



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

1.1.3

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

2022-23

Biotechnology

Skill Enhancement Course: Food and Fermentation Technology

MODULE 1: Introduction to Fermentation technology and production of foods from cereals (Total: 15 hours)

1.1: Introduction to fermentation technology (fermenters, microorganisms) and significance of fermented foods (2h)

1.2: Introduction, History, Action of microorganisms/ metabolites/ enzymes, Processing and storage of: (3h)

(a) Idli/Dosa/sanna

(b) Bread

(c) Dhokla

1.3: Activities based on the above 2 units (10h)

MODULE 2: Fermented Beverages (Total: 15 hours)

2.1: Introduction, History, Action of microorganisms/ metabolites/ enzymes, Processing and storage of: (4h)

(a) Beer

(b) Fermented juices (eg. apple)

(c) Vinegar

(d) Wine

2.2: Activities based on the above unit (11h)

MODULE 3: Fermented Non-dairy products (Total: 15 hours)

3.1: Introduction, History, Action of microorganisms/ metabolites/ enzymes, Processing and storage of: (3h)

(a) Tofu

(b) Sauerkraut

(c) Miso

3.2: Activities based on the above unit (12h)

MODULE 4: Fermented Dairy products (Total: 15 hours)

4.1: Introduction, History, Action of microorganisms/ metabolites/ enzymes, Processing and storage of: (3h)

(a) Yoghurt

(b) Cheese

(c) Cultured buttermilk

4.2: Activities based on the above unit (10h)

4.3: Fermented foods for better gut health (2h)

SEMESTER III/IV

SKILL ENHANCEMENT COURSE:
NUTRACEUTICAL PRODUCT DEVELOPMENT

COURSE CODE:	SEC
MARKS:	100
CREDITS:	4
CONTACT HOURS:	Theory: 15 Hours Practice hours: 45 Hours
COURSE OUTCOMES:	On the successful completion of the course, students will be able to: CLO1: Explain the concept of nutraceuticals and functional foods. CLO2: Extract and estimate bioactive compounds from plant and animal sources. CLO3: Discuss the trends in the nutraceutical industry and perform market research. CLO4: Understand the process of nutraceutical product development.

NUTRACEUTICAL PRODUCT DEVELOPMENT

MODULE	TOPICS	CONTACT HOURS	TOTAL HOURS
MODULE 1: Introduction to Nutraceuticals	<p>1.1: Nutraceuticals: Definition and Classification, dietary supplements, novel foods, post-biotics, fortified foods and functional foods.</p> <p>1.2: The Nutraceutical Industry: Indian and global scenario</p> <p>Activities based on module 1: Analysis of reports, market trends and projections, choosing topic for mini-project</p>	03 02 10	15
MODULE 2: Phyto-Nutraceuticals	<p>2.1: Plant Based Nutraceuticals Plant secondary metabolites, Concept of cosmeceuticals and aquaceuticals.</p> <p>2.2: Popular Phyto-nutraceuticals Glucosamine from ginseng, Omega-3 fatty acids from linseed, Epigallocatechin, gallate from green tea, lycopene, polysaccharides from seaweeds.</p> <p>Activities based on module 2: Extraction of phytochemicals, antioxidant assay</p>	02 02 11	15
MODULE 3: Animal Based Nutraceuticals	<p>3.1: Animal Based Nutraceuticals Chitin, chitosan, glucosamine, chondroitin sulphate and other polysaccharides, protein isolates and omega-3 fatty acids of animal origin and marine sources</p> <p>Activities based on module 3: Extraction of chitin and chitosan production from seafood waste and fungi</p>	04 11	15
MODULE 4: Product development	<p>4.1: Efficacy, Safety and Toxicity of nutraceuticals, Regulatory bodies, QC, QA, FSSAI</p> <p>4.2: Mini project: Case studies on product development (paediatric/geriatric/lactose intolerant/supplements during pregnancy/protein supplements/diabetes)</p>	02 13	15

REFERENCES

Mandatory Reading

- A.P. Sarkate, M.A. Patil and P.V. Agharde, (2021) Nutraceuticals and Human Health. Brillion Publishing. New Delhi, India.

Supplementary Reading

- Pathak Y. V. (2009) Handbook of Nutraceuticals Volume I- Ingredients, Formulations, and Applications CRC Press, Florida, USA
- Gupta, R.C. (2016) Nutraceuticals- Efficacy, safety and Toxicity. Elsevier, Massachusetts, USA.

Web References

- <https://www.classcentral.com/course/swayam-functional-foods-and-nutraceuticals-14069>
- New Concepts in Nutraceuticals as Alternative for Pharmaceuticals
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4336979/>
- <https://www.escardio.org/Journals/E-Journal-of-Cardiology-Practice/Volume-9/Nutraceuticals-what-they-are-and-how-they-work>
- <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4336979/>

Botany

COURSE TITLE: MICROBIOLOGY

(THEORY) COURSE CODE: BOT.II.C-4

MARKS: 100 (75 Theory+ 25 Practicals)

CREDITS: 4 (3 Theory+ 1 Practical)

COURSE DURATION: 45 HOURS

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, its 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: Upon successful completion of the course, students will be able to:

CO1 : Appraise the students to the fundamental basis of all living organisms (Plant and Microbes)

CO2 : Relate interaction of microbes with plant and the environment.

CO3 : Describe, demonstrate and Assess methods of microbial preparation.

CO4 : Understand applications of the microbes in food, agriculture and industry with sustainable usage of resources for the benefit and human survival.

Sr.No.	TOPICS	Hours
Module I: Overview of microbial world & development		15
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, satellite viruses.	
1.3	Distribution of microbes in the environment (air, soil & water) Scope of microbiology and Microbial diseases	

Module 2: Isolation, characterization, growth of microorganisms & microbial genetics		15	
2.1	Control of microbial growth: Biochemical characterization & nutritional types; Sterilization techniques,		
2.2	Preparation of pure cultures; growth factors & growth curve.		
2.3	Staining techniques		
2.4	Bacterial Reproduction: Conjugation, Transformation & transduction;		
2.5	Methods of viral replication (Lytic & Lysogenic mode)		
Module 3: Application Microbiology		15	
3.1	Applications in Environment: Applications of microbes in environment sustenance (microbial degradation of cellulose, hemicelluloses, lignin, biodegradation of hydrocarbons),		
3.2	Applications in Agriculture: Association of plants with cyanobacteria, actinomycetes, fungus; Xenobiotics (biodegradation of pesticides, herbicides, metals) biofuels		
3.3	Applications in Medicine: Microbial antibiotics		
3.4	Applications in Industry: Microbes in Fermentation technology & dairy industry, bioreactors, UASB reactor and tricking filters for waste water treatment		
		TOTAL	45

COURSE TITLE: MICROBIOLOGY (PRACTICAL)

COURSE CODE: BOT-II.C-4

MARKS: 25

CREDITS: 1

COURSE DURATION: 15 SESSIONS

Sr.No.	Topics	Practical Sessions
1	Preparation of culture media for bacteria, pure cultures and aseptic transfer of pure culture	3
2	Staining of microorganisms (Gram staining)	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
TOTAL		15

REFERENCES:

1. Aneja, K. R. (2007). *Experiments in Microbiology Plant Pathology & Biotechnology*. 5th ed. New Age International Publishers.
2. Atlas, R. M. (1997). *Principles of Microbiology*. 2nd ed. McGraw-Hill
3. Dubey, R.C & Maheshwari, D.K. (2002). *Practical Microbiology*. New Delhi: S. Chand & Company Ltd.
4. Frazier, W.C. and Westhoff, D.C. (2008). *Food Microbiology*. 4th ed. McGraw Hill.
5. Pelczar, M. (2000). *Microbiology*. 5th ed. Tata-McGraw Hill.
6. Powar, C. B. & Dagainawala, H.F. (1982). *General Microbiology*–Volume II. Mumbai: Himalaya publishing house.
7. Prescott, H. (2008). *Microbiology*. Boston: McGraw-Hill Higher Education.
8. Prescott, L. M. (2005). *Microbiology*. 6th ed. McGraw-Hill.

9. Salle, A. J. (1999). *Fundamental Principles of Bacteriology*. 7th ed. Tata- McGraw Hill.
10. Shivkumar, P. K., Joe, M. M. & Sukesh, K. (2010). *An Introduction to Industrial Microbiology*. 1st ed. New Delhi: S. Chand & Company Pvt. Ltd.

Sociology

2. Elective Course Title: INTRODUCTION TO QUALITATIVE RESEARCH METHODS

COURSE CODE: SOC.E.2

Credits: 04

Marks: 100

Hours: 60

Each Course shall have sixty lectures of one hour duration i.e. four lectures per week over a period of fifteen weeks of a semester.

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. Explain the fundamentals of qualitative research.
2. Illustrate the use of Qualitative methods in order to undertake a research.
3. Justify the need of ethics in Qualitative research.
4. To design a research proposal based on Qualitative methods.

Course Content

- | | |
|---|-----------------|
| 1: Introduction | 10 hours |
| 1.1 Introduction to qualitative research. | |
| 1.2 Understanding qualitative methods. | |
| 1.3 Qualitative research ethics. | |
| 2: Qualitative Interviews | 10 hours |
| 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. | |
| 3: Case Study | 10 hours |
| 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.

3. Elective Course Title: INTRODUCTION TO NGO MANAGEMENT

Course Code: SOC-E.3

Credits: 04

Marks: 100

Hours: 60

Each Course shall have sixty lectures of one hour duration i.e. four lectures per week over a period of fifteen weeks of a semester.

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, 7th 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.

4. Elective Course Title: GLOBALIZATION AND NEW MEDIA (DIGITAL STORY TELLING)

Course Code: SOC.E.4

Credits: 4

Marks 100

Duration 60 hour

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. Create structure story.
2. Apply Voice recording and editing.
3. Demonstrate basic editing by using Picture.
4. Employ Video filming and basic editing.
5. Apply free ready to use software for merging sound and images.
6. Design and create stories in digital form from Sociological perspective.

Each Course shall have sixty lectures of one hour duration i.e. four lectures per week over a period of fifteen weeks of a semester.

Course Contents

- | | |
|---|-----------------|
| 1. Globalisation and the role of media | 10 hours |
| 2. Digital Story Telling (using images only) | 20 hours |
| 2.1: Structuring a story | |
| 2.2: Editing pictures | |
| 2.3: Voice recording | |
| 2.4: Making of DST | |
| 3. Video Filming and Editing. | 15 hours |
| 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.

Course Title: INTRODUCTION TO SOCIAL WORK

Course Code: **SOC.E-12**

Marks: 100

Credits: 4

Each Course shall have sixty lectures of one hour duration i.e. four lectures per week over a period of fifteen weeks of a semester.

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. Explain the evolution of social work in India and the World.
2. Illustrate the ethics and process of social work.
3. Demonstrate the structure of agencies in social work.
4. Present their experiences of working with a agency.
5. Present the role of Voluntary action in Social Work.
6. Apply a Social Work approach for the welfare of people.

Course Content

1. Introduction to Social Work	10 hours
1.1 Evolution of Social Work in America	
1.2 Evolution of Social Work in Europe	
1.3 Evolution of Social Work in India	
2. Social Work and Social Welfare services in India	15 hours
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	
3: Social Work Ethics	15 hours

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

SKILL ENHANCEMENT COURSE (SEC)

Course Title : **EXPLORATORY DRILLING AND DRILLHOLE DATA MANAGEMENT**

Course Code : **UG-GEL-SEC1**

Credits : **03**

Marks : **50**

Duration : **30 hours**

Course Objectives

Drilling is the ultimate test to all geological interpretations made during the prospecting phase. Invariably, it is an essential task that needs to be taken up to complete any exploration project related to ground water, oil & gas or mineral prospecting. The objective of this course is to provide the students an understanding of the various processes involved in a drilling project and the role of a geologist in it. The course focuses on developing skills pertaining to drillhole data management using Ms Excel.

Course Learning Outcomes

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

CLO1 Explain the stages of an exploratory drilling program.

CLO2 Explain the processes involved in collection of drillhole data.

CLO3 Create Excel tables for managing drilling data and construct a dummy drillhole database in
MS Excel

Module I

(15 hours)

Introduction to Drilling: Purpose and Types of drilling

Planning a drilling Programme

Outline of a drilling contract

Defining job responsibility: Driller and the geologist

Drill site hazards: Environment and Safety

Site preparation

Measures needed to abandon drilling site

Module II

(15 hours)

Drill hole data Management

Daily drilling report

Survey data- drill hole location and drillhole deviation

Geological data- Geological map, Borehole logging, sampling data

Quality Assurance and Quality Control (QAQC)

Management of drill hole data in excel: Types of files (mandatory and optional files)

Practical : 1 credit

(30 hours)

Marks : 25

- Excel Tables for managing and reporting of drilling data
- Creating digital borehole logs
- Constructing and analysis of QAQC data: scatter plots and control charts
- Creating a drillhole plan and cross sections manually
- Create a drillhole database in MS Excel

- Importing the database into QGIS and viewing the drillholes in 3-D. (demonstration)

List of books recommended for reference

- Abzalov, M. (2016). Applied Mining Geology. Switzerland: Springer International Publishing.
- Marjoribanks, R. (2010). Geological Methods in Mineral Exploration and mining (Second Edition ed.). New York: Springer Heidelberg Dordrecht London.
- Charles J. Moon, M. K. (2005). Introduction to Mineral Exploration. Oxford, UK: Blackwell Publishing.

Course Title : **FIELD TECHNIQUES FOR GEOLOGICAL MAPPING**
Course Code : **UG-GEL-SEC2**
Credits : **03**
Marks : **50**
Duration : **30 hours**

Course Objectives:

Earth materials and structures can be studied better when seen with related features, this is where field study becomes an important part of learning geology. The objective of this course is to offer the students a basic knowledge of performing a field study. This includes understanding map basics, getting acquainted with the geological equipment, making field observations, and recording it in a systematic manner.

Course Learning Outcomes

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

CLO1 Read a geological map and toposheet

CLO2 Use a clinometer compass

CLO3 Make field observations and record them systematically

Module I

(15 hours)

Field Geology in General: Aims and Objectives

Outcrop and exposure

Topography and features

Toposheets: Toposheet Indexing and Scale

Reading a Geological Map and Scale

Maintaining a Field diary

Reconnaissance studies: field equipment and their utility in the field

Compass: Clinometer working and use

Module II

(15 hours)

Bearings: Whole Circle Bearings (WCB), Quadrantal Bearings (QB).

Measuring distances

Map Symbols- Attitude of the bed, Structural features.

Observations done in field.

Collecting Rock samples in field.

Surveying

Preparing Geological Field Report.

Practical : 1 credit

(30 hours)

Marks : 25

Plane Table Survey

Geological Field Work and Report Writing

List of books recommended for reference:

- Lisle R., Brabham P and Barnes J., (2011) Basic Geological Mapping (Geological Field Guide), Wiley Blackwell.
- Gokhale, N W., (2001) A Guide to Field Geology, CBS Publishers & Distributors.
- Lambert, D A., (1998) Field Guide to Geology, Facts on File Inc.

- Compton, R R., (1985) *Geology in the Field*, John Wiley & Sons, Inc.
- Compton, R R., (1962) *Manual of Field Geology*, John Wiley & Sons, Inc.

Annexure II
SKILL ENHANCEMENT COURSE (SEC) – SEMESTER III

Course Title : **GEMMOLOGY**
Course Code : **GEL-III.SEC-1A**
Credits : **4 (60 Contact hours)**
Marks : **100**

Course Objectives

To introduce students to the scientific identification of gemstones.

Course Outcomes

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

- CO1** Decide on the factors deciding cost of a gemstone, explain the causes of colours in gemstones.
- CO2** Explain how gemstones are synthesized, explain how gemstones are enhanced from low-grade to saleable quality, and explain the styles of cuts preferred for different gemstones.
- CO2** Identify gemstones based on visual observations, by using a dichroscope, polariscope and determining Specific Gravity.
- CO4** Identify gemstones using a refractometer, spectroscope, ultraviolet lamp and microscope.

Module I

(15 hours)

Introduction to Gemmology
Association of Gemstones with rocks
Factors deciding the cost of a gemstone
Causes of colour in gemstones
International grading of diamonds
Composites

Module II

(15 hours)

Enhancement and Treatments of gemstones
Synthesis of gemstones
Need for Faceting
Styles of cut

Module III

(15 hours)

Visual observation of gemstones: Colour changing Sapphire, Colour changing Alexandrite, Opal, Sunstone, Star Garnet, Star Ruby, Diamond, Spectrolite, Lapis Lazuli, Chrysoberyl cats' eye, Tigers eyes, Aquamarine Cats eye, sillimanite Cats eye, Labradorite, Moss Agate, Amber,

Study of Natural crystals: Garnet, Emerald, Spinel, Tourmaline, Gypsum, Magnetite, Aquamarine, Ruby

Dichroscope for identifying gemstones: Andalusite, Tsavorite Garnet, Chrome Tourmaline, Green Tourmaline, Pink Tourmaline, Alexandrite, Sapphire, Natural Ruby, Synthetic Ruby, Tanzanite, Kyanite, Iolite.

Polariscope for identifying gemstones: Rose Quartz, Lemon Quartz, Rock crystal, Aquamarine, Iolite, Alexandrite, Scapolite.

Determination of Specific Gravity by Hydrostatic Method

Module IV

(15 hours)

Spectroscope in gemstone identification: Cubic Zirconia (American Diamond), Zircon, Diamond, Synthetic Ruby, Natural Ruby, Synthetic Sapphire, Natural Sapphire.

Refractometer in gemstone identification: Aquamarine, Tourmaline, Quartz (Uniaxial), Iolite, Kyanite (Biaxial)

Ultra Violet lamp in gemstone identification: Synthetic and Natural Ruby, Synthetic and Natural Sapphire, Zircon, Cubic Zirconia, Colour Changing Sapphire.

Gemmological Microscope in gemstone identification: Tourmaline, Sillimanite, Emerald, Kyanite, Spectrolite

List of books recommended for reference

- Fernandes S. and Choudhary G., (2010) Understanding Rough Gemstones, Indian Institute of Jewellery.
- Karanth, R V; (2000) Gem and Gem deposits of India, Geological Society of India.
- Read, P. G., (1991). Gemmology, Butterworth-Heinemann Ltd.
- Webster, R., edited by Anderson, B, W., (1983) Gems: Their Sources, Descriptions and Identification, Butterworth-Heinemann Ltd.
- Sinkankas, J., (1969) Mineralogy: A First Course, Van Nostrand Reinhold Company.

French

Course Title: Developing Listening and Speaking Skills-LEVEL 1 PART 1

Course Code: FRE-I.C-2

Marks: 100

Credits: 4

Duration: 60 Hours

Syllabus introduced in 2019

Pre-requisites: Any student pursuing the B.A Honours programme in French.

Name of the Text: ECHO A1

Course Objectives:

1. The course aims at developing student's listening and speaking skills through a wide range of communication activities and role plays.
2. The course aims at integrating the various aspects of language-learning which are complementary to one another.
3. The course aims at developing communicative strategies, grammatical structures as well as cultural and civilizational elements.
4. The course aims at enhancing the skills in oral comprehension and expression by exposing students to various movies, songs, plays, dialogues etc. in simple French.
5. The course 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 everydaylife.
CO4	be able to emulate the rhythm and intonations specific to the basic expressions in French.

Syllabus:

Oral comprehension and oral expression based on the lessons 0-6 of the text ECHO A1 will be the Syllabus for Semester I

Module 1 (15 hours)

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? Cartespostales et messages
Leçon 1	Situations orales : Aborder quelqu'un, dire son nom, saluer, prendre congé
Leçon 1	Situations orales : Remercier, dire si on comprend
Leçon 1	Phonétique : Repérage des sons difficiles, rythmes et enchainements
Leçon 1	Compréhension orales des textes : Écrits de la rue

Leçon 1	Exercices d'écoute : Expression orale
Leçon 1	Exercices d'écoute : Compréhension orale

Module 2 (15 hours)

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 enchaînements
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 hours)

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 »
Leçon 4	Exercices d'écoute
Leçon 5	Expressions orales sur : Comparaisons, adjectifs démonstratifs, adjectifs possessifs
Leçon 5	Situations orales : Choisir, négocier une activité commune

Module 4 (15 hours)

Leçon 5	Situations orales : Faire des recommandations, demander/donner une explication
Leçon 5	Situations pratiques relatives au voyage
Leçon 5	Phonétique : Sons ə - 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:

1. Alter Ego – Niveau 1 / Michel Guilloux –Publisher :Hachette
2. Champion – Niveau1/ Annie Monnerie-Goarin -- Publisher : CLEInternational
3. Panorama – Niveau 1/ Jacky Giradet, Jean Marie Cridlig - Publisher :CLE International

Web References:

1. Français avec Pierre
2. podcastfrançaisfacile.com
3. Comme une française
4. Frenchspin.com
5. Duolingo.com
6. Les Zexperts FLE
7. Lexiquefle.free.fr.familleCourse

Title: French for Tourism and Hospitality PART 1

Course Code: FRE-E-2

No. Of Credits: 4

Marks: 100

Duration: 60 Hours

**Syllabus introduced in
2016**

Pre-requisites: Any student pursuing the B.A Honours programme in French.

Name of the Text: *Bon Voyage*

Course objectives :

1. The course aims at the acquisition of 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. The course aims at developing oral and written skills in French, in the domain of tourism and hospitality.
3. The course aims at enabling the students to apply the skills in real life situations and to understand and use documents in the target language from various media e.g. tariff cards, reservation forms, tourist guide literature.
4. The course aims at enabling students 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. The course aims at using different media for course related tasks: dictionaries, internet, newspapers, television and documentaries.

Course outcomes:

At the end of the course the students will:

CO1	be able 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	be able to communicate with a client, give directions, suggest tourist spots, handle hotel bookings and cancellations and provide information on transport facilities in French.
CO3	be able 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	be able 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	be able to have a general understanding of the intercultural nuances, history and architecture and narrate a few anecdotes related on touristic sites and monuments.

Syllabus:

Units 1, 2, 3 and 4 of Tourisme.com will be the syllabus for this course. Selected parts of Units 5 and 6 will be included in the syllabus

Module 1 (15 hours)

a	Vocabulaire et utilisation et importance des 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, iv) l'heure, v) les jours de la semaine, vi) les prépositions avec les verbes « arriver' et « partir », vii) Décrire un objet perdu viii) un hôtel une chambre ix) un restaurant
c	Jeu de rôle: -Je vous présente. , Le vol part à -C'est un grand hôtel luxueux
d	L'expression écrite: (Rédiger des récits et des dialogues)

Module 2 (15 hours)

a	Vocabulaire et utilisation et importance des 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 hôteldeux étoiles, Quel beau temps ! A la réception - C'est à 3 kilomètres... Dars La rue - Ce matin on va visiter, Cette région vous offre ...Dars le car / bus touristique
d	L'expression écrite: (Rédiger des récits et des dialogues)

Module 3 (15 hours)

a	Vocabulaire et utilisation et importance 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: (Rédiger des récits et des dialogues)

Module 4 (15 hours)

a	Vocabulaire et utilisation et importance 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: (Rédiger 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
4. Dix chiffres sur le Tourisme en France et dans le monde
5. Paris – Office du Tourisme – site officiel
6. France tourisme.fr

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 Hours

Syllabus introduced in 2015

Pre-requisites: Any student pursuing the B.A Honours programme in French

Name of the Text: ECHO A1

Course Objectives:

1. The course aims at training the students to use the language in realistic settings rather than merely focusing on written exercises. Language will be used to perform tasks involving a meaningful communication between language speakers.

2. The course also aims at learning 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.

Course Outcomes:

At the end of the course students will:

CO1	have achieved the skills of oral communication at Level A1.2 as prescribed by the CECR. Reply to questions related to day to day scenarios.
CO2	be able to communicate in different day-to-day situations (make requests, express likes and dislikes, speak about hobbies, make purchases and fix a rendezvous and give advice).
CO3	be able to comprehend basic dialogue by native French speakers pertaining to everyday life and display their oral competences by replying or commenting on the oral documents from the prescribed simple text or from external sources and take notes when information is dictated in French.
CO4	be able to emulate the rhythm and intonations specific to the basic expressions in French.
CO5	display skills to be able to work individually or as a team.

