)	15
<b>MODULE 2:</b> Fish Handling and preservation	2.1: Recent Scenario: Quality Changes and Shelf life of Chilled Fish, The effect of Hygiene during handling 2.2: Fish Handling Methods: Organoleptic test, Assessment of Fish Quality, Quality assessment of Fresh Fish, Quality Assessment of Fish Products, Physical methods, Assurance of Fresh Fish Quality, Post harvest Changes in Fish, How does a Fish Lose its Quality, fish as vectors of zoonotic diseases 2.3: Fish Preservation: Reasons for Spoilage of Fishes, Methods of Fish.	15
<b>MODULE 3:</b> Value of Fish	3.1: Economic Importance of Fish: Food value, Fish By-Products, surimi, Goan fish para, balchao 3.2: Postmortem changes in Fish, Bacteriological Changes, Lipid Oxidation and Hydrolysis, Chemical Composition, Lipids, Proteins, N- containing Extractives, Vitamins and Minerals, 3.3: Aquatic Resources and their utilization, value added product: chitin	15
<b>MODULE 4</b> Field/activity based Study	Field Based study: Visit to Fish Processing Centre/ Fishing Co-operative Society / Fishery Institute/ Fishery survey of India, Vasco (FSI) to study the following: 1) Quality control of fishes 2) Fish parasites (ecto and endo) 3) Fish filleting, 4) Fish preservation (salting/ pickling)	15

**REFERENCE BOOKS :**

- 1) *Braj Kishore Singh (2008) Applied Fisheries and Aquaculture Swastik Publishers and Distributers  
Delhi,India*
- 2) *Pandey and Shukla (2015) Fish and Fisheries, IIIrd Revised Edition, Rastogi Publications Meerut, India*

**REFERENCE BOOKS FOR PRACTICALS:**

- 1) *Braj Kishore Singh (2008) Applied Fisheries and Aquaculture Swastik Publishers and Distributers  
Delhi,India*
- 2) *Pandey and Shukla (2015) Fish and Fisheries, IIIrd Revised Edition, Rastogi Publications Meerut, India*

**SEMESTER VI:**

<b>CORE COURSE: WILDLIFE BIOLOGY</b>	
<b>COURSE CODE</b>	<b>ZOO-VI-C-8</b>
<b>MARKS</b>	100 [75 -Theory; 25-Field based report]
<b>CREDITS</b>	04
<b>CONTACT HOURS</b>	Theory: 45 HOURS [03 Lectures Per Week] Fieldbased work: 15 HOURS.
<b>COURSE OBJECTIVES</b>	<ul style="list-style-type: none"><li>• This course is designed to enable students to understand the basics of wildlife status, conservation, assessment and management.</li></ul>
<b>COURSE OUTCOME</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• CO1: Apply the techniques used in assessment and monitoring of wildlife.</li><li>• CO2: Understand the basics of wildlife status, conservation, assessment and management.</li><li>• CO3: Know about the diversity, extent, range of wildlife population dynamics.</li><li>• CO4: Know the rules, regulations and factors governing wildlife.</li></ul>

## ZOO-VI-C-8: WILDLIFE BIOLOGY

MODULE	TOPICS	CONT ACT HOUR S
<b>MODULE 1:</b> Introduction To Wildlife	UNIT 1: Introduction to wildlife <ul style="list-style-type: none"> <li>• Values of wildlife - Conservation ethics, Importance of conservation, Causes of depletion, World conservation strategies.</li> </ul> UNIT 2: Evaluation and management of wildlife <ul style="list-style-type: none"> <li>• Habitat analyses, Physical parameters: Topography, Geology, Soil and water.</li> <li>• Biological Parameters: food, cover, forage, browse and ground cover estimation.</li> <li>• Standard evaluation procedures: remote sensing and GIS.</li> </ul>	15
<b>MODULE 2:</b> Population Estimation And Protected Areas	UNIT 3: Population estimation <ul style="list-style-type: none"> <li>• Population density, natality, mortality, fertility schedules and sex ratio computation.</li> <li>• Analysis of scat and dropping of ungulates and carnivores.</li> <li>• Trichotaxonomy, pug marks and census method based on indirect evidences.</li> </ul> UNIT 4: Protected areas <ul style="list-style-type: none"> <li>• Protected Area network (PAN): National parks and wildlife sanctuaries.</li> <li>• Biogeographical features of important features of protected areas in India (any 3).</li> <li>• Tiger conservation - tiger reserves in India, challenges and management of tiger reserves.</li> </ul>	15
<b>MODULE 3:</b> Managemen t Of Wildlife	UNIT 5: Management of habitats <ul style="list-style-type: none"> <li>• Setting back succession, grazing logging, mechanical treatment, advancing the succession process, artificial feeding grounds.</li> <li>• Cover construction, preservation of general genetic diversity, restoration of degraded habitats,</li> </ul> UNIT 6: Management planning of wildlife in protected areas <ul style="list-style-type: none"> <li>• Habitat carrying capacity, visitors carrying capacity, eco tourism / wild life tourism, concept of climax persistence, ecology of perturbation.</li> <li>• Role of national / state statutory bodies on governing wildlife (NBWL, IUCN, CITES, state wildlife boards and forest department).</li> </ul> UNIT 8: Management of critical population <ul style="list-style-type: none"> <li>• Radio- telemetry, care of injured and diseased animal, quarantine, common diseases of wild animals, capture and translocation of wildlife.</li> <li>• Captive management – a brief idea.</li> </ul>	15

<p><b>MODULE 4:</b></p> <p>Field based Practicals</p>	<p>Field based study report on:</p> <ul style="list-style-type: none"> <li>• Study of butterflies and their host plants on the campus / molluscs/ ants/ spiders / birds</li> <li>• Any two biodiversity monitoring by various field techniques for flora and fauna:</li> <li>• Trail / transect-quadrant monitoring for abundance and diversity estimation of mammals and birds (direct and indirect evidences) (on campus or fieldtrip)</li> <li>• Identification of animals through pug marks, hoofmarks, scats, pellet groups, nest, antlers, feathers, etc.</li> <li>• Local case study report of wild life conflict</li> </ul> <p>Use of compass, binoculars, spotting scope, range finders, Global Positioning System on field.</p>	<p>15</p>
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**REFERENCE BOOKS:**

1. Caughley, G., and Sinclair, A.R.E. (1994). Wildlife Ecology and Management. Blackwell Science.
2. Woodroffe R., Thirgood, S. and Rabinowitz, A. (2005). People and Wildlife, Conflict or Co-existence. Cambridge University.
3. Bookhout, T.A. (1996). Research and Management Techniques for Wildlife and Habitats, 5<sup>th</sup> edition. The Wildlife Society, Allen Press.
4. Sutherland, W.J. (2000). The Conservation Handbook: Research, Management and Policy. Blackwell Sciences
5. Hunter M.L., Gibbs, J.B. and Sterling, E.J. (2008). Problem-Solving in Conservation Biology and Wildlife Management: Exercises for Class, Field, and Laboratory. Blackwell Publishing.

**ELECTIVE COURSE: HEALTH AND NUTRITION**

<b>COURSE CODE</b>	<b>ZOO-VI-E-13</b>
<b>MARKS</b>	100 [75 -Theory ; 25- Practical]
<b>CREDITS</b>	04 [03 -Theory; 01- Practical]
<b>CONTACT HOURS</b>	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
<b>COURSE OBJECTIVES</b>	<ul style="list-style-type: none"><li>• This course is an introduction to the nutrients, their functions and role in maintaining good health of humans.</li></ul>
<b>COURSE OUTCOME</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• CO1: Know about nutrients and their function</li><li>• CO2: Read and interpret food labels.</li><li>• CO3: Correlate role of lifestyle and food habits in causing diseases.</li><li>• CO4: Prepare Diet Plans for different age group individuals.</li></ul>



**ZOO-VI-E-13: HEALTH AND NUTRITION**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
<p>MODULE 1: BASIC CONCEPT OF FOOD AND NUTRITION</p>	<p>UNIT 1: Overview of health and nutrition</p> <ul style="list-style-type: none"> <li>• Definition of health and nutrition</li> <li>• Scope of nutrition, food as a source of nutrients</li> <li>• Nutrients and energy</li> <li>• Adequate, optimum and balanced diet</li> <li>• Malnutrition and health.</li> </ul> <p>UNIT 2: Nutritional Biochemistry</p> <ul style="list-style-type: none"> <li>• Carbohydrates, lipids, proteins - definition, classification, structure and properties</li> <li>• Significance of acid value, iodine value and saponification value of lipids</li> <li>• Essential and non-essential amino acids</li> <li>• Enzymes- definition, classification, properties(overview).</li> <li>• Coenzymes, vitamins (fat soluble and water soluble), structure and properties</li> <li>• Minerals- iron, calcium, phosphorus, iodine, selenium and zinc and their properties</li> </ul>	<p align="center"><b>15</b></p>
<p>MODULE 2: NUTRIENTS AND DIETARY PATTERN FOR HUMANS</p>	<p>UNIT 3: Functions of food components of food-nutrients</p> <ul style="list-style-type: none"> <li>• Biochemical role and dietary sources of macro and micronutrients (carbohydrates, lipids and proteins, fat soluble vitamins-A, D, E and K , water soluble vitamins – thiamin, riboflavin, niacin, pyridoxine, folate, vitamin B12 and vitamin - C Minerals – calcium, iron and iodine).</li> <li>• Changes of nutrient value during cooking of the following food groups: cereals, pulses and vegetables. Nutrient loss - dry, moist, frying and microwave cooking.</li> </ul> <p>UNIT 4: Nutrition and dietetics</p> <ul style="list-style-type: none"> <li>• Physiological considerations, nutrient needs and dietary pattern for various groups- adults, pregnant and nursing mothers, infants, pre-school and school children, adolescents and geriatric nutrition.</li> </ul>	<p align="center"><b>15</b></p>

<p><b>MODULE 3: DIET RELATED DISEASES</b></p>	<p><b>UNIT 5:Health and diseases</b></p> <ul style="list-style-type: none"> <li>• Major nutritional deficiency diseases- protein energy malnutrition, Vitamin deficiency, iron deficiency anaemia, iodine deficiency disorders, their causes, symptoms, treatment, prevention and government programmes, if any.</li> <li>• Life style related diseases- obesity, hypertension, hyperurecimia, diabetes mellitus, polycystic ovarian disease (PCOD) - their causes and prevention through dietary/lifestyle modifications.</li> <li>• Social health problems: smoking, alcoholism, drug dependence and Acquired Immune Deficiency Syndrome (AIDS);</li> <li>• Common ailments- irritable bowel disease (IBD), constipation: causes and dietary management</li> </ul> <p><b>UNIT 6: Food hygiene</b></p> <ul style="list-style-type: none"> <li>• Potable water- sources and methods of purification at consumer level</li> <li>• Food and water borne infections: bacterial infection: cholera, typhoid, dysentery; viral infection: hepatitis, poliomyelitis, protozoan infection: Amoebiasis, Giardiasis; Parasitic infection: Taeniasis and Ascariasis their causative agent, symptoms, transmission and prevention.</li> <li>• Brief account of food spoilage: Causes and preventive measures</li> </ul>	<p><b>15</b></p>
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<p align="center"><b>PRACTICAL COMPONENT OF ‘HEALTH AND NUTRITION ZOO-VI-E-13: DURATION (30 HOURS – 02hrs/WEEK)</b></p>		
<p><b>SR. NO</b></p>	<p align="center"><b>PRACTICAL</b></p>	<p><b>NO. OF PRACTICAL S</b></p>
<p>1.</p>	<p>To detect adulteration in a) Ghee b) Sugars c) Tea leaves and d) Turmeric</p>	<p>03</p>
<p>2.</p>	<p>Estimation of lactose in milk</p>	<p>02</p>
<p>3.</p>	<p>Titrametic estimation of:</p> <ul style="list-style-type: none"> <li>• Ascorbic acid estimation in food</li> <li>• Calcium in food</li> </ul>	<p>02</p>
<p>4.</p>	<p>Observation of any two grain pests</p>	<p>01</p>
<p>5.</p>	<p>Project based:</p> <ul style="list-style-type: none"> <li>• Identify nutrient rich sources of foods, their seasonal availability and price</li> <li>• Study of nutrition labeling on selected foods</li> </ul>	<p>04</p>

**REFERENCE BOOKS:**

- 1) Mudambi, SR and Rajagopal, MV. (2007). Fundamentals of Foods, Nutrition and Diet Therapy; Fifth Ed; New Age International Publishers.
- 2) Srilakshmi B. (2002). Nutrition Science; New Age International (P) Ltd.
- 3) Srilakshmi B. (2007). Food Science; Fourth Ed; New Age International (P) Ltd.
- 4) Swaminathan M. (2009). Handbook of Foods and Nutrition; Fifth Ed; 1986; BAPPCO.
- 5) Bamji MS, Rao NP, and Reddy V. Text Book of Human Nutrition; Oxford & IBH Publishing Co. Pvt Ltd.
- 6) Wardlaw GM, Hampl JS. (2007). Perspectives in Nutrition; Seventh Ed; McGraw Hill.
- 7) Lakra P, Singh MD. (2008). Textbook of Nutrition and Health; First Ed; Academic Excellence.

**ELECTIVE COURSE: ECOLOGY AND ETHOLOGY**

<b>COURSE CODE</b>	ZOO-V.E-14
<b>MARKS</b>	100 [75 – Theory; 25 – Practicals]
<b>CREDITS</b>	04 [03 – Theory; 01 – Practical]
<b>CONTACT HOURS</b>	THEORY : 45 HOURS (03 LECTURE/WEEK) PRACTICALS : 30 HOURS (01 PRACTICAL/WEEK)
<b>COURSE OBJECTIVES</b>	<ul style="list-style-type: none"><li>• To study the distribution of organisms, their interrelations in populations and communities and interactions between biotic and abiotic components</li><li>• To study impact of anthropogenic activities on ecosystem and study behaviour of organisms under natural conditions</li></ul>
<b>COURSE OUTCOME</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• CO1: gain better understanding of concepts of ecology.</li><li>• CO2: Acquainted with the basics of animal behaviours</li><li>• CO3: Know strategies of biodiversity conservation,</li><li>• CO4: Understand mechanisms of sustainable development.</li></ul>

**ZOO-VI.E- 14 : ECOLOGY AND ETHOLOGY**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
<b>MODULE 1 :</b> Basic Ecology	1.1 :Introduction to Ecology : What is Ecology? History of ecology, ecology today, scope of ecology, objective of study,subdivisions of ecology 1.2 : Ecosystem Ecology:kinds of ecosystem,Gaia hypothesis, energy flow within the Ecosystem, food chains, ecological pyramids, ecological niche nutrient and Cycling of trace elements: Cobalt (Co), Molybdenum (Mo) and Lead. 1.3: Population Ecology:survivorship curve and life tables,age distribution,biotic potential of population, growth models, population dispersal, regulation of population, co-operative and disoperative coactions and carrying capacity,predator –prey relationships,symbiosis	
<b>MODULE 2 :</b> Conservation Ecology and Basic Ethology	2.1: Community Ecology:characters of a community, classification of a community,community periodism, community stratification,community succession 2.3:Introduction to Ethology: the history of ethology, types of behavior – instinct and learning,economic andsocial aspect of behaviour, ethologists and their work – Lorenz, Tinbergen, Goodall, M.K. Chandrashekar, animal behaviour :an evolutionary approach 2.4: Concept of Ethology:stimuluos –response concept,reflexes, innate releasing mechanisms,fixed action pattern,ethogram releaser,motivation or drive with respect to hunger and sexual behaviour	
<b>MODULE 3 :</b> Advanced Ethology	3.1 : Approaches to studying behaviour, methods associated with neurophysiological approach,psychological and ethological approach. 3.2: Pheromones :introduction,types of pheromones,the primer pheromones,the imprinting pheromones 3.3:Hormones: effect of hormones on sexual behaviour,maternal behaviour,territorial marking, learning and memory 3.4:Patterns of behavior :feeding, aggressive and reproductive behavior, biological clocks 3.5:Communication behavior :introduction,communication signals,	