Syllabus:

Oral comprehension based on the lessons 7-12 of the text ECHO A1 will be the syllabus for semester II

Module 1 (15 hours)

Leçon 7	Expressions orales sur : La conjugaison pronominale, l'impératif, l'expression de la quantité, (peu, un peu, quelques, etc)
Leçon 7	Expressions orales sur: Les activités quotidiennes, Les achats, l'argent
Leçon 7	Situations orales : Demander des nouvelles de quelqu'un, choisir, acheter et payer un objet
Leçon 7	Situations orales : S'informer sur la présence ou l'existence d'une personne ou d'un objet
Leçon 7	Phonétique : Rythme de la conjugaison pronominale

Leçon 7	Phonétique : Intonation de l'impératif, prononciation des pronoms toniques
Leçon 8	Expressions orales sur : Prépositions et adverbess de lieu, verbes exprimant un déplacement (emploi des prépositions)
Leçon 8	Expressions orales sur: Le logement, la localisation, l'orientation, l'état physique, le temps qu'il fait
Leçon 8	Situations orales : S'informer sur l'état physique de quelqu'un, s'informer sur un itinéraire, une orientation

Module 2 (15 hours)

Leçon 8	Situations orales : Demander de l'aide, exprimer une interdiction
Leçon 8	Phonétique : Différenciation [s],[z],[a],ã
Leçon 8	Phonétique : Différenciation du masculin et du féminin des adjectifs
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
Leçon 9	Expressions orales sur : Les moments de la vie, la famille, les relations amicales, amoureuses, familiales)
Leçon 9	Situations orales : Raconter brièvement un souvenir, présenter sa famille
Leçon 9	Situations orales : Demander /donner des informations sur la biographie d'une personne
Leçon 9	Situations orales : Demander /donner des informations sur ses relations amicales ou familiales
Leçon 9	Phonétique : Le[j], différenciation [ɔ] et

Module 3 (15 hours)

Leçon 10	Expressions orales sur : Les pronoms compléments directs, les pronoms compléments indirects de personne, l'expression de la fréquence et de la
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	répétition
Leçon 10	Expressions orales sur : Les moyens de communication (courrier, téléphone, internet)
Leçon 10	Situations orales : Aborder quelqu'un
Leçon 10	Situations orales : Se présenter, faire valoir son droit
Leçon 10	Situations orales : Exprime une opinion sur la vérité d'un fait
Leçon 10	Phonétique : Rythme des constructions avec pronoms, Différenciation [f], [ʒ], [s], [z]
Leçon 11	Expressions orales sur : Passé récent, présent progressif, future proche, action achevée/ inachevée
Leçon 11	expressions orales sur : Le corps, la santé et la maladie

Module 4 (15 hours)

Leçon 11	Situations orales : Parler de ses activités de loisirs
Leçon 11	Situations orales : Téléphoner/prendre rendez-vous
Leçon 11	Situations orales : Exposer un problème/réagir
Leçon 11	Phonétique : Son [y], rythme des constructions négatives
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
Leçon 12	Expressions orales sur : La description physique et psychologique des personnes, les vêtements, les couleurs
Leçon 12	Situations orales : Demander/donner une explication
Leçon 12	Jeux de rôle
Leçon 12	Phonétiques : Différenciation masculin/féminin
Leçon 12	Phonétiques : Différenciation masculin/féminin

References:

Méthodes :

1. Alter Ego – Niveau 1 / Michel Guilloux – Publisher : Hachette
2. Champion – Niveau 1 / Annie Monnerie-Goarin – Publisher : CLE International
3. Panorama – Niveau 1 / Jacky Girardet, Jean Marie Cridlig – Publisher : CLE International

Web References :

1. Français avec Pierre
2. Podcastfrançaisfacile.com
3. Comme une française
4. Un flux RSS
5. Duolingo.com
6. Les Zexperts FLE

Hindi

F.Y.B.A - (Semester - I)

Core Paper

Paper Title: हिन्दी कविता एवं काव्य सौंदर्य

Paper Code: HIN-I.C-2

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।

Course Outcome:

इस पाठ्यक्रम के माध्यम से -

- 1) विद्यार्थी मध्ययुगीन तथा आधुनिक कवियों और उनकी कविताओं की जानकारी प्राप्त करेंगे।
- 2) मध्ययुगीन समाज और जीवन दृष्टि से आधुनिक जीवन दृष्टि की तुलनात्मक क्षमता विकसित होगी।
- 3) विद्यार्थियों में काव्य सौंदर्य की दृष्टि विकसित होगी तथा काव्य रचना की ओर प्रेरित होंगे।
- 4) काव्यसौंदर्य में अलंकार, छंद एवं समास का ज्ञान प्राप्त होगा।

Syllabus:

कविता संग्रह: हिन्दी विभाग-पार्वतीबाई चौगुले कॉलेज मडगांव,गोवा

(बी.ओ.एस की सहमति के अनुसार संकलित कविता संग्रह)

काव्य सौंदर्य: अलंकार, छंद एवं समास

इकाई विभाजन:

इकाई एक :

(15 Lectures)

1. कबीर बानी। (10 दोहे)
2. सूर के पद । (5 पद)
3. रामराज्य वर्णन। (तुलसीदास, आरंभ के 5 दोहे एवं चौपाइयां)

इकाई दो :

(15 Lectures)

1. रहीम के दोहे- रहीम।
2. जूही की कली- सूर्यकांत त्रिपाठी 'निराला'।
3. सवरे उठा तो धूप खिली थी- सच्चिदानंद हीरानंद वात्स्यायन 'अज्ञेय'।

इकाई तीन :

(15 Lectures)

1. बीस साल बाद- सुदामा पाण्डेय 'धूमिल'।
2. बेजगह- अनामिका।
3. प्रेत का बयान- नागार्जुन

इकाई चार : काव्यसौंदर्य।

(15 Lectures)

- क) अलंकार - i)शब्दालंकार -अनुप्रास, यमक, श्लेष।
ii) अर्थालंकार- उपमा, रूपक, उत्प्रेक्षा।
- ख) छंद- i) मात्रिक छंद- दोहा, सोरठा, चौपाई।
ii) वर्णिक छंद- इंद्रवज्रा, उपेन्द्रवज्रा, सवैया।
- ग) समास।

संदर्भ ग्रंथ

1. रामस्वरूप चतुर्वेदी, 'हिन्दी कवि का इतिहास', लोकभारती प्रकाशन, इलाहाबाद, 2012
2. देवेन्द्रनाथ शर्मा, 'काव्य के तत्व', लोकभारती प्रकाशन, इलाहाबाद, 2013
3. हजारीप्रसाद द्विवेदी, 'मध्यकालीन बोध का स्वरूप', राजकमल प्रकाशन, 2003

4. रामबहोरी शुक्ल, 'हिन्दी प्रदीप' हिन्दी भवन, इलाहाबाद, 2010
5. भगीरथ मिश्र-'काव्यशास्त्र', विश्वविद्यालय प्रकाशन, वाराणसी, 1999
6. डॉ. ब्रजकिशोर प्रसाद सिंह -'हिन्दी व्याकरण', नमन प्रकाशन, नई दिल्ली, 2009

F.Y.B.A - (Semester - II)

Core Paper

Paper Title: हिन्दी नाटक, वृत्तचित्र एवं फीचर फिल्म

Paper Code: HIN-II.C-3

Marks: 100

Credit: 4 (60 Lectures)

Course Objective

असगर वजाहत का नाटक 'जिस लाहौर नई देख्या ओ जम्याइ नई' के माध्यम से नाटक का परिचय कराते हुए विद्यार्थियों को सांप्रदायिक सद्भाव एवं मानवी मूल्यों का परिचय कराना। साथ ही वृत्तचित्र एवं फीचर फिल्म लेखन के सैद्धांतिक पक्ष की जानकारी देना।

Course Outcome:

- 1) विद्यार्थी नाट्य परंपरा एवं नाटक की अवधारणा, स्वरूप एवं तत्वों से परिचित होंगे।
- 2) 'जिस लाहौर नई देख्या ओ जम्याइ नई' नाटक एवं नाटककार असगर वजाहत के रचना संसार से परिचित होंगे और विद्यार्थियों को सांप्रदायिक सद्भाव एवं मानवीय मूल्यों का परिचय प्राप्त होगा।
- 3) विद्यार्थियों में अभिनय कौशल के प्रति अभिरुचि पैदा होगी।
- 4) वृत्तचित्र एवं फीचर लेखन के सैद्धांतिक पक्ष तथा उसके अंतर को समझने में सक्षम होंगे।

Syllabus:

1. जिस लाहौर नई देख्या वो जम्याइ नई - असगर वजाहत
2. वृत्तचित्र एवं फीचर फिल्म।

इकाई विभाजन:

इकाई - 1. :

(15 Lectures)

1. नाटक की अवधारणा।
2. नाटक का स्वरूप।

3. नाटक के तत्व।

इकाई - 2. 'जिस लाहौर नई देख्या वो जम्याइ नई' का पाठ्यालोचन। (15 Lectures)

इकाई - 3. 'जिस लाहौर नई देख्या वो जम्याइ नई' का समीक्षात्मक अध्ययन।(15 Lectures)

इकाई - 4. वृत्तचित्र एवं फ़ीचर फ़िल्म। (15 Lectures)

1. वृत्तचित्र की अवधारणा एवं विशेषताएँ।
2. फीचर फिल्म की अवधारणा एवं विशेषताएँ।
3. वृत्तचित्र एवं फीचर फिल्म में अंतर।

संदर्भ ग्रंथ

1. दशरथ ओझा, 'हिन्दी नाटक का विकास', राजपाल एण्ड सन्स, नयी दिल्ली, 2003
2. साठोत्तर हिन्दी नाटक-के. वी. नारायण कुरूप लोकभारती प्रकाशन, इलाहाबाद, 2007
3. समकालीन फिल्मों के आर्डने में समाज-सत्यदेव त्रिपाठी शिल्पायन प्रकाशन, दिल्ली, 2013
4. साहित्य और सिनेमा -सं.डॉ.शैलजा भारद्वाज, चिंतन प्रकाशन, कानपुर, 2013
5. सिनेमा और साहित्य- हरीश कुमार संजय प्रकाशन, दिल्ली, 2010
6. मनोहर श्याम जोशी, 'पटकथा लेखन', राजकमल प्रकाशन, दिल्ली, 2002

F.Y.B.A - (Semester - II)

Core Paper

Paper Title: हास्य - व्यंग्य निबंध एवं पत्रकारिता

Paper Code: HIN-II.C-4

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।

Course Outcome:

- 1) विद्यार्थी निबंध विधा से परिचित होकर हास्य एवं व्यंग्य की अवधारणा तथा स्वरूप को समझेंगे।
- 2) हास्य-व्यंग्य निबंध एवं निबंधकारों से अवगत होंगे।
- 3) पत्रकारिता का सामान्य परिचय प्राप्त करेंगे।
- 4) पत्रकारिता की उपयोगिता एवं महत्त्व समझेंगे।

Syllabus: हिंदी हास्य-व्यंग्य निबंध संग्रह- हिन्दी विभाग-पार्वतीबाई चौगुले कॉलेज मडगांव, गोवा

(बी.ओ.एस की सहमति के अनुसार संकलित निबंध संग्रह)

पत्रकारिता: सामान्य परिचय, भेद, उपयोगिता और महत्त्व।

इकाई एक -

(15 Lectures)

1. हास्य एवं व्यंग्य की अवधारणा एवं स्वरूप।
2. हास्य एवं व्यंग्य के तत्व।
3. हास्य एवं व्यंग्य में अंतरसंबंध।

इकाई दो -

(15 Lectures)

1. नया साल- अमृतराय।
2. अपना मकान- इंद्रनाथ मदान।
3. पगडंडियों का जमाना- हरिशंकर परसाई।
4. मोची भया उदास -प्रेम जनमेजय

इकाई तीन -

(15 Lectures)

1. अध्यक्ष महोदय -शरद जोशी ।
2. घूस एक चिकनाई है- रवींद्र कालिया।
3. धमाका- अभिमन्यु अनत।
4. अच्छी हिन्दी - रवीन्द्र नाथ त्यागी

इकाई चार -

(15 Lectures)

1. पत्रकारिता का सामान्य परिचय।
2. पत्रकारिता के भेद।
3. पत्रकारिता की उपयोगिता एवं महत्त्व।

(15 Lectures)

संदर्भ ग्रंथ

1. डॉ.बालेन्दु शेखर तिवारी, 'हिन्दी का स्वातंत्र्योत्तर हास्य और व्यंग्य', अन्नपूर्णा प्रकाशन, कानपुर, 1978
2. डॉ. प्रेमनारायण टंडन, 'हिन्दी साहित्य में हास्य-व्यंग्य', हिन्दी साहित्य भंडार, लखनऊ, 1975
3. डॉ. उषा शर्मा, 'हिन्दी निबंध साहित्य में व्यंग्य', आत्माराम एण्ड सन्स कश्मीरी गेट, दिल्ली, 1985
4. प्रयोजनमूलक हिन्दी - विनोद गोदरे, वाणी प्रकाशन, नई दिल्ली, वर्ष 2007
5. डॉ.माधव सोनटक्के, 'प्रयोजनमूलक हिन्दी', लोकभारती प्रकाशन, इलाहाबाद, 2008
6. कैलाशचंद्र पाण्डेय, 'प्रयोजनमूलक हिन्दी की नयी भूमिका', लोकभारती प्रकाशन, इलाहाबाद, 2007

F.Y.B.A - (Semester - I)

Optional Paper

Paper Title: भाषा कौशल

Paper Code:

Marks: 100

Credits: 04 (60 Lectures)

Course Objective:

इस पाठ्यक्रम के माध्यम से विद्यार्थियों में भाषा कौशल की वृद्धि कराना है। संगणक युग में भी भाषण, लेखन वाचन, लेखन कौशल बना रहे, इस दिशा में प्रयत्न कराना है। उन्हें क्रमशः इन चार कौशलों के माध्यम से उस सोपान तक ले जाना है, जहाँ वे हिन्दी भाषा का प्रयोग एवं लेखन सही ढंग से कर सकें।

Course Outcome:

- 1) भाषण-कला विकसित होगी।
- 2) श्रवण-क्षमता का विकास होगा।
- 3) वाचन-कौशल निर्माण होगा।
- 4) लेखन-कला के साथ हिन्दी भाषा के व्यवहार में दक्ष होंगे।

Syllabus:

इकाई एक -भाषा-कौशल: सामान्य परिचय एवं भाषा-कौशल का महत्व (15 Lectures)

इकाई दो- भाषण एवं श्रवण कौशल। (15 Lectures)

1. भाषण एवं श्रवण कौशल का स्वरूप।
2. भाषण एवं श्रवण कौशल का महत्व।
3. भाषण एवं श्रवण कौशल के उद्देश्य।

4. भाषण एवं श्रवण कौशल की विशेषताएँ।
5. भाषण एवं श्रवण कौशल को बेहतर करने के उपाय।

इकाई तीन- वाचन कौशल।

(15 Lectures)

1. वाचन कौशल का स्वरूप।
2. वाचन कौशल का महत्त्व।
3. वाचन कौशल के उद्देश्य।
4. वाचन कौशल की विशेषताएँ।
5. वाचन कौशल को बेहतर करने के उपाय।

इकाई चार- लेखन कौशल।

(15 Lectures)

1. लेखन कौशल का स्वरूप।
2. लेखन कौशल का महत्त्व।
3. लेखन कौशल के उद्देश्य।
4. लेखन कौशल की विशेषताएँ।
5. लेखन कौशल को बेहतर करने के उपाय।

संदर्भ ग्रंथ

1. हिन्दी का सही प्रयोग - नीलम मान, तक्षशिला प्रकाशन, नई दिल्ली, वर्ष 2005
2. भानुशंकर मेहता, 'बोलने की कला', विश्वविद्यालय प्रकाशन, वाराणसी, 2013
3. ईश्वरचंद्र राही, 'लेखन कला का इतिहास', उत्तरप्रदेश हिन्दी संस्थान, लखनऊ, 1983
4. रामचंद्र वर्मा, 'अच्छी हिन्दी', लोकभारती प्रकाशन, इलाहाबाद, 2008
5. शशिबाला- 'हिन्दी शिक्षण विधियाँ', डिस्कवरी पब्लिशिंग हाउस, नई दिल्ली, 2006

नोट : इस प्रश्न पत्र पर विद्यार्थियों से व्यावहारिक कार्य कराया जाएगा।

T.Y.B.A - (Semester - V)

Elective Course

Course Title: मीडिया लेखन: रेडियो एवं टेलीविजन

Course Code: HIN-V.E-11

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 गया है।

Course Outcome

- 1) मीडिया लेखन के सिद्धांत, स्वरूप एवं महत्व को समझेंगे।
- 2) रेडियो एवं टेलीविजन लेखन के सिद्धांत एवं प्रकारों से अवगत होंगे।
- 3) रेडियो एवं टेलीविजन के विविध कौशल की ओर प्रवृत्त होंगे।
- 4) रेडियो एवं टेलीविजन लेखन के व्यावहारिक पक्ष का ज्ञान होगा।

Syllabus:

इकाई एक - (15 lectures)

मीडिया लेखन : स्वरूप, सिद्धान्त एवं महत्व।

इकाई दो - (15 lectures)

1. रेडियो लेखन के सिद्धान्त।
2. रेडियो लेखन के प्रकार: समाचार लेखन, रेडियो वार्ता, भेंट वार्ता, चर्चा-परिचर्चा, रेडियो नाटक, संचालन कला (रेडियो जाँकी)

इकाई तीन - (15 lectures)

1. टेलीविज़न लेखन के सिद्धान्त।
2. टेलीविज़न लेखन के प्रकार: समाचार लेखन, साक्षात्कार, धारावाहिक, वेबसीरीज लेखन।

इकाई चार - रेडियो और टेलीविज़न लेखन के व्यावहारिक रूप का अध्ययन (15 lectures)

1. रेडियो वार्ता लेखन।
2. संवाद लेखन।
3. दृश्य रूपान्तरण।
4. भेंट-वार्ता।
5. रेडियो समाचार लेखन।
6. रेडियो विज्ञापन लेखन।
7. टेलीविज़न विज्ञापन लेखन।

संदर्भ ग्रंथ-

1. डॉ. अंबादास देशमुख, 'प्रयोजनमूलक हिन्दी:अधुनातन आयाम', शैलजा प्रकाशन, कानपुर, 2006
2. सं. डॉ. सुभाष तलेकर, 'रोजगाराभिमुख हिन्दी :दिशाएँ एवं संभावनाएँ', नंदादीप प्रकाशन, पुणे, 2010
3. डॉ. सुजाता वर्मा, 'पत्रकारिता और मीडिया,' विकास प्रकाशन, कानपुर, 2016
4. रामशरन जोशी, 'मीडिया विमर्श', सामयिक प्रकाशन, दरियागंज, नई दिल्ली, 2002
5. डॉ. अजय प्रकाश, डॉ.रमेश वर्मा, 'प्रयोजनमूलक हिन्दी', समवेत, रामबाग, कानपुर, 2005

T.Y.B.A - (Semester - VI)

Elective Course

Course Title: हिंदी भाषा, लिपि एवं व्याकरण

Course Code: HIN-VI.E-15

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।

Course Outcome

- 1) विद्यार्थी हिन्दी भाषा की पृष्ठभूमि एवं उसके विकास से परिचित होंगे।
- 2) देवनागरी लिपि का स्वरूप, नामकरण, विकास एवं मानकीकरण का ज्ञान प्राप्त होगा।
- 3) हिन्दी की वर्ण-रचना, विकारी एवं अविकारी शब्दों से का सामान्य ज्ञान प्राप्त करेंगे।
- 4) संज्ञा, सर्वनाम, विशेषण, क्रिया के रूपान्तरण से अवगत होंगे।

Syllabus:

इकाई एक -

(15 Lectures)

1. भाषा : प्राचीन एवं मध्यकालीन आर्यभाषा।
2. हिन्दी भाषा का उद्भव और विकास।

इकाई दो -

(15 Lectures)

1. लिपि- देवनागरी लिपि का उद्भव एवं विकास।
2. देवनागरी लिपि की विशेषताएँ।
3. देवनागरी लिपि का मानकीकरण

इकाई तीन-

(15 Lectures)

1. व्याकरण: वर्ण विचार- स्वर, व्यंजन।
2. शब्दसाधन- विकारी एवं अविकारी शब्दों का सामान्य परिचय।

इकाई चार -

(15 Lectures)

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

S.Y.B.A - (Semester - III)

Skill Enhancement Course

Course Title: हिन्दी पथनाट्य (नुक्कड़ नाटक)

Course Code: HIN-II. SEC-1

Marks: 100

Credits: 04 (60 Lectures)

Course Objective:

- 1) इस पाठ्यक्रम के माध्यम से विद्यार्थियों को पथनाट्य लेखन हेतु प्रवृत्त करना।
- 2) पथनाट्य के माध्यम से विद्यार्थियों के अभिनय कौशल को विकसित करना।
- 3) विद्यार्थी पथनाट्य को प्रस्तुत करने का तंत्र समझेंगे।

Course Outcomes :

- 1) पथनाट्य की अवधारणा और स्वरूप के साथ तत्वों का ज्ञान प्राप्त होगा।
- 2) प्रमुख नुक्कड़ नाटकों की प्रासंगिकता से अवगत होंगे।
- 3) पथनाट्य लेखन एवं प्रस्तुतीकरण कला में निपुण होंगे।
- 4) अभिनय के साथ-साथ अन्य कौशलों का भी विकास होगा।

Syllabus:

इकाई एक:

(15 Lectures)

1. पथनाट्य की अवधारणा एवं स्वरूप।
2. पथनाट्य का विकास।
3. पथनाट्य के तत्व एवं सरोकार

इकाई दो:

(15 Lectures)

1. गिरगिट - रमेश उपाध्याय
2. जनता पागल हो गई है - शिवराम।

इकाई तीन:

(15 Lectures)

1. सबसे सस्ता गोश्त- असगर वजाहत।

2. देखो, वोट बटोरे अन्धा- असगर वजाहत।

इकाई चार:

(15 Lectures)

उपर्युक्त नाटकों का तात्विक विवेचन।

(व्यावहारिक कार्य: पथनाट्य : प्राथमिक लेखन, प्रकट वाचन, समूह चर्चा, पुनर्लेखन
पथनाट्य: समूह में प्रस्तुतीकरण एवं मूल्यांकन।)

संदर्भ ग्रंथ-

1. कुसुम त्रिपाठी, 'नुक्कड़ नाटक कैसे खेले', आह्वान नाट्य मंच प्रकाशन, बम्बई 1995
2. निदेशालय, प्रौढ़ शिक्षा, नुक्कड़ भाग- 1,2 जामनगर हाऊस, हटमेंटस, नई दिल्ली 1995
3. सं. अखिलेश कुमार मिश्र, 'अंधेर-नगरी, भारत दुर्दशा', प्रयाग प्रकाशन, इलाहाबाद, 1985
4. हिंदी रंगकर्म : दशा और दिशा, जयदेव तनेजा, तक्षशिला प्रकाशन, दिल्ली, 1988
5. चन्द्रेश, 'नुक्कड़ नाटक', राधाकृष्ण प्रकाशन नई दिल्ली, 1983
6. असगर वजाहत, 'सबसे सस्ता गोश्त', राजपाल एंड सन्स, कश्मीरी गेट, दिल्ली, 2015

S.Y.B.A - (Semester -IV)

Course Title: हिन्दी एकांकी

Course Code: HIN-IV. SEC-2

Marks: 100

Credits: 04 (60 Lectures)

Course Objective:

1. विद्यार्थियों को एकांकी का परिचय कराना।
2. विद्यार्थी एकांकी की आवश्यकता को समझ सकें।
3. इसके माध्यम से विद्यार्थी एकांकी को प्रस्तुत करने का तंत्र समझेंगे।

Course Outcomes:

- 1) एकांकी के विकास और रंगमंचीयता से परिचित होंगे।
- 2) प्रमुख एकांकी एवं एकांकीकारों का परिचय प्राप्त होगा।
- 3) विद्यार्थी अभिनय, संवाद कला एवं एकांकी प्रस्तुतीकरण में निपुण होंगे।
- 4) एकांकी का गहन अध्ययन करके एकांकी लेखन कला से परिचित होंगे।

Syllabus:

इकाई एक -

(15 Lectures)

1. एकांकी: अवधारणा, स्वरूप एवं विकास।
2. एकांकी के तत्त्व।
3. रंगमंचीयता एवं उसका विकास।

इकाई दो -

(15 Lectures)

1. भोर का तारा- जगदीश चंद्र माथुर।(पाठ विवेचन)
2. धीरे बहो गंगा-लक्ष्मी नारायण लाल।(पाठ विवेचन)

इकाई तीन -

(15 Lectures)

1. आवाज नीलाम - धर्मवीर भारती (पाठ विवेचन)
2. जुलूस- कणाद ऋषि भटनागर (पाठ विवेचन)

इकाई चार - निर्धारित रचनाओं का समीक्षात्मक अध्ययन

(15 Lectures)

1. अभिनेयता
2. रंगमंचीयता
3. संवाद योजना
4. निर्देश

संदर्भ ग्रंथ-

1. गिरीश रस्तोगी, हिन्दी नाटक और रंगमंच की नई दिशाएँ, ग्रंथम प्रकाशन, कानपुर, 1966
2. दशरथ ओझा, हिन्दी नाटक: उद्भव और विकास, दिल्ली राजपाल एण्ड सन्स, दिल्ली, 2003
3. डॉ. पशुपतिनाथ उपाध्याय, 'हिन्दी नाटक एवं रंगमंच', जवाहर पुस्तकालय, मथुरा, 2009
4. नेमिचन्द्र जैन, 'रंगदर्शन', राधाकृष्ण प्रकाशन, नई दिल्ली, 2008
5. डॉ. रामशरण महेंद्र, 'एकांकी और एकांकीकार', वाणी प्रकाशन, नई दिल्ली, 2001
6. सं. अखिलेश कुमार मिश्र, 'अंधेर-नगरी, भारत दुर्दशा', प्रयाग प्रकाशन, इलाहाबाद, 1985
7. डॉ. सुरेन्द्र यादव, 'एकांकी और एकांकी', राजकमल प्रकाशन, नई दिल्ली, 2001

Marathi

Course Title: साहित्याभिरूचीचे स्वरूप

Course Code: MAR-E-3

Marks: 100

Credits: 0 4

Duration: 60 hrs

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.

Course Outcome:

1. वैयक्तिक पातळीवर आणि कौटुंबिक किंवा सामाजिक पातळीवरील वाचन संस्कृती विकसित होण्यास हातभार लागेल.
2. सामाजिक पातळीवरील साहित्यविषयक उपक्रमशिलता वाढीस लागेल.
3. साहित्याशी अनुबंध जुळल्यामुळे साहित्यनिर्मितीची प्रेरणा मिळून साहित्यव्यवहार बळकट होईल.
4. वैयक्तिक पातळीवरील नेतृत्व गुणांची जोपासना होऊ शकेल.

Syllabus:]

1. वाचनसंस्कृती आणि वाचनाचे विविध स्तर (ललित साहित्याचे वाचन, गंभीर साहित्याचे वाचन, नाटक, कादंबरी, कविता यांच्या वाचन संदर्भात, अभिवाचन) **(15 Hours)**
2. गटवार पध्दतीने विविध उपक्रमांचे आयोजन – **(15 Hours)**
अ. काव्यवाचन, कथाकथन,
ब. पारितोषिक वितरण आणि विविध पुरस्कारांची माहिती.
3. साहित्याचा सामाजिक व्यवहार - ग्रंथ प्रकाशन, ग्रंथ चर्चा, साहित्यिकांशी संवाद.

(15 Hours)

4. साहित्यविषयक उपक्रमशीलता – ग्रंथ प्रदर्शने, ग्रंथ वितरण, इ. वितरण प्रणाली

(15 Hours)

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.
9. प्रकाशनविश्व, 2017
10. लोकराज्य वाचनसंस्कृती विशेषांक, 2016

Course Title: कार्यक्रम संयोजन (इवेंट मॅनेजमेंट) व संचालन (अॅन्करिंग) कौशल्य

Course Code: MAR-SEC-1`

Marks: 100

Credits: 0 4

Duration: 60 hrs

Course Objective:

1. विद्यार्थ्यांमध्ये संयोजन व संचालनाचे कौशल्य विकसित करणे.
2. कार्यक्रमाची आखणी व अन्य तयारी याविषयीची कौशल्ये आत्मसात करणे.
3. व्यक्तिमत्त्व विकास साधणे.
4. विद्यार्थ्यांमध्ये विविधांगी कलागुण विकसित करून त्यांची जीवनविषयक दृष्टी विकसित करणे.
5. विविध साहित्यविषयक उपक्रमांचा प्रसार आणि नेतृत्व करणे.

Course Outcome:

1. कार्यक्रम संयोजनासंदर्भात ज्ञान प्राप्त होईल.
2. सूत्रसंचालनाची कौशल्ये आत्मसात करता येतील.
3. वैयक्तिक पातळीवरील नेतृत्व गुणांची जोपासना होऊ शकेल.
4. स्वयंरोजगाराच्या दृष्टीने ही कौशल्ये उपयुक्त ठरतील.

Syllabus:

1. कार्यक्रमाची पूर्वतयारी , कार्यक्रमाची आखणी व अन्य पूरक तयारी (15 Hours)
2. सूत्रसंचालनाचे स्वरूप, वैशिष्ट्ये व प्रकार (15 Hours)
3. सूत्रसंचालनाचे तंत्र व सूत्रसंचालकाची भूमिका (15 Hours)
4. संहिता लेखन व वाचन, कार्यक्रमाची प्रसिद्धी (15 Hours)

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 सूत्रसंचालन', अक्षय्य प्रकाशन, पुणे, 2012

4. पंडित, माधव., 'त्रिवेध', प्रकाशन, मडगाव, 2008
5. पाटील, के आर., 'सूत्रसंचालन कसे करावे?', ज्ञानसंवर्धन प्रकाशन, कोल्हापूर, 2014
6. बागडे आचार्य, 'कार्यक्रमाचे प्रभावी संयोजन आणि सूत्रसंचालन', परफेक्ट इव्हेंट मॅनेजमेंट, साकेत प्रकाशन, पुणे, 2016
7. मिरजकर श्यामसुंदर, सूत्रसंचालन एक प्रयत्नसाध्य कला, नाम-नालंदा प्रकाशन

Course Title: पत्रकारिता: स्वरूप आणि कौशल्ये

Course Code: MAR- E-11

Marks: 100

Credits: 0 4

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. बातमीदारासाठी आवश्यक नीतिमूल्यांचा परिचय होईल.
3. बातमीलेखनाचे कौशल्य आत्मसात करता येईल.
4. वृत्तपत्राच्या वार्ताहराला आवश्यक गुणकौशल्ये आत्मसात करता येतील.

Syllabus:

1. पत्रकारिता : स्वरूप, संकल्पना व वाटचाल **(15 hours)**
2. बातमी: व्याख्या स्वरूप, बातमी आणि बातमीपत्र लेखन **(15 hours)**
3. वृत्तपत्रीय लेखन: (वाचकांचा पत्रव्यवहार, लेख, स्तंभलेखन, सदरलेखन, अग्रलेख) **(15 hours)**
4. इलेक्ट्रॉनिक पत्रकारिता (सामाजिक प्रसारमाध्यमे) **(15 hours)**

संदर्भ ग्रंथ

1. अकलूजकर प्रसन्नकुमार, 'फीचर रायटिंग', श्रीविद्या 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. देशपांडे ए.व्ही., 'मराठी पत्रकारिता', सुखद सौरभ प्रकाशन, सातारा, 2008
6. पाध्ये प्रभाकर, 'पत्रकारितेची मूलतत्त्वे', (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: भाषांतर विद्या

Course Code: MAR- E-15

Marks: 100

Credits: 0 4

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 महत्त्व 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 | (15 hours) |
| 2. भाषांतराचे प्रकार आणि वर्गीकरण | (15 hours) |
| 3. भाषान्तरप्रक्रिया, भाषांतरातील समस्या, भाषांतरकाराचे गुण | (15 hours) |
| 4. स्वाध्याय - (मुळ साहित्यकृती व तिचे मराठीमधील भाषांतर) | (15 hours) |

संदर्भ ग्रंथ

1. अर्जुनवाडकर लीला, 'ललित साहित्याचे भाषांतर: एक यक्षप्रश्न' (भाषा आणि जीवन, 10,3, पावलाळा, 1992)
2. कच्हाडे 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, 1989

Course Title: माहितीपट (डॉक्युमेंटरी) : लेखन कौशल्य आणि उपयोजन

Course Code: MAR-SEC-2

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.

Course outcomes:

1. माहितीपटाचे स्वरूप अभ्यासल्यामुळे या क्षेत्रातील व्यावसायिक कौशल्ये विकसित होतील.
2. सदर विषयाच्या अभ्यासामुळे पटकथा वा चित्रपटकथा लेखनाची प्राथमिक तयारी होऊ शकेल.
3. माहितीपट चित्रिकरण प्रक्रियेचा परिचय होऊ शकेल.
4. प्रसारमाध्यमे आणि जनसंपर्क क्षेत्रात रोजगाराची संधी उपलब्ध होईल.

Syllabus:

1. माहितीपट- व्याख्या, स्वरूप व उद्दिष्टे (15 hours)
प्रकार-परिचयात्मक (व्यक्ती, संस्था, स्थल इ.)
जागृतीपर- प्रबोधनपर, संशोधनपर इ. माहितीपट रचनेचे स्वरूप
2. माहितीपट लेखन- विषय, रूपरेषा, साधनसामग्री, इ. (15 hours)
घटकाभ्यास- निवेदन, संवाद, वातावरण, स्वभावदर्शन,
गीत, प्रतीक, श्रेयनामावलीचे महत्त्व
3. माहितीपट निर्मितीप्रक्रिया- चित्रीकरणपूर्व तयारी, प्रत्यक्ष चित्रिकरण, (15 hours)
उपलब्ध चित्रण, छायाचित्रे व अन्य दस्ताऐवज,

प्रमुख व्यक्तीचे भाष्य व प्रसंगाची पुनर्निर्मिती

4. माहितीपटाचे उपयोजन / निर्मितीचे सादरीकरण

(15 hours)

- निवडलेल्या विषयावरील माहितीपटाचे सादरीकरण,

संदर्भ ग्रंथ

1. पाडळकर विजय, 'गर्द रानात... भर दुपारी', मौज प्रकाशन, मुंबई, 2002
2. पाडळकर विजय, 'फ्लॅशबॅक', मौज प्रकाशन, मुंबई, 2005
3. बर्बे 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: भाषिक कौशल्ये आणि व्यक्तिमत्त्व विकास

Course Code: MAR- E-12

Marks: 100

Credits: 04

Course Objective:

1. व्यक्तिमत्त्व विकासात असलेल्या भाषिक कौशल्याचा परिचय करून घेणे.
2. जनसंपर्कात भाषिक कौशल्याचे महत्त्व कसे असते ते समजावून घेणे.
3. व्यक्तिमत्त्व विकासाचे संवर्धन ज्या घटकांमुळे होऊ शकते त्या घटकांचा अभ्यास करणे.
4. भाषिक कौशल्यांचा अभ्यास व सादरीकरणामुळे व्यक्तिमत्त्वात होणाऱ्या बदलांची जाणीव करून देणे.

Learning Outcome:.

1. व्यक्तिमत्त्व विकासाविषयी एक स्वतंत्र जाणीव निर्माण होईल.
2. विविध भाषिक कौशल्यांचा अभ्यास होईल.
3. भाषा व साहित्याद्वारे व्यक्तिमत्त्व विकास होऊ शकतो असा आत्मविश्वास विद्यार्थ्यांच्या मनात निर्माण होईल.
4. भाषिक कौशल्यांच्या सादरीकरणामुळे व प्रात्यक्षिकामुळे सुप्त कलागुणांना उत्तेजन मिळेल.

Syllabus:

1. भाषिक कौशल्यांचे स्वरूप व महत्त्व - श्रवण, वाचन, आकलन, लेखन भाषण व संभाषण
(15 hours)
2. जनसंपर्कात भाषिक कौशल्यांचे महत्त्व आणि इतर भाषिक कौशल्ये - उच्चारण निवेदन, अभिवाचन, भाषाशैली, देहबोली.
(15 hours)
3. व्यक्तिमत्त्व विकासाचे महत्त्व - कलागुणांची जोपासना, समाजविकासाची जाणीव, नेतृत्व गुणांची जोपासना.
(15 hours)
4. अन्य भाषिक कौशल्ये - अवतरणे, सुभाषित व सुविचार, ग्रंथांचे संदर्भोल्लेख इ.
(15 hours)

संदर्भ ग्रंथ

1. देसाई रवींद्र, 'प्रभावी भाषणकला', प्रफुल्लता प्रकाशन, पुणे, 2004
2. देशपांडे पु.ल., 'रेडियोवरील भाषणे', मौज प्रकाशन, पुणे, 1980
3. पेंडसे अंजली, 'देहबोली', नीलकंठ प्रकाशन, पुणे, 2004
4. नसिराबादकर ल.रा., 'व्यावहारिक मराठी', फडके प्रकाशन, कोल्हापूर, 2008
5. माळी सुनील, 'बातमीदारी', राजहंस प्रकाशन, पुणे, 2008
6. साने र.य., 'लेखनमित्र', विद्या विकास पब्लिशर्स प्रा.लि. नागपूर, 2007

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 तांचेविशीं जाणविकाय करून घेवपाक आदार करप.
3. बोली ही संकल्पना कशेतरेन 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 आधार जातलो.
3. बोलींचो आनी त्यो उलोवपी लोकांचें खाशेलेपण कळटलें.

No. of Hours: 4 Hours per week

अभ्यासक्रम :

सिध्दांतीक माहिती (20 तासिका)

- बोली संकल्पना स्पष्ट 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

1. Kelkar Ashok. *Language: Linguistics: The Application*, Vol. 8. Simla: *A Reprint from Language and a Society in India, Transaction of the Indian Institute of Advance Study*, Vol. 8, 1969.
2. श्रीवास्तव, रवीन्द्रनाथ. *हिंदी भाषा का समाजशास्त्र*. नईदिल्ली : 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.

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 गीत, सोकारत, नमन

दुसरो वांटो (10 तासिका)

- लोकनृत्य : धालो, फुगडी, मूसळ नाच, घोडेमोडणी, गोफ, तोणयांमेळ, तालगडी, कुणबी नाच, देखणी, चपय (धनगर नाच)

तिसरो वांटो (10 तासिका)

- लोकनाट्य : रणमालें, जागर, कालो

- 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. केरकर, पौर्णीमा. *गोव्यातील धालो उत्सवाचे स्वरूप*. आलत परवरी गोवा: गोमन्तक मराठी अकादमी, 2011.
2. खेडेकर, विनायक. *गोमंतकीय लोकभाषा*. पणजी गोवा: शारदीय वितरण.
3. खेडेकर, विनायक. *लोकसरिता – गोमन्तकीय जन जीवनाचा समग्र अभ्यास*. कला अकादमी गोवा, 1993.
4. फेर्नांडीस, जुवांव. *गोंयचो आवाज.*, केपें, गोंय : जे. पी. एल. प्रकाशन 2013.
5. नायक, जयंती. *लोकमंथन*. केपें गोंय : राजाई प्रकाशन, 2008
6. नायक, जयंती. *आमोणेचीं धालो गीतां*. पणजी गोंय : गोवा कोंकणी अकादेमी, 1992.
7. नायक, जयंती. *गोंयची लोककला*. केपें गोंय : राजाई प्रकाशन, 2004.
8. नायक, जयंती. *लोकबींब*. पणजी गोंय: गोवा कोंकणी अकोदमी, 1998.
9. नायक, जयंती. *लोकरंग*. आमोणें, केपें गोंय: राजाई प्रकाशन, 2008.
10. वेरेंकार, श्याम. *गोंयच्या लोकवेदाचो रुपकार*. पणजी गोंय : गोवा कोंकणी अकादेमी, 1991.
11. वेरेंकार, श्याम. *धालो*. बेती वेरें : कोंकण टायम्स प्रकाशन, 1984.
12. हळर्णकार, तानाजी. (संपादक). *कोंकणी विश्वकोश – खंड – 1*, ताळगांव गोंय : गोंय विद्यापीठ, 1999.
13. एल. सुनिताबाय. *हिन्दी और कोंकणी लोकसाहित्य का तुलनात्मक अध्ययन*. काक्कनाड कोच्ची, 2010.
14. Khedekar, Vinayak. *Folk Dances of Goa*. Udaipur: West Zone Culture.
15. Pereira, Jose Micael Martins; Da Costa Antonio. *Song of Goa: Crown of Mandos*. Broadway Publishing House, 2010.

Chemistry

ELECTIVE COURSE

THEORY

Course Code: CHE-III.E-2

Course Title: Introduction to Industrial Chemistry

Credits: 03

Duration: 45 Hours

Maximum Marks: 75

Course Objectives:

The main objective of this course is to study the selected key industrial processes, waste management, properties of selected solid materials and industrial safety.

Course Learning Outcomes:

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

CO1: Describe the importance of catalysts in industrial processes.

CO2: Explain the composition of various materials such as alloys, glass, etc. and understand the process of corrosion and its prevention.

CO3: Discuss several common industrial processes such as halogenations, nitration and sulphonation.

CO4: Classify and discuss boilers, heat exchangers and paints.

CO5: Describe diverse effluent treatments for waste management and apply the knowledge of safety in industries.

CO6: Will understand the fundamentals of industrial processes.

CO7: Will learn to treat industrial effluents.

CO8: Will learn electroplating.

Unit I: Fundamentals of Industrial Chemistry and Electroplating **15 hours**

Relevance of catalysis in modern industrial processes, Mechanical properties of materials and change with respect to temperature, Metals and alloys- important metals and alloys, Glass- types, composition, manufacture, physical and chemical properties applications, Corrosion- various types of corrosion relevant to chemical industry- Mechanism, Preventive methods. Introduction: definition, fundamental principles- Faraday's laws, mechanism of deposition, surface preparation for electroplating of Zinc and Tin. Testing of electro deposits: for thickness, adhesion, stress and corrosion. Use of Hull cell in plating.

Unit II: Industrial processes, Boilers, Heat exchangers and Paint chemistry **15 hours**

Halogenation: Introduction, type of halogenation reactions, halogenating agents, kinetics and mechanism of halogenation, manufacturing of chloroethane, chlorobenzene, chloral; Nitration: Introduction, type of nitration reaction, nitrating agents, kinetics and mechanism of nitration, manufacturing of nitrobenzene and p-nitroacetanilide; Sulphonation: Introduction, type of sulphonation reaction, sulphonating agents, mechanism of sulphonation reaction, commercial sulphonation of benzene and alkyl benzene; Physico chemical principles involved in the

manufacture of HNO_3 (Ostwald's method) and NH_3 (Haber's method); Introduction, classification and applications of boilers and heat exchangers; Introduction, general classification, composition, characteristics and applications of paints.

Unit III: Industrial Safety, Conducts, Waste management and Effluent treatment 15 hours

Meaning of industrial safety, industrial accidents, industrial hazards, MSDS and safety programme. Process Safety: a) Chemical reaction hazards: Fundamental understanding, various instruments used to understand chemical reaction hazards; b) Fire and Explosion Hazards: Fundamental understanding, various instruments used to understand fire and explosion hazards; Principles and equipments for aerobic, anaerobic treatment, adsorption, filtration, sedimentation, bag filters, electrostatic precipitators, mist eliminators, wet scrubbers, absorbers, solid waste management and reverse osmosis; Treatment of electronic waste.

PRACTICALS

Course Code: CHE-III.E-2

Course Title: Introduction to Industrial Chemistry

Credits: 1

Duration: 30 Hours

Maximum Marks: 25

LIST OF EXPERIMENTS:

1. Preparation of 1-nitro naphthalene from naphthalene (Nitration).
2. Preparation of 2,4,6-tribromophenol from phenol (Bromination).
3. Preparation of 4-hydroxy benzene sulphonic acid from phenol (Sulphonation).
4. Electroplating of Ni or Cu
5. Electroless plating of Ni or Cu
6. Effect of pH and salinity on rate of corrosion of iron/steel.
7. Formation of thin films of metals or alloys.
8. Synthesis of common industrial compounds involving two step reactions: Phthalic acid to Phthalic anhydride.
9. To prepare crystals of potash alum, $\text{K}_2\text{SO}_4 \cdot \text{Al}_2(\text{SO}_4)_3 \cdot 24 \text{H}_2\text{O}$, from aluminium foil.
10. Ore analysis: Calcium from lime stone.
11. To estimate the amount of copper from copper salt by spectrophotometric method.
12. To determine the rate of corrosion on a zinc plate in acidic medium.
13. To determine the rate of corrosion on an Aluminium plate in basic medium.
14. To determine the effect of temperature on rate of corrosion in acidic medium.
15. To determine the rate of corrosion on different metallic plates (Iron, Aluminium) in various HCl concentrations.

TEXT BOOK:

Sharma, B. K., *Industrial Chemistry*, 6th Edition, Goel Publishing House, Meerut.

REFERENCE BOOKS:

1. Bentley, J. et. al., *Introduction to paint chemistry and principles of paint technology*, 4th Edition, Springer Netherlands.
2. Cotton, F. A. et. al. *Basic Inorganic Chemistry*, 2nd Edition, Wiley Eastern Ltd.
3. De, A. K., *Environmental Chemistry*, Wiley Eastern Ltd.
4. Foye, A. O., *Principles of Medicinal Chemistry*, Publication Philadelphia.
5. Frederick, A. L., *Modern Electroplating*, 3rd Edition, J. Wiley and sons Inc., New York.

6. Iqbal, S. A. et. al., *Chemistry of Air and Air Pollution*, Discovery Publishing House, New Delhi.
7. Korolkovas, A. et. al., *Essentials of Medicinal Chemistry*, Wiley Interscience.
8. Lednicer, D. et. al., *Organic Chemistry of Drugs Synthesis*, Wiley Interscience.
9. Lee, J. D., *Concise Inorganic Chemistry*, 5th Edition, Wiley Blackwell Science Publications.
10. Naseer, K., *Electroplating- Basic Principles, Processes and Practice*, 1st Edition, Elsevier.
11. Singh, P. P. et. al., *An Introduction to Synthetic Drugs*, Himalaya Publication, Bombay.
12. Terrance, H. I., *The Chemical Analysis of Electroplating Solutions*, Chemical Publishing Co. New York.
13. Tyagi, O. D. et. al., *A Text Book of Environmental Chemistry*, Anmol Publications, New Delhi.
14. Wilson, C. O. et. al., *Textbook of Organic Medicinal and Pharmaceutical Chemistry*, Lippincott - Toppan.

Note: Wherever possible, latest edition of the prescribed books are to be used.

WEB REFERENCES

1. <https://www.sciencedirect.com/science/article/pii/S0010938X19309163>
2. <https://www.intechopen.com/books/wastewater-treatment-engineering/biological-and-chemical-wastewater-treatment-processes>
3. <https://www.acs.org/content/acs/en/careers/college-to-career/chemistry-careers/paints-pigments-coatings.html>
4. https://oshwiki.eu/wiki/Prevention_of_fires_and_explosions
5. <https://www.safeopedia.com/definition/1052/industrial-safety>

Philosophy

Course Title: LOGIC

Course Code: PHI-I.C-2

Credits: 04

Marks: 100

Duration: 60 hours

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.

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 analyze and assess logical arguments in the context of their relevance in today's world.

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. Inferences-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. Sorites -its meaning and distinction between Aristotelian and Goelenian sorites.

References

Mandatory Reading:

1. Copi, Irving M. & Cohen, Carl. (2006) – 8th& 9th 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 *Mind*, Vol. 41, No. 163 (Jul., 1932), pp. 341-3
<https://www.jstor.org/stable/2250309>
2. *Ancient Logic* A. C. Lloyd *The Philosophical Quarterly (1950-)*, Vol. 5, No. 19 (Apr., 1955), pp. 175-178 <https://www.jstor.org/stable/2217144>

**PARVATIBAI CHOWGULE COLLEGE OF ARTS AND SCIENCE
(AUTONOMOUS), MARGAO - GOA**

SYLLABUS FOR PROGRAMME BACHELOR OF ARTS IN PHILOSOPHY

APPROVED SEC COURSES SEMESTER II

Course Title: PHILOSOPHY AND FILMS (SEC/GEC)

Course Code: PHI.INT-02

Credits: 04

Marks: 100

Duration: 60 hours

The paper 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. Explore philosophical problems surrounding films: as a form of entertainment and also as a work of art.
2. Approach the cognitive, psychological and ethical dwellings of film and inherent relationship between film and philosophy.
3. Enable the students to approach a movie not only as a mode of entertainment but also as a spectator to evaluate it as a critique so that they get exposed to the field of interdisciplinary work in aesthetics and cognitive science.
4. Stimulate innovative interactions between students that will allow students to make enriching connections between two disciplines, i.e. Philosophy and Films.

Course Outcome: At the end of the course student should be able to –

- CO 1:** Elaborate upon the concepts in the philosophy of movies.
- CO 2:** Interpret a film plot in the context of philosophical thinking and apply the concepts of philosophy that are learnt from films in practical situations.
- CO 3:** Design videos, plays, etc. that depict human life in the aesthetic context of movies
- CO 4:** Assess arguments for and against concepts that crop up through a study of films.