<b>PRACTICAL COMPONENT OF ZOO-VI.E-14: ECOLOGY AND ETHOLOGY ( DURATION -02 HRS /WEEK)</b>		
<b>SR.NO.</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1	Field Based practicals: <ul style="list-style-type: none"> <li>• Determination of population density in a natural/ hypothetical community by Quadrats method in intertidal zone.</li> <li>• Report on a visit to National Parks/ Biodiversity Parks/ Wild life sanctuary</li> <li>• Observation of random subjects for understanding human behaviour.</li> </ul>	05
2	Study of an aquatic/mangrove ecosystem: Measurement of the area, temperature, turbidity, determination of pH, and dissolved oxygen content (Winkler's method), and free CO <sub>2</sub>	03
3	Ethology: <ul style="list-style-type: none"> <li>• To study the habituation to light stimulus in earthworm/crabs/snails/ spider web</li> <li>• To demonstrate phototactic and geotactic responses of the animal provided earthworm/crabs</li> </ul>	02
4	Study of Life Tables and plotting of survivorship curves of different types from the hypothetical/real data provided.	02

#### **REFERENCE BOOKS :**

1. Arora, Mohan. P. (2004) : *Ecology* , Himalaya Publishing House
2. Aubrey Manning and stamp Dawkins (1997) : *An Introduction to Animal behaviour (fourth edition)*, Cambridge University Press.
3. Dash M. C. (2001) : *Fundamental of Ecology* , Tata Mc Graw – Hill publishing Company Limited New Delhi
4. Felicity Huntingford (1984) : *The study of Animal behaviour* , Chapman and Hall.
5. Hoshang S. Gundevia and Hare Govind Singh (2006) : *A Text Book of Animal Behaviour*, S. Chand & Company LTD. New Delhi-110055.
6. Juneja Kavita (2002) : *Ecology* , Anmol Publications PVT. LTD. New Delhi-110002 (India)
7. Mathur Reena (1994) : *Animal Behaviour*, Rastogi and Company, Meerut-250002 India.
8. Rana, S. V. S.(2003) : *Essentials of Ecology and Environmental Science* ,Prentice- Hall of India Private Limited , New Delhi-110001
9. Ranga, M. M.(2002) : *Animal Behaviour Second Enlarged Edition* , Agrobios (India)
10. Robert A. Wallace (1938) : *Animal Behaviour Its Development, Ecology and Evolution* , Goodyear Publishing Company, Inc. Santa Monica, California.
11. Sharma P.D.(2014-15) : *Ecology and Environment*, Rastogi Publications. Meerut (12<sup>th</sup> revised edition) -25002.
12. W.H. Thorpe (1979) : *The Origins and rise of Ethology*, Praeger Publishers.

**ELECTIVE COURSE: LABORATORY TECHNIQUES IN PATHOLOGY**

<b>COURSE CODE</b>	ZOO-VI.E-15
<b>MARKS</b>	100 [75 -Theory; 25- Practical]
<b>CREDITS</b>	04 [03 -Theory; 01- Practical]
<b>CONTACT HOURS</b>	THEORY : 45 HOURS (03 LEC / WEEK) PRACTICAL: 30 HOURS (01 PRACTICAL / WEEK)
<b>COURSE OBJECTIVES</b>	<ul style="list-style-type: none"><li>• This course is an introduction to the various techniques used in pathological diagnosis.</li></ul>
<b>COURSE OUTCOME</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• CO1: Perform basic techniques of cell/tissue processing</li><li>• CO2: Be Familiar with procedures of tests done for disease detection</li><li>• CO3: Process various body fluids and tissues for disease detection..</li><li>• CO4: Understand the clinical implication of the pathological tests.</li></ul>

**ZOO-VI.E-15: LABORATORY TECHNIQUES IN PATHOLOGY**

<b>MODULE</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
MODULE 1: Blood Analysis	UNIT 1: Introduction to medical lab techniques and its importance UNIT 2: : Analyses of human Blood: <ul style="list-style-type: none"> <li>• Ways of obtaining blood samples, precautions and complications.</li> <li>• Methods of estimation and clinical significance of: hemoglobin, Packed Cell Volume (PCV), RBC count, WBC count, Complete Blood Count (CBC), platelets, Erythrocyte Sedimentary Rate (ESR), Differential Leucocyte Count (DLC).</li> </ul>	15
MODULE 2: Evaluation Of Excretory Material And Gametes	UNIT 3: Urine Analyses <ul style="list-style-type: none"> <li>• Physical characteristics, preservation of urine sample</li> <li>• Gross examination, chemical examination, abnormal constituents and its clinical implications.</li> <li>• Microscopy of urinary sediments</li> </ul> UNIT 4: Stool Analyses <ul style="list-style-type: none"> <li>• Stool tests for protozoan parasites and helminth eggs.</li> <li>• Clinical significance.</li> </ul> UNIT 5: Semen analyses: <ul style="list-style-type: none"> <li>• Constituents of semen</li> <li>• Gross and microscopic, cytochemical examination, clinical implications.</li> </ul>	15
MODULE 3: Liver Function Cytology Imaging	UNIT 6: Clinical status of liver function - <ul style="list-style-type: none"> <li>• Function of liver.</li> <li>• Tests of excretion by liver, evaluation of synthesis in liver, evaluation of enzyme activity.</li> </ul> UNIT 7: Clinical cytological studies <ul style="list-style-type: none"> <li>• Fine Needle Aspiration Cytology (FNAC), Ultrasound guided FNAC, aspiration of intra thoracic masses,               <ul style="list-style-type: none"> <li>• Techniques of preparing cell smears, staining techniques</li> </ul> </li> </ul> UNIT 8: Medical imaging <ul style="list-style-type: none"> <li>• X-Ray, PET, CT Scan, MRI, Dexa Scan, Ultrasound, Doppler's Test (using photographs/reports etc).</li> </ul>	15



<b>PRACTICAL COMPONENT OF: LABORATORY TECHNIQUES IN PATHOLOGY ZOO-VI.E-15 - (30 HOURS – 02hrs/WEEK)</b>		
<b>SR. NO</b>	<b>PRACTICAL</b>	<b>NO. OF PRACTICALS</b>
1.	Preparation of blood smears and staining techniques ( Leishman's staining, Giemsa staining, Field's staining).	02
2.	Use of different types of anticoagulants, obtaining serum from blood, preparation of cell suspension (blood cells).	01
3.	RBC Count, WBC Count, Differential WBC Count	03
4.	Urine analysis – normal and abnormal constituents	02
5.	Blood sugar estimation using glucometer	01
6.	Estimation of hemoglobin (Sahli's method)	01
7.	Estimation of PCV	01
8.	Estimation of ESR (Wintrobe's / Westergreen method)	01

**REFERENCE BOOKS:**

1. Sood R (1999). Medical laboratory techniques, Jaypee publishers, New Delhi.
2. Park, K. (2007), Preventive and Social Medicine, B.B. Publishers
3. Godkar P.B. and Godkar D.P (2007). Textbook of Medical Laboratory Technology, II Edition, Bhalani Publishing House.
4. Cheesbrough M (2002)., A Laboratory Manual for Rural Tropical Hospitals, A Basis for Training Courses
5. Prakash, G. (2012), Lab Manual on Blood Analysis and Medical Diagnostics, S. Chand and Co. Ltd. New Delhi.

**ELECTIVE COURSE: BIOENTREPRENEURSHIP**

<b>COURSE CODE</b>	ZOO-VI.E- 16
<b>MARKS</b>	100 [75 -Theory; 25- Fieldbased report]
<b>CREDITS</b>	04
<b>CONTACT HOURS</b>	Theory: 45 HOURS [03 Lectures Per Week] Fieldbased work: 15 HOURS.
<b>COURSE OBJECTIVES</b>	<ul style="list-style-type: none"><li>• To help students recognize the opportunities of enterprises in the field of life sciences</li><li>• To encourage students to think independently and explore new vistas</li><li>• To familiarize them with the basic skills required for a start-up</li></ul>
<b>COURSE OUTCOME</b>	Upon successful completion of the course, students will be able to: <ul style="list-style-type: none"><li>• CO1: understand concept of business Proposals</li><li>• CO2: familiar with the methodologies and regulations required to start an enterprise</li><li>• CO3: Identify opportunities available in life science for start-ups.</li><li>• CO4: Generate Ideas and initiate a Business Plan.</li></ul>

**ZOO-VI.E- 16: BIOENTREPRENEURSHIP**

<b>UNIT</b>	<b>TOPICS</b>	<b>CONTACT HOURS</b>
MODULE 1: Entrepreneurship Development	Unit 1: Introduction to entrepreneurship: <ul style="list-style-type: none"><li>entrepreneurial competencies and goal setting, bio entrepreneurship, building a bio-enterprise : balance management, capital, technology</li></ul> Unit 2: Introduction to innovation: <ul style="list-style-type: none"><li>identifying business opportunities</li></ul> Unit 3: Raising funds: public and private	15
MODULE 2: Business plan And Guidelines and regulations for entrepreneurship in life sciences	Unit 4: Business model canvas Unit 5: Guidelines and regulations: <ul style="list-style-type: none"><li>Certification and licensing, acts, regulations and guidelines, marketing and export process, accessing university technology, research and development agencies in India</li></ul> Unit 6: Role of micro, medium and small scale industry sector Unit 7: Innovations in research: writing project proposals to various funding bodies such as MHRD, UGC, DST, DBT, etc.	15
MODULE 3:  Start -up, quality, safety and procedural compliances in a bio enterprise	Unit 8: Intellectual Property Rights and trademark of biological resources Unit 9: quality, safety and procedural compliances <ul style="list-style-type: none"><li>Bio safety and its implementations</li><li>Quality control in entrepreneurship</li><li>WHO Guidelines for setting up of a contract research organization.</li><li>Starting a research laboratory in India – guidelines and permits required</li></ul>	15
MODULE 4: Field and project based component	Field and project based component: -Lateral thinking and testing entrepreneurial competencies of the students - Interactions with successful entrepreneur, Banker/ Angel Investor / workshops on entrepreneurship. -Visit to a bio-startup/ Formulating and presenting Business model	15

**REFERENCES:**

1. Garg, M.C. (2015) Entrepreneurial development. Guset User.
2. Kolchinsky, P. (2004) The entrepreneurs guide to a biotech startup. 4<sup>th</sup> edition. [www.evelexa.com](http://www.evelexa.com)

**Additional reading:**

1. Simon, S. 2009. Start with why: How great leaders inspire everyone to take action. Penguin Group (USA) Inc .
2. Welch, J. and Byrne, J.A. 2003. Straight from the gut. Business plus publishers.

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**B.Voc**

**3D Media and Virtual Reality – VFX**  
**Multimedia - Digital Filmmaking – MDF**

**Annexure-III**

**Parvatibai Chowgule College of Arts and Science  
(Autonomous)**

**DEPARTMENT OF APPLIED AND PROFESSIONAL STUDIES**

**SYLLABUS**

**THREE YEAR B.VOC. DEGREE PROGRAMME IN 3D MEDIA AND VIRTUAL  
REALITY – VFX**

**&**

**THREE YEAR B.VOC. DEGREE PROGRAMME IN MULTIMEDIA – DIGITAL  
FILMMAKING**

**THREE YEAR B.VOC. DEGREE PROGRAMME IN 3D MEDIA AND VIRTUAL  
REALITY – VFX**

**SEMESTER-I**

**Course Title: Drawing & Painting**

**Course Code: VFX-SK1**

**Marks: 50**

**Credits: 02**

**Total Hours: 30**

**Course Prerequisites: Nil**

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**Course Objectives:**

- To make the student learn to perceive, read and translate the visual world into personal forms of pictorial expression and representation.
- To enable the student to develop a relationship with the physical production of art and also acquire knowledge of its theory, history and criticism.

**Learning Outcome:** At the end of this course, students will be able to

- Identify the various techniques used and elements required in drawing.
- Sketch virtual art using computer graphics software program.
- Compose layouts as per their own creative visualizations.

**SYLLABUS:**

**Module - I - Fundamentals of Art**

**(12 Hrs.)**

This module involves a series of exercises designed to introduce the basics and give a grounding in various types of drawings.

The sections covered are:

**Fundamentals of Art-** The fundamentals of art are the building blocks for successful art-making. Artwork can also be analyzed according to the use of the elements in a work of art.

**Elements of Art-**The elements of art are the basic components of art-marking. It is impossible to create a work of art without using at least one of the seven elements of art.

**Principles of Art-**Balance, emphasis, movement, proportion, rhythm, unity, and variety; the means an artist uses to organize elements within a work of art. By the careful placement of repeated elements in a work of art to cause a visual tempo or beat. Equilibrium or stability to a work of art.

**Content-** Refers to the message or meaning within an artwork.

**Aesthetics -** Refers to the artwork's visual attraction or beauty.



**Art Criticism** - An organized approach to evaluating artwork.

**Symbolism** - Using visual objects or arrangements to represent an alternate meaning.

## **Module - II - Fundamentals of Drawing**

**(12 Hrs.)**

**Introduction with Basic Line Drawing** - This includes drawing straight lines, circles & half circles to give the student a basic exercise of free hand drawing.

**Different Technique of Drawing** - This includes techniques of holding pencils, brushes and use of other mediums and drawing materials which help the student understand the different techniques of drawing.

**Object Drawing** – This section involves drawing basic geometric 3d objects such as squares, triangles, cones, circular objects and spheres, this will help the students get an understanding of the dimensions of different objects.

**Pictorial Design** – This is a 2d design which will help students to gain an understanding of composition, color & balance in a design.

**Nature Drawing** – Involves the drawing of natural objects such as leaves, flowers, fruits, vegetables in a still life composition.

**Perspective** – Various methods of perspective will be looked where students will learn the rules of perspective and learn how to effectively use them in their drawings & compositions

**Composition** – Composition is the most important part of art work as it helps an artist to create visual harmony and balance in a painting. Students will learn the rules of composition in any given space.

**Color Theory**- practical guidance to color mixing and the visual effects of a specific color combination. Definitions (or categories) of colors based on the color wheel: primary color, secondary color and tertiary color.

## **Module - III - Digital Painting**

**(6 Hrs.)**

Digital painting is a method of creating an art object (painting) digitally. It is a technique for making digital art on the computer. As a technique, it refers to a computer graphics software program that uses a virtual canvas and virtual painting box of brushes, colors and other resources. The virtual box contains many instruments that do not exist outside the computer. This helps to give digital artwork a different look and feel from an artwork that is made the traditional way.

**Digital Drawing** – Introduction of digital format as a canvas for drawing and painting. Students will learn different digital media techniques and professional digital painting software.

**Textbook:**

1. Barrington Barber, The Fundamentals of Drawing, Arcturus publishing Limited, 2009.
2. Victor Perard, Anatomy and Drawing, Grace Prakashan, 2011.

**References:**

1. 3D Total Team, Gilles Beloeil, Andrei Riabovitchev, Roberto F. Castro, Publishing 3D Total; Art Fundamentals: Color, Light, Composition, Anatomy, Perception and Depth, 3D Total Publishing, 2013.
2. <https://www.craftsy.com/art>
3. <https://www.youtube.com/watch?v=8xdchD4lUXI>

**Lab: Drawing & Painting**

**Marks: 50**

**Credits: 4**

**Total Hours: 60**

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1. Drawing of straight lines, curve lines, horizontal lines, vertical lines, thick lines, thin lines, diagonal lines, dotted lines.
  2. Drawing of basic geometric 3d objects such as squares, triangles, cones, circular objects and spheres.
  3. Drawing of two objects by observation.
  4. Drawing of illustrative design.
  5. Drawing of objects from nature.
  6. Drawing using the rules of perspective.
  7. Drawing using the rules of composition.
  8. Using the different color combinations to create visual art.
  9. Using the color wheel: primary color, secondary color and tertiary color to create visual art.
  10. Creating digital art object using Wacom Intuos.