SYLLABUS

Unit I – Analytic and cognitive approaches

(15 hours)

- 1:1 Philosophy around films
- 1:2 Document, Documentary and Narratives
- 1:3 Thought orientation through motion picture
- 1:4 Text, Context and Non-text

Unit II – Film and Practical Approach (15 hours)

2. 1. Photography and Representation: Beauty, Symbolism and Metaphors
2. 2. Presentation: Reality and Fiction
2. 3. Teachings through Cinema
2. 4. Film Criticism and Virtue theory

Unit III – Development of Psychological Elements in Films (15 hours)

3. 1. Films and Emotions: Fear, Comedy, Empathy, Suspense
3. 2. Imagination, Identification and Spectatorship
3. 3. Communication and Persuasion
3. 4. Photographic Psychology: Image and Psyche

Unit IV– Ethics in films (15 hours)

4. 1. Ethics in Filmmaking
4. 2. Authorship and copyright
4. 3. Evils and Issues: Pornography, Freewill
4. 4. Civil Rights Ordinance

References

Mandatory reading:

1. Carroll, Noël and Jinhee Choi. (2006). *Philosophy of Film and Motion Pictures*. Malden: Blackwell Publishing.
2. Colman, Felicity. (ed). (2009). *Film, Theory and Philosophy: the key thinkers*. Montreal and Kingston: McGill-Queens University Press.
3. Freeland, Cynthia A. and Thomas E. Wartenberg (eds.). (1995). *Philosophy and Film*. New York: Routledge.
4. Tredell, Nicholas, (ed.). (2002). *Cinemas of the Mind: A Critical History of Film Theory*. Cambridge: Icon Books.

Supplementary readings:

1. Allen, Richard and Malcolm Turvey (eds.). (2001). *Wittgenstein, Theory and the Arts*. London: Routledge.
2. Bordwell, David. (1997). *Narration in the Fiction Film*. New York: Routledge.
3. Currie, Gregory. (1995). *Image and Mind: Film, Philosophy, and Cognitive Science*. Cambridge: Cambridge University Press.
4. Plantinga, Carl. (1997). *Rhetoric and Representation in Nonfiction Film*. Cambridge: Cambridge University Press.
5. Tan, Ed S. (1996). *Emotion and the Structure of Narrative Film: Film As An Emotion Machine*. London: Routledge.

Web links:

1. Choi, Jinhee. “Apperception on Display: Structural Films and Philosophy.” *The Journal of Aesthetics and Art Criticism*, vol. 64, no. 1, 2006, pp. 165–172. JSTOR, www.jstor.org/stable/3700501.

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(AUTONOMOUS), MARGAO - GOA**

SYLLABUS FOR PROGRAMME BACHELOR OF ARTS IN PHILOSOPHY

APPROVED SEC COURSES SEMESTER III

Course Title: Practical Logic (SEC)

Course Code: PHI-SEC-21

Credits: 04

Marks: 100

Duration: 60 hours

The paper 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 paper is designed with following objectives–

1. A practical introduction to the basic concepts of logic and various methods of argumentation will equip students with necessary analytical tools to understand and engage in critical reasoning.
2. Extensive in-class exercises on different language uses and definitional techniques which will build confidence in applying the methods in a wide variety of circumstances and in increasingly complex arguments.
3. A discussion on different fallacies in language combined with in-class exercises to illustrate the principles and ensure practical competency.
4. To enhance reasoning skills that will enable students to answer various competitive examinations.

Course Outcome: At the end of the course the students will be able to–

- CO 1:** Understand and summarize the different types of arguments by identifying its premises and conclusion.
- CO 2:** Apply critical thinking on denotative and connotative techniques to develop strong definitions.
- CO 3:** Categorize systematically the different means of communication by analyzing various functions of language.
- CO 4:** Distinguish different types of informal fallacies that will enable to reason skillfully and clarify obscurity in language.

SYLLABUS

UNIT – I: Propositions

(15 hours)

- 1:1 Definition and nature of simple proposition and compound proposition
- 1:2 Types of simple propositions and compound propositions
- 1:3 Symbolic representation of simple propositions and compound propositions

UNIT – II: Meaning and Definitions**(15 hours)**

2. 1. Varieties of Meaning
2. 2. The intension and extension of terms
2. 3. Definition and their purposes: Stipulate, Lexical, Précising, Theoretical and Persuasive
2. 4. Definitional techniques: Denotative and Connotative
2. 5. Identifying different types of definitions

UNIT – III: Aspects of Language**(15 hours)**

3. 1. Language functions: Informative, Expressive, Directive, mixed functions of language
3. 2. Emotive words and Emotively Neutral language
3. 3. Dispute and Ambiguity
3. 4. Kinds of agreement and disagreements- belief and attitude
3. 5. Identifying the different types of agreement and disagreement

UNIT – IV: Fallacies**(15 hours)**

4. 1. Meaning of fallacy and its classifications
4. 2. Fallacies of Relevance
4. 3. Fallacies of Presumption, Ambiguity
4. 4. Identifying different kinds of fallacies

References**Mandatory Reading:**

1. Copi, Irving M. & Cohen, Carl. (2006) – 8th & 9th edition. *Introduction to Logic*. New Delhi: Prentice Hall of India.
2. Hurley, Patrick J. (2007). *Introduction to Logic*. New Delhi: Cengage Course 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. Miller, Barry. “*Logically Simple Propositions*.” *Analysis*, vol. 34, no. 4, 1974, pp. 123–128. JSTOR, www.jstor.org/stable/3328014.
2. “*COMPOUND PROPOSITION*.” *The Massachusetts Teacher* (1858-1871), vol. 11, no. 10, 1858, pp. 373–376. JSTOR, www.jstor.org/stable/45024334.
3. Walton, Douglas. “*Defeasible Reasoning and Informal Fallacies*.” *Synthese*, vol. 179, no. 3, 2011, pp. 377–407. JSTOR, www.jstor.org/stable/41477428.
4. Hahn, Ulrike, and Mike Oaksford. “*A Bayesian Approach to Informal Argument Fallacies*.” *Synthese*, vol. 152, no. 2, 2006, pp. 207–236. JSTOR, www.jstor.org/stable/27653391

Psychology

Course Title: Basic Course in Psychology I

Course Code: PSY- C-9 (Experimental)

Marks: 75

Credits: 3

Course Objectives:

1. To build the foundation necessary to study Psychology.
2. To understand the psychological grounding of human behaviour.

Course Learning Outcome: After completion of the course students will be able to:

CLO1: Distinguish between various schools of psychology.

CLO2: Describe the functioning of the nervous system.

CLO3: Analyze the influence of motives on behavior.

CLO4: Analyze the role of learning and culture on emotions

CLO5: Describe the importance of emotional intelligence

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 and Biological Foundation

Number of Hours:15

- A. Psychology – definition and goals
- B. Founding the Science of Psychology
- C. Contemporary perspectives and specialty areas in psychology
- D. What we know about human behavior: Some starting places
- E. Characteristics of the nervous system
- F. Divisions of the nervous system
 - A. Central Nervous System
 - B. Peripheral Nervous System
- G. Structures and functions of the brain
- H. Forebrain: Cognition, motivation, emotion and action
- I. Endocrine system and its impact on behaviour

UNIT II: Motivation

Number of Hours:15

- A. Approaches to motivation
 - a. Instinct Approach
 - b. Drive-reduction approaches
 - c. Arousal approaches

- d. Incentive approaches
- e. Cognitive Approaches
- f. Humanistic approaches
 - i. Maslow's Hierarchy of needs
 - ii. Self-determination theory
- g. Solomon's Opponent-Process theory of acquired motives
- h. Intrinsic and Extrinsic Motives
- B. Biological motives
 - a. Hunger
 - b. Thirst
 - c. Sex
 - d. Other motives: Sleep, Temperature Regulation, Pain avoidance
- C. Psychological motives
 - a. Need for stimulation
 - b. Need for affiliation
 - c. Need for achievement
 - d. Aggression
 - e. Need for Competence, Power: In brief

UNIT III: Emotions

Number of Hours:15

- A. The three elements of emotion (Ciccarelli & White)
 - i. The physiology of emotion
 - ii. The behaviour of emotion: emotional expression
 - iii. Subjective experience: labeling emotion
- B. Early Theories of Emotions
 - i. James-Lange Theory
 - ii. Cannon-Bard Theory
 - iii. The facial Feedback Hypothesis
- C. Cognitive Theories of Emotion
 - i. Cognitive arousal theory
 - ii. Cognitive mediational theory
- D. Role of learning and culture in emotions (Lahey; Baron & Misra)
- E. The functions of emotions (Feldman)
- F. Emotional Intelligence
 - i. Major components of emotional intelligence
 - ii. EI: Evidence on its existence and effects

*Implications of motives to be included for UNIT II as CA/Class activity

Books for Study:

1. Baron, R. A. & Misra, G. (2014). *Psychology: Indian Subcontinent Edition* (5th ed). Pearson
2. Baron, R.A. (2001). *Psychology* (1st Ed). Pearson Education
3. Ciccarelli, S. K. & White, J. N. (2018). *Psychology* (5th ed.). Pearson India Education Services Pvt Ltd.
4. Feldman, R. S. (2017). *Understanding Psychology* (12th ed.). McGraw Hill Education
5. Lahey, B.B. (2012). *Psychology: An Introduction* (11th Ed.). Tata Mc Graw Hill Publishing Company Limited.
6. Santrock, J.W. (2005). *Psychology Essentials* (2nd ed.). Tata Mc Graw Hill Publishing Company Limited.
7. Smith, E.S., Nolen-Hoeksema, S., Fredrickson, B., & Loftus, G.R. (2006). *Atkinson & Hilgards's Introduction to Psychology* (14th Ed.- 4th Reprint). Thomson Business Information India Pvt. Ltd.

Web Resources:

1. Psychology, The basis of human behaviour (43-53),
<http://ncert.nic.in/ncerts/l/kepy103.pdf>
2. Paul Anderson, The Neuron, <https://www.youtube.com/watch?reload=9&v=HZh0A-IWSmY>
3. Matthew Barry Jensen, Structure of the nervous system,
<https://www.khanacademy.org/science/high-school-biology/hs-human-body-systems/hs-the-nervous-and-endocrine-systems/v/structure-of-the-nervous-system>
4. Introduction to psychology, Emotion and Motivation,
<https://courses.lumenlearning.com/wmopen-psychology/chapter/introduction-motivation/>

Course Title: Basic Course in Psychology I

Course Code: PSY- C-9 (Experimental)

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:

CLO1: Build rapport, Collect subject's information, Give instructions

CLO2: 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. Emotional Intelligence Test
 - d. Conformity
 - e. Attribution
 - f. Attitude scale
 - g. Compliance

Books for study:

1. Anastasi, A., Urbina, S.(2008). *Psychological Testing*. (7th Ed.). Pearson Education.
2. Ciccarelli, S. K. & White, J. N. (2018). *Psychology* (5th ed.). Pearson India Education Services Pvt Ltd
3. Cohen, J.R. ,&Swerdlik, M.E.(2010). *Psychological Testing and Assessment: An Introduction to Test and Measurements*. (7th Ed.). Mc Graw-Hill Publishing International Edition Company Ltd.
4. Dandeker, W.N. (1999). *Fundamentals in Experimental Psychology*. Anmol Prakashan.
5. Hussain, A. (2014). *Experiments in Psychology* (1st ed.). PHI Learning
6. Mohanty, G. (1996). *Experiments in Psychology*. Kalyani Publishers.

7. Mohsin, S.M. (2013). *Experiments in Psychology*. MLBD
8. Parry, J., & Adisheshiah, W. (1997). *Experimental Psychology*. Allied Publishers Private Limited.
9. Test Manuals

Course Title: Social Psychology

Course Code: PSY- C-10 (Non-experimental)

Marks: 100

Credits: 4

Course Objective:

1. To help students to develop an understanding of how we influence the society and how society influences our behaviour.
2. To help students learn various tactics to prevent negative influence of others on self.

Course Learning Outcomes - At the end of this course students will be able to:

- CLO1: Identify sources of error in attribution
- CLO2: Describe tactics for impression management
- CLO3: Discuss ways to resist persuasion
- CLO4: Explain techniques to counter prejudices
- CLO5: Analyze the influence of others on our behaviour

Course Duration: Each paper in Non-Experimental subjects shall have sixty lectures of one hour duration i.e., four lectures per week over a period of fifteen weeks of a semester.

Syllabus

UNIT I: Perceiving and Understanding others

Number of Hours: 15

- A. Social Psychology: what it is and what not
- B. Social cognition
 - a. Heuristics: how we employ simple rules in social cognition
 - b. Potential sources of error in social cognition
- C. Attribution: understanding the causes of behaviour
 - a. Theories of attribution
 - b. Basic sources of error in attribution
- D. Impression formation and impression management
 - a. Foundational research on first impressions: central and peripheral traits
 - b. How quickly and accurately are first impressions formed?
 - c. Can first impressions be changed?
 - d. Impression management – tactics for ‘looking good’ to others
 - e. How well do impression management tactics work?

Unit II: Attitudes and Persuasion

Number of Hours: 15

- A. Attitudes

- a. Attitude formation
- b. When and why do attitudes influence behaviour?
- c. How do attitudes guide behaviour?
- B. Persuasion
 - a. The science of Persuasion: how attitudes are changed
 - b. Resisting persuasion attempts
- C. Cognitive dissonance

Unit III: Stereotyping, Prejudice and Discrimination

Number of Hours: 15

- A. How members of different groups perceive inequality
- B. The nature and origins of stereotyping
- C. Prejudice: feelings toward social groups
- D. Discrimination: prejudice in action
- E. Techniques for countering prejudice

Unit IV: Social influence

Number of Hours: 15

- A. Conformity: How Groups and norms influence our behaviour
 - a. Social pressure the irresistible force
 - b. How social norms emerge
 - c. Factors affecting conformity
 - d. Social foundations of conformity
 - e. The downside of conformity
 - f. Why we sometimes choose not to go along
 - g. Minority influence: Does the majority always rule?
- B. Compliance
 - a. The underlying principles
 - b. Tactics based on friendship or liking
 - c. Tactics based on commitment or consistency
 - d. Tactics based on reciprocity
 - e. Tactics based on scarcity
 - f. Do compliance tactics work?
- C. Prosocial Behaviour
 - a. Why people help: Motives for prosocial behaviour
 - b. Responding to emergency: will bystanders help
 - c. Factors that increase or decrease the tendency to help
 - d. Emotions and prosocial behaviour

Books for study:

Mandatory:

1. Baron, R. A. & Branscombe, N. R. (2017). *Social Psychology* (14th ed.). Pearson Education Ltd.

Supplementary Reading:

1. Baron, R. A. & Branscombe, N. R., Byrne, D., and Bharadwaj, G. (2011). *Fundamentals of Social Psychology* (1sted.). Pearson education India
2. Baron, R. A. and Byrne, D. (2004). *Social Psychology*(10th ed.). Pearson education India
3. Myers, D.G. and Twenge, J.M. (2020). *Exploring Social Psychology*(8th ed.). McGraw Hill

Course Title: Basic Course in Psychology II

Course Code: PSY- C-11 (experimental)

Marks: 75

Credits: 3

Course Objectives:

1. To build the foundation necessary to study Psychology.
2. To equip with basic knowledge of behavioral aspects.

Course Learning Outcomes: After completion of the course students will be able to:

CLO1: Analyze the factors that influence memory

CLO2: Use various techniques to improve memory.

CLO3: Apply learning theories to modify behavior.

CLO4: Compare different views of the nature of intelligence

CLO5: Explain why people differ in intelligence

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: Memory and Forgetting

Number of Hours:15

- A. Theories of memory
 - a. Three Stages of memory: An Information processing view
 - b. Levels of processing
- B. Theories of Forgetting
 - a. Decay theory
 - b. Interference Theory
 - c. Reconstruction theory
 - d. Motivated forgetting
- C. Application: How to improve memory

UNIT II: Learning

Number of Hours:15

- A. Classical Conditioning

- a. Factors in Classical Conditioning
- b. Applications of Classical Conditioning
- B. Operant Conditioning
 - a. Edward Thorndike
 - b. B.F. Skinner and Reinforcement
 - c. Types of Reinforcers
 - d. Factors in Operant Conditioning
 - e. Applications of Operant Conditioning
- C. Cognitive Theories of Learning (Ref: Lahey)
 - a. Place Learning
 - b. Latent Learning
 - c. Insight Learning
 - d. Modeling
- D. Application: Behaviour Modification

UNIT III: Intelligence

Number of Hours:15

- A. Contrasting views of the nature of intelligence (Baron & Misra)
 - a. Unitary or multifaceted
 - b. Gardner's Theory of Multiple Intelligences
 - c. Sternberg's Triarchic Theory
 - d. Cattell's theory of Fluid and Crystallized intelligence
 - e. PASS theory of intelligence
 - f. Culture and intelligence
 - g. Intelligence in the Indian Tradition
- B. Measuring Intelligence
 - a. IQ: Its meaning then and now
 - b. The Wechsler Scales
 - c. Individual Tests of intelligence: Measuring the extremes
 - d. Group tests of intelligence
 - e. The cognitive basis of intelligence
 - f. The neurological basis of intelligence
- C. Individual Difference
 - a. Evidence for the influence of heredity
 - b. Evidence for the influence of environmental factors
- D. Group Differences
 - a. Evidence for the role of environmental factors
 - b. Is there any evidence for the role of genetic factors?
 - c. Gender differences in Intelligence

*All applications should be made mandatory as the topic of CA rather than a part of the syllabus.

Books for Study:

1. Baron, R. A. & Misra, G. (2014). *Psychology: Indian Subcontinent Edition* (5th ed). Pearson
2. Baron, R.A. (2001). *Psychology* (1st Ed). Pearson Education
3. Ciccarelli, S. K. & White, J. N. (2018). *Psychology* (5th ed.). Pearson India Education Services Pvt Ltd.
4. Feldman, R. S. (2017). *Understanding Psychology* (12th ed.). McGraw Hill Education
5. Lahey, B.B. (2012). *Psychology: An Introduction* (11th Ed.). Tata Mc Graw Hill Publishing Company Limited.
6. Santrock, J.W. (2005). *Psychology Essentials* (2nd ed.). Tata Mc Graw Hill Publishing Company Limited.
7. Smith, E.S., Nolen-Hoeksema, S., Fredrickson, B., & Loftus, G.R. (2006). *Atkinson & Hilgards's Introduction to Psychology* (14th Ed.- 4th Reprint). Thomson Business Information India Pvt. Ltd.

Web Resources:

1. Australian Academy of Science, <https://www.science.org.au/curious/people-medicine/how-memory-develops>
2. Jeffrey Walsh, Positive and negative reinforcement, <https://www.khanacademy.org/test-prep/mcat/behavior/learning-slug/v/operant-conditioning-positive-and-negative-reinforcement-and-punishment>

Course Title: Basic Course in Psychology II

Course Code: PSY- C-10 (experimental)

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

Course Learning Outcomes: At the end of this course, students will be able to

CLO1: Include citations in introduction

CLO2: Write references according to the APA guidelines

CLO3: Administer a personality test and write a report

Syllabus

- A. Experiments
 - a. Measures of Retention
 - b. Retroactive inhibition
 - c. Learning (association or reinforcement)
- B. Psychological Tests:
 - a. Self-report inventory - Big Five Inventory
 - b. Projective technique – sentence completion test
 - c. Performance test – any one Subtest of WAIS – Indian adaptation

Books for study:

1. Anastasi , A. , Urbina, S.(2008). *Psychological Testing*. (7th Ed.). Pearson Education.
2. Ciccarelli, S. K. & White, J. N. (2018). *Psychology* (5th ed.). Pearson India Education Services Pvt Ltd
3. Cohen, J.R. ,&Swerdlik, M.E.(2010). *Psychological Testing and Assessment: An Introduction to Test and Measurements*. (7th Ed.). Mc Graw-Hill Publishing International Edition Company Ltd.
4. Dandeker, W.N. (1999). *Fundamentals in Experimental Psychology*. Anmol Prakashan.

5. Hussain, A. (2014). *Experiments in Psychology* (1st ed.). PHI Learning
6. Mohanty, G. (1996). *Experiments in Psychology*. Kalyani Publishers.
7. Mohsin, S.M. (2013). *Experiments in Psychology*. MLBD
8. Parry, J., & Adisheshiah, W. (1997). *Experimental Psychology*. Allied Publishers Private Limited.
9. Test Manuals

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*, (7thEd.). 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 7th 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: Sport Psychology

Course Code: PSY-III.E-4

Marks: 100

Credits: 4

Course Objectives:

- a) To introduce sport psychology as a career option for students.
- b) To impart basic knowledge about the field of sport psychology.
- c) To impart basic skills of applying psychological knowledge to sports.

Course Outcomes: At the end of this course, students will be able to:

- CO1: Describe the role of a sport psychologist
- CO2: Analyse the impact of aggression in a sporting situation
- CO3: Describe how motivation can be applied to sports performance
- CO4: Analyse group dynamics in a sports team
- CO5: Evaluate the leadership styles used by different sportspersons
- CO6: Construct a plan for performance enhancement for a sportsperson

Course Duration: Each paper in Non-Experimental subjects shall have 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 Sport psychology

Number of Hours: 10

1. What is sport psychology?
2. A brief history of sport psychology
3. Who is a sport psychologist?
4. Research in sports
 - a. Experiments, case studies and observations
 - b. Qualitative and Quantitative research

UNIT II. Aggression and Motivation in Sports

Number of Hours: 20

1. Defining aggression
 - a. Hostile aggression, instrumental aggression and assertiveness
 - b. Sanctioned and unsanctioned aggression
 - c. The link between aggression and performance
2. Theories of aggression
 - a. Instinct theory, Social learning theory, Frustration-aggression hypothesis
3. Situational factors affecting aggression in sport
4. Does sports increase or reduce aggression?
5. The reduction of aggression
 - a. Punishment, Catharsis, Role modeling, Contracting, Anger-management

6. Intrinsic and extrinsic motivation
7. Humanistic perspectives on motivation: Maslow's hierarchy of needs
8. Achievement-motivation: McClelland-Atkinson's theory of need achievement
9. Cognitive approaches to motivation
 - a. Weiner's model of attribution
 - b. Learned helplessness and reattribution training
 - c. Self-efficacy

UNIT III: Group processes

Number of Hours: 15

1. Groups and teams
 - a. Group formation
 - b. Cohesiveness and performance
 - c. Social facilitation and social loafing
 - d. Groupthink
2. Leadership
 - a. Leadership style
 - b. Theories of leadership: trait theories, Fiedler's contingency theory

UNIT IV: Performance enhancement and other issues

Number of Hours: 15

1. Issues of motivation
2. Issues of arousal and anxiety
3. Issues of concentration
4. Issues of confidence
5. Injury
6. Burnout and over-training

References:

1. Jarvis, M. (1999). *Sport psychology*. Routledge modular psychology series, USA and Canada.
2. Weinberg, R. S., & Gould, D. (2015). *Foundations of Sport and Exercise Psychology* (Sixth Edition). Courier Companies, Inc.
3. Shaw, D., Gorely, T., and Corban, R. (2007). *Sport and Exercise Psychology*. The Instant Notes series, BIOS Scientific Publishers, UK and USA.

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

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.

- 3) Cohen, R. J. & Swerdlik, M. E, Psychological Testing and Assessment: An Introduction to Tests and Measurement (seventh Edition). New York: McGraw-Hill.

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 abnormal behaviour from different theoretical perspectives

CO3: Describe different therapeutic approaches to deal with abnormal 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: 15

- A. What do we mean by Abnormality?
 - a) Indicators of Abnormality
 - b) The DSM V and ICD 11
- B. Classification of disorders
 - a) What are the advantages and disadvantages of classification?
 - b) How can we reduce prejudicial attitude (stigma) against the mentally ill?
- C. Clinical Assessment and Diagnosis
 - a) Assessment of the Physical organism: General Physical examination, Neurological examination, Neuropsychological examination
 - b) Psychosocial assessment: Assessment interview, Clinical observation, Psychological tests

UNIT II: Mood and Anxiety disorders

Number of Hours: 12

- 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

UNIT III. Theories and Treatment of Abnormality

Number of Hours: 18

- A. Biological approaches
 - a. Causes: Brain dysfunction, Biochemical imbalances, The endocrine system, Genetic abnormalities
 - b. Treatment: Drug Therapies, Electroconvulsive Therapy and Brain Stimulation, Psychosurgery
 - c. Assessing Biological approaches
- B. Psychological approaches
 - a. Behavioral approaches and therapies
 - b. Cognitive approaches and therapies
 - c. Psychodynamic approaches and therapies
 - d. Humanistic approaches and therapies
 - e. Family systems approaches and therapy
 - f. Third-wave approaches and therapy
 - g. Assessing psychological approaches
- C. Socio-cultural approaches
 - a. Cross-cultural issues in treatment
 - b. Culturally specific therapies
 - c. Assessing socio-cultural approaches

References:

1. Hooley, J. M., Butcher, J. N., Nock, M. K., & Mineka, S. (2017). *Abnormal Psychology* (17th Edition). Pearson Education Limited.
2. Nolen-Hoeksema, S. (2020). *Abnormal Psychology* (8th Edition). McGraw-Hill Education.

3. American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.
4. World Health Organization. (2019). *International statistical classification of diseases and related health problems* (11th ed.). <https://icd.who.int/>

Suggested Reading:

1. Comer, R.J. (2005). *Fundamentals of Abnormal psychology*. (4th edi). Worth publishers. 41 Madison Avenue.
2. Davison, G.C. & Neale, J.M. (1998). *Abnormal Psychology*. (7th edi). John Wiley & sons, Inc. New York/Chichester/Weinheim/Brisbane/Singapore/Toronto.
3. Koeksema-susan Nolen. (2007). *Abnormal Psychology*. (3rd 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)

Course Title: Psychopathology I

Course Code: PSY-III.C-5 (Practical Component)

Marks: 25

Credits: 1

No. of Practicals: 06

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

- 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: 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: 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

UNIT II: Personality Disorders

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

UNIT III: 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

***Probable CA idea:** Research facts about serious mental illness from 2010

References: Mandatory:

1. Hooley, J. M., Butcher, J. N., Nock, M. K., & Mineka, S. (2017). *Abnormal Psychology* (17th Edition). Pearson Education Limited.
2. Nolen-Hoeksema, S. (2020). *Abnormal Psychology* (8th Edition). McGraw-Hill Education.
3. American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). Washington, DC: Author.
4. World Health Organization. (2019). *International statistical classification of diseases and related health problems* (11th ed.). <https://icd.who.int/>

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*. (7th edi). John Wiley & sons, Inc. New York/Chichester/Weinheim/Brisbane/Singapore/Toronto.
3. Koeksema-susan Nolen. (2007). *Abnormal Psychology*. (3rdEdi) the McGraw-Hill companies, New York.
4. Comer, R.J. (2005). *Fundamentals of Abnormal psychology*. (4th 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%3Ascgs%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)

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
 - 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 (any two, 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. DiIorio. (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 & Hilgard'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*. (11thEd.). New Delhi: Indian Reprint by Pearson Education Hall, Taj Press.

Economics

CORE COURSES

Course Title: Principles of Economics

Course Code: ECO-I.C-1

Marks: 100

Credits: 04

Duration: 60 Hours

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 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.

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; 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, Monopolistic competition, 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, (2013)*Principles of Economics*, Thomson / South-Western, Seventh Edition.
- 2.Salvatore, Dominick,(2012) *Principles of Micro Economics*, Oxford International student edition, Eighth Edition.

Supplementary:

1. Tucker,I. *Economics for Today*,(2005), Cengage learning, Inc.
- 2..Pindyck, Robert S and Rubinfeld, Daniel L. (2012) *Microeconomics*, Pearson, Delhi

Web Based:

1. https://s.docworkspace.com/d/AHKfZ6DYjI4uwfvQ_JOdFA
2. https://www.google.com/url?sa=t&source=web&rct=j&url=https://mpr.aub.uni-muenchen.de/390/1/MPRA_paper_390.pdf&ved=2ahUKEwjFzsWugcHkAhUfTY8KHUQaABYQFjAPegQIBxAB&usq=AOvVaw2GV4rf2L5axBFyI3HuAu3J
3. https://mpr.aub.uni-muenchen.de/390/1/MPRA_paper_390.pdf
4. <https://econpapers.repec.org/bookchap/eeelabchp/5-11.html>

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 (15 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; Coordinate geometry: straight line, rectangular hyperbolas, concave & convex, tangency.

Unit 2: Concept of Function and Types (20 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.

Unit 3: Optimization (15 Hours)

Problems of Maxima and Minima in Single and Multivariable Functions; 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.
2. Chiang, A.C. & Kevin Wainwright (2005), *Fundamental Methods of Mathematical Economics*; Fourth Edition, McGraw-Hill.
3. Dowling, Edward T. (1992), *Schaum's Outline of Theory and Problems of Introduction to Mathematics*; 3rd Edition, McGraw-Hill

Supplementary:

4. Zumruddin and Khanna, *Business Mathematics*, second edition, S Chand and sons Delhi. 2009
5. Mehta – Madnani (1973), *Mathematica for Economist*, S Chand and Sons Delhi.

Web Based:

1. <https://www.semanticscholar.org/paper/The-use-of-Mathematics-in-Economics-and-its-Eect-a-Espinosa-Rond%C3%B3n/3f7f08695495e297dcc2ee31e8c3d2ee67a15cbe>
2. <https://pdfs.semanticscholar.org/3f7f/08695495e297dcc2ee31e8c3d2ee67a15cbe.pdf>

3. https://www.google.com/search?safe=strict&ei=hJeJXZLxCp3Vz7sPwumS4Ag&q=Mathematical+Modelling+and+Ideology+in+the+Economics+Academy%3A+competing+explanations+of+the+failings+of+the+modern+discipline%3F&oq=Mathematical+Modelling+and+Ideology+in+the+Economics+Academy%3A+competing+explanations+of+the+failings+of+the+modern+discipline%3F&gs_l=psyab.12..0i362i308i154i357i6.27692.32493..36100...0.0..0.533.533.5-1.....1....1j2..gswiz.....6.Od4MgZUFbQo&ved=0ahUKEwiSw9LhyjkAhWd6nMBHcK0BIwQ4dUDCAs

Course Title: Economics of Growth and Development

Course Code: ECO-II.C-3

Marks: 100

Credits: 4

Duration: 60Hours

COURSE OUTCOMES: Upon completion of the syllabus students will be able to:

CO1: Distinguish between the concept of economic growth & development

CO2: Calculation of Human development index

CO3: Mind-map the theories of growth and development on a timeline

CO4: State the patterns of growth based on classical & neoclassical theories of growth and development

CO5: Give examples of economies which have experienced the growth & development in line with any given theory.

CO6: Compare & contrast various growth & development models as applicable to India since 1947 till date.

CO7: Categorize intra and inter regional growth patterns in India

SYLLABUS

Unit 1: Growth and Development (15 Hours)

Growth and development, Components, Indicators, Approaches to development: Traditional and Modern; Sen's capabilities approach, Human development Index.

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 few Indian States including Goa.

REFERENCES:

Mandatory:

1. Todaro M , Smith S.(2013), *Economic development*, Pearson, Noida, India .
2. Thirlwall A.,(2005), *Growth and development: with special reference to developing economies*, Palgrave, Macmilan, USA .

Supplementary:

1. Hayami Y, (2005), *Development economics: from the poverty to the wealth of nation*, Oxford India, Paperback, India
2. Ray Debraj, (2007), *Development economics*, Oxford India paperback, Noida, India

Web Based:

1. https://www.google.com/url?sa=t&source=web&rct=j&url=http://www.fao.org/docs/up/easypol/882/defining_development_paradigms_102en.pdf&ved=2ahUKEwiE-LqDhMHkAhWBL48KHUAKD0AQFjABegQIARAB&usg=AOvVaw3vGwR2K6i4nyzrnoyqPW5G
2. [LqDhMHkAhWBL48KHUAKD0AQFjABegQIARAB&usg=AOvVaw3vGwR2K6i4nyzrnoyqPW5G](https://www.google.com/url?sa=t&source=web&rct=j&url=http://www.fao.org/docs/up/easypol/882/defining_development_paradigms_102en.pdf&ved=2ahUKEwiE-LqDhMHkAhWBL48KHUAKD0AQFjABegQIARAB&usg=AOvVaw3vGwR2K6i4nyzrnoyqPW5G)
3. <http://hdr.undp.org/en/content/human-development-index-hdi>
4. <https://www.indiabudget.gov.in/economicsurvey/>

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: Summarize, interpret and graph data appropriately

CO 3: Apply discrete and continuous probability distributions to various business problems

CO 4: Analyze 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: Correlation and Regression

(15 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; *Use of MS EXCEL/Other spreadsheet.

Unit 2: Time Series & Index Numbers

(15 Hours)

Definition and Utility of Time Series Analysis; Components of Time Series; Decomposition of Time Series; Methods of Measurement of Trend: freehand method, semi-averages, moving average, least squares method; Meaning and Concept of Index Numbers; Issues in Construction of Index Numbers; Classification of Index Numbers; Methods of Constructing Index Numbers: Weighted Index Numbers, Unweighted Index Numbers.

Unit 3: Probability Distributions

(15 Hours)

Meaning of probability; Fundamental Concepts and Approaches to Probability; Probability Laws: Addition Law, Multiplication Law, Applications of probability Law; Bayes' Theorem; Types of Probability Distribution; Concept of Random Variables; Discrete Probability Distribution: Binomial Distribution, Poisson Distribution; Continuous Probability Distribution: Normal Distribution, Characteristics of Normal Distribution, Importance and Application of Normal Distribution.

Unit 4: Population, Sampling and Hypothesis Testing

(15 Hours)

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;

Hypothesis; Level of significance, critical area; Type I and Type II errors, Z, t, F and χ^2 distribution; ANOVA (one way and two ways).

*Existing or Extra lectures on use of Excel (Mandatory)

REFERENCES:

Mandatory:

1. Gupta, S.P. 1999, Elementary Statistical Methods, Sultan Chand & Sons, New Delhi.
2. Arora, P.N. et.al. (2007), *Comprehensive Statistical Methods*, 1st edition, S. Chand, New Delhi.

Supplementary:

1. Anderson, David R. et.al. *Statistics for Business and Economics*, Cengage Learning India Edition.
2. Levine, D. M., Berenson, M. L., & Stephan, D. (1997). *Statistics for managers using Microsoft Excel*. Upper Saddle River, N.J: Prentice Hall.

Web links:

1. <https://www.itl.nist.gov/div898/handbook/prc/section1/prc131.htm>
2. <https://www.statisticshowto.com/probability-and-statistics/hypothesis-testing/>
3. <https://www.excel-easy.com/examples/descriptive-statistics.html>

Course Title: Microeconomics

Course Code: ECO-III.C-5

Marks: 100

Credits: 4

Duration: 60Hours

COURSE OUTCOMES: Upon completion of the course students will be able to:

CO1: Distinguish concepts related to consumer & producer behaviour theories

CO2: Construct Indifference curve and Budget lines under different scenarios

CO3: Distinguish between price effect, substitution effect and income effect using Slutsky & Hick's method for different types of goods.

CO4: Compute total, average & marginal concepts related to production, cost & revenue.

CO5: Compare & contrast competitive & non competitive market structures.

CO6: Categorize normal profit, supernormal profit, loss and shutdown point across different Market structures.

SYLLABUS

Unit 1: Consumer Behavior and Demand (15 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 (15 Hours)

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, so-cost line - Ridge Line, Returns to Scale.

Unit 3: Cost and Revenue (15 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 & imperfect market structure (15 Hours)

Perfect markets, Behavior of profit maximizing firms and the production process; Price and output decisions; costs and output in short and long run;

Nature and types of imperfect market structures, Assumptions, Conditions of imperfections, Imperfect markets: price & output under Monopoly, monopolistic competition and Oligopoly.

REFERENCES:

Mandatory:

1. Salvatore, Dominick, *Principles of Micro Economics*, (Eighth Edition) Oxford International student edition,
2. Pindyck, Robert S and Rubinfeld, Daniel L. (2012) *Microeconomics*, Pearson, Delhi
3. Tucker, J. *Economics for Today*, (Eleventh edition), Cengage learning, Inc
4. Pindyck, Robert S and Rubinfeld, Daniel L. (2012) *Microeconomics*, Pearson, Delhi

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.Koutsyannis, A, *Modern MicroEconomics*, (Second Edition), Palgrave Macmilan

Web based:

1. https://www.researchgate.net/publication/276345195_Indifference_Curve_Analysis_The_Correct_and_the_Incorrect/link/584de00008ae4bc8993312cd/download
2. <https://economics.ucsc.edu/research/downloads/Friedman-Sakovics-MU23.pdf>
3. <http://etheses.lse.ac.uk/3053/1/U616008.pdf>
4. <http://www.oecd.org/daf/competition/1920526.pdf>

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 and measurement: GDP, GNP, NDP, NNP; Methods of measurement: Value Added and Expenditure Approach; Price Indices and Deflator.

Unit 3: Keynesian Macro-economic Framework (20 Hours)

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 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 difference between public finance and Public economics.

CO2: Appreciate public economics & its rationale.

CO3: Discuss the nature of public economy, the functioning of markets and determinants of market failure.

CO4: Evaluate the welfare effect of taxes

CO5: Demonstrate the theory of public goods in reality.

CO6: Identify the major areas and roles for government activity

CO7: Describe the major items of government revenue and expenditure

CO8: Familiarize the students with concepts of welfare economics

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; Federal state v/s unitary.

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, Benefit and ability to pay principle, 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; Cost –Benefit analysis; 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.(2009) Public Finance & Public Choice: Analytical Perspectives, Oxford
2. Aurbach, A. & M. Feldstein (eds) (1987) Handbook of Public Economics, Vol.I& II, Elsevier, New York
3. Baumol, W. J. (Ed.) (2001), Welfare Economics, Edward Elgar Publishing Ltd. U.K

4. Herber, B.P.. Modern Public Finance, Third Edn. 1975, Richard D. Irwin, Inc.
5. Atkinson, A.B and. Stiglitz J.E (2015), Lectures on Public Economics, McGraw–Hill, New York

Supplementary:

1. Musgrave, R. A. (1959), The Theory of Public Finance, McGraw Hill, New York.
2. Musgrave, R. and Musgrave P. (2004), Public Finance in Theory and Practice, McGraw–Hill.
3. Cornes, R. & T. Sandler (1986) The Theory of Externalities, Public Goods and Club Goods, Cambridge University Press, Cambridge
4. Hindriks J. and Myers G.D. () Intermediate Public Economics, Prentice Hall of India, New Delhi

Web Based

1. <https://dea.gov.in/external-debt>
2. <https://ocw.mit.edu/courses/economics/14-471-public-economics-i-fall-2012/lecture-notes/>
3. <https://www.startupindia.gov.in/content/sih/en/international/go-to-market-guide/tax-system-india.html>
4. https://www.indiabudget.gov.in/exp_budget.php

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 analyzing trade theories & the economic effects of trade policies

CO4: Analyze 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

CO7: Highlight the concept of Portfolio and direct investment

SYLLABUS

Unit 1: Classical Trade Theories

(15 Hours)

Introduction & importance of international trade, Introduction to international trade theories, 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, Local content requirement, 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; foreign direct investments and Foreign Portfolio ; Multinational enterprises and world trade.

REFERENCES:

Mandatory:

1. Carbaugh, Robert J. (2002), *International Economics*, South-Western (Thomson Publishing), Bangalore, 8th edition (Latest available 15th edition)
2. Paul R. Krugman & Maurice Obstfeld (2009), *International Economics Theory and Policy*, Pearson Education Publication New Delhi.
3. Salvatore, Dominic (2014), *International Economics: Trade and Finance*, John Wiley & Sons, Delhi
4. Gandolfo, G (2006), *International Trade: Theory and Policy*, Springer (India) private limited.
5. Krugman, Paul R.; Obstfeld, Maurice (2011), *International Economics: Theory and Policy*, Pearson, New Delhi.

Supplementary:

1. Husted Steven and Michel Melvin (2009), *International Economics*, Addison-Wesley, New York.
2. Jones, K.A. (2015), *Reconstructing the World Trade Organization for the 21st Century: An Institutional Approach*, Oxford University Press, New York.
3. Thompson, Henry (2010), *International Economics*, Cambridge University Press India, New Delhi.
4. Bhagwati, J. (Ed.) (1981), *International Trade, Selected Readings*, Cambridge University Press, Mass

Web based:

1. <http://www.makeinindia.com/policy/foreign-direct-investment>
2. <https://study.com/academy/lesson/modern-approach-to-international-trade-theory.html>
3. https://ocw.mit.edu/courses/economics/14-54-international-trade-fall-2016/lecture-slides/MIT14_54F16_Lecture_8.pdf

Course Title: Regional Economics

Course Code: ECO- E-2

Marks: 100

Credits: 04

Duration: 60 Hours

COURSE OUTCOMES: Upon completion of the course students will be able to:

CO1: Identify the distribution of economic activities across space especially in India.

CO2: Understand the market structures

CO3: Assess the migration patterns.

CO4: Explain the problems involved in regional growth.

CO5: Examine the impact of migration on regional development.

SYLLABUS

Unit 1: Introduction to regional economics, Clustering & Agglomeration (15 Hours)

Regional economics: Meaning, Scope and Relevance; Types of regions: Homogeneous, heterogeneous; Regionalization: Development, planning & policies. Industrial clustering and returns to scale, Agglomeration economies: source, types, clustering & nature of transactions, Urban consumption, limited information, uncertainty and evolution of clusters.

Unit 2: Location Theory and Economic Activity (15 Hours)

Weber'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, Land competition (bid rent model).

Unit 3: Problems of Regional Economic Growth (15 Hours)

Mono centricity, land supply and landownership, labor markets, wage flexibility & Interregional labor migration, Balance of payments and regional growth.

Unit 4: Regional flows and economic growth (15 Hours)

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.
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.

Supplementary:

1. Krugmen, Paul *Geography and trade*, MIT press.
2. Martin, Beckmann. (1968), *Location Theory*, Random House, New York.
3. Moses, Leon (1968), *Spatial Economics: General Equilibrium Approach*, in Encyclopedia of the Social Sciences, Macmillan, New York.
4. Nijkamp, Peter, Mill, S Edwin. (2007), *Handbook of Regional and Urban Economics: Regional economics*, North- Holland publishers.
5. Nourse, Hugh O (1968), *Regional Economics*, McGraw-Hill, New York.
5. Richardson, W Harry (1978), *The State of Regional Economics*, International Regional Science Review, Fall.
6. Webber, J Michael. (1972), *Impact of Uncertainty on Location*, MIT Press, Cambridge.

7. Woglom, W. H. (1954), *The Economics of Location*, Yale University Press, New Haven.

Web based:

1. https://www.researchgate.net/publication/266457660_Application_of_the_Von_Thunen_Model_in_Determining_Optimal_Locations_to_Transport_Compost_for_Crop_Production_Outside_of_Yaounde_Cameroon
2. https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2260059
3. <https://planningtank.com/settlement-geography/central-place-theory-walter-christaller>
4. https://www.maa.org/sites/default/files/pdf/ebooks/GTE_sample.pdf
5. https://www.researchgate.net/publication/249871420_Agricultural_location_theory_Von_Thunen's_contribution_to_economic_geography
6. <https://spinlab.vu.nl/wp-content/uploads/2016/09/ExerciseVonThunen.pdf>

Course Title: Environmental Economics

Course Code: ECO- E-4

Marks: 100

Credits: 4

Duration: 60Hours

COURSE OUTCOMES: Upon completion of the course students will be able to

CO1: Define basic concepts in 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 an 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
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*, 9th edition, Pearson

Supplementary:

1. Wallace Oates (Editor) (2006), *The RFF Reader in Environmental and Resource Policy*, 2nd edition, RFF Press

Web based:

1. http://eepseapartners.org/pdfs/pdfs/12628447961Luangmany_et_al_-_Valuing_Environmental_Services.pdf
2. <https://www.cbd.int/financial/finplanning/g-costestimate-worldbank.pdf>
3. http://www.eemj.icpm.tuiasi.ro/pdfs/vol7/no6/39_Petru%20%20Condrea.pdf
4. <https://pdfs.semanticscholar.org/27ab/f13c63e7ac46fc324b2566c83ba83a11a646.pdf>
5. https://www.researchgate.net/publication/261874311_Environmental_cost-benefit_analysis_of_decentralised_wastewater_treatment_and_re-use_A_case_study_of_rural_Jordan
6. <https://ideas.repec.org/a/ags/joaac/155413.html>

Course Title: Introduction to Industrial Economics

Course Code: ECO- E-7

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; Factors Affecting Industrial Development, Industry and Sectoral Linkages, Industrial Organization and Ownership Structure- Public; Private; Joint and Cooperative Sectors, Significance of Size- Traditional Industries and Modern Industries- IT sector, FMCG, Defence, health sector and tourism, Export oriented industries , Agro-processing Industries, MSMEs- Small-Scale Industries; Cottage and Village Industries and Rural Industrialization, Role of MSMEs, public and private and their contribution in economy and problems faced, Recent trends in Indian industrial growth , Startups-theory and concept

Theory of the Firm: Concept, optimum size and objectives of the firm; Alternative approaches: transaction cost theory and behavioral theory of firm, Separation of ownership and control – implications.

Unit 2: Structure, Conduct and Performance and market structure (15 Hours)

Price and non-price competition: differentiation between price and non-price competition, Non Price Competition: Meaning & Product Differentiation- Horizontal and vertical Product Differentiation, Brand Proliferation as an Entry Deterrence Strategy, Firm Behavior & Market Outcomes. i Collusion ii Merger iii Acquisition , iv Joint Ventures: their performance and sustainability.

Market Performance and Growth of the firm – Size, growth, & profitability of a firm; Productivity, Efficiency and capacity utilization. Constraints on the above.

Unit 3: Industrial Location Analysis (10 Hours)

Meaning of Industrial Location, Theories of industrial location – Weber and Sargent Florence- modern Approach, Determinants of Industrial Location: Factors affecting location

Unit 4: Industrial Policy, MNCs and Regulatory Mechanisms (15 Hours)

India's industrial policy pre and post globalization need for reforms in regulatory mechanisms: Industrial policy for inclusive growth, labour reforms, Industrial policy in a global economy, Corporate Governance and Business Ethics Corporate Social Responsibility Act 2013

Regulatory Mechanism: Competition Act 2002, SEBI, TRAI, RBI, SIDBI, other centre and state polices and regulations stressing only on their regulations on industries. Global changes and their impact on Marketing Strategies and Information System for Indian Industries– structure and recent initiatives, FEMA; Export-Import (EXIM) Policy.

REFERENCES:

Mandatory readings:

Mandatory Reading:

1. Barthwal, R. R. (2021), Industrial Economics (14th Edition) , Wiley Eastern Ltd., New Delhi.

Supplementary Reading:

1. McCann, Philip. (2013), Modern Urban and Regional Economics, Oxford University press
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, (2021),*Dynamics of Industrial Relation (sixteenth edition* ,Himalaya Publishing House, Mumbai.
4. SenRatna,(2003), *Industrial Relations In India*, Macdonald and Evans, G. Britain.

Web links

1. <https://www.ibef.org/industry>
2. <https://msme.gov.in/>
3. <https://www.sciencedirect.com/topics/economics-econometrics-and-finance/location-theory>
4. <https://www.dgft.gov.in/CP/?opt=ft-policy>

Course Title: Introduction to Econometrics

Course Code: ECO- E-9

Marks: 100

Credits: 4

Duration: 60Hours

COURSE OUTCOMES: Upon completion of the syllabus students will be able to:

CO1: Understand the concepts used in sampling in particular and in Econometrics at large

CO2: Use OLS for calculating parameters in regression.

CO3: Construction of point and confidence interval estimate.

CO4: Formulate, test and draw inferences from hypothesis.

CO5: Use R programming to run multiple regression models.

CO6: Interpret the results obtained for linear & multiple regression model

SYLLABUS

Unit 1: 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 2: The Two-Variable Model: Hypothesis Testing. (15 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 3: Multiple Regressions: 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 4: 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. (2009), *Basic Econometrics*, McGraw Hill, Singapore.

2. Ramanathan, Ramu (1998), *Introductory Econometrics with Applications*, Thomson Asia Pte Ltd., Singapore.
3. Koutsyannis, A.(1990), *Theory of Econometrics*, Palgrave Macmilan.
4. Journal of Econometrics

Supplementary:

1. .Gujarati, Damodar N. (1999), *Essentials of Econometrics*, Irwin/McGraw Hill, Singapore.
2. Studenmund, A. H. (1997), *Using Econometrics: A Practical Guide*, Adisson-Wesley, Reading, Mass.

Web References:

- 1.<https://instruction.bus.wisc.edu/jfrees/jfreesbooks/Longitudinal%20and%20Panel%20Data/Book/Chapters/FreesFinal.pdf>
2. https://www.researchgate.net/publication/7222561_Study_Design_III_cross-sectional_studies/link/00463530cc57333de4000000/download
3. https://www.reed.edu/economics/parker/312/tschapters/S13_Ch_1.pdf

Course Title: Indian Economy

Course Code: ECO- E-1

Marks: 100

Credits: 04

Duration: 60Hours

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: Critically evaluate the policies with regard to Indian economy.

CO4: Review India's position with regard to foreign trade FDI, FII, MNC's, WTO globally.

CO5: Compare and contrast between planning commission & NITI Aayog

CO6: Appraise the status of Indian economy with regard to current economic situation.