**Hardware**

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- Wacom Intuos

**Course Title: 3D Animation – I**

**Course Code: VFX-SK2**

**Marks: 50**

**Credits: 02**

**Total Hours: 30**

**Course Prerequisites: Nil**

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**Course Objectives:**

- To give an introduction to basic animation tools and techniques.
- To prepare the student for the advanced level course in the next semester.

**Learning Outcome:** At the end of this course, students will be able to

- Explore the basic tools and interfaces used to model a 3D animation character.
- Positioning 3D objects.
- Create 3D object using splines tools and splines modifier.
- Manipulate and segregate 3D objects.

**SYLLABUS**

**Module – I - Fundamentals of 3D Animation**

**(12 Hrs.)**

In this module, we teach how to plan the production and interact with 3D studio max software.

**Introduction with 3D Studio Max CC** - Learn to get around with 3d studio max, from ground up, providing overview of the entire package as well as essential workflows that require to create professional models and animations.

**Exploring Interface** - Complete overview of the 3Ds Max interface, navigation, configure major parts of the interface, including the viewports, the timeline, the outliner, and the various other parts of the 3Ds Max UI.

**Controlling of Viewports** - Creating and manipulating standard 3ds Max primitives such as spheres, cubes, cones, and cylinders, then moves on to extended primitives such as the capsule and the oil tank. Exploring modifiers and use them as the basis for modeling.

**Working with Files & Hierarchy** - Exploring the different 3d file extension and assembly. Discover various file association, referencing and grouping techniques. Learn industry standard file types like FBX and alembic.

## **Module - II- Modeling in 3D**

**(9 Hrs.)**

Creating and positioning 3D Object, running a mass Fx simulation and animating object with key frames.

**Creating and Modeling, Editing Primitive** - Overview of graphite modeling tools. Exploring functionality of connect tool, weld tool, extrude tool and various component tool that help in modeling and topology techniques.

**Selecting Objects and Using Layers** - Overview of modeling interface and modifier stacks. Procedural way of modifying objects, parameters and adjusting the workflow of modeling techniques. Preparing and understanding assets through poly modeling.

**Transformation Tools** – Learning rich tool set to view and manipulate vertex editing, edge and border editing. Zoom in and out workflows with controlling distance with clipping planes.

**Cloning and Array** - Overview of breaking edit mesh and poly mesh models into different files for sub tool modeling techniques. Explore isolated, hidden, freeze, wire frame and adaptive degradation technique with proxy file assembly.

## **Module – III - Shapes and Splines**

**(9 Hrs.)**

Working with layer and creating 3D object using splines tools and splines modifier.

**Creating and Modeling, Editing Primitive** - Creating common nurms and spline shapes primitive that allow to create 3d objects from 2d shapes. Shapes comprises of basic line, circle, and curved shapes, with their own set of parameters that can be further edited

**Selecting Objects and Using Layers** - Learn to renaming and segregate objects. Using selection sets and compile them to layer distribution for non-linear edits and modifying objects. Discover layer base modeling and animatics with layer properties and parameters.

**Transformation Tools** - Explore the manipulation tools translate, rotate and scale. In-depth parameters on manipulation gizmo and co-ordinate. Discover how manipulation axis order in global, local, view and normal contribute to the workflow of developing professional 3d objects.

### **Textbooks:**

1. Kelly L. Murdock, 3ds Max Bible 2012, John Wiley & Sons Inc., 2012.

### **References:**

1. Jeffrey M. Harper, Mastering Autodesk 3ds Max, John Wiley & Sons Inc., 2013.
2. Richard E. Williams, The Animator's Survival Kit, Faber, 2009.
3. <https://www.autodesk.com/education/home>
4. <https://www.youtube.com/watch?v=kqQmwXCH6w8>

## **Lab: 3D Animation – I**

**Marks: 50**

**Credits: 04**

**Total Hours: 60**

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1. Introduction to 3ds Max, opening and saving the files, adjusting workspace, exploring the menus.
2. Creating and manipulating objects, adjusting the pivot, aligning, snapping, and adjusting the gizmos.
3. Manipulating object using vertexes, lines, and faces. Create a crusher using polygon tools.
4. Modelling of coke bottle and detailing with extrude.
5. Modelling interior furniture using connect and weld tool.
6. Modelling interior using chamfer tool.
7. Modelling a ship using boolean modifier.
8. Modelling shrine using duplicate option and array.
9. Modelling a bicycle using spline.
10. Create chess pieces using revolve modifier.

## **Softwares**

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- Autodesk 3ds Max
- Blender (Open Source)

**Course Title: Vector Graphics - Illustrator**

**Course Code: VFX-SK3**

**Marks: 50**

**Credits: 02**

**Total Hours: 30**

**Course Prerequisites: Nil**

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## **Course Objectives:**

- To make the student learn to perceive, read and translate the visual world into digital forms.
- To train students to create small file size vector graphics.

**Learning Outcome:** At the end of this course, students will be able to

- Sketch virtual art using computer graphics software program.
- Create vector images using Adobe Illustrator.

## SYLLABUS

### **Module - I – Introduction to Adobe Illustrator**

**(10 Hrs.)**

Adobe Illustrator is a program used by both artists and graphic designers to create vector images. These images will then be used for company logos, promotional uses or even personal art work, both in print and digital form.

**Introduction to Adobe Illustrator** - Complete overview of adobe illustrator, from core concept of the entire package as well as essential workflows that require to create professional graphic illustration.

**Working with Illustrator Documents** –Create a document using preloaded templates or built in document profiles such as print, web & film.

### **Module – II – Working with Tools**

**(20 Hrs.)**

**Working with Shapes & Symbols** – Understanding vector and raster graphics, drawing basic shapes, working with drawing modes, shapes & perspectives, selections, transforming shapes using shape builder tools and working with symbols.

**Working with Colors, Gradients & Patterns** - Explore standard graphic tools for vector-based images. Creating point-based vector shapes and symbols. In depth study on color wheel and gamut for modifying and setting color pallet and pattern for repetitive design.

**Drawing and Painting in Illustrator** - Learn to use illustrator as traditional brush-based painting software & vector-based color pattern designer.

**Working with Type** – Learning Type of Tools using Type to format text and different type styles.

**Working with Brushes, Styles & Effects** - Brief overview of tools pallet and standard function. Defining and exploring brush parameters, styles setting and effects panel to make professional illustrations.

**Working with Text** - Exploring text and typography, base design workflow for designing object and subjects.

**Automation Saving and Exporting** - Learning core concept of various file association and parameter to control exporting illustrations for production.

**Organizing Objects in Illustrator** – Exploring the layer panel, creating new layers, sub layer, hiding and showing layers, merging layers, moving objects to another layer, isolation mode and working with ruler's guides and grids.

### **Textbook:**

1. Adobe Press, Adobe Illustrator CC Classroom in a Book, Pearson Education India, 2014.

**References:**

1. Kogent Learning Solution Inc., Illustrator CS6 in Simple Steps, Dreamtech Press, 2014.
2. <https://helpx.adobe.com/illustrator/tutorials.html>

**Lab: Adobe Illustrator****Marks: 50****Credits: 04****Total Hours: 60**

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1. Explore the workspaces; tabbed document windows, application bar, workspace switcher, panel title bar, control panel, tool panel, collapse to icons button and four panel groups in vertical dock.
  2. Draw straight lines with the Line Segment tool, draw rectangles and squares, specify the corner radius of a rounded rectangle, draw ellipses, polygons, stars, arcs, spirals and grids.
  3. Working with multiple artboards, tools and shapes.
  4. Working with color and blending modes, RGB, CMYK, HSB, grayscale, color spaces and gamut, spot and process colors.
  5. Working with gradients and strokes, layers, brushes, graphic styles and effects.
  6. Exploring character paragraph and text; change the definition of a default character and paragraph styles, remove style overrides, delete character or paragraph styles.
  7. Importing, exporting and saving artwork into file formats, compressing – PDF, SWF, JPEG, PSD, PNG, TIFF, EPS, SVG.
  8. Use the shape builder tool to create new complex new shapes by merging simple shapes.
  9. Draw an object, assign either fill or stroke or both to it. Draw other objects, paint similarly, and layer each new object on top of the previous ones.
  10. Draw objects, create an envelope using either preset wrap shape or rectangular grid or an object, and reshape the envelope.

**Software**

- 
- Adobe Illustrator
  - GIMP (Open Source)

## SEMESTER II

**Course Title: Creative Design & 2D Animation**

**Course Code: VFX-SK4**

**Marks: 50**

**Total Hours: 30**

**Credits: 02**

**Course Prerequisites: Nil**

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### **Course Objectives:**

- To introduce the student to the creative processes which combines art and technology to communicate ideas visually.

**Learning Outcome:** At the end of this course, students will be able to

- Identify the software tools used to create graphics and manipulate images.
- Associate the interaction of the tools with the graphics or images to attain the intended result.
- Manipulate images to attain the desired result.
- Animate 2D characters.

## **SYLLABUS**

### **Module – I - Adobe Flash**

**(15Hrs.)**

Adobe Flash is a multimedia software platform for production of animations, browser games, rich Internet applications, desktop applications, mobile applications and mobile games. Flash displays text, vector graphics and raster graphics to provide animations, video games and applications. It allows streaming of audio and video, and can capture mouse, keyboard, microphone and camera input.

**Introduction to Adobe Flash** - Overview of Adobe Flash for creating dynamic, interactive graphics. Exploring tools and interface. Learn to incorporate shapes objects and other media to develop professional presentation for video and web.

**Image, Audio & Animation** - Exploring the stage and property tools to assemble image, audio and make 2D animation. Learning pallets for preset parameters to deliver frame by frame animation.

**Drawing and Painting** - Creating line art and brush-based painting with flash. Explore the bucket and brush parameters to modify design in various interactive form.

**Text & Interactivity** - Making buttons, roll over and hyperlink properties with text and ty99pographic parameter. Using general snippets creating functional interactivity for rich media presentation.



**Action Script & Effects** – Understanding core concept of Adobe Flash programming learning the common syntax of action script 3.0 and action script 2.0.

**Exporting and Publishing** - Creating frame by frame motion, tweening and animation with proper workflows. Understanding the publish dialogue box for export parameters and publish in standard professional extensions.

**Module – II- Adobe Photoshop** (15Hrs.)

Adobe Photoshop is the predominant photo editing and manipulation software on the market. Its uses range from full featured editing of large batches of photos to creating intricate digital paintings and drawings that mimic those done by hand.

**Introduction to Adobe Photoshop** – This section will help introduce the student to digital image editing, creating a new file and familiarizing them with the various tools in Photoshop. Knowing when to use Photoshop.

**Working with Selection, Layers & Channel** – This section will help students learn how to use the selection tool, menu & choosing selections based on color.

**Using Paint, Paths, Shapes and Text Tools** – This section will help to learn to use different paint brushing techniques and customizing paint brush settings. Understanding how parts and shapes are manipulated and created. Learn to add text to images as vector objects.

**Working with Camera Raw** – Examining raw file types and displaying images in camera Raw. Understanding Raw workspace, creating altered versions of your images and exporting from the raw format.

**Working with 3D Images** – Understanding the 3D workspace and using different 3D file formats. Creating 3D objects, importing 3D objects into Photoshop and working with them.

**Working with Video and Animations** – Dealing with aspect ratio, opening video files and using a timeline panel. Trimming of video clips and rearranging video footage. Animating text and 3D objects using key frames.

**Advance Output Techniques** – Understanding color management, calibrating color profiles, configuring color management to print accurate colors.

**Textbook:**

1. Russell Chun, Adobe Flash Professional CC Classroom in a Book, Adobe, 2014.
2. Andrew Faulkner and Conrad Chavez, Adobe Photoshop CC Classroom in a Book, Adobe Press, 2015.

## References:

1. Fred Gerantabee, Adobe Flash Professional CS6 Digital Classroom, John Wiley & Sons, 2012.
2. Lisa Danae Dayley and Brad Dayleyz, Adobe Photoshop CC Bible, Wiley India Pvt. Ltd., 2014.
3. Angie Taylor, Design Essentials for the Motion Media Artist: A Practical Guide to Principles & Techniques, Focal Press, 2010.
4. <https://helpx.adobe.com/in/photoshop/tutorials.html>
5. <https://helpx.adobe.com/in/adobe-character-animator/tutorials.html>

## Lab: Creative Design & 2D Animation

**Marks: 50**

**Credits: 4**

**Total Hours: 60**

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1. Working with Software Layouts.
2. Photo Manipulation using shapes and pen tool.
3. Adjusting image brightness, contrasts, saturation and levels.
4. Mixing of different photographs to create a single image.
5. Working on transparent layers.
6. Changing the view size of a document, resizing files and adjusting resolutions, printing on different mediums.
7. Working with multiple shapes and objects.
8. Working with images and audios.
9. Working with objects in motion and animation of different shapes.
10. Drawing and painting using different tools.
11. Working with text animation and interactivity, action script and effects.
12. Exporting and publishing in different file products.
13. Creating animation for webpages and videos.

## Software

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- Adobe Photoshop
- Adobe Flash Professional / Animate
- GIMP (Open Source)

**Course Title: 3D Animation - II**  
**Course Code: VFX-SK5**  
**Marks: 50**  
**Total Hours: 30**  
**Credits: 02**  
**Course Prerequisites: 3D Animation – I (VFX-SK2)**

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**Course Objectives:**

- Use the basic knowledge acquired in combination with advanced level 3D modelling.
- Compose advance 3D animation characters for architecture, games, videos. Etc.

**Learning Outcome:** At the end of this course, students will be able to

- Identify the various modeling techniques.
- Associate how the different modeling techniques are used to model a 3D character.
- Model advanced 3D characters.

**SYLLABUS:**

**Module - I: Advance Modeling in 3d Animation**

**(10 Hrs.)**

**3D Assets Modeling** - Creating different 3d asset types and function for modeling scene hierarchy. Understand core concept of developing inter portability asset modeling including edit poly modeling, bezier modeling and sub-d modeling.

**Nurbs Modeling** - Exploring the non-rational B-spline techniques to build 3d objects from line projections. Understanding nurb isoparms, hulls and control vertex. Learning the parametric adaptation to modify object geometry according to suite.

**Patch Modeling** - Overview of quad based patch geometric data for advance nurbs modeling. Explore the parameters and various operation like lathe, revolve, birail and planer.

**Polygon Modeling** - Create 3d advance objects with use of quad surface poly. Exploring different parameter of component level modeling like vertex edge and face. Learning the tools for sub level polygon operation like extrude bevel and various definitive.

**Module – II - Material & Texturing and Virtual Camera**

**(10Hrs.)**

**Standard Materials** - Overview of shade materials to give color perception to 3d objects. Using nodes and connectors to channel color data for illuminating surface parametric representation.

**Slate Material Editor** - Explore one of the material controller sets of preset assembly. Learn to use compact node stack workflow for editing and making materials.

**Compact Material Editor** - Explore advanced material controller sets of preset assembly. Learn to use nonlinear node workflow for editing and making materials.

**Material Modifier** - Explore modifier functionality for controlling material look and development. Apply set of world space and object spec modifier to enhance color data.

**UV Mapping** - Overview of processing 3d objects to retain and apply 3d image or procedural texture in 0 and 1 space of quad poly adaptation. Learn the workflow of setting and manipulating face coordinate to create world space UV coordinate for material and shading.

**Concept of Virtual Cameras** - Exploring the parameters and operation of cameras for rendering and final output. Overview of camera properties to control depth, color, blur, material and scene content.

### **Module – III - Lighting, Rendering and Export**

**(10 Hrs.)**

**Lighting Techniques** - Overview of light panel with in depth study of standard and photometric lights. Creating light lister and referencing for advance light probe techniques.

**Standard and Photometric Lights** - Core concept of virtual light paradigms operation and relation. Explore the illumination model in various spaces like world view and local.

**Atmospheric and Render Effects** - Create background FX with render atmospheric tools. Learning the effects parameter functionality to control various effects for final render.

**Rendering with Mental Ray** - Overview of interface and operative nodes of Mental ray render engine. Learning advanced render algorithms Final Gather and Global illumination techniques. Explore core concept for calculating and finalising render outputs.

**Compositing with Video Elements** - Exploring render data composition in various formats and assembly. Learn to manipulate and modify editable video data from composite render elements.

**Video Post and Export** - Learn video post dialogue parameter to modify edit and deliver for final production output.

#### **Textbook:**

1. Kelly L. Murdock, 3ds Max Bible 2012, John Wiley & Sons Inc., 2012

#### **References:**

1. Jeffrey M. Harper, Mastering Autodesk 3ds Max, John Wiley & Sons Inc., 2013.
2. Isaac V. Kerlow, The Art of 3D Computer Animation and Effects, John Wiley & Sons, 2009.
3. <https://www.autodesk.com/education/home>
4. <https://www.youtube.com/watch?v=kqQmwXCH6w8>

## **Lab: 3D Animation – II**

**Marks: 50**

**Credits: 04**

**Total Hours: 60**

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1. Converting spline modelling into polygon modelling.
2. Creating of complex model using advance modelling tools.
3. Building an exterior using NURBS, patch and polygon modelling.
4. Understanding material editor in slate mode and compact material.
5. Solving UV and create a map for a given model.
6. Use max cameras to get the shot render from different angles.
7. Light up the interior scene using standard light in MAX.
8. Illuminate scene using photometric lights.
9. Create a daylight system using mental ray.
10. Take video output of a ten second after composting final scene.

## **Software**

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- Autodesk 3ds Max
- Blender (Open Source)

**Course Title: Project - First Year End**

**Course Code: VFX-SK6**

**Marks: 100**

**Credits: 06**

**Hours: 90**

**Course Prerequisites:**      **Drawing & Painting (VFX-SK1)**  
   **3D Animation - I (VFX-SK2)**  
   **Vector Graphics - Illustrator (VFX-SK3)**  
   **Creative Design & 2D Animation (VFX-SK4)**  
   **3D Animation – II (VFX-SK5)**

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## **Project - First Year End – Part A – (50 Marks)**

- **Logo Creation:** The student should create a logo based of his choice.
- **Corporate Branding:** The student should create layouts and design a company’s letterhead, envelopes, business cards, brochure, and banner stand.
  - Creating a Design – 10 Marks
  - Color Scheme – 5 Marks
  - Comprehension – 10 Marks
  - Placements - 5 Marks
  - Concept - 10 Marks

- Presentation - 10 Marks
  - Logo – 1 nos.
  - Corporate Branding – 5 nos.
    - Letterhead
    - Envelope
    - Business Card
    - Brochure
    - Banner Stand

**Project - First Year End – Part B – (50 Marks)**

- Model a building architecture. Map the project and take the final output into photo realistic JPEG file.
  - Creating a design – 5 Marks
  - Modelling – 5 Marks
  - Solving UVs – 10 Marks
  - Texturing – 5 Marks
  - Lighting – 10 Marks
  - Rendering – 5 Marks
  - Final Presentation – 10 Marks

## B.VOC. IN MULTIMEDIA – DIGITAL FILMMAKING

### SEMESTER I

**Course Title: Drawing & Painting**

**Course Code: MDF-SK1**

**Marks: 50**

**Credits: 02**

**Total Hours: 30**

**Course Prerequisites: Nil**

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#### **Course Objectives:**

- To make the student learn to perceive, read and translate the visual world into personal forms of pictorial expression and representation.
- To enable the student to develop a relationship with the physical production of art and also acquire knowledge of its theory, history and criticism.

**Learning Outcome:** At the end of this course, students will be able to

- Identify the various techniques used and elements required in drawing.
- Sketch virtual art using computer graphics software program.
- Compose layouts as per their own creative visualizations.

#### **SYLLABUS:**

##### **Module - I - Fundamentals of Art**

**(12 Hrs.)**

This module involves a series of exercises designed to introduce the basics and give a grounding in various types of drawings.

The sections covered are:

**Fundamentals of Art-** The fundamentals of art are the building blocks for successful art-making. Artwork can also be analyzed according to the use of the elements in a work of art.

**Elements of Art-**The elements of art are the basic components of art-marking. It is impossible to create a work of art without using at least one of the seven elements of art.

**Principles of Art-**Balance, emphasis, movement, proportion, rhythm, unity, and variety; the means an artist uses to organize elements within a work of art. By the careful placement of repeated elements in a work of art to cause a visual tempo or beat. Equilibrium or stability to a work of art.

**Content-** Refers to the message or meaning within an artwork.

**Aesthetics -** Refers to the artwork's visual attraction or beauty.

**Art Criticism** - An organized approach to evaluating artwork.

**Symbolism** - Using visual objects or arrangements to represent an alternate meaning.

### **Module - II - Fundamentals of Drawing**

**(12 Hrs.)**

**Introduction with Basic Line Drawing** - This includes drawing straight lines, circles & half circles to give the student a basic exercise of free hand drawing.

**Different Technique of Drawing** - This includes techniques of holding pencils, brushes and use of other mediums and drawing materials which help the student understand the different techniques of drawing.

**Object Drawing** – This section involves drawing basic geometric 3d objects such as squares, triangles, cones, circular objects and spheres, this will help the students get an understanding of the dimensions of different objects.

**Pictorial Design** – This is a 2d design which will help students to gain an understanding of composition, color & balance in a design.

**Nature Drawing** – Involves the drawing of natural objects such as leaves, flowers, fruits, vegetables in a still life composition.

**Perspective** – Various methods of perspective will be looked where students will learn the rules of perspective and learn how to effectively use them in their drawings & compositions

**Composition** – Composition is the most important part of art work as it helps an artist to create visual harmony and balance in a painting. Students will learn the rules of composition in any given space.

**Color Theory**- practical guidance to color mixing and the visual effects of a specific color combination. Definitions (or categories) of colors based on the color wheel: primary color, secondary color and tertiary color.

### **Module - III - Digital Painting**

**(6 Hrs.)**

Digital painting is a method of creating an art object (painting) digitally. It is a technique for making digital art on the computer. As a technique, it refers to a computer graphics software program that uses a virtual canvas and virtual painting box of brushes, colors and other resources. The virtual box contains many instruments that do not exist outside the computer. This helps to give digital artwork a different look and feel from an artwork that is made the traditional way.



**Digital Drawing** – Introduction of digital format as a canvas for drawing and painting. Students will learn different digital media techniques and professional digital painting software.

**Textbook:**

3. Barrington Barber, The Fundamentals of Drawing, Arcturus publishing Limited, 2009.
4. Victor Perard, Anatomy and Drawing, Grace Prakashan, 2011.

**References:**

4. 3D Total Team, Gilles Beloeil, Andrei Riabovitchev, Roberto F. Castro, Publishing 3D Total; Art Fundamentals: Color, Light, Composition, Anatomy, Perception and Depth, 3D Total Publishing, 2013.
5. <https://www.craftsy.com/art>
6. <https://www.youtube.com/watch?v=8xdchD4lUXI>

**Lab: Drawing & Painting**

**Marks: 50**

**Credits: 4**

**Total Hours: 60**

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11. Drawing of straight lines, curve lines, horizontal lines, vertical lines, thick lines, thin lines, diagonal lines, dotted lines.
  12. Drawing of basic geometric 3d objects such as squares, triangles, cones, circular objects and spheres.
  13. Drawing of two objects by observation.
  14. Drawing of illustrative design.
  15. Drawing of objects from nature.
  16. Drawing using the rules of perspective.
  17. Drawing using the rules of composition.
  18. Using the different color combinations to create visual art.
  19. Using the color wheel: primary color, secondary color and tertiary color to create visual art.
  20. Creating digital art object using Wacom Intuos.

**Hardware**

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- Wacom Intuos

**Course Title: 3D Animation – I**

**Course Code: MDF-SK2**

**Marks: 50**

**Credits: 02**

**Total Hours: 30**

**Course Prerequisites: Nil**

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**Course Objectives:**

- To give an introduction to basic animation tools and techniques.
- To prepare the student for the advanced level course in the next semester.

**Learning Outcome:** At the end of this course, students will be able to

- Explore the basic tools and interfaces used to model a 3D animation character.
- Positioning 3D objects.
- Create 3D object using splines tools and splines modifier.
- Manipulate and segregate 3D objects.

**SYLLABUS**

**Module – I - Fundamentals of 3D Animation**

**(12 Hrs.)**

In this module, we teach how to plan the production and interact with 3D studio max software.

**Introduction with 3D Studio Max CC** - Learn to get around with 3d studio max, from ground up, providing overview of the entire package as well as essential workflows that require to create professional models and animations.

**Exploring Interface** - Complete overview of the 3Ds Max interface, navigation, configure major parts of the interface, including the viewports, the timeline, the outliner, and the various other parts of the 3Ds Max UI.

**Controlling of Viewports** - Creating and manipulating standard 3ds Max primitives such as spheres, cubes, cones, and cylinders, then moves on to extended primitives such as the capsule and the oil tank. Exploring modifiers and use them as the basis for modeling.

**Working with Files & Hierarchy** - Exploring the different 3d file extension and assembly. Discover various file association, referencing and grouping techniques. Learn industry standard file types like FBX and alembic.

## **Module - II- Modeling in 3D**

**(9 Hrs.)**

Creating and positioning 3D Object, running a mass Fx simulation and animating object with key frames.

**Creating and Modeling, Editing Primitive** - Overview of graphite modeling tools. Exploring functionality of connect tool, weld tool, extrude tool and various component tool that help in modeling and topology techniques.

**Selecting Objects and Using Layers** - Overview of modeling interface and modifier stacks. Procedural way of modifying objects, parameters and adjusting the workflow of modeling techniques. Preparing and understanding assets through poly modeling.

**Transformation Tools** – Learning rich tool set to view and manipulate vertex editing, edge and border editing. Zoom in and out workflows with controlling distance with clipping planes.

**Cloning and Array** - Overview of breaking edit mesh and poly mesh models into different files for sub tool modeling techniques. Explore isolated, hidden, freeze, wire frame and adaptive degradation technique with proxy file assembly.

## **Module – III - Shapes and Splines**

**(9 Hrs.)**

Working with layer and creating 3D object using splines tools and splines modifier.

**Creating and Modeling, Editing Primitive** - Creating common nurms and spline shapes primitive that allow to create 3d objects from 2d shapes. Shapes comprises of basic line, circle, and curved shapes, with their own set of parameters that can be further edited

**Selecting Objects and Using Layers** - Learn to renaming and segregate objects. Using selection sets and compile them to layer distribution for non-linear edits and modifying objects. Discover layer base modeling and animatics with layer properties and parameters.

**Transformation Tools** - Explore the manipulation tools translate, rotate and scale. In-depth parameters on manipulation gizmo and co-ordinate. Discover how manipulation axis order in global, local, view and normal contribute to the workflow of developing professional 3d objects.

### **Textbooks:**

2. Kelly L. Murdock, 3ds Max Bible 2012, John Wiley & Sons Inc., 2012.

### **References:**

5. Jeffrey M. Harper, Mastering Autodesk 3ds Max, John Wiley & Sons Inc., 2013.
6. Richard E. Williams, The Animator's Survival Kit, Faber, 2009.
7. <https://www.autodesk.com/education/home>
8. <https://www.youtube.com/watch?v=kqQmwXCH6w8>

**Lab: 3D Animation – I****Marks: 50****Credits: 04****Total Hours: 60**

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11. Introduction to 3ds Max, opening and saving the files, adjusting workspace, exploring the menus.
12. Creating and manipulating objects, adjusting the pivot, aligning, snapping, and adjusting the gizmos.
13. Manipulating object using vertexes, lines, and faces. Create a crusher using polygon tools.
14. Modelling of coke bottle and detailing with extrude.
15. Modelling interior furniture using connect and weld tool.
16. Modelling interior using chamfer tool.
17. Modelling a ship using boolean modifier.
18. Modelling shrine using duplicate option and array.
19. Modelling a bicycle using spline.
20. Create chess pieces using revolve modifier.

**Software**

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- Autodesk 3ds Max
- Blender (Open Source)

**Course Title: Vector Graphics - Illustrator****Course Code: MDF-SK3****Marks: 50****Credits: 02****Total Hours: 30****Course Prerequisites: Nil**

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**Course Objectives:**

- To make the student learn to perceive, read and translate the visual world into digital forms.
- To train students to create small file size vector graphics.

**Learning Outcome:** At the end of this course, students will be able to

- Sketch virtual art using computer graphics software program.
- Create vector images using Adobe Illustrator.

## SYLLABUS

### **Module - I – Introduction to Adobe Illustrator**

**(10 Hrs.)**

Adobe Illustrator is a program used by both artists and graphic designers to create vector images. These images will then be used for company logos, promotional uses or even personal art work, both in print and digital form.

**Introduction to Adobe Illustrator** - Complete overview of adobe illustrator, from core concept of the entire package as well as essential workflows that require to create professional graphic illustration.

**Working with Illustrator Documents** –Create a document using preloaded templates or built in document profiles such as print, web & film.

### **Module – II – Working with Tools**

**(20 Hrs.)**

**Working with Shapes & Symbols** – Understanding vector and raster graphics, drawing basic shapes, working with drawing modes, shapes & perspectives, selections, transforming shapes using shape builder tools and working with symbols.

**Working with Colors, Gradients & Patterns** - Explore standard graphic tools for vector-based images. Creating point-based vector shapes and symbols. In depth study on color wheel and gamut for modifying and setting color pallet and pattern for repetitive design.

**Drawing and Painting in Illustrator** - Learn to use illustrator as traditional brush-based painting software & vector-based color pattern designer.

**Working with Type** – Learning Type of Tools using Type to format text and different type styles.

**Working with Brushes, Styles & Effects** - Brief overview of tools pallet and standard function. Defining and exploring brush parameters, styles setting and effects panel to make professional illustrations.

**Working with Text** - Exploring text and typography, base design workflow for designing object and subjects.

**Automation Saving and Exporting** - Learning core concept of various file association and parameter to control exporting illustrations for production.

**Organizing Objects in Illustrator** – Exploring the layer panel, creating new layers, sub layer, hiding and showing layers, merging layers, moving objects to another layer, isolation mode and working with ruler's guides and grids.

**Textbook:**

2. Adobe Press, Adobe Illustrator CC Classroom in a Book, Pearson Education India, 2014.

**References:**

3. Kogent Learning Solution Inc., Illustrator CS6 in Simple Steps, Dreamtech Press, 2014.
4. <https://helpx.adobe.com/illustrator/tutorials.html>

**Lab: Adobe Illustrator**

**Marks: 50**

**Credits: 04**

**Total Hours: 60**

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11. Explore the workspaces; tabbed document windows, application bar, workspace switcher, panel title bar, control panel, tool panel, collapse to icons button and four panel groups in vertical dock.
  12. Draw straight lines with the Line Segment tool, draw rectangles and squares, specify the corner radius of a rounded rectangle, draw ellipses, polygons, stars, arcs, spirals and grids.
  13. Working with multiple artboards, tools and shapes.
  14. Working with color and blending modes, RGB, CMYK, HSB, grayscale, color spaces and gamut, spot and process colors.
  15. Working with gradients and strokes, layers, brushes, graphic styles and effects.
  16. Exploring character paragraph and text; change the definition of a default character and paragraph styles, remove style overrides, delete character or paragraph styles.
  17. Importing, exporting and saving artwork into file formats, compressing – PDF, SWF, JPEG, PSD, PNG, TIFF, EPS, SVG.
  18. Use the shape builder tool to create new complex new shapes by merging simple shapes.
  19. Draw an object, assign either fill or stroke or both to it. Draw other objects, paint similarly, and layer each new object on top of the previous ones.
  20. Draw objects, create an envelope using either preset wrap shape or rectangular grid or an object, and reshape the envelope.