SYLLABUS

Unit 1: Structural Changes in the Indian Economy (15 Hours)

India on the eve of independence, Pre reform period (1951-1991)-Need for planning (brief introduction and highlights of all plans), Structural adjustment programme: need, impact, Liberalization, Privatization, and Globalization; Primary -Secondary -Tertiary sector Linkages – trends

Unit 2: Key Issues of Indian Economy (15 Hours)

Key issues: Population-theory of demographic transition demographic dividend, gender ratio; poverty-Absolute and relative and its extent, Health, Education, inequality, gini coefficient, inequality, unemployment-types organised and unorganized, labour force participation; (causes and trends of each issue); Challenges: Inclusive growth: social; Parallel Economy; Rural development, urbanization, migration; Environment & Sustainable development.

Unit 3: Policy Perspectives (15 Hours)

Shift from Planning commission to NITI Aayog (Planning commission to be briefly assessed till 12th plan); Impact of policy shifts on decisions: finance, infrastructure, Evaluation of the performance of NITI Aayog, investments; Flagship Missions of GOI (MNREGA, PMJDY, Digital India, Swachh Bharat Abhiyan, PMUY, NHM, Make in India), Fiscal Federalism.

Unit 4: India's Foreign Trade (15 Hours)

India's foreign Trade post 1991: Features, value, composition, direction; India's position in the world economy: Foreign Trade: Features and trends; Capital movements: FDI, FII, MNC's; WTO-structure, its impact on Indian economy, Agreements.

REFERENCES:

Mandatory:

1. Government of India: Economic Survey (various years), Government of India, New Delhi.
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.

Supplementary:

1. Kapila, Uma. (2007), India's Economic development since 1947, Academic Foundation, New Delhi.
2. Rajan, K. (2006), Indian Economy Post Reform Scenario, Serials Publication, New Delhi

Web based:

1. <https://www.indiabudget.gov.in/economicsurvey/>
2. <https://www.adb.org/sites/default/files/publication/28930/understanding-poverty-india.pdf>
3. <http://www.iegindia.org/upload/publication/Workpap/wp349.pdf>
4. <https://dbie.rbi.org.in/DBIE/dbie.rbi?site=home>
5. <https://www.india.gov.in/website-niti-aayog>
6. https://www.researchgate.net/publication/262126139_Economic_Growth_and_Human_Development_in_Indian_States

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 (15 Hours)

a. Origin, nature and scope of Actuarial Economics: Its importance; Link between financial planning and risk management; Utility and risk preference.

b. Annuity and its Calculations

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 2: Pricing (15 Hours)

Basic elements in computation of life insurance premium; premium calculation; formulae for calculation of net premium.

Unit 3: Mortality Tables (15 Hours)

Probability theory in insurance; mortality table; types: select and ultimate tables; stages involved in construction of mortality table.

Unit 4: Product Design and Actuarial Profession (15Hours)

Basic methodology and setting assumptions; product design; actuarial standards and regulations, role of IRDA.

REFERENCES:

Mandatory:

1. Mishra K.C. & Kumar C.S., (2009), *Elements of Actuarial Science*, Cengage Learning, Delhi
2. Booth, P.M. et al., (1999), *Modern Actuarial Theory and Practice*, Chapman and Hall, London
3. Newton Bowers et al., (1997), *Actuarial Mathematics*, Society of Actuaries, (second edition), Illinois.
4. Sherris, Michael, (2001), *Principles of Actuarial Science*, **PDF**
5. Marco Corazza et al. (2016), *Mathematical and Statistical Methods for Actuarial Science and Finance*, Springer International Publisher.

Web-based:

1. https://www.researchgate.net/publication/306082366_Knowledge_and_Perceptions_of_Actuarial_Science_Among_Students_and_Academics_Evidence_from_JABU
2. <https://www.casact.org/library/astin/vol36no1/1.pdf>
3. https://faculty.wharton.upenn.edu/wp-content/uploads/2013/05/Lemaire_2005_Actuarial_1.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: Map the theories of distribution from classical to neo classical.

CO2: Classify theories of distribution in competitive and non -competitive market structures.

CO3: Distinguish between general equilibrium & welfare economics.

CO4: Compare & contrast partial equilibrium with general equilibrium.

CO5: Examine market failure and causes of it.

CO6: Construct Edgeworth box.

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; Rawls' 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.
2. Cowell A Frank (2006) Microeconomics: Principles and Analysis, Oxford University Press, New York.
3. Gravelle Hugh and Ray Rees (2008), Microeconomics, Pearson Education Inc. and Dorling

Kindersely Publishing Inc., New Delhi.

4. Hal R Varian, (2010), *Microeconomic Analysis*, W W Norton & Company, New York.

5. Baumol W.J (1987), *Economic Theory and Operations Analysis*, Prentice Hall of India, New Delhi.

Supplementary:

1. Gravelle, H and Ray Rees, (2004), *Microeconomics*, Pearson Education Limited, England.

2. Maddala G.S and Ellen Muller(1989), *Microeconomics: Theory and Applications*, McGraw Hill, Singapore.

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.

Web based:

1. <https://www.youtube.com/watch?v=R7GL4wFpGHQ>

2. <https://www.youtube.com/watch?v=XlhoCeksmX4>

Course Title: Introduction to Operations Research for Economists

Course Code: ECO-E-13

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:

Mandatory:

1. Kantisawrup et al, (2005), *Operations Research*, S Chand & sons, New Delhi
2. Tulsian P.C., Pandey V., (2006), *Quantitative Techniques*, Pearson India.

Supplementary:

1. Taha H., (2006), *Operation Research: An Introduction*, Pearson, 7th Edition

Web based:

1. <https://arxiv.org/ftp/arxiv/papers/1410/1410.4774.pdf>
2. https://www.researchgate.net/journal/0377-2217_European_Journal_of_Operational_Research
3. <https://www.sciencedirect.com/science/article/abs/pii/S0377221705005047>

Course Title: Economics of Foreign Exchange

Course Code: ECO- E-14

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 organization 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(Ex. RBI mechanism); Exchange controls; Nature of international reserves; International Monetary Fund and facilities for borrowing reserves; Basel Norms(emphasis on latest).

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. Salvatore, Dominic (2014), *International Economics: Trade and Finance*, John Wiley & Sons, Delh
2. Krugman, P.R. and M. Obstgeld (2011), *International Economics: Theory and Policy*, Glenview, Foresman.

Supplementary:

1. Carbaugh, Robert J. (2002), *International Economics*, South-Western (Thomson Publishing), Bangalore.
2. Pilbeam, Keith (2013), *International Finance*, Palgrave Macmillan, London

Web based:

1. <https://www.drishtias.com/to-the-points/paper3/basel-norms#:~:text=The%20Basel%20norms%20is%20an,banks%20and%20the%20financial%20system.>
2. <https://www.kotaksecurities.com/ksweb/Research/Investment-Knowledge-Bank/what-is-derivative-trading>

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 (15 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 (15 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 (15 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 (15 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.
2. Bodie, Zvi Kane, Alex Marcus Alan (2012), Essentials of Investments, 9th Edition, McGraw Hill Higher Education.
3. Eichberger J and Ian.R. Harper,(1997), Financial Economics, Oxford University Press,Oxford.

4. Avadhani V. A 2012, Financial Economics, Theory and Practice, Himalaya Publications
5. Pilbeam Keith (1998), Finance and Financial Markets, Palgrave, New Delhi.

Supplementary:

1. D.E. Fisher and R.J. Jordan – (2001) Security Analysis and Portfolio Management, Prentice-Hall/Pearson Edu., 6th Edition,
2. Reilly Frank K and Keith C. Brown, (2007) Investment Analysis and Portfolio Management, 8th edition, Thomson Learning
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, McGraw Hill, 7th edition.
5. Thomas E. Copeland, J. Fred Weston and Kuldeep Shastri (2003), Financial Theory and Corporate Policy, Prentice Hall, 4th edition.

Web based:

1. <https://www.bseindia.com/>
2. <https://www.nseindia.com/>
3. <https://www.sebi.gov.in/>
4. <https://economictimes.indiatimes.com>

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, Money measures, 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. Harris, C.L. (1961), *Money and Banking*, Allyn and Bacon, London.
3. Laliwala, J.I. (1984), *The Theory of Inflation*, Vani Educational Book, New Delhi.
4. Mishra, S.S. (1981), *Money, Inflation and Economic Growth*, Oxford & IBH Publishing Company, New Delhi.
5. Ackey, G (1976), *Macro Economics Theory and Policy*, Macmillan Publishing Company, New York.
6. Ahuja H. L. (2002), *Macroeconomics Theory and Policy*, Chand and Co. Ltd New Delhi

Supplementary:

1. Mankiw N. G. (2010), *Macroeconomics*, 7th 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

Web based:

1. <https://indianmoney.com/articles/banking-system-in-india#:~:text=The%20banking%20system%20in%20India%20has%20four%20tiers%3A,bank%20of%20India%20act%2C%201934.&text=Regional%20rural%20banks%3A%20these%20banks,banks%20operating%20in%20rural%20areas.>
2. <https://www.macrotrends.net/countries/IND/india/inflation-rate-cpi#:~:text=India%20inflation%20rate%20for%202019,a%200.93%25%20decline%20from%202015.>

SKILL ENHANCEMENT COURSES

Course Title: Entrepreneurship

Course Code: ECO-SEC -1

Marks: 100

Credits: 4

Duration: 60 Hours

COURSE OUTCOME: Upon completion of the course students will be able to:

CO1: Identify and evaluate business opportunities

CO2: Evaluate risks

CO3: Pursue innovations

CO4: Production and marketing of goods to understand the economics of entrepreneurship

CO5: Prepare/Create a business plan.

SYLLABUS

Unit I. Introduction to entrepreneurship (15 hours)

Entrepreneurship: meaning, definition, Types, qualities, skills and functions; Risk and uncertainty; Analysis of Business Environment & Policies: Market, Resources & Competition. Use of SWOT and Porter's Five Forces Analysis; Difference between Entrepreneurship & start ups,

Unit 2: Risk & Innovations (15 Hours)

Importance and management of risk; market/commercial risk, technological risk, financial risk, social risk, political risk, personal risk; Innovations: Concept & theory, Types and forms of innovations; innovation & imitation; Branding, Patents and Copyrights, Support for startups: Purpose of Incubators & Accelerators.

Unit 3: Sources of funds and Costing, Pricing and Marketing (15 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. 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 4: Preparing the Business Plan* (15 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: (15 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.

3. Chandra, Prasana (1995), *Projects: Planning, Analysis, Selection, Implementation & Review*, Tata McGraw Hill, New Delhi.
4. Kuriloff, Arthur H; Hemphill, John M. (1988), *Starting and Managing the Small Business*, McGraw-Hill, New York.
5. Mukherjee AbhikKumar;RoyShaunak, (2019)*Entrepreneurship Development and Business Ethics*,Oxford University Press,New Delhi

Web based:

1. <https://up.startupindia.gov.in/content/sih/en/home-page.html>
2. <http://www.ciba.org.in/>
3. <https://www.goa.gov.in/wp-content/uploads/2017/09/Goa-IT-Start-up-Policy-2017.pdf>
4. <https://www.forbes.com/pictures/mgj45fgmd/100-best-websites-for-entrepreneurs-3/#1c3d2dd71e87>
5. <https://www.india.gov.in/people-groups/community/entrepreneur>
6. <https://www.entrepreneur.com/magazine>

Course Title: Accounting for Non-accountants

Course Code: SEC-2

Marks: 100

Credits: 4

Duration: 60 Hours

Course Outcomes: Upon completion of the course students will be able to

CO1: Identify the concept of Financial, Cost and Management accounting

CO2: Develop the understanding and skills to prepare Accounts of corporate and banking sector.

CO3: Understand company's final accounts.

CO4: Record transactions and prepare financial statements for a business entity.

CO5: Prepare cost sheets.

CO6: Examine the meaning of material control with pricing methods

CO7: Understand the know-how and concept of marginal costing with practical problems

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

(15 Hours)

Creating new ledgers/Company; Reconciliation Statements and Accounting for Depreciation: definition and causes of depreciation ,need for depreciation , methods of calculating the amount of depreciation, straight line method, diminishing balance method; Bank Reconciliation Statement; Receivables / Payables Reconciliation Statement; Stock Reconciliation Statement.

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 and Management Accounting

(15 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). 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
2. T.S. Reddy & A. Murthy (2011), *Financial Accounting*, Margham Publications, Sixth Revision Edition
3. P.C. Tulsian (2003), *Financial Accounting*, Tata MC Graw Hill Ltd
4. Manosh Dutta (2010), "Cost Accounting", Dorling Kindersley (India) Pvt. Ltd
5. T.S. Reddy & Y. Hari Prasad Reddy, (2014) "Cost Accounting", Margham Publications

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.
3. M.C. Shukla, T.S. Grewal, Dr.M.P.Gupta (2010) *Cost Accounting*, S.Chand & Company Ltd.

Web based:

1. <https://corporatefinanceinstitute.com/resources/knowledge/accounting/types-depreciation-methods/>
2. <https://quickbooks.intuit.com/in/resources/finance-and-accounting/depreciation-methods/>
3. https://www.google.com/url?sa=t&source=web&rct=j&url=http://download.nos.org/srsec320newE/320EL28a.pdf&ved=2ahUKEwiDiJuG45bkAhUGbisKHb8MA_YQFjAMegQIARAB&usg=AOvVaw28Anp7XnANz-jweoiTFmRC
4. <https://cleartax.in/s/cost-accounting>
5. <https://www.toppr.com/guides/principles-and-practice-of-accounting/accounting-concepts/>
6. <https://corporatefinanceinstitute.com/resources/knowledge/accounting/bank-reconciliation/>

GENERIC ELECTIVE COURSES

Course Title: Taxation for All

Course Code: ECO-GEC-1

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:

Mandatory:

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.

Supplementary:

1.Saraogi CA Vishal (2017) Goods and Services Tax Laws Practice & Procedure with Commentary, Lawpoint Publications

2. Singhania, Monica; SinghaniaVinod K (2017) Student's Guide to Income Tax (University Edition), Taxman

3. Sreekantaradhya B.S., 'STRUCTURE AND REFORMS OF TAXATION IN INDIA', Deep & Deep, New Delhi.

Web based:

1.<https://www.incometaxindia.gov.in/Pages/acts/income-tax-act.aspx>

2.Taxmann Goods and Service tax <https://gst.taxmann.com/>

3.Cleartax on GST <https://cleartax.in/s/gst-law-goods-and-services-tax>

4. GST India <http://www.gstindia.com/about/>

5. <https://www.taxmann.com/blogpost/2000001834/gst-rates-2019-gst-council-meeting-updates-latest-gst-tax-slabs.aspx>

6. <https://cleartax.in/s/customs-duty-india>

Paper Title: Financial Investment for All

Paper: GEC

Paper code: ECO-GEC-2

Total Contact Hours: 60

Credits: 4

Class: S.Y.B.A/BSC

COURSE OBJECTIVE:

CO1: State the different types of financial markets and financial instruments

CO2: Explain the organization 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: (15 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; Cryptography & crypto currencies: Bitcoin's; Recent changes in banking sector in India.

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 and Mutual Funds (15 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; 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.

Mandatory References:

1. Chandra. P. (2014), *Investment Analysis and Portfolio Management*, Tata McGraw-Hill, New Delhi
2. Khan M. Y. ; Jain P. K. (2015), *Financial Management*, Tata McGraw-Hill Publishing, New Delhi

Supplementary

1. Graham, B. (2008), *The Intelligent Investor*, Harper
2. Siegel, Jeremy J. (1998) *Stocks for the Long Run*, McGraw-Hill. New York
3. L.M. Bhole (3rd Edition, 2002): *Financial Institutions and Markets*, Tata McGraw Hill, Delhi.

Web links

1. <https://www.bseindia.com/>
2. <https://www.nseindia.com/>
3. <https://www.sebi.gov.in/>
4. <https://economictimes.indiatimes.com>

Course Title: Gandhian Economic Thought

Course Code: ECO-GEC -3

Marks: 100

Credits: 4

Duration: 60Hours

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: Analyse the principle of trusteeship

CO5: Recognize Gandhian ideas of sarvodaya

CO6: Propose alternative solution based on Gandhian economic thought to any economic problem.

CO7: Evaluate the sources which influenced Gandhi to formulate his economics ideas

CO8: Illustrate the Gandhian concepts of Economics

SYLLABUS

Unit 1: Basic Principles of Gandhian Economy

(15 Hours)

Background of Gandhian Economic thought, Concept of bread Labor, Views on distribution of wealth, Principles of Trusteeship; Swadeshi and its present relevance to India; Principle of Sustainability: Economic, environmental and social; Policy of education, vocational training and status of women.

Unit 2: Decentralized Economy

(15 Hours)

Decentralization of economic power; self-sufficient village economy, Role of agriculture; Solutions to issues of poverty and unemployment in India.

Unit 3: Industrial Economy

(15 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: 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, Rajghat, Varansi.

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

Web based:

https://www.mkgandhi.org/articles/gandhian_economics.html

English

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

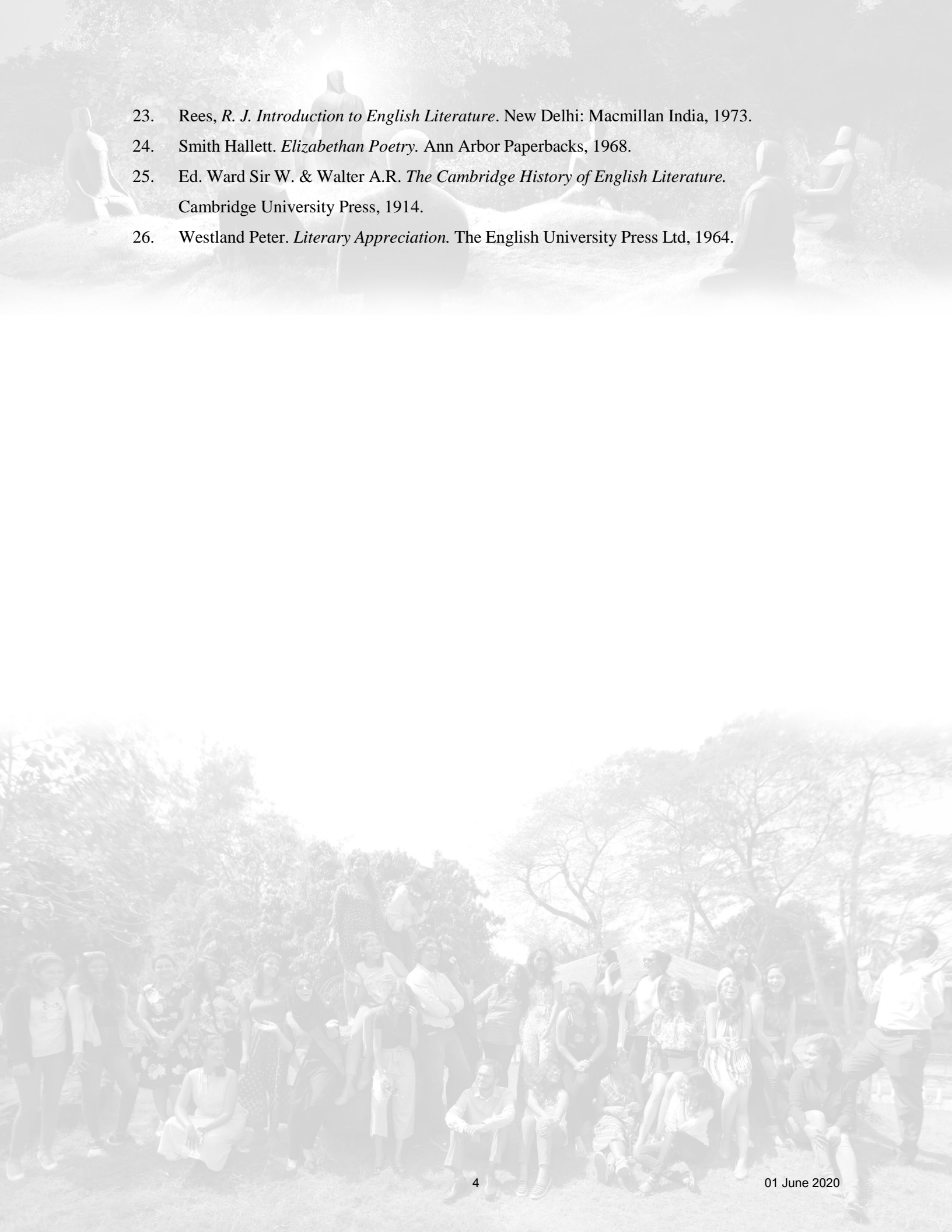
5. **Reference Books :**

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*. 11th 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.

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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.

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 18th century contributed to the rise of the Novel, and how the conditions prevalent in the 19th 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 18th 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 19th 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

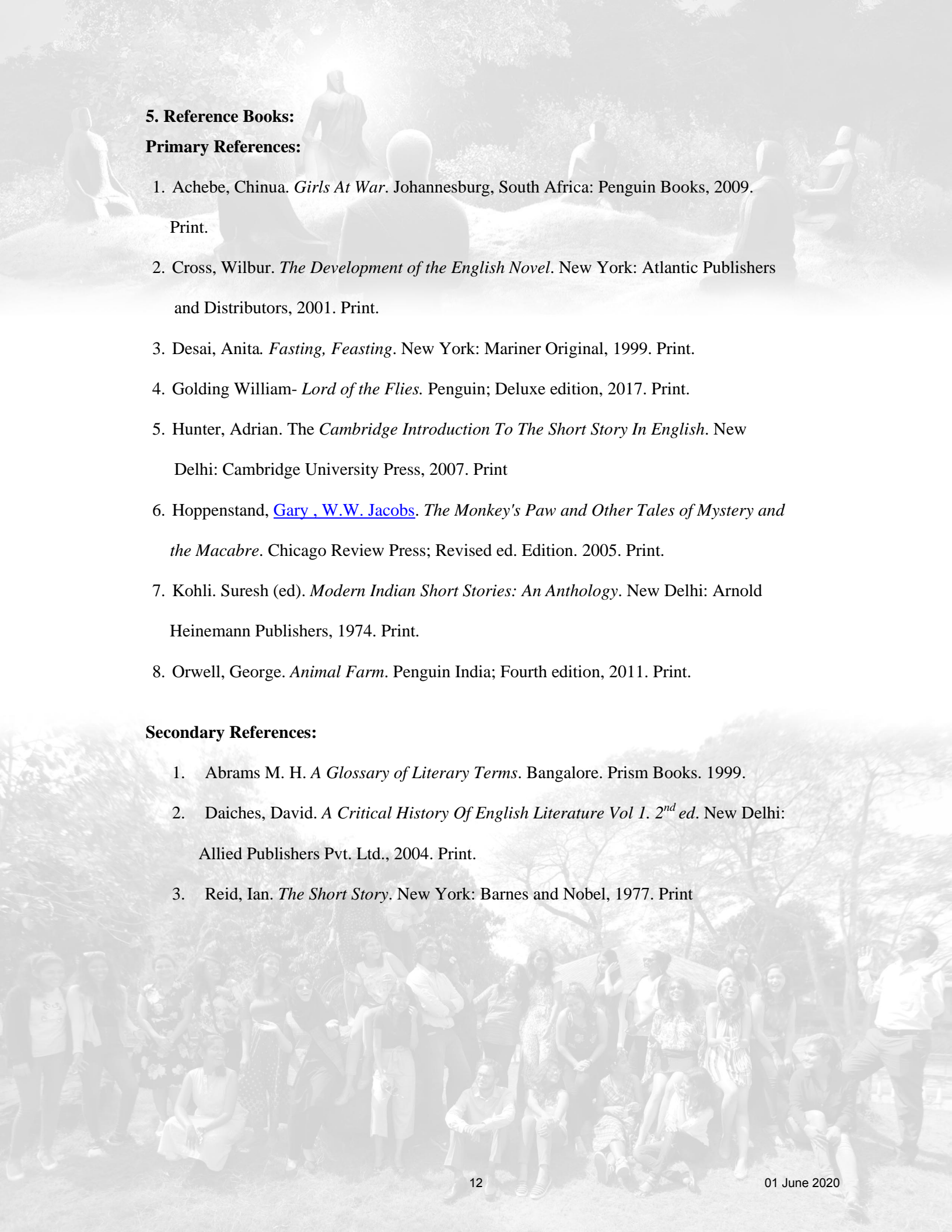
1. The Gift Of the Magi - O Henry
2. The Cask Of Amontillado - Edger Alan Poe
3. Darling - Chekov
4. A Wrong Man in Worker's Paradise - Rabindranath Tagore
5. The Tiger In the Tunnel - Ruskin Bond
6. The Doctor's word - Rasipuram Krishnaswami Iyer Narayanaswami
7. Vengeful Creditor - Chinua Achebe
8. 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. 2nd 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 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 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 – 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 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 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 at least 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.