## Software

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- Adobe Illustrator
- GIMP (Open Source)

## SEMESTER II

**Course Title: Creative Design & 2D Animation**

**Course Code: MDF-SK4**

**Marks: 50**

**Total Hours: 30**

**Credits: 02**

**Course Prerequisites: Nil**

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### **Course Objectives:**

- To introduce the student to the creative processes which combines art and technology to communicate ideas visually.

**Learning Outcome:** At the end of this course, students will be able to

- Identify the software tools used to create graphics and manipulate images.
- Associate the interaction of the tools with the graphics or images to attain the intended result.
- Manipulate images to attain the desired result.
- Animate 2D characters.

## **SYLLABUS**

### **Module – I - Adobe Flash**

**(15Hrs.)**

Adobe Flash is a multimedia software platform for production of animations, browser games, rich Internet applications, desktop applications, mobile applications and mobile games. Flash displays text, vector graphics and raster graphics to provide animations, video games and applications. It allows streaming of audio and video, and can capture mouse, keyboard, microphone and camera input.

**Introduction to Adobe Flash** - Overview of Adobe Flash for creating dynamic, interactive graphics. Exploring tools and interface. Learn to incorporate shapes objects and other media to develop professional presentation for video and web.

**Image, Audio & Animation** - Exploring the stage and property tools to assemble image, audio and make 2D animation. Learning pallets for preset parameters to deliver frame by frame animation.

**Drawing and Painting** - Creating line art and brush-based painting with flash. Explore the bucket and brush parameters to modify design in various interactive form.

**Text & Interactivity** - Making buttons, roll over and hyperlink properties with text and ty99pographic parameter. Using general snippets creating functional interactivity for rich media presentation.



**Action Script & Effects** – Understanding core concept of Adobe Flash programming learning the common syntax of action script 3.0 and action script 2.0.

**Exporting and Publishing** - Creating frame by frame motion, tweening and animation with proper workflows. Understanding the publish dialogue box for export parameters and publish in standard professional extensions.

**Module – II- Adobe Photoshop** (15Hrs.)

Adobe Photoshop is the predominant photo editing and manipulation software on the market. Its uses range from full featured editing of large batches of photos to creating intricate digital paintings and drawings that mimic those done by hand.

**Introduction to Adobe Photoshop** – This section will help introduce the student to digital image editing, creating a new file and familiarizing them with the various tools in Photoshop. Knowing when to use Photoshop.

**Working with Selection, Layers & Channel** – This section will help students learn how to use the selection tool, menu & choosing selections based on color.

**Using Paint, Paths, Shapes and Text Tools** – This section will help to learn to use different paint brushing techniques and customizing paint brush settings. Understanding how parts and shapes are manipulated and created. Learn to add text to images as vector objects.

**Working with Camera Raw** – Examining raw file types and displaying images in camera Raw. Understanding Raw workspace, creating altered versions of your images and exporting from the raw format.

**Working with 3D Images** – Understanding the 3D workspace and using different 3D file formats. Creating 3D objects, importing 3D objects into Photoshop and working with them.

**Working with Video and Animations** – Dealing with aspect ratio, opening video files and using a timeline panel. Trimming of video clips and rearranging video footage. Animating text and 3D objects using key frames.

**Advance Output Techniques** – Understanding color management, calibrating color profiles, configuring color management to print accurate colors.

**Textbook:**

3. Russell Chun, Adobe Flash Professional CC Classroom in a Book, Adobe, 2014.
4. Andrew Faulkner and Conrad Chavez, Adobe Photoshop CC Classroom in a Book, Adobe Press, 2015.

## References:

6. Fred Gerantabee, Adobe Flash Professional CS6 Digital Classroom, John Wiley & Sons, 2012.
7. Lisa Danae Dayley and Brad Dayleyz, Adobe Photoshop CC Bible, Wiley India Pvt. Ltd., 2014.
8. Angie Taylor, Design Essentials for the Motion Media Artist: A Practical Guide to Principles & Techniques, Focal Press, 2010.
9. <https://helpx.adobe.com/in/photoshop/tutorials.html>
10. <https://helpx.adobe.com/in/adobe-character-animator/tutorials.html>

## Lab: Creative Design & 2D Animation

**Marks: 50**

**Credits: 4**

**Total Hours: 60**

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14. Working with Software Layouts.
15. Photo Manipulation using shapes and pen tool.
16. Adjusting image brightness, contrasts, saturation and levels.
17. Mixing of different photographs to create a single image.
18. Working on transparent layers.
19. Changing the view size of a document, resizing files and adjusting resolutions, printing on different mediums.
20. Working with multiple shapes and objects.
21. Working with images and audios.
22. Working with objects in motion and animation of different shapes.
23. Drawing and painting using different tools.
24. Working with text animation and interactivity, action script and effects.
25. Exporting and publishing in different file products.
26. Creating animation for webpages and videos.

## Software

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- Adobe Photoshop
- Adobe Flash Professional / Animate
- GIMP (Open Source)

**Course Title: 3D Animation - II**  
**Course Code: MDF-SK5**  
**Marks: 50**  
**Total Hours: 30**  
**Credits: 02**  
**Course Prerequisites: 3D Animation – I (MDF-SK2)**

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**Course Objectives:**

- Use the basic knowledge acquired in combination with advanced level 3D modelling.
- Compose advance 3D animation characters for architecture, games, videos. Etc.

**Learning Outcome:** At the end of this course, students will be able to

- Identify the various modeling techniques.
- Associate how the different modeling techniques are used to model a 3D character.
- Model advanced 3D characters.

**SYLLABUS:**

**Module - I: Advance Modeling in 3d Animation**

**(10 Hrs.)**

**3D Assets Modeling** - Creating different 3d asset types and function for modeling scene hierarchy. Understand core concept of developing inter portability asset modeling including edit poly modeling, bezier modeling and sub-d modeling.

**Nurbs Modeling** - Exploring the non-rational B-spline techniques to build 3d objects from line projections. Understanding nurb isoparms, hulls and control vertex. Learning the parametric adaptation to modify object geometry according to suite.

**Patch Modeling** - Overview of quad based patch geometric data for advance nurbs modeling. Explore the parameters and various operation like lathe, revolve, birail and planer.

**Polygon Modeling** - Create 3d advance objects with use of quad surface poly. Exploring different parameter of component level modeling like vertex edge and face. Learning the tools for sub level polygon operation like extrude bevel and various definitive.

**Module – II - Material & Texturing and Virtual Camera**

**(10Hrs.)**

**Standard Materials** - Overview of shade materials to give color perception to 3d objects. Using nodes and connectors to channel color data for illuminating surface parametric representation.

**Slate Material Editor** - Explore one of the material controller sets of preset assembly. Learn to use compact node stack workflow for editing and making materials.

**Compact Material Editor** - Explore advanced material controller sets of preset assembly. Learn to use nonlinear node workflow for editing and making materials.

**Material Modifier** - Explore modifier functionality for controlling material look and development. Apply set of world space and object spec modifier to enhance color data.

**UV Mapping** - Overview of processing 3d objects to retain and apply 3d image or procedural texture in 0 and 1 space of quad poly adaptation. Learn the workflow of setting and manipulating face coordinate to create world space UV coordinate for material and shading.

**Concept of Virtual Cameras** - Exploring the parameters and operation of cameras for rendering and final output. Overview of camera properties to control depth, color, blur, material and scene content.

### **Module – III - Lighting, Rendering and Export**

**(10 Hrs.)**

**Lighting Techniques** - Overview of light panel with in depth study of standard and photometric lights. Creating light lister and referencing for advance light probe techniques.

**Standard and Photometric Lights** - Core concept of virtual light paradigms operation and relation. Explore the illumination model in various spaces like world view and local.

**Atmospheric and Render Effects** - Create background FX with render atmospheric tools. Learning the effects parameter functionality to control various effects for final render.

**Rendering with Mental Ray** - Overview of interface and operative nodes of Mental ray render engine. Learning advanced render algorithms Final Gather and Global illumination techniques. Explore core concept for calculating and finalising render outputs.

**Compositing with Video Elements** - Exploring render data composition in various formats and assembly. Learn to manipulate and modify editable video data from composite render elements.

**Video Post and Export** - Learn video post dialogue parameter to modify edit and deliver for final production output.

#### **Textbook:**

2. Kelly L. Murdock, 3ds Max Bible 2012, John Wiley & Sons Inc., 2012

#### **References:**

5. Jeffrey M. Harper, Mastering Autodesk 3ds Max, John Wiley & Sons Inc., 2013.
6. Isaac V. Kerlow, The Art of 3D Computer Animation and Effects, John Wiley & Sons, 2009.
7. <https://www.autodesk.com/education/home>
8. <https://www.youtube.com/watch?v=kqQmwXCH6w8>

## Lab: 3D Animation – II

**Marks: 50**

**Credits: 04**

**Total Hours: 60**

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11. Converting spline modelling into polygon modelling.
12. Creating of complex model using advance modelling tools.
13. Building an exterior using NURBS, patch and polygon modelling.
14. Understanding material editor in slate mode and compact material.
15. Solving UV and create a map for a given model.
16. Use max cameras to get the shot render from different angles.
17. Light up the interior scene using standard light in MAX.
18. Illuminate scene using photometric lights.
19. Create a daylight system using mental ray.
20. Take video output of a ten second after composting final scene.

## Software

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- Autodesk 3ds Max
- Blender (Open Source)

**Course Title: Project - First Year End**

**Course Code: MDF-SK6**

**Marks: 100**

**Credits: 06**

**Hours: 90**

**Course Prerequisites:**      **Drawing & Painting (MDF-SK1)**  
   **3D Animation - I (MDF-SK2)**  
   **Vector Graphics - Illustrator (MDF-SK3)**  
   **Creative Design & 2D Animation (MDF-SK4)**  
   **3D Animation – II (MDF-SK5)**

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## Project - First Year End – Part A – (50 Marks)

- **Logo Creation:** The student should create a logo based of his choice.
- **Corporate Branding:** The student should create layouts and design a company’s letterhead, envelopes, business cards, brochure, and banner stand.
  - Creating a Design – 10 Marks
  - Color Scheme – 5 Marks
  - Comprehension – 10 Marks

- Placements - 5 Marks
- Concept - 10 Marks
- Presentation - 10 Marks
  - Logo – 1 nos.
  - Corporate Branding – 5 nos.
    - Letterhead
    - Envelope
    - Business Card
    - Brochure
    - Banner Stand

**Project - First Year End – Part B – (50 Marks)**

- Model a building architecture. Map the project and take the final output into photo realistic JPEG file.
  - Creating a design – 5 Marks
  - Modelling – 5 Marks
  - Solving UVs – 10 Marks
  - Texturing – 5 Marks
  - Lighting – 10 Marks
  - Rendering – 5 Marks
  - Final Presentation – 10 Marks

# **Software Development**

## Yearwise Syllabus for 1.1.3 of NAAC Criteria I

**(Year 2017-18)**

### **B.Voc (Software Development)**

**Course Title:** Office Automation Tools **Course**

**Code:** COM- I.SD-SK1 **Marks:** 75

**Credits :** 03

**Total Hours:** 45 **Prerequisite Courses:**

#### **Nil Course Objectives:**

• The main objectives of this course to provides basic training of computer and its most common software use in office work..

#### **Learning Outcome:**

- To become proficient in using:
  - Spreadsheet Applications
  - Desktop Publishing Applications

#### **Syllabus:**

#### **PART-I**

#### **1: MS Excel and Open Office-Calc:**

[6Hrs]

Spread Sheet & its Applications, Opening Spreadsheet, Menus - main menu, Formula Editing, Formatting, Toolbars, Using Icons, Using help, Shortcuts, Spreadsheet types. Working with Spreadsheets- opening, Saving files, setting Margins, Converting files to different formats (importing, exporting, sending files to others), Spread sheet addressing - Rows, Columns & Cells, Referring Cells & Selecting Cells – Shortcut Keys. Entering & Deleting Data- Entering data, Cut, Copy, Paste, Undo, Redo, Filling Continuous rows, columns, Highlighting values, Find, Search & replace, Inserting Data, Insert Cells, Column, rows & sheets, Symbols, Data from external files, Frames, Clipart, Pictures, Files etc, Inserting Functions, Manual breaks, Setting Formula - finding total in a column or row.



## **2: Mathematical operations:**

[5Hrs]

(Addition, Subtraction, Multiplication, Division, Exponentiation), Using other Formulae. Formatting Spreadsheets- Labeling columns & rows, Formatting- Cell, row, column & Sheet, Category - Alignment, Font, Border & Shading, Hiding/ Locking Cells, Anchoring objects, Formatting layout for Graphics, Clipart etc., Worksheet Row & Column Headers, Sheet Name, Row height & Column width, Visibility - Row, Column, Sheet, Security, Sheet Formatting & style, Sheet background, Color etc, Borders & Shading – Shortcut keys. Working with sheets – Sorting, Filtering, Validation, Consolidation, and Subtotal. Creating Charts - Drawing. Printing. Using Tools – Error checking, Spell Checks, Formula Auditing, Creating & Using Templates, Pivot Tables, Tracking Changes, Security, Customization.

## **3: OpenOffice-Calc :**

[4Hrs]

Introduction – Introduction to Spreadsheets, Overview of a Worksheet, Creating Worksheet & Workbooks, Organizing files, Managing files & workbooks, Functions & Formulas, Working with Multiple sheets, Creating Charts & Printing Charts – Operating with MS Excel documents, which are already created and saved in MS Excel.

## **PART-II**

## **4: Adobe Page Maker**

[5Hrs]

**Basic concept:** Creating and opening publication, using the tool box, working with palettes, text and graphics, starting a publication from the template, saving and closing a publication. Tutorial - positioning ruler guides, typing text, formatting graphics. Creating columns, creating styles, changing type style and alignment. Rotating and moving of text block and graphics, placing text file, setting tab, indents, and leaders copying graphics between publication, positioning and resizing the logo.

## **5: Constructing a publication :**

[6Hrs]

setting up pages, changing document setup, using masterpages, choosing a measurement system and setting up rulers, adjusting layout, numbering pages, rearranging pages creating running header and footers importing text, threading text blocks, balancing columns, edit story. Customizing the dictionary, hyphenation, leading frames layers, locking, objects wrapping text around graphics cropping a graphic using libraries assembling publication into a book, indexing a publication , creating table of contents

,applying color, edit color creating custom color, color libraries table editor, importing, linking and exporting a graphic. OLE (object linking and embedding).TIFF image. PDF HTML formats printing of publication proof corrections with appropriate proof reading

marks. Typography - Types(Fonts), Type sizes, Different families , Point system and other system of measuring , Casting off, typography, proof reading, familiarization with symbols/proofreading marks used in marking copy, typescript for press, Determining line measure and depth and margins, House of style, Page composition through Page Maker.

## **6: Corel Draw:-Graphic design:**

[9Hrs]

Creating. Opening drawing. Setting up the drawing page. Using the rulers. Grid. And guidelines. Viewing document. Drawing and Shaping Objects:- Drawing. Moving & Shaping Object, drawing lines and curves, dimensions line. \* Working with Style & Templates Organizing Objects: Changing the order of objects. Grouping, Ungrouping locking and unlocking objects. Using and setting layers . Aligning & editing objects data. Working with pattern and texture draw. fills. Applying and editing line ending shapes, splitting and erasing portions of objects positioning moving stretching and rotating objects.

## **7: Working with multiple on screen color palettes:** [10Hrs]

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Adding graphics symbols and specials characters. Editing. Formatting text and paragraph. Hyphenating text. Linking paragraph text frames, using spell checker and grammar, using thesaurus. Creating and editing blends. Envelopes , Creating and modifying vector and bitmap. Extrusions. Creating drop shadows. Creating and editing transparencies, contoured. Objects, Working with linked bitmap, cropping, coloring and converting bitmaps. Applying special effects to bitmaps by 3D ,effects, blur effects, contour effects, Creating documents for various formats, using layout. Previewing sizing and positioning a print job. Creating color separations, working with halftone and bitmap screens Importing and exporting files. OLE (Object linking and embedding).