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:

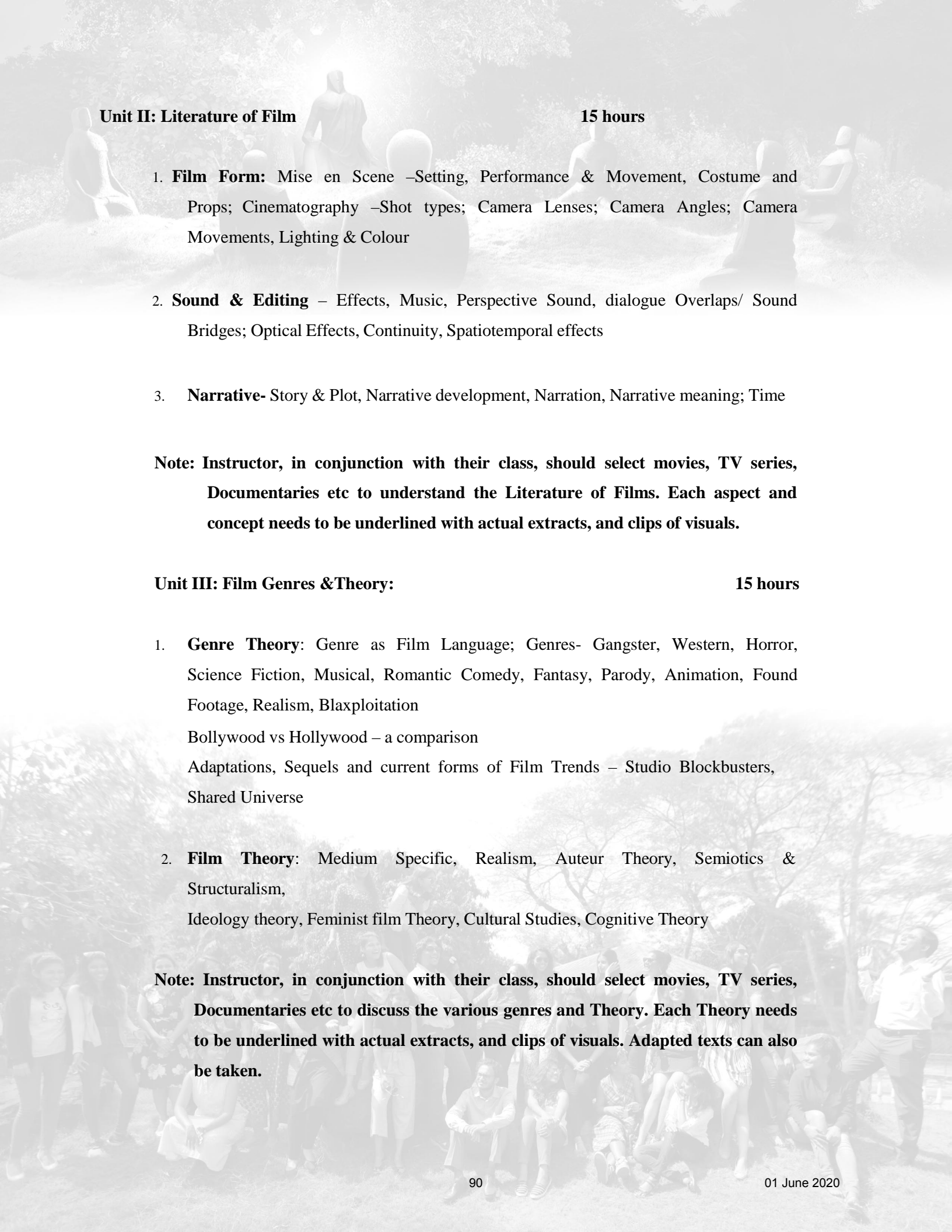
Total number of hours: 60

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, 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*. Masachusetts: 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. 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.



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: 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 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

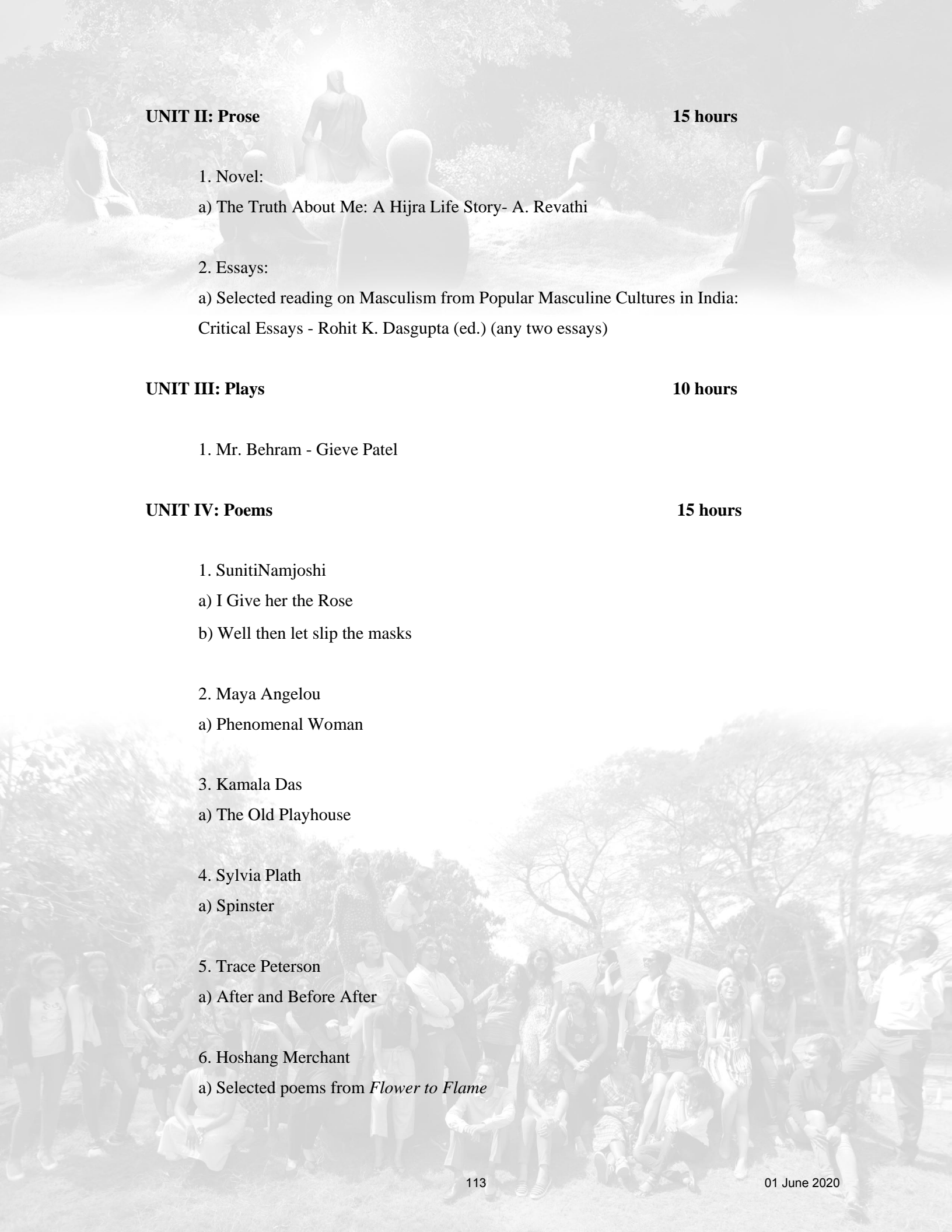
a) The Five Sexes: Why males and females are not enough- Anne Fausto-Sterling

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.

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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

Zoology

ELECTIVE COURSE: VERTEBRATE ENDOCRINOLOGY	
COURSE CODE:	ZOO-III.E-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">• To study the endocrine organs of vertebrates• To understand the underlying principles of hormone functions• To gain an insight into the current and important issues in endocrinology
COURSE OUTCOME:	Upon successful completion of the course, students will be able to: CO1: Be familiar with all the endocrine organs of human body. CO2: Associate hormones to body growth, metabolism, reproduction and development. CO3: To understand the underlying principles and disorders associated with hormone functions CO4: Learn techniques of histology and tissue identification

ZOO-III.E-1: VERTEBRATE ENDOCRINOLOGY

MODULE	TOPICS	CONTACT HOURS
MODULE 1: Anatomy and histology	Unit 1: <ul style="list-style-type: none"> • Aim and scope of endocrinology, • techniques in endocrinology - histology, histochemistry, immunocytochemistry, in situ hybridisation, radio immune assay, surgical techniques, • Regulation of hormone secretion: feedback mechanisms - positive, negative, short loop, long loop 	15
	Unit 2: <ul style="list-style-type: none"> • Anatomy and histology of endocrine glands- • Pituitary, Pineal gland, Thyroid, Parathyroid, • Thymus, Adrenal, Endocrine pancreas, GI tract, • Endocrine hypothalamus, Gonads, Placenta 	
MODULE 2: Hormones	Unit 3: <ul style="list-style-type: none"> • Classification of hormones • Hormone structure • Biological actions of hormones 	15
	Unit 4: <ul style="list-style-type: none"> • Mechanisms of hormone action • Receptor and its regulation • Steroid and peptide hormones actions 	
	Unit 5: Hormones and Homeostasis - Calcium and glucose	
MODULE 3: 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, insipidus	

PRACTICAL COMPONENT OF ZOO-III.E-1: Vertebrate Endocrinology (DURATION -02 HRS /WEEK)		
Sr. No	Practical	No. of Practicals
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 5th edition.
2. Hadley, M. and Levine, J (2006) *Endocrinology*. Benjamin Cummings 6th edition.
3. Kovacs, J.W. and S.R. Ojeda (2011) *Textbook of endocrine physiology* 6th 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*, 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

COURSE CODE:	ZOO-III-E-2
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:	To provide a comprehensive survey of microbiology with basic information on bacteria and learn the fundamentals of biotechnological techniques.
COURSE OUTCOME:	Upon successful completion of the course, students will be able to: CO1: Gain working knowledge of basic bacterial laboratory techniques and use of microorganism in biotechnology. CO2: Perform techniques of bacterial isolation and identification. CO3: Have knowledge about various molecular techniques of gene manipulation. CO4: Should be able to Perform techniques of isolate DNA, bring about transformation and identification of recombinants

ZOO-III-E-2: BASIC MICROBIOLOGY AND FUNDAMENTALS OF ANIMAL BIOTECHNOLOGY

MODULE	TOPICS	CONTACT HOURS
MODULE 1: Microbiology	1: Introduction to Microorganisms-Bacteria <ul style="list-style-type: none"> ○ Structure and Identification of bacteria(morphological types) ○ Nutritional types ○ Nutritional requirements 	15
	2: Isolation and Culture of Bacteria: <ul style="list-style-type: none"> ○ Cultivation of bacteria ○ Different methods of isolation and maintenance of pure cultures ○ Culture characteristics 	
	3: Use of microorganisms in biotechnology-An overview: <ul style="list-style-type: none"> ○ Production of valuable substances ○ Fuel Production, recovery of minerals and oils ○ Microorganisms in bioassays ○ Food and agriculture sector ○ Medicine and health 	
MODULE 2: Tools in Biotechnology	4: Scope and importance of Biotechnology <ul style="list-style-type: none"> ○ Definition ○ Contribution and importance of biotechnology 	15
	5: Nucleic Acid Enzymology: <ul style="list-style-type: none"> ○ Restriction enzymes, Ligases, Alkaline phosphatase ○ Polynucleotide kinase, Terminal Transferases, S1 Nuclease ○ Polymerases, Reverse transcriptase 	
	6: Gene Cloning vectors: <ul style="list-style-type: none"> ○ Plasmids, Bacteriophage, cosmids ○ Shuttle and expression vectors 	
MODULE 3: Genetic Engineering	7: Techniques in genetic engineering: <ul style="list-style-type: none"> ○ Gene transfer methods ○ Methods of Labeling Nucleic acids ○ Nucleic acid Hybridization ○ Polymerase chain reaction 	15
	8: Recombinant DNA technology: <ul style="list-style-type: none"> ○ Procedure / Technique 	
	9: Blotting Techniques: <ul style="list-style-type: none"> ○ Southern Blotting ○ Northern Blotting ○ Western Blotting 	
	10: DNA sequencing techniques: <ul style="list-style-type: none"> ○ Chemical Degradation method ○ Chain termination method ○ Automated Sequencing 	

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 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

COURSE CODE:	ZOO-III-E-3
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">• To study the different environmental pollutants and their toxicity.• To know the physiological effects of toxicant exposure.
COURSE OUTCOME:	Upon successful completion of the course, students will be able to: CO1: Distinguish, classify and characterize a variety of environmental pollutants based on their biological and physical properties. CO2: Identify the main sources and types of environmental pollutants and assess their potential environmental fate. CO3: Understand mechanisms of detoxification of various varieties of toxicants. CO4: Know the procedures/protocols used to assess physicochemical parameters and environmental contaminants.

ZOO-III-E-3: ENVIRONMENTAL TOXICOLOGY		
MODULE	TOPIC	CONTACT HOURS
MODULE 1: Introduction To Toxicology	<p>1.1 Introduction To Toxicology:</p> <ul style="list-style-type: none"> ○ Definition and History of Toxicology and Toxicity ○ Disciplines of Toxicology ○ Biouptake, Bioaccumulation, Biotransfer and Biological Magnification, Relationship to Other Sciences, Scope and importance of Toxicology <p>1.2: Classes Of Toxicant:</p> <ul style="list-style-type: none"> • Define Toxicant and Toxins, their classification • Toxicants in Air, Water and Soil • Toxicants in Domestic and Occupational Settings • Synthetic drugs: Solvents; Therapeutic drugs, Drugs of abuse, Combustion products, Cosmetics • Movement and fate of Toxicants in the environment 	15
MODULE 2: Environmental Impact Mitigation	<p>2.1: Toxicity Of Heavy Metals:</p> <ul style="list-style-type: none"> • Toxicity of Arsenic, Lead, Mercury, • Cadmium, Copper, Zinc, Aluminium, Iron and Manganese; Sources and portals of heavy metal pollutants; Toxicity of substances on Human and Animals <p>2.2: Agro-Chemical Pesticides And Their Environmental Impact Mitigation</p> <ul style="list-style-type: none"> • Definition and Classification • Organochlorine Insecticides, Organophosphate Insecticides, Carbamates, Pyrethroid Insecticides, Dinitrophenols, Herbicides, Fungicide • Control of Pesticide Pollution; Integrated Pest management 	15
MODULE 3: Food Additives AND Toxicity tests.	<p>3.2: Food Additives:</p> <ul style="list-style-type: none"> • General account of Food Additives: • Incidental or Indirect additives • 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 • 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) 	15

PRACTICAL COMPONENT OF ZOO-III.E-3:ENVIRONMENTAL TOXICOLOGY (DURATION-02 HRS/WEEK)		
Sr.No.	Practical	No.of Practicals
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.

SKILL ENHANCEMENT COURSE: WASTE MANAGEMENT TECHNIQUES	
COURSE CODE	Skill Enhancement Course(SEC): ZOO-III-SE-1
MARKS	100 [25 -Theory; 75- Practice Based]
CREDITS	04
CONTACT HOURS	Theory: 15 HOURS [01 Lectures Per Week] Practice based: 45 HOURS.
COURSE OBJECTIVES	<ul style="list-style-type: none"> • To familiarize students with the techniques of waste management. • To encourage students to get hands on experience on techniques of managing waste. • To help students understand the importance of reducing, reusing and recycling
COURSE OUTCOME	<p>CO1: Understand concept of types of waste, its transport and disposal.</p> <p>CO2: Perform composting techniques / procedures.</p> <p>CO3: Identify means of reducing waste production.</p> <p>CO4: Plan and conduct research in areas of waste management</p>

**ZOO-SE-1: WASTE MANAGEMENT TECHNIQUES
(SEC- Skill Enhancement Course)**

MODULE	TOPICS	CONTACT HOURS
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 and Rules	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- <ul style="list-style-type: none"> • 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 and IV). • Biomedical waste handling rules 2016 (GSPCB – Schedule I and II). • Plastic waste management rules 2016 (Part-II, Section-3, Sub-section (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: <ol style="list-style-type: none"> 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.

**ELECTIVE COURSE:
ANIMAL CELL CULTURE AND APPLICATIONS**

COURSE CODE:	ZOO-IV-E-5
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:	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.
COURSE OUTCOME:	Upon successful completion of the course, students will be able to: CO1: Operate, calibrate, and maintain standard equipment found in an animal cell culture laboratory; CO2: Prepare and sterilize media and solutions used in cell culture. CO3: Understand concepts and applications of mammalian cell culture. CO4: Perform primary cell culture of suspension and adherent cells.

ZOO-IV-E-5: ANIMAL CELL CULTURE AND APPLICATIONS

MODULE	TOPICS	CONTACT HOURS
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"> ○ Lab facilities and setup for cell culture ○ Major and minor equipments ○ Environmental conditions ○ Substrates for Culturing and sub culturing 	
	4: Animal tissue culture media <ul style="list-style-type: none"> ○ Natural media – biological fluids, tissue extracts ○ Chemically defined media- characteristic and composition ○ Media supplements – L Glutamine, serum. Advantages and disadvantages of serum in media / serum free media 	
MODULE 2: CELL CULTURE TECHNIQUES	5: Primary cell culture: <ul style="list-style-type: none"> ○ Mechanical disaggregation ○ Enzymatic disaggregation ○ Protocol for primary cell culture 	15
	6: Secondary cell culture/ Sub culturing: <ul style="list-style-type: none"> ○ Protocol for sub culturing of suspension culture ○ Protocol for sub culturing of adherent ○ Established cell lines 	
	7: Scale up of animal cell culture: <ul style="list-style-type: none"> ○ Techniques of Scale up of suspension cultures ○ Techniques of Scale up of Monolayer cultures 	
MODULE 3: CELL CULTURE APPLICATIONS	8: Cell Hybridoma Technology : <ul style="list-style-type: none"> ○ Steps of cell Hybridoma technology ○ Procedure ○ Production of monoclonal antibodies ○ Applications of monoclonal antibodies 	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.	

PRACTICAL COMPONENT OF ZOO-IV-E-5: DURATION -02 HRS /WEEK ANIMAL CELL CULTURE AND APPLICATIONS		
Sr. No	Practical	No. of Practicals
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"> ▪ Reagents ▪ Media / Buffers 	02
3.	Setting up of primary cell culture <ul style="list-style-type: none"> - Methods used for cell disaggregation – Mechanical and Enzymatic - Quantification of cells (Viable cell count) by Tryphan blue exclusion dye. - Suspension culture - Adherent cell culture - Chicken embryo fibroblast culture 	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 IR (2007). *Culture of animal Cells: A manual of Basic Techniques*. 5th 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.

ELECTIVE COURSE : AQUACULTURE AND FISHERIES

COURSE CODE:	ZOO-IV.E-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">• To improve the understanding of conservation and sustainability of living resources• To improve the social and economic benefits derived from aquaculture and fisheries.• To study the role of aquaculture in rural development in solving nutritional security and unemployment.• Empowerment of fishery and entrepreneurship development
COURSE OUTCOME:	Upon successful completion of the course, students will be able to: CO1: Understand conservation and sustainability of aquaculture resources. CO2: Acquainted with various techniques of aquaculture. CO3: Know strategies of improving the social and economic benefits derived from aquaculture and fisheries. CO4: Initiate business enterprise in area of aquaculture.

ZOO-IV.E-6: AQUACULTURE AND FISHERIES

MODULE	TOPIC	CONTACT HOURS
MODULE 1:	<p>1.1: Inland Fisheries:</p> <ul style="list-style-type: none"> • Riverine ;Reservoir fisheries; Lakesterine fisheries; Cold water fisheries <p>1.2: Marine Fisheries:</p> <ul style="list-style-type: none"> • 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>) • Coastal fisheries or Inshore fisheries: Elasmobranch fishery and Teleost fishery • Offshore and Deep sea fisheries: Pomfrets(<i>Pampus</i>,<i>Stromateus</i>) <i>Eleutheronema tetradactylus</i>(rava). <p>1.3: Crustacean And Molluscan Fisheries:</p> <ul style="list-style-type: none"> • Prawn fisheries in Goa: Penaeid and Palaemonid groups. • Crab fisheries in Goa • Edible oyster fisheries in Goa • Mussel fisheries in Goa 	15
MODULE 2:	<p>2.1: Integrated Fish Farming Systems:</p> <ul style="list-style-type: none"> • Principle of integrated Fish farming; Integration with animal husbandry and farming systems. <p>2.2: Induced Breeding:</p> <ul style="list-style-type: none"> • 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. <p>.4 :Fishing Methods:</p> <ul style="list-style-type: none"> • Marine Fishing Crafts and Gears used in Goa. • Inland Fishing Crafts and Gears used in Goa 	15
MODULE 3:	<p>3.1: Fish Culture System:</p> <ul style="list-style-type: none"> • 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 <p>3.2: Cage And Pen Culture:</p> <ul style="list-style-type: none"> • 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 	15

**PRACTICAL COMPONENT OF ZOO-IV.E-6: AQUACULTURE AND FISHERIES
(DURATION – 02 HRS/ WEEK)**

Sr. No.	Practical	No. of Practicals
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: <ul style="list-style-type: none"> • 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.,RaoVirbhadr,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	
COURSE CODE:	ZOO-IV.E-7
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:	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.
COURSE OUTCOME:	Upon successful completion of the course, students will be able to: CO1: Understand the components of the immune system and their function. CO2: Explain the mechanisms of immune response. CO3: Know about the techniques used in detecting immunological diagnosis. CO4: Perform immunoassays for disease detection.

ZOO-IV-E-7: IMMUNOLOGY

MODULE	TOPICS	CONTACT HOURS
MODULE 1: Introduction To Immunology	1: OVERVIEW OF IMMUNE SYSTEM: <ul style="list-style-type: none"> • Basic concepts in immunology • Components of the immune system 	15
	2: INNATE AND ADAPTIVE IMMUNITY. <ul style="list-style-type: none"> • Innate immunity-Anatomical barriers/ layers of defense, cells and molecules involved in innate immunity • Adaptive immunity-cell mediated and humoral immunity, passive immunity (artificial and natural), Active(artificial and natural), Immune dysfunction 	
MODULE 2: Antigens And Immunoglobulins	3: ANTIGENS. <ul style="list-style-type: none"> • Antigenicity and immunogenicity, Immunogens, adjuvants and haptens • Factors influencing immunogenicity • B and T cell epitopes 	15
	4: IMMUNOGLOBULINS <ul style="list-style-type: none"> • Structure and function of different classes of Immunoglobulin. • Antigen-Antibody interactions • Immunoassays, monoclonal & polyclonal antibodies 	
	5: MAJOR HISTOCOMPATIBILITY COMPLEX. <ul style="list-style-type: none"> • Structure and function of endogenous and exogenous pathways of antigen presentation 	
MODULE 3: Immune Response	6: CYTOKINES AND COMPLEMENT SYSTEM <ul style="list-style-type: none"> • Properties and functions of cytokines, cytokine based therapies • Components and pathways of complement activation 	15
	7: HYPERSENSITIVITIES, AUTOIMMUNITY AND TRANSPLANTATION <ul style="list-style-type: none"> • Gell and coombs' classification, types of hypersensitivities(overview) • Autoimmune responses against self antigens (SLEs), responses to alloantigens and transplant rejection (graft rejection, types and mechanisms of transplant rejection) 	
	8: VACCINES <ul style="list-style-type: none"> • Types of vaccines -inactivated, attenuated, toxoid, subunit, conjugate, experimental (DNA and recombinant vaccine), monovalent/polyvalent vaccines 	

PRACTICAL COMPONENT OF ZOO-IV-E-7: IMMUNOLOGY (DURATION -02 hrs/WEEK)		
Sr. No	Practical	No. of Practicals
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.*

SKILL ENHANCEMENT COURSE: WASTE MANAGEMENT TECHNIQUES	
COURSE CODE	Skill Enhancement Course(SEC): ZOO-III-SE-1
MARKS	100 [25 -Theory; 75- Practice Based]
CREDITS	04
CONTACT HOURS	Theory: 15 HOURS [01 Lectures Per Week] Practice based: 45 HOURS.
COURSE OBJECTIVES	<ul style="list-style-type: none"> • To familiarize students with the techniques of waste management. • To encourage students to get hands on experience on techniques of managing waste. • To help students understand the importance of reducing, reusing and recycling
COURSE OUTCOME	CO1: Understand concept of types of waste, its transport and disposal. CO2: Perform composting techniques / procedures. CO3: Identify means of reducing waste production. CO4: Plan and conduct research in areas of waste management

**ZOO-SE-1: WASTE MANAGEMENT TECHNIQUES
(SEC- Skill Enhancement Course)**

MODULE	TOPICS	CONTACT HOURS
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 and Rules	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- <ul style="list-style-type: none"> • 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 and IV). • Biomedical waste handling rules 2016 (GSPCB – Schedule I and II). • Plastic waste management rules 2016 (Part-II, Section-3, Sub-section (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: <ol style="list-style-type: none"> 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.