## **Text Book:**

1. PageMaker-Complete by R. Shamms, Mortier & Rick Wallacl ,Techmedia
2. Learning PageMaker 7 by Ramesh Bangia of Khanna Book Publishing Co Pvt Ltd
3. Straight to the Point – MS Office 2003 By Dinesh Maidasani, Publisher: firewall
4. Master Visually Microsoft Office 2003 By Michael S. Toot, Publisher: visual
- 5:Mastering Excel: Building Dashboards by Mark Moore
6. Mastering WORD 6 for Windows - Mansfield – BPB
7. Mastering EXCEL 4 for Windows - Townsend –BPB

**Lab : Office Automation Tools**

**Credit : 03**

**Marks: 75**

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Suggested list of Practical

**PART-I**

1. Using formulas and functions:

To prepare a Worksheet showing the monthly sales of a company in different branch offices (Showing Total Sales, Average Sales).

Prepare a Statement for preparing Result of 10 students in 5 subjects (using formula to get Distinction, I Class, II Class and Fail under Result column against each student).

2. Operating on the sheets:

Finding, deleting and adding records, formatting columns, row height, merging, splitting columns etc. Connecting the Worksheets and enter the data.

3. Creating a Chart:

To create a chart for comparing the monthly sales of a company in different branch offices.

4. Using the data consolidate command:

To use the data consolidate command to calculate the total amount budgeted for all departments

(wages, travel and entertainment, office supplies and so on) or to calculate the average amount budgeted for – say, department office expenses.

5. Sorting Data, Filtering Data and creation of Pivot tables

**PART-II**

CorelDraw/Page Maker

1. Introduction

2. Basic Drawing Skills

3. Using Text and Color

4. Working with Objects

5. Adding special effects

6. Creating output

7. Layout and layers

8. Styles and templates

9. Advanced Effects.

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**Course Title:** Web Designing  
**Course Code:** COM- I.SD-SK2  
**Marks:** 75  
**Credits :** 03  
**Total Hours:** 45

**Prerequisite Courses : Nil**

**Course objectives:**

- How to design good user interfaces covering important design principles such as learnability , visibility, error prevention, efficiency and graphic design

**Learning Outcomes:**

- Implementation of user interfaces following design principles and using technologies such as HTML, CSS, JavaScript and JQuery.

**Syllabus**

**1: User Interface** [6Hrs]

Introduction, its importance, design principles–learnability, visibility, error prevention, efficiency, graphic design. Design Patterns for GUI – View tree, Listener, Widget, Model-View-Controller. Approaches to GUI programming – Procedural, Declarative, Direct Manipulation. Web UI – HTML, Javascript, JQuery.

**2: Structure and Style with HTML and CSS** [6Hrs]

HTML: Introduction. The development process, basic HTML, formatting and fonts, commenting code, color, hyperlink, lists, tables, images, simple HTML forms, web site structure, Meta tags, Character entities, frames and frame sets.

**3: HTML5** [6Hrs]

Introduction, New Elements, Canvas, SVG, Drag/Drop, Geolocation, Video, Audio, Input types, form elements, form attributes, semantic, web storage, app cache, web workers, SSE

**4: CSS**

**[5Hrs]**

Introduction – Syntax, Id & Class, Backgrounds, Text, Fonts, Links, Lists, Tables. CSS Box Model – Border, Outline, Margin, Padding. Advanced - Grouping/Nesting, Dimension, Display, Positioning, Floating, Align, Pseudo-class, Pseudo-element, Navigation Bar, Image Gallery, Image Opacity, Image Sprites, Media Types, Attribute Selectors.

## **5: CSS3**

[5Hrs]

Introduction, Borders, Backgrounds, Gradients, Text Effects, Fonts, 2D Transforms, 3D Transforms, Transitions, Animations, Multiple Columns.

## **6: Javascript**

[10Hrs]

Introduction - What is JavaScript, Understanding Events, JavaScript Example, External JavaScript. Basic Elements – Comment, Variable, Global Variable, Data Types, Operators, If Statement, Switch, Loop: for and while, Function. JavaScript Objects – objects, Array. Browser Object Model - Browser Objects, Window Object, Document Object – getElementById, getElementsByName, getElementsByTagName, innerHTML property, innerText property. Validation- form validation, email validation.

## **7: Introducing jQuery**

[7Hrs]

JQuery : Introduction - Syntax, Selectors, Events. Effects- Hide/Show, Fade, Slide, Animate, stop(), Callback, Chaining. HTML/CSS- Add, Remove, CSS Classes, css(), Dimensions, slider. Traversing – ancestors, descendants, siblings, filtering.

### **Text Book:**

1. Elisabeth Robson, Eric Freeman, —Head First HTML and CSS, O'Reilly
2. Ivan Bayross, —HTML 5 and CSS 3 Made Simple, BPB publication
3. Kogent Learning Solutions Inc., —HTML5 Black Book: Covers CSS3, Javascript, XML, XHTML, Ajax, PHP and JQuery, Pearson Education.
4. Steven M. Jacobs, Ben Shneiderman, —Designing the User Interface : Strategies for effective human-computer interaction, 5<sup>th</sup> Edition, Pearson Education

**Lab : Web Designing**

**Marks: 75**

**Credits: 03**

**List of Assignments:**

- 1) Case studies to review UI designs
- 2) Create a HTML page with the following :
  - a) title heading paragraph emphasis strong and image elements
  - b) complex HTML table
  - c) simple HTML Form covering major form elements
  - d) Embed Video in an HTML page
- 3) Using CSS do the following :
  - a) Create a Navigation bar (with dropdown) with CSS
  - b) Create a CSS Grid
  - c) Create a CSS3 based button
  - d) make an image rounded shape
  - e) Create a CSS based sticky footer
  - f) Create CSS3 Corner Ribbon
  - g) Create CSS3 blurry text effect
  - h) Create CSS3 speech bubble shape
  - i) Create image cross fade with CSS3 transition
  - j) Set style for link hover active and visited states of hyperlink
- 4) Write JavaScript functions to :
  - a) accept a string as a parameter and converts the first letter of each word of the string in upper case
  - b) check whether a given credit card number is valid or not.
  - c) check whether a given value is an valid url or not.
  - d) check whether a given email address is valid or not.
  - e) print an integer with commas as thousands separators
  - f) remove items from a dropdown list.
- 5) Use JQuery to :
  - a) Disable buttons
  - b) Make textbox read only
  - c) Uncheck check boxes
  - d) Confirm again
  - e) Sort
  - f) Switch rows and columns

**A mini project combining all the technologies learnt using a front-end development framework such as bootstrap is recommended.**

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**Course Title :** Introduction to Programming

**Course Code:** COM- I.SD-SK3

**Marks :** 75

**Credits :** 03

**Total Hours:** 45

**Prerequisite Courses :** Nil

**Course Objectives :**

- To provide skills of data analysis using Python programming language.

**Learning Outcome:**

Students will learn Python programming, and apply it in data analysis & visualization.

**Syllabus**

**1: Introduction to Python** [3Hrs]

Motivation, programming paradigms, What Python can do, Python's technical strength, Python interpreter, Program execution, Execution model variations, How to run programs

**2: Basic Syntax** [6Hrs]

Variable and Data Types, Operator, Conditional Statements - if, if- else, Nested if-else. Looping – For, While, Nested loops. Control Statements – Break, Continue, Pass.

**3: String Manipulation** [5Hrs]

Accessing Strings, Basic Operations, String slices, Function and Methods.

**4: Lists** [3Hrs]

Introduction, Accessing list, Operations, Working with lists, Function and Methods

**5: Tuple** [4Hrs]

Introduction, Accessing tuples, Operations, Working, Functions and Methods

## 6: Dictionaries

[4Hrs]

Introduction, Accessing values in dictionaries, Working with dictionaries, Properties, Functions

**7: Functions** [6Hrs]

Defining a function, Calling a function, Types of functions, Function Arguments, Anonymous functions, Global and local variables

**8: Modules** [5Hrs]

Importing module. Math module. Random module. Packages. Composition

**9: Input-Output** [5Hrs]

Printing on screen, Reading data from keyboard, Opening and closing file, Reading and writing files, Functions

**10: Exception Handling** [4Hrs]

Exception. Exception Handling - Except clause, Try ? finally clause. User Defined Exceptions

**Text Book:**

1. Mark Lutz, Learning Python, O'Reilly Media, Third Edition, 2008

**Reference Books:**

1. Alex Martelli, Python – A Nutshell, O'Reilly Media, Second Edition, 2006

2. Wes McKinney, Python for Data Analysis, O'Reilly Media, 2012

**Lab:** Introduction to Programming

**Credit:** 03

**Marks:** 75

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List of Experiments using Python Language

- 1) Program to compute a given formula
- 2) if else
- 3) nested if else
- 4) loop
- 5) loop
- 6) string manipulation
- 7) string manipulation

- 8) list
- 9) tuple

- 10) dictionary
  - 11) function
  - 12) module
  - 13) Input-Output
  - 14) Input-Output
  - 15) exception handling
-

**Course Title:** Computer Organization and Operating System

**Course Code:** COM-II.SD-SK4

**Marks:** 75

**Credits:** 03

**Total Hours:** 45

**Prerequisite Courses :** Nil

**Course Objectives:**

- To have a thorough understanding of the basic structure and operation of a digital computer.

**Learning Outcome:**

- Understand the CPU architecture and organization.
- Study the hierarchical memory system.
- Study the different ways of communicating with I/O devices and standard I/O interfaces & management of the I/O device.
- Students will understand Memory Management

**Syllabus:**

**1: Computer System:** [3Hrs]

Function and structure of a computer, Interconnection of components, Performance of a computer. Computer Architecture – Princeton (Von Neumann) and Harvard architecture.

**2: Memory Subsystem:** [10Hrs]

Characteristics of memory system, the memory hierarchy, Semiconductor memories, Types of ROM & RAM, Cache memory unit - Concept of cache memory, Organization of a cache memory unit, replacement algorithms, write policy, block size.

**3: Input/ Output Subsystem:** [8Hrs]

General block diagram of External device & I/O module, Programmed I/O, Interrupt

driven I/O, DMA, I/O channels and I/O processors. I/O interfaces –Serial port, Parallel port, PCI bus, SCSI bus, USB bus, Firewire and Infiniband.

**4: Introduction to Operating System:** [4Hrs]

Basic elements of a computer system: Processor, Main Memory, I/O Modules, System Bus, Instruction Execution; Operating Systems: Definition, Operating system Structure, operating system operations, Relationship between Kernel, OS, and Hardware, Operating system services, System calls, Types of system calls, System programs.

**5: Process Management:** [5Hrs]

Process Definition, Process Control Block, Process States, Operations on Process; Interprocess communication, Threads and Microkernels

**6: Memory Management:** [10Hrs]

Introduction, Swapping, Contiguous Memory Allocation, Paging, Page Table, Segmentation  
Virtual Memory: Introduction, Demand Paging, Page Replacement, Allocation of Frames, Thrashing

**7: Storage Management** [5Hrs]

File System, Concepts, File Organization and Access Methods, Directory and Disk Structure. Secondary Storage Structure - Overview, disk structure, Disk attachment, Disk scheduling.

**Text Book:**

1. William Stallings, —Computer Organization and Architecture - Designing for performance, EEE, PHI, 9th Edition.
2. A. Silberchatz, Galvin, Gagne, 2008, Operating System Concepts, Wiley publication 8<sup>th</sup> Edition.

**Reference Books:**

1. M. Morris Mano, —Computer System Architecture, Pearson Education, 3<sup>rd</sup> Edition, 2008
2. William Stallings, Operating Systems: Internals and Design Principles, Prentice Hall, 6th Edition

**Lab:** Computer Organization and Operating System

**Marks:** 75

**Credits:** 03

### **PART-I**

Exploring the Functions and Components of a PC

1. Recognizing CPU Sockets, Removing and Installing a CPU, Cooling CPU
2. Identifying BIOS ROM, Accessing BIOS via the CMOS Setup Program, Configuring and Clearing CMOS Setup Program Passwords, Configuring BIOS Settings
3. Identifying Internal Expansion Slots, Installing Expansion Cards, Managing Hardware with Device Manager
4. Removing and Labeling Components and Cables, Removing a Motherboard, Identifying Motherboard Features, Researching New Motherboards, Installing a Motherboard.
5. Installing Parallel ATA Hard Drives, Installing Serial ATA Hard Drives, Configuring CMOS Settings, Comparing Solid-State Drives and Magnetic Hard Drives, troubleshooting Hard Drive Installations, Data Recovery from hard drive.
6. Installing Video, Configuring Multiple Displays.
7. Researching Laptop Upgrade Paths, Replacing and Upgrading RAM, Adjusting Power Management to Optimize Battery Life,
8. Examining Types of Printers, Installing a Printer, Maintaining and Troubleshooting Printers

### **PART-II**

1. Demo/Review of Installing Linux / Windows Operating System, Partitioning and formatting disk, Installing applications device drivers, working with files, mounting file systems, checking system space, creating, modifying and deleting user accounts
  2. Study of Basic commands of Linux.
  3. Shell Programming in Unix/Linux, arithmetic operations, loops
  5. Menu Driven Shell scripting
  6. Filters and Pipes in LINUX
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**Course Title:** Data Structure  
**Course Code:** COM-II.SD-SK5  
**Marks:** 75  
**Credits:** 03  
**Total Hours:** 45

**Prerequisite Courses :** Introduction to Programming(COM- I.SD-SK3)

**Course Objectives:**

To understand different methods of organizing data and efficiently implement different data structures.

**Learning outcome:**

On completion of the course student will learn:

- Different data structures like Stack, Queues, Linked Lists, Graphs and their applications.
- Implementation of data structures.

**Syllabus**

**1: Introduction to data structures** [3Hrs]

Concept, Data type, Data object, ADT, Need of Data Structure, Types of Data Structure

**2: Algorithm analysis** [3Hrs]

Algorithm – definition, characteristics, Space complexity, time complexity, Asymptotic notation (Big O)

**3: Linked List:** [8Hrs]

Introduction to List, Implementation of List – static & dynamic representation, Types of Linked List, Operations on List, Applications of Linked List, polynomial manipulation, Generalized linked list – concept & representation.

**4: Stacks:** [8Hrs]

Introduction, Representation-static & dynamic, Operations, Application - infix to postfix & prefix, postfix evaluation, Simulating recursion using stack.

**5: Queues:**

[5Hrs]

Introduction, Representation -static & dynamic, Operations, Circular queue, priority queue (with implementation), Concept of doubly ended queue.

**6: Trees:**

[10Hrs]

Concept & Terminologies, Binary tree, binary search tree, Representation – static & dynamic, Operations on BST – create, Insert, delete, traversals (preorder, inorder, postorder), counting leaf, non-leaf & total nodes, non recursive inorder traversal, Expression Tree.

**Graph:**

[8Hrs]

Concept & terminologies, Graph Representation – Adjacency matrix, adjacency list, Traversals – BFS & DFS, Application of BFS, DFS – Shortest path, Backtracking.

**Text Book:**

1: Data Structures and Algorithms in Python Roberto Tamassia, Michael H. Goldwasser Michael T. Goodrich, Wiley Student Edition

**Reference Books:**

1. Horowitz Ellis, Sahni Sartaj, *Fundamentals of Data Structures in C*, University Press, 2<sup>nd</sup> Edition, 2008.
2. Michael T. Goodrich, Roberto Tamassia, *Data Structures and algorithms in Java*, John Wiley & sons inc., 5<sup>th</sup> Edition, International Student version.
3. Langsam Yedidyah, Augenstein J. Moshe, Tenenbaum M. Aaron, *Data Structures using C and C++*, Pearson Education, Second Edition, 2009
4. Gilbeg Richard, Forouzan Behrouz, *Data Structures: A Pseudocode Approach with C++*, Cengage Learning, Second Edition

**Lab : Data Structures****Credit: 03****Marks: 75**

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Programs using C language / Java Language that covers the following concepts:

1. Stack: Static/Dynamic stack implementation.
2. Stack: infix to postfix.
3. Stack: Evaluation of Postfix expression.
4. Queues: Static and Dynamic Queue Implementation
5. Queues: Circular queue
6. List: Singly Linked List,
7. List: Doubly Linked List

**8. List: Circular Linked List**

**9. Linked List: Polynomial addition**

- 10.** Trees: Binary Search Tree: create, add, delete, display nodes.
  - 11.** Trees: BST traversal.
  - 12.** Graph: Representation of Graphs, Graph Traversals.
  - 13.** Graph: DFS, BFS.
-

**Course Title:** Multimedia  
**Course Code:** COM-II.SD-SK6  
**Marks:** 75  
**Credits:** 03  
**Total Hours:** 45

**Prerequisite Courses** Nil

**Course Objectives:**

- On completion of the course the students will develop specific skills and competencies by making them proficient in Designing Graphical Images, Audio and Video Capture and Editing using Software tools

**Learning Outcomes:**

- To study Multimedia Concepts
- To develop their Creativity and publish a self-contained multimedia Application using multimedia authoring tools in various application areas.

**Syllabus**

**1: Introduction to Multimedia:** [6Hrs]

Commonly used terms associated with multimedia like CDROM, Storyboard, Script and Authoring tools. Stages of a Multimedia Project: Planning and Costing, Designing and Producing, Testing and Delivering. The Multimedia team and their roles: Project Manager, Writer, Video specialist, Audio specialist and Multimedia programmer. Multimedia Software. Multimedia Hardware.

**2: Multimedia Authoring Tools:** [3Hrs]

Types of Authoring tools - card or page based tools, icon-based, event-driven tools, time-based

and presentation tools and object-oriented tools.

### **Multimedia Building Blocks:**

**3: Text** [4Hrs]

Designing with Text, menus and buttons for navigation ,Animating text,Hypermedia and Hypertext

**4: Sound** [6Hrs]

Basic Sound Concepts, Music,Speech, MIDI and Digital Audio

**5: Images** [8Hrs]

Making still images, Bitmaps, Clipart, Capturing and Editing Images,Scanning Images, Vector, Drawing, 3D Drawing and Rendering.

**6: Animation** [8Hrs]

Principles of Animation- persistence of vision, animation file formats Computer animation , kinematics and morphing, Making animations that work- a rolling ball, a bouncing ball and creating an animated scene.

**7: Video** [8Hrs]

Video Broadcast Standards- NTSC, PAL, SECAM, HDTV, Integrating Computers and, Television like Video Overlay Systems, Digitized Video Playback,, Differences between Computer and Television Video, Recording Formats like S-VHA Video, Component (YUV), Component Digital, Composite, Digital, Video Hardware Resolutions, Video Tips like Shooting platforms, Lighting, Chroma Key or Blue Screen, Video Compression methods like MPEG and DVI.

**8: Assembling and Delivering a project** [2Hrs]

The four primary navigational structures used in multimedia like linear, hierarchical, non-linear and composite

### **Text Book:**

1: Vaughan, Tay , —Multimedia: Making it Work, 3rd edition, Tata McGraw-Hill

### **Reference Books:**

1. Jeffcoate, Judith, —Multimedia in Practice, Technology and Applications, Prentice Hall India.
2. Buford, J.F. K , —Multimedia Systems, Pearson Education
3. Elson-Cook, —Principles of Interactive Multimedia, McGraw Hill Higher Education. ISBN-13: 978-0077096106

**Lab: Multimedia**

**Credit: 03**

**Marks: 75**

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 List of suggested **PRACTICALS** using any Multimedia Software (the numbers in brackets indicate number of practicals) :

1. Image Handling: Cropping an image, adjusting image size, increasing the size of the work canvas, saving an image (2P)
2. Layers: Adding layers, dragging and pasting selections on to layers, dragging layers between files, viewing and hiding layers, Editing layers, rotating selections, scaling an object, preserving layers transparency, moving and copying layers, duplicating layers, deleting layers, merging layers, using adjustment layers (2P)
3. Channels and Masks: Channel palette, showing and hiding channels, splitting channels in to separate image, merging channels, creating a quick mask, editing masks using quick mask mode (1P)
4. Painting and Editing: Brushes palette, brush shape, creating and deleting brushes, creating custom brushes, setting brush options, saving, loading and appending brushes, Options palette (2P)
5. Opacity, pressure, or exposure , paint fade-out rate, making selections, using selection tools, adjusting selections, softening the edges of a selection, hiding a selection border, moving and copying selections, extending and reducing selections, pasting and deleting selections (2P)
6. Sound : Recording Sound using Sound Recorder (Capture), Sound capture through sound editing software , Sound editing, Noise correction, Effect enhancement ; Voice Recognition; Importing audio and saving audio from Audio CD. Sound Quality types: CD Quality, Radio Quality, Telephone Quality (2P)
7. Video: Record video from video capture devices, webcams, screen capture or even streaming video and Video Editing (2P)
8. Mini Project/Problem Statement/Case Study (integrating the above experiments) (2P)

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**Course Title :** Object Oriented Paradigm

**Course Code :** COM-III.SD-SK7

**Marks :** 75

**Credits :** 3

**Total Hours:** 45

**Prerequisite Courses:** Nil

**Course Objectives:**

- To learn the basic concepts and techniques of object oriented programming paradigm
- To introduce object oriented programming (OOP) using Java.

**Learning Outcome:**

- Understand the concept and underlying principles of Object-Oriented Programming.
- Understand how object-oriented concepts are incorporated into the Java programming language.
- Develop problem-solving and programming skills using the OOP concept.

**Syllabus**

**1. Principles of OOP:** [3Hrs]

Programming Paradigms, Basic concepts, OOP: major principles - encapsulation, abstraction, inheritance, polymorphism. Benefits of OOP, Applications of OOP.

**2. Introduction to Java:** [6Hrs]

Basics of Java programming, Data types, Variables, Operators, Control structures including selection, Looping, Java methods, Overloading, java.Math class, Arrays in java.

**3. Objects and Classes:** [7Hrs]

Basics of objects and classes in java, Constructors, Finalizer, Visibility modifiers, Methods and objects, Inbuilt classes like String, Character, StringBuffer, File, this reference.

**4. Inheritance and Polymorphism:** [6Hrs]

Inheritance in java, super and sub class, Overriding, java.lang.Object class, Polymorphism, Dynamic binding, Casting objects, Instance of operator, Abstract class, Interface in java,

Package in java, java.util package.

**5. Event driven and GUI programming** [7Hrs]

Windows and Layout Manipulation, Dialogs (Message, confirmation, input), Event Handling:  
Event sources, Listeners, Mouse and Keyboard Event Handling

**6. Review on Exception Handling:** [6Hrs]

Exception handling – what and why? Try and catch block. Multiple catch blocks. Nested try, finally block, throw keyword, throws keyword. Custom Exception.

**7. Multithreading** [5Hrs]

Running and starting thread using Thread class. Thread priorities. Running multiple threads. The Runnable interface. Synchronization and inter thread communication.

**8. UML Diagrams** [5Hrs]

Class Diagrams ,Use case Diagrams,Sequence Diagrams

**Text Book:**

1. Mahesh Matha, “Core Java, A Comprehensive Study “, PHI, India
2. Deitel & Deitel, Java - How to Program, Prentice Hall Publications

**Reference Books:**

1. Patrick Naughton, Herbert Schildt, Java 2 – The Complete Reference, McGraw Hill Education (India) Pvt. Ltd., 2002.
2. Patrick Naughton, The Java Handbook, McGraw Hill Education (India) Pvt. Ltd., 1996.
3. Balaguruswamy E, Programming with Java – A Primer, McGraw Hill Education (India) Pvt. Ltd., 2009.
4. Flanagan David, Java Examples in a Nutshell, Spd/O'Reilly Reprint, 2nd Edition.
5. Gosling J, Arnold K, & Holmes D, The Java Programming Language, Addison-Wesley Professional, 3rd Edition, 2008.

**Lab: Object Oriented Paradigm**

**Credit: 3**

**Marks: 75**

Programs using Java language that covers the following concepts:

1. Classes and instances (1P)
  2. Working with the java.Math class (1P)
  3. Inheritance (2P)
  4. Polymorphism, abstract classes and interfaces (3P)
  5. Utilising the java.util package (1P)
  6. Collections framework (1P)
  7. Event handling and GUI (2P)
  8. Exception handling (1P)
  9. UML Diagrams(3P)
-

**CourseTitle:** Computer Networks

**Course Code:**COM-III.SD-SK8

**Marks:** 75

**Credits:** 3

**Total Hours:** 45

**Prerequisite Courses :**

- Introduction to Programming (COM-I.SD-SK3)

**Course Objectives:**

- To understand the basic concepts of Computer Networking
- Be familiar with the components required to build and design different types of networks.

**Learning outcome:**

- Gain Knowledge of the Reference models
- Understand basic concepts of data transmission medium, Compare various routing, transport protocols and Identify suitable protocol for a given network.
- Able to design the basic Computer network and maintain the networks
- Develop client server programs for different applications

**Syllabus :**

## **1. Introduction**

[8Hrs]

Basics of Computer Networks, Classification: transmission technology, scale; Applications; Data Communications: data, signal, bandwidth, bit interval and bit rate, Modes of Communication. Layered network architecture, Networks models: OSI model, TCP / IP protocol suite; Guided and Unguided Transmission media, Multiplexing: FDM, TDM. Switching: Circuit switching, message switching, Packet Switching.

## **2. Data link layer**

[12Hrs]

Data link control: Framing: Character Count, Character Stuffing, Bit Stuffing , Error Detection and correction, Flow and error control, HDLC; Multiple access: Random access – Controlled access , ALOHA, CSMA, CSMA/CD and CSMA/CA; Ethernet : IEEE standards, standard Ethernet, Fast Ethernet, Gigabit Ethernet; Connecting devices: repeater/hub, bridge, router and gateway, Backbone networks - Virtual LANS

## **3. Network layer**

[14Hrs]

Functions of Network layer; Network Service types: Virtual Circuits, Datagrams; Logical addressing: IPv4, private and public IP addressing, special IP addresses, subnetting, IPV6 addressing Internet Protocol: Internetworking:IPv4, Fragmentation and reassembly , Address mapping : ARP, RARP, BOOTP, DHCP, ICMP . Routing: classification of routing, Shortest path routing, Distance Vector routing, Link State routing

## **4. Transport layer and Application layer**

[9Hrs]

Process-to-Process delivery: User Datagram Protocol (UDP), Transmission Control Protocol (TCP), Quality of services (QoS); Application Layer: Domain Name System (DNS) , E-mail, FTP, HTTP.

## **5. Wireless Networks**

[2Hrs]

Basics of wireless networking.

### **Text Book:**

1. Andrew S. Tanenbaum, David J. Wetherall “Computer Networks”, Prentice-Hall, 5th Edition.

2. Behrouz A. Forouzan, “Data communication and Networking”, Tata McGraw – Hill, 2011, 4th Edition.

**Reference Books:**

1. James F. Kurose, Keith W. Ross, “Computer Networking – A Top-Down Approach Featuring the Internet”, Pearson Education, 2009, 5 th Edition,
2. Nader. F. Mir, “Computer and Communication Networks”, Pearson Prentice Hall Publishers, 2010.

**Lab :** Computer Networks

**Credits :** 3

**Marks :** 75

List of Practicals

1. Installing virtual machines, Ethernet cabling (1P)
  2. Study of network commands ping, ipconfig, netstat, traceroute (1P)
  3. Setting up of LAN Network (1P)
  4. IP address manipulation -Extract network id and Host id given netmask (1P)
  5. Mini Project / Packet capture tool/ packet generator tool (1P)
  6. UDP Socket programming (c/c++/Java/ Perl/Python ) (1P)
  7. TCP Socket programming –I (1P)
  8. Configuring VLAN (DLink Switch)/ TCP Socket programming –II (1P)
  9. Configuring routing tables (1P)
  10. Configuring DHCP server/client (1P)
  11. Configuring Telnet/SSH and ftp server. (1P)
  12. Firewall Configuring (1P)
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**Course Title:** Database Management System

**Course Code:** COM-III.SD-SK9

**Marks:** 75

**Credits:** 03

**Total Hours:** 45

**Prerequisite Courses:** Nil

**Course objectives:**

- To develop database model and apply to medium scale application.

**Learning Outcomes:**

- On completion of the course students will learn Database concepts and structures. They will be able to explain terms related to database design and management. Students will understand data modeling and database development process.
- Students will be able to construct and normalize data models and implement the same using any Relational Database Management System.
- Students will become proficient in using database query language, i.e. SQL.

**Syllabus**

**1. Introduction to Database Systems:** [3Hrs]

File Systems versus DBMS, The Relational Model, Levels of abstraction in a DBMS, Data independence, Structure of DBMS, Advantage of DBMS, People who deal with Databases.

**2. Conceptual design and ER model:** [8Hrs]

Overview of Database Design –The ER model-features, Key Constraints, Participation Constraints, weak Entities, Class Hierarchies, Aggregation.

**3. The Relational Model and SQL:** [14Hrs]

Attributes and domains, Relations, Integrity Constraints, Key Constraints, Foreign Key Constraints, General Constraints, Query Languages

SQL: The Form of Basic SQL query, Condition specification, SQL Join, Union, Intersect, Except, Nested queries - Aggregate Operators, updates, Null values, Embedded SQL, Triggers, Data Definition Language, Introduction to Database Security : views



**4. Indexing:** [3Hrs]

Properties of indexes: clustered vs unclustered indexes, dense vs sparse index, Primary vs secondary index.

**5. Schema Refinement and Normal forms:** [11Hrs]

Introduction, Schema Refinement, Functional Dependencies, Closure of a set of FDs and Attribute closure, Normal Form 1NF, 2NF, Third Normal Form, BCNF, Decomposition-Lossless-Join Decomposition, Dependency-Preserving Decomposition, Normalisation-Decomposition into BCNF, Decomposition into 3NF.

**6. Transaction:** [3Hrs]

The concept of transaction, transaction and schedule, Notion of consistency

**7: Latest Trends** [3Hrs]

NOSQL databases, Spatial Databases, Multimedia Databases, Distributed databases.

**Text Book:**

1. A Silberschatz, H F Korth, S Sudarshan, *Database system concepts*, McGraw-Hill ,sixth Edition

**Reference Books:**

1. Ramakrishan, J Gehrke, "*Database management systems*", McGraw-Hill , 3<sup>rd</sup> edition
2. R Elmasri, S B Navathe, "*Fundamentals of database Systems*", Pearson Education , 5<sup>th</sup> Edition

**Lab :** Database Management Systems

**Credit :** 3

**Marks :** 75

**List of Practicals**

1. ER diagram (2P)
  - a. ER diagram with specialization/generalization and aggregation.
  - b. Converting ER diagram to Schemas
  - c. Converting ER diagram with generalization/specialization, aggregation into schema
2. Studying RDBMS (2P)
2. Introduction to MySQL
  - a. Understanding client server architecture.
  - b. Installing a MySQL server and client
  - c. Creating databases in MySQL

3. SQL (5P)
  - a. Syntax
  - b. Insert, update, delete
  - c. Select
  - d. Aggregate functions
  - e. Wildcards
  - f. Aliases
  - g. in, union
  - h. joins
  - i. indexing
4. Transactions (1P)
5. Python database API (2P)

Tools like Mysql Workbench is recommended.

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**Course Title:** Web Development Framework

**Course Code:**COM-IV.SD-SK10

**Marks:** 75

**Credits:** 03

**Total Hours:** 45

**Prerequisite Course:**

- Web Designing(COM- I.SD-SK2)
- Introduction to programming(COM- I.SD-SK3)
- Object Oriented Paradigm(COM- III.SD-SK7)
- Database Management System(COM- III.SD-SK9)

**Course Objectives:**

- Introduction to the ReactJS JavaScript library for JS developers, starting from the very basics such as React components and JSX, props, state and more.
- Covers all the practical aspects of developing with React and managing data and server communication

**Learning Outcomes:**

- Understand the MVC architecture and use it to create applications.

**Syllabus**

**1: Introduction to react** [5Hrs]

History of front end libraries, Motivation for using React, Thinking in React, One way binding, JSX + CSS modules, Virtual DOM, ES6

**2: React components** [5Hrs]

Component lifecycle, Component API, Render functions, State, Props, Mixins

**3: Interaction between components** [15Hrs]

Passing data from parent to child, Passing data from child to parent, Passing data between 2 components at the same level, Forms, Refs, React-Router, API integration

#### **4: Introduction to Node**

[6Hrs]

Brief overview on the benefits of using Node.js and how Node.js is used in modern web development, Node and NPM, Introduction to setting up a Node.js project, Importing modules using npm, Using core modules to make HTTP requests and manipulate the file system.

#### **5: Introduction to the Express framework**

[9Hrs]

Set up a web server, Implementing API routing, Implementing middleware, Implementing URL parameters.

#### **6: Introduction to setting up MySQL**

[5Hrs]

Settings up a database and connecting it to a Node.js server, Storing and retrieving data from the database.

#### **Text Books**

1. Basarat Ali Syed Apress; Beginning Node.js , 1st ed. edition , 4 December 2014
2. David Herron, Node.JS Web Development , Packt Publishing Limited; 3rd Revised edition edition (27 June 2016)

#### **Reference Books**

1. Stoyan Stefanov, React Up Running Building Web Applications, Shroff Publishers & Distributors Pvt Ltd (1 August 2016)
2. Vipul Amler, and Prathamesh Sonpatki, ReactJS by Example- Building Modern Web Applications with React, Packt Publishing Limited (18 April 2016)

**Lab:** Web Development Framework

**Marks:** 75

**Credits:** 03

1. Creating simple web server. (1P)
2. Connect to MySQL database. (1P)

3. CRUD using PHP database API's. (4P)
    - a. Fetch data from a form, validate and insert in the database.
    - b. Delete data in the database.
    - c. Update data in the database
    - d. Display data from the database.
  4. Uploading files. (1P)
  5. Login functionality using sessions. (1P)
  6. Using cookies to store website data. (1P)
  7. Mini Project (3P)
-

**Course Title:** Agile Software Engineering  
**Course Code:** COM-IV.SD-SK11  
**Marks:** 75  
**Credits:** 3  
**Total Hours:** 45

**Prerequisite Courses :** Nil

**Course Objectives:**

- To apply agile and lean approach to software development.

**Learning outcome:**

- Plan and deliver an effective software engineering process, based on knowledge of widely used development lifecycle models.
- Develop Team working skills including general organization, planning and time management and inter-group negotiation.
- Develop pair programming, unit testing and refactoring skills.

**Syllabus**

**1: Software processes** [9Hrs]

Introduction- software definition, Software myths from managers, ‘users and developers’ perspective, Software characteristics, Why engineering approach, definition(s) of software engineering.Characteristics of software process. Software Development Processes and Methodologies: waterfall, prototyping, iterative, spiral, unified process, Agile methodologies

**2: Introduction to Agile** [5Hrs]

Defining Agility, Agile manifesto and principles, Benefits of an Agile approach, Introduction to scrum and XP .

**3:Project management using Scrum** [6Hrs]

Defining scrum, scrum origins, Scrum team structure, Roles - (Product owner, Scrum master,

development team), responsibilities and characteristics of each role. Sprints (timeboxed, short duration, consistent duration), sprint execution, sprint review. Requirements and user stories, product backlog, product backlog characteristics, flow management, estimation and velocity, scrum planning principles, planning (scrum planning principles, multilevel planning, portfolio planning).

#### **4: Extreme Programming**

[6Hrs]

Introduction to extreme programming, values, principles, Primary Practices - Sit together, Whole team, informative workspace, energized work, pair programming, stories, weekly cycle, quarterly cycle, Slack, Ten-minutes build, continuous integration, test first programming, incremental design.

Corollary Practices - Real Customer interaction, incremental deployment, team continuity, shrinking team, root-cause analysis, shared code, code and tests, single code base, incremental deployment, Negotiated scope contract, Pay-per-use

XP team - testers, interaction designers, architects, project managers, product managers, executives, technical writers, users, programmers, human resources, roles

#### **5. Test Driven Design- Refactoring, Unit Testing and Pair programming**

[12Hrs]

What is refactoring, why refactoring, principles of refactoring, bad smells and related refactorings. Unit testing- test case design, test suite. Pair programming- roles of driver and navigator, shifting roles, advantages of pair programming. Behavior driven design- brief introduction

#### **6. Version management using Git**

[4Hrs]

Version management, repository, pushing and pulling source code, branches, merging.

#### **7. Lean Software Development**

[3Hrs]

Introduction to lean, lean principles - Eliminate waste, Amplify learning, Decide as late as possible, Deliver as fast as possible, Empower the team, Build integrity in, See the whole.

#### **Text Book:**

1. Mike Cohn, Succeeding with Agile: Software Development Using Scrum, Addison Wesley
2. Kent Beck, Cynthia Andres, Extreme Programming Explained: Embrace Change (XP Series), 2nd Edition

#### **Reference**

#### **Books:**

1. Martin Fowler, Refactoring , Addison Wesley, 3rd Edition
2. Pankaj Jalote ,An Integrated Approach to Software Engineering . Narosa Publishing House, 2nd Edition.

### **ReferenceBook**

1. Mike Cohn ,User Stories applied-For Agile Software Development, Pearson Education; First Edition edition (2016)
2. Mike Cohn ,Agile Estimating and Planning, Prentice Hall; 1 edition (November 11, 2005)
3. Mary Poppendick ,Addison Wesley - Lean Software Development - An Agile Toolkit

**Lab:** Agile Software Engineering

**Credit:** 3

**Marks:** 75

**List of practicals**

**(using Eclipse workbench with plugins)**

1. Junit Testing (6P)
  2. Refactoring (6P)
  3. Git & Git hub(1P)
  4. BDD using cucumber (1P)
-



**Course Title:** Mobile Application Development

**CourseCode:**COM-IV.SD-SK12

**Marks:** 75

**Credits:** 3

**Total Hours:** 45

**Prerequisite Courses :**

Object Oriented Paradigm(COM-III.SD-SK7)

Web Designing(COM-I.SD-SK2)

Database Management System(COM-III.SD-SK9)

**Course Objective:**

To develop applications for mobile devices, including smart phones and tablets, introduced to the current mobile platforms, mobile application development environments and mobile device input methods.

**Learning Outcome :**

Upon successful completion of the course, the student will demonstrate the ability to:

- Explain mobile devices, including their capabilities and limitations.
- Review current mobile platforms and their architectures.
- Develop mobile applications on a popular mobile platform.
- Evaluate development with another mobile platform.

**Syllabus**

**1: Introduction to mobile devices**

[3Hrs]

Mobile devices vs. desktop devices, Why we Need Mobile App, Different Kinds of Mobile Apps, ARM and intel architectures, Power Management, Screen resolution, Touch interfaces, Application deployment - App Store, Google Play, Windows Store, Development environments – Android Studio, PhoneGAP, Native vs. web applications.

**2: Mobile OS Architectures**

[3Hrs]

Comparing and Contrasting architectures of Android, iOS and Windows, Underlying OS (Darwin vs. Linux vs. Windows ), Kernel structure and native level programming, Runtime (Objective-C vs. Dalvik vs. WinRT), Approaches to power management, Security.

**3: Android overview** [4Hrs]

Introduction to Android. Overview of android stack, Introduction to OS layers, Android features. Linux Kernel, Libraries, Android Runtime, Application Framework, Dalvik VM

**4: Android Components – Introduction** [4Hrs]

Activities, Services, Broadcast Receivers ,Content Providers.

**5: Building UI with Activities** [5Hrs]

Activities, Views, layouts and Common UI components, Creating UI through code and XML, Activity life cycle, Intents, Communicating data among Activities.

**6: Advanced UI** [5Hrs]

Selection components (GridView, ListView, Spinner ), Adapters, Custom Adapters, Menus, Toast, Custom Toast, Dialogs, Status bar Notifications.

**7: Intent, Intent Filters and Broadcast Receivers** [5Hrs]

Role of filters, Intent-matching rules, Filters in your manifest, Filters in dynamic Broadcast Receivers, Creating Broadcast receiver, Receiving System Broadcast, Understanding Broadcast action, category and data, Sending Broadcast.

**8: Data Storage** [6Hrs]

Shared Preferences, Android File System, Internal storage, External storage. SQLite Introducing SQLite, SQLiteOpenHelper and creating a database, Opening and closing a database, Working with cursors, inserts, updates, and deletes.

**9: Services** [5Hrs]

Overview of services in Android, Implementing a Service, Service lifecycle, Inter Process Communication (AIDL Services). Web Services and WebView - Consuming web services, Receiving HTTP Response (XML, JSON ), Parsing JSON and XML, Using WebView.

**12. Firebase** [5Hrs]

Introduction to Firebase and cloud messaging, real time database, authentication.

**Text Books:**

1. Wei-Ming Lee ,Beginning Android 4 Development, John Wiley & Sons
2. Satya Komateneni, Dave MacLean Pro Android 4 (Apress)

**Reference Books:**

1. Ed Brunette -Hello Android - Introducing Google's Mobile Development platform - The Pragmatic Bookshelf
2. Onur Cinar, Android Apps with Eclipse (Apress) ,1st Edition

**Lab:** Mobile Application Development

**Credit:** 3

**Marks:** 75

**List of practicals**

1. Getting Started with Android – Installing the Development Environment, Configuring Android Stack (1P)
  2. Creating the First Android Application - Creating a Simple Android Project, Debugging Application through DDMS. setting up environment. AVD Creation, Executing Project on Android Screen. (2P)
  3. Android application development - Use of GUI components to implement a simple application such as a Calculator. (1P)
  4. Review the earlier application making use of the advanced UI components. (1P)
  5. Implementing Data storage application - an application to make Insert , update , Delete and retrieve operation on the database. (2P)
  6. Optimizing your app performance with Services/Multithreading/Multiprocessing (1P).
  7. Libraries(2P)
  8. Firebase(3P)
  9. Mini Project (2P)
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**Course Title:** Mathematical Foundation of Computer Science

**Course Code:** COM-II.SD-G5

**Marks:** 100

**Credits:** 4

**Total Hours:** 60

**Prerequisite Courses :** Nil

**Course Objectives:**

- To build mathematical foundations that are essential requirement in understanding various concepts related to computer science.

**Learning Outcome:**

On completion of the course students will learn the concepts of the following:

- Combination and permutation.
- Numbers systems and conversions
- Boolean Algebra and Logic
- Set, Relations and Functions

2. **Combinatory:** [10Hrs]

Permutations; Combinations; Counting; Summation; generating functions; recurrence relations.

3. **Binary Number System:** [10Hrs]

Decimal to binary conversion and vice versa, binary number representation (signed, 1's Complement and 2's complement) binary addition, subtraction, binary to octal, hexadecimal conversion and vice versa. Floating point representation.

4. **Boolean Algebra:** [10Hrs]

Boolean functions, truth table, DeMorgan's theorem, logic gates, Realization of Boolean Function using logic gates, Simplification using Karnaugh map.

**5. Set, Relations and Functions:**

[10Hrs]

Venn diagram, set operations, relations and properties, closures, equivalence relations, Partial ordering, functions, function types, inverse of functions, composition of functions, recursive functions, growth of functions.

**6. Logic:** [8Hrs]

Propositional logic, first order logic, mathematical induction, deduction, proof by contradiction, program correctness.

**7. Linear Algebra** [12Hrs]

Adjoint, inverse of a matrix; Rank; Linear equations; Characteristics roots and vectors

**Text Book:**

1: Rosen H. Kenneth, *Discrete Mathematics and its Applications*, Tata McGraw Hill, seventh edition, 2011.

**Reference Books:**

1: Sarkar Kumar Swapan, *A Textbook of Discrete Mathematics*, S Chand & Company, 2005.

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**Course Component:** Foundation Course

**Course Title:** Academic Writing

**Course Code:** D-2

**Course Credits:** 4

**Number of Hours:** 60

This course introduces students to basic concepts and conventions of Academic Writing. It focuses on Academic Essay Writing in the form of – Expository, Argumentative and Compare & Contrast essays. It will include modules on writing a Paragraph, paraphrasing, summarizing and editing essays. The main aim of the course is to develop academic writing skills. The modules will include topics on developing coherent, compelling lines of argument as required to develop a student's thought process and writing skills.

**Course Objectives:**

- To provide valuable practice of essential academic structures, vocabulary, and organizational patterns
- To ensure that students will attain a level of writing expected by an academic audience.
- To enable students to understand a variety of academic genres.
- To ensure that students understand how to document their sources appropriately i.e use of citations and works cited/references.
- To ensure that students learn to quote, paraphrase, and summarize information accurately and with confidence
- To help students develop a formal tone and style (registers) expected in academic writing

**Learning Outcomes:**

- Students will gain a complete understanding of each stage of writing process Students will attain
- practical experience of writing essay outlines, editing drafts, and producing a completed essay for each of the three essay types.
- Students will learn to use sources and incorporate them effectively into an essay, adding valuable evidence and authority to an essay.
- Student will develop a strong academic vocabulary using transitional words and comparison and contrast phrases.

## **Course Content**

### **Unit 1: Writing a Paragraph *10 Lectures***

Brainstorming

Writing a coherent paragraph

Editing a paragraph

Transitional words and phrases

### **Unit 2: Writing an Academic Essay *10 Lectures***

Generating thesis statement

From a Paragraph to an Essay

Essay Structure

Editing an Essay

Writing an Expository Essay

### **Unit 3: Writing an Argumentative Essay *10 Lectures***

- Developing and Organizing Arguments
- Supporting Arguments
- Strengthening Arguments
- Reporting Verbs and Tones
- Editing an Argumentative Essay

### **Unit 4: The Compare and Contrast Essay *10 Lectures***

- Compare and Contrast Essay Structure
- Useful Vocabulary and Style
- Editing compare and contrast essays

### **Unit 5: Working with sources *10 Lectures***

- Avoiding plagiarism
- Selecting resources
- Citing the sources of information
- Citations, quotations and integration

### **Unit 6: Working with drafts *10 Lectures***

- Drafting
- Revising and Proof reading



## Primary References

- Fowler, R.H., Aaron, J.E. & McArthur, M., 2005. *The Little Brown Handbook*. 4th ed. Toronto: Pearson Longman.
- Harris, M., 2008. *Prentice Hall Reference Guide*. 7th ed. New Jersey: Pearson Prentice Hall.
- Heather, A., Lucille, S., Karen, T. & Kathleen, J.-C., 1995. *Thinking It Through: A Practical Guide To Academic Essay Writing*. 2nd ed. Peterborough: Academic Skills Centre Trent University Peterborough.
- Hurling, S. et al., 2007. *Academic Writing Skills and Strategies II*. Shinjuku-ku: Waseda University International Co., Ltd.
- Troyka, L.Q. & Hesse, D., 2005. *Simon & Schuster Handbook For Writers*. 4th ed. Toronto: Pearson Prentice Hall.
- Graff, G., & Birkenstein, C. (2006). *"They Say/I Say"*. New York: W.W. Norton & Company Ltd.

## Mode of Teaching the Academic Writing Paper

- Lectures/sessions for Units I to VI: (60 hours in a semester)
  - All lectures/sessions involving Units I to VI are to be conducted through regular lectures/contact sessions.
  - The content delivery methods will be power point presentations, group discussions, practicals and class tests
  - Continuous assessments of the course work for 40 marks will be conducted for Units I to VI.
  - The term paper will be of 60 marks.

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