ELECTIVE COURSE: MOLECULAR GENETICS AND FORENSIC SCIENCE

COURSE CODE	ZOO-V.E-9
MARKS	100 [75 – Theory; 25 – Practicals]
CREDITS	04 [03 – Theory; 01 – Practical]
CONTACT HOURS	THEORY : 45 HOURS (03 LECTURE/WEEK) PRACTICALS : 30 HOURS (01 PRACTICAL/WEEK)
COURSE OBJECTIVES	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.
COURSE OUTCOME:	Upon successful completion of the course, students will be able to: CO1: Understand and explain the process of replication, transcription and translation CO2: Differentiate between the gene expression in prokaryotes and eukaryotes CO3: Understand the Branches of forensic science CO4: know the application of molecular tools in genetic diagnosis

ZOO-V.E-9: MOLECULAR GENETICS AND FORENSIC SCIENCE

MODULE	TOPICS	CONTACT HOURS
<p>MODULE 1 : Gene Expression and Gene Regulation</p>	<p>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</p>	<p align="center">15</p>
<p>MODULE 2 : Basics of Forensic Science</p>	<p>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)</p>	<p align="center">15</p>
<p>MODULE 3 : Diagnostic Genetics</p>	<p>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</p>	<p align="center">15</p>

**PRACTICAL COMPONENT OF ZOO-V.E-9: MOLECULAR GENETICS AND
FORENSIC SCIENCE
(DURATION -02 HRS /WEEK)**

SR.NO.	PRACTICAL	NO. OF PRACTICALS
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: BASIC AND APPLIED ENTOMOLOGY	
COURSE CODE	ZOO-VI.E-11
MARKS	100 [75 – Theory; 25 – Practicals]
CREDITS	04 [03 – Theory; 01 – Practical]
CONTACT HOURS	THEORY : 45 HOURS (03 LECTURE/WEEK) PRACTICALS : 30 HOURS (01 PRACTICAL/WEEK)
COURSE OBJECTIVE	<ul style="list-style-type: none"> • To develop a strong foundation in entomology, including understanding of the importance of insects to the human society. • To review important areas in insect biology such as morphology, physiology, ecology, behaviour, genetics, phylogeny, ontogeny and population biology. • To develop a sufficient background for advanced entomology.
COURSE OUTCOME:	<p>Upon successful completion of the course, students will be able to:</p> <p>CO1: Be familiar with the identification of bio economical species.</p> <p>CO2: Identify entrepreneurial opportunities in entomology.</p> <p>CO3: Important insects and their products.</p> <p>CO4: Insect pests of public health and veterinary importance and their management.</p>

ZOO-VI.E-11: BASIC AND APPLIED ENTOMOLOGY

MODULE	TOPIC	CONTACT HOURS
MODULE 1 Fundamentals of Entomology	Unit 1: Class Insecta: <ul style="list-style-type: none"> • Salient features • Classification of insects up to orders – an overview Unit 2: Morphological studies: <ul style="list-style-type: none"> • of antenna, wings, legs, Mouth parts Unit 3: Techniques: <ul style="list-style-type: none"> • Collection of insects • Preservation of insects 	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"> • 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) Unit 5: Insects of medicinal importance: <ul style="list-style-type: none"> • mosquitoes, housefly, sand fly, cockroaches, human lice, bed bug, rat fleas Unit 6: Termites: <ul style="list-style-type: none"> • social organization, termitaria and termite control measures 	15
MODULE 3 Useful insects and pest management	Unit 7: Useful insects: <ul style="list-style-type: none"> • Honeybees (Apiculture); Mulberry silk worm (sericulture); lac insects (lac culture) Unit 8: Insect pest control methods: <ul style="list-style-type: none"> • biological, chemical (attractants, pheromones and hormones), Integrated Pest Management (IPM) Unit 9: Role of insects in ecosystem services	15

PRACTICAL COMPONENT OF BASIC AND APPLIED ENTOMOLOGY ZOO-VI.E-14 PRACTICAL (DURATION: 30 HOURS – 02hrs/WEEK)		
SR. NO	PRACTICAL	NO. OF PRACTICALS (12)
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*, 2nd edition. Scientific publishers India Jodhpur.
- 3) David, B.V. and Ananthakrishnan, T.N (2006): *General and applied entomology*, 2nd edition Tata McGraw hill, New Delhi.
- 4) Reddy, D.S (2010) *Applied entomology*, 2nd 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, 1st edition.

***ELECTIVE COURSE: BASIC AND APPLIED ENTOMOLOGY
(AS NON PRACTICAL BSED COURSE)**

COURSE CODE	ZOO-VI.E-11
MARKS	100 [75 -Theory; 25- Fieldbased]
CREDITS	04
CONTACT HOURS	Theory: 45 HOURS [03 Lectures Per Week] Fieldbased work: 15 HOURS.
COURSE OBJECTIVE	<ul style="list-style-type: none"> • To develop a strong foundation in entomology, including understanding of the importance of insects to the human society. • To review important areas in insect biology such as morphology, physiology, ecology, behaviour, genetics, phylogeny, ontogeny and population biology. • To develop a sufficient background for advanced entomology.
COURSE OUTCOME:	<p>Upon successful completion of the course, students will be able to:</p> <p>CO1: Be familiar with the identification of bio economical species.</p> <p>CO2: Identify entrepreneurial opportunities in entomology.</p> <p>CO3: Important insects and their products.</p> <p>CO4: Insect pests of public health and veterinary importance and their management.</p>

ZOO-VI.E-11: BASIC AND APPLIED ENTOMOLOGY

MODULE	TOPIC	CONTACT HOURS
MODULE 1 Fundamentals of Entomology	Unit 1: Class Insecta: <ul style="list-style-type: none">• Salient features• Classification of insects up to orders – an overview Unit 2: Morphological studies: <ul style="list-style-type: none">• of antenna, wings, legs, Mouth parts Unit 3: Techniques: <ul style="list-style-type: none">• Collection of insects• Preservation of insects	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">• 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) Unit 5: Insects of medicinal importance: <ul style="list-style-type: none">• mosquitoes, housefly, sand fly, cockroaches, human lice, bed bug, rat fleas Unit 6: Termites: <ul style="list-style-type: none">• social organization, termitaria and termite control measures	15
MODULE 3 Useful insects and pest management	Unit 7: Useful insects: <ul style="list-style-type: none">• Honeybees (Apiculture); Mulberry silk worm (sericulture); lac insects (lac culture) Unit 8: Insect pest control methods: <ul style="list-style-type: none">• biological, chemical (attractants, pheromones and hormones), Integrated Pest Management (IPM) Unit 9: Role of insects in ecosystem services	15
MODULE 4 Field based Study	<u>Field based study report:</u> <ul style="list-style-type: none">• Identification and study of agricultural pests / pest of fruits / vegetables.• Insect collection techniques: light traps, sweep net, Berlese funnel.• Study of insects of college campus dragon fly/ pests of different plants• Visit to ICAR old Goa/ Gov.t of Goa agriculture department/national Malaria research Institute	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*, 2nd edition. Scientific publishers India Jodhpur.
- 3) David, B.V. and Ananthkrishnan, T.N (2006): *General and applied entomology*, 2nd edition Tata McGraw hill, New Delhi.
- 4) Reddy, D.S (2010) *Applied entomology*, 2nd edition New Vishal publications

REFERENCE BOOKS FOR PRACTICALS:

1. Fenemore, P.G. and Prakash, A. (1995): *Applied Entomology*, Wiley Eastern Limited new age international.

**ELECTIVE COURSE:
FISH PRESERVATION AND PROCESSING**

COURSE CODE	ZOO-V.E-12
MARKS	100 [75 – Theory; 25 – Practicals]
CREDITS	04 [03 – Theory; 01 – Practical]
CONTACT HOURS	THEORY : 45 HOURS (03 LECTURE/WEEK) PRACTICALS : 30 HOURS (01 PRACTICAL/WEEK)
COURSE OBJECTIVES	<ul style="list-style-type: none"> • To familiarize the students with different methods of fish preservation and processing • To acquaint them with techniques and precautions for hygienic fish handling • The course content is locally relevant and prepares students for entrepreneurship and self employment
COURSE OUTCOME:	<p>Upon successful completion of the course, students will be able to:</p> <p>CO1: gain understanding of the economic benefits of fishes.</p> <p>CO2: They will also be able to understand the nutritional values of the fishes</p> <p>CO3: Perform some protocols of Fish processing and preservation.</p> <p>CO4: Acquaint oneself with the processes at fish processing industry</p>

ZOO-V.E- 12 : FISH PRESERVATION AND PROCESSING

MODULE	TOPICS	CONTACT HOURS
MODULE 1: Fishery Development	1.1 : Status of Development of the fishery and seafood processing industry. 1.2: Empowerment through Aquatic Products: (Background,Nutritionalsecurity,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
MODULE 2: Fish Handling and preservation	2.1: Recent Scenario: Quality Changes and Shelf life of Chilled Fish,Theeffect of Hygiene duringhandling 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
MODULE 3: Value of Fish	3.1:Economic Importance of Fish:Food value,Fish By-Products, surimi, Goan fish para, balchao 3.2: Postmortem changesin 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

PRACTICAL COMPONENT OF ZOO-V.E-12: FISH PRESERVATION AND PROCESSING (DURATION -02 HRS /WEEK)		
SR.NO.	PRACTICAL	NO. OF PRACTICALS
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*

**ELECTIVE COURSE:
FISH PRESERVATION AND PROCESSING
(AS NON-PRACTICAL BASED COURSE)**

COURSE CODE	ZOO-V.E-12
MARKS	100 [75 -Theory; 25- Fieldbased report]
CREDITS	04
CONTACT HOURS	Theory: 45 HOURS [03 Lectures Per Week] Fieldbased work: 15 HOURS.
COURSE OBJECTIVES	<ul style="list-style-type: none"> • To familiarize the students with different methods of fish preservation and processing • To acquaint them with techniques and precautions for hygienic fish handling • The course content is locally relevant and prepares students for entrepreneurship and self employment
COURSE OUTCOME:	<p>Upon successful completion of the course, students will be able to:</p> <p>CO1: gain understanding of the economic benefits of fishes.</p> <p>CO2: They will also be able to understand the nutritional values of the fishes</p> <p>CO3: Perform some protocols of Fish processing and preservation.</p> <p>CO4: Acquaint oneself with the processes at fish processing industry</p>

ZOO-V.E- 12 : FISH PRESERVATION AND PROCESSING		
MODULE	TOPICS	CONTACT HOURS
MODULE 1: Fishery Development	1.2 : Status of Development of the fishery and seafood processing industry. 1.2: Empowerment through Aquatic Products: (Background,Nutritionalsecurity,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
MODULE 2: Fish Handling and preservation	2.1: Recent Scenario: Quality Changes and Shelf life of Chilled Fish,Theeffect of Hygiene duringhandling 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
MODULE 3: Value of Fish	3.1:Economic Importance of Fish:Food value,Fish By-Products, surimi, Goan fish para, balchao 3.2: Postmortem changesin 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
MODULE 4 Field based Study	<u>Field Based study:</u> 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, Illrd 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, Illrd Revised Edition, Rastogi Publications Meerut, India.*

SEMESTER VI

CORE COURSE: WILDLIFE BIOLOGY	
COURSE CODE	ZOO-VI-C-8
MARKS	100 [75 -Theory ; 25- Practical]
CREDITS	04 [03 -Theory; 01- Practical]
CONTACT HOURS	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
COURSE OBJECTIVES	This course is designed to enable students to understand the basics of wildlife status, conservation, assessment and management.
COURSE OUTCOME:	Upon successful completion of the course, students will be able to: CO1: Apply the techniques used in assessment and monitoring of wildlife. CO2: Understand the basics of wildlife status, conservation, assessment and management. CO3: Know about the diversity, extent, range of wildlife population dynamics. CO4: Know the rules, regulations and factors governing wildlife

ZOO-VI-C-8: WILDLIFE BIOLOGY

MODULE	TOPICS	CONTACT HOURS
MODULE 1: Introduction To Wildlife	UNIT 1: Introduction to wildlife <ul style="list-style-type: none"> • Values of wildlife - Conservation ethics, Importance of conservation, Causes of depletion, World conservation strategies. UNIT 2: Evaluation and management of wildlife <ul style="list-style-type: none"> • Habitat analyses, Physical parameters: Topography, Geology, Soil and water. • Biological Parameters: food, cover, forage, browse and ground cover estimation. • Standard evaluation procedures: remote sensing and GIS. 	15
MODULE 2: Population Estimation And Protected Areas	UNIT 3: Population estimation <ul style="list-style-type: none"> • Population density, natality, mortality, fertility schedules and sex ratio computation. • Analysis of scat and dropping of ungulates and carnivores. • Trichotaxonomy, pug marks and census method based on indirect evidences. UNIT 4: Protected areas <ul style="list-style-type: none"> • Protected Area network (PAN): National parks and wildlife sanctuaries. • Biogeographical features of important features of protected areas in India (any 3). • Tiger conservation - tiger reserves in India, challenges and management of tiger reserves. 	15
MODULE 3: Management Of Wildlife	UNIT 5: Management of habitats <ul style="list-style-type: none"> • Setting back succession, grazing logging, mechanical treatment, advancing the succession process, artificial feeding grounds. • Cover construction, preservation of general genetic diversity, restoration of degraded habitats, UNIT 6: Management planning of wildlife in protected areas <ul style="list-style-type: none"> • Habitat carrying capacity, visitors carrying capacity, eco tourism / wild life tourism, concept of climax persistence, ecology of perturbation. • Role of national / state statutory bodies on governing wildlife (NBWL, IUCN, CITES, state wildlife boards and forest department). UNIT 8: Management of critical population <ul style="list-style-type: none"> • Radio- telemetry, care of injured and diseased animal, quarantine, common diseases of wild animals, capture and translocation of wildlife. • Captive management – a brief idea. 	15

PRACTICAL COMPONENT OF WILDLIFE BIOLOGY ZOO-VI-C-8: (DURATION: 30 HOURS – 02hrs/WEEK)		
SR. NO	PRACTICAL	NO. OF PRACTICALS
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, 5th 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.*

CORE COURSE: WILDLIFE BIOLOGY (AS NON-PRACTICAL BASED COURSE)	
COURSE CODE	ZOO-VI-C-8
MARKS	100 [75 -Theory; 25- Field based]
CREDITS	04
CONTACT HOURS	Theory: 45 HOURS [03 Lectures Per Week] Field based work: 15 HOURS.
COURSE OBJECTIVES	This course is designed to enable students to understand the basics of wildlife status, conservation, assessment and management.
COURSE OUTCOME:	Upon successful completion of the course, students will be able to: CO1: Apply the techniques used in assessment and monitoring of wildlife. CO2: Understand the basics of wildlife status, conservation, assessment and management. CO3: Know about the diversity, extent, range of wildlife population dynamics. CO4: Know the rules, regulations and factors governing wildlife

ZOO-VI-C-8: WILDLIFE BIOLOGY

MODULE	TOPICS	CONT ACT HOUR S
MODULE 1: Introduction To Wildlife	UNIT 1: Introduction to wildlife <ul style="list-style-type: none"> • Values of wildlife - Conservation ethics, Importance of conservation, Causes of depletion, World conservation strategies. UNIT 2: Evaluation and management of wildlife <ul style="list-style-type: none"> • Habitat analyses, Physical parameters: Topography, Geology, Soil and water. • Biological Parameters: food, cover, forage, browse and ground cover estimation. • Standard evaluation procedures: remote sensing and GIS. 	15
MODULE 2: Population Estimation And Protected Areas	UNIT 3: Population estimation <ul style="list-style-type: none"> • Population density, natality, mortality, fertility schedules and sex ratio computation. • Analysis of scat and dropping of ungulates and carnivores. • Trichotaxonomy, pug marks and census method based on indirect evidences. UNIT 4: Protected areas <ul style="list-style-type: none"> • Protected Area network (PAN): National parks and wildlife sanctuaries. • Biogeographical features of important features of protected areas in India (any 3). • Tiger conservation - tiger reserves in India, challenges and management of tiger reserves. 	15
MODULE 3: Managemen t Of Wildlife	UNIT 5: Management of habitats <ul style="list-style-type: none"> • Setting back succession, grazing logging, mechanical treatment, advancing the succession process, artificial feeding grounds. • Cover construction, preservation of general genetic diversity, restoration of degraded habitats, UNIT 6: Management planning of wildlife in protected areas <ul style="list-style-type: none"> • Habitat carrying capacity, visitors carrying capacity, eco tourism / wild life tourism, concept of climax persistence, ecology of perturbation. • Role of national / state statutory bodies on governing wildlife (NBWL, IUCN, CITES, state wildlife boards and forest department). UNIT 8: Management of critical population <ul style="list-style-type: none"> • Radio- telemetry, care of injured and diseased animal, quarantine, common diseases of wild animals, capture and translocation of wildlife. • Captive management – a brief idea. 	15

<p>MODULE 4:</p> <p>Field based Study</p>	<p>Field based study report on:</p> <ul style="list-style-type: none"> • Study of butterflies and their host plants on the campus / molluscs/ ants/ spiders / birds • Any two biodiversity monitoring by various field techniques for flora and fauna: • Trail / transect-quadrant monitoring for abundance and diversity estimation of mammals and birds (direct and indirect evidences) (on campus or fieldtrip) • Identification of animals through pug marks, hoofmarks, scats, pellet groups, nest, antlers, feathers, etc. • Local case study report of wild life conflict <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, 5th 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

COURSE CODE	ZOO-VI-E-13 /
MARKS	100 [75 -Theory ; 25- Practical]
CREDITS	04 [03 -Theory; 01- Practical]
CONTACT HOURS	THEORY : 45 HOURS (03 LEC/WEEK) PRACTICALS: 30 HOURS (01 PRACTICAL /WEEK)
COURSE OBJECTIVES	This course is an introduction to the nutrients, their functions and role in maintaining good health of humans.
COURSE OUTCOME:	Upon successful completion of the course, students will be able to: CO1: Know about nutrients and their function CO2: Read and interpret food labels. CO3: Correlate role of lifestyle and food habits in causing diseases. CO4: Prepare Diet Plans for different age group individuals.

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"> • Definition of health and nutrition • Scope of nutrition, food as a source of nutrients • Nutrients and energy • Adequate, optimum and balanced diet • Malnutrition and health. <p>UNIT 2: Nutritional Biochemistry (Overview)</p> <ul style="list-style-type: none"> • Carbohydrates, lipids, proteins - definition, classification, structure and properties • Significance of acid value, iodine value and saponification value of lipids • Essential and non-essential amino acids • Enzymes- definition, classification, properties(overview). • Coenzymes, vitamins (fat soluble and water soluble), structure and properties • Minerals- iron, calcium, phosphorus, iodine, selenium and zinc and their properties 	<p align="center">15</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"> • 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). • Changes of nutrient value during cooking of the following food groups: cereals, pulses and vegetables. Nutrient loss - dry, moist, frying and microwave cooking. <p>UNIT 4: Nutrition and dietetics</p> <ul style="list-style-type: none"> • 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. 	<p align="center">15</p>

<p>MODULE 3: DIET RELATED DISEASES</p>	<p>UNIT 5:Health and diseases</p> <ul style="list-style-type: none"> • 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. • Life style related diseases- obesity, hypertension, hyperurecimia, diabetes mellitus, polycystic ovarian disease (PCOD) - their causes and prevention through dietary/lifestyle modifications. • Social health problems: smoking, alcoholism, drug dependence and Acquired Immune Deficiency Syndrome (AIDS); • Common ailments- irritable bowel disease (IBD), constipation: causes and dietary management <p>UNIT 6: Food hygiene</p> <ul style="list-style-type: none"> • Potable water- sources and methods of purification at consumer level • 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. • Brief account of food spoilage: Causes and preventive measures 	<p>15</p>
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<p align="center">PRACTICAL COMPONENT OF ‘HEALTH AND NUTRITION ZOO-VI-E-13: DURATION (30 HOURS – 02hrs/WEEK)</p>		
<p>SR. NO</p>	<p align="center">PRACTICAL</p>	<p>NO. OF PRACTICAL S</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>Titrametric estimation of:</p> <ul style="list-style-type: none"> • Ascorbic acid estimation in food • Calcium in food 	<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"> • Identify nutrient rich sources of foods, their seasonal availability and price • Study of nutrition labeling on selected foods 	<p>04</p>

**GENERIC ELECTIVE COURSE: HEALTH AND NUTRITION
(For students of other discipline)**

COURSE CODE	*ZOO-VI-GE-1
MARKS	Theory 100 marks
CREDITS	04 [Theory]
CONTACT HOURS	Theory(4 Lec/week)
COURSE OBJECTIVES	This course is an introduction to the nutrients, their functions and role in maintaining good health of humans.
COURSE OUTCOME:	Upon successful completion of the course, students will be able to: CO1: Know about nutrients and their function CO2: Read and interpret food labels. CO3: Correlate role of lifestyle and food habits in causing diseases. CO4: Prepare Diet Plans for different age group individuals.

***ZOO-VI-GE-1:HEALTH AND NUTRITION**
(As Generic elective to students of other discipline)

MODULE	TOPICS	CONTA CT HOURS
MODULE 1: BASIC CONCEPT OF FOOD AND NUTRITION	UNIT 1: Overview of health and nutrition <ul style="list-style-type: none"> • Definition of health and nutrition • Scope of nutrition, food as a source of nutrients • Nutrients and energy, principles of meal planning • Adequate, optimum and balanced diet • Malnutrition and health. UNIT 2: Nutritional Biochemistry (Overview) <ul style="list-style-type: none"> • Carbohydrates, lipids, proteins - definition, classification, structure and properties • Significance of acid value, iodine value and saponification value of lipids • Essential and non-essential amino acids • Enzymes- definition, classification, properties (overview). • Coenzymes, vitamins (fat soluble and water soluble), structure and properties • Minerals- iron, calcium, phosphorus, iodine, selenium and zinc and their properties UNIT 3: Activities related to module 1(5hrs).	15
MODULE 2: ROLE OF NUTRIENT S AND CHANGES IN NUTRIENT VALUES	UNIT 4: Functions of food components of food-nutrients <ul style="list-style-type: none"> • Overview of the Vitamins and minerals - dietary sources of macro and micronutrients. UNIT 5: Changes in nutrient values <ul style="list-style-type: none"> • Changes of nutrient value during cooking of the following food groups: cereals, pulses, vegetables and meats. • Methods of cooking and Nutrient loss - dry, moist, frying and microwave cooking. Canning of food. UNIT 6: Activities related to module 2(5hrs).	15
MODULE 3: DIETARY PATTERN FOR HUMANS	UNIT 7: Nutrition and dietetics 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. UNIT 8: Food based dietary guidelines, enhancing the nutritional quality of the diet, nutritional labeling. UNIT 9: Activities related to Module3 (Comparison of different nutrient labels of various food products). (5hrs).	15

<p>MODULE 4: HEALTH AND DISEASES</p>	<p>UNIT 8: 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.</p> <p>UNIT 9: Life style related diseases- obesity, hypertension, hyperurecimia, diabetes mellitus, polycystic ovarian disease (PCOD) - their causes and prevention through dietary/lifestyle modifications.</p> <p>UNIT 10: Food hygiene: Potable water- sources and methods of purification at consumer level. Brief account of food spoilage: Causes and preventive measures</p> <p>UNIT 11: Activities related to Module 4(5hrs).</p>	<p>15</p>
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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

COURSE CODE	ZOO-V.E-14
MARKS	100 [75 – Theory; 25 – Practicals]
CREDITS	04 [03 – Theory; 01 – Practical]
CONTACT HOURS	THEORY : 45 HOURS (03 LECTURE/WEEK) PRACTICALS : 30 HOURS (01 PRACTICAL/WEEK)
COURSE OBJECTIVES	<ul style="list-style-type: none">• To study the distribution of organisms, their interrelations in populations and communities and interactions between biotic and abiotic components• To study impact of anthropogenic activities on ecosystem and study behaviour of organisms under natural conditions
COURSE OUTCOME:	Upon successful completion of the course, students will be able to: CO1: gain better understanding of concepts of ecology. CO2: Acquainted with the basics of animal behaviours CO3: Know strategies of biodiversity conservation, CO4: Understand mechanisms of sustainable development.

ZOO-V.E- 11 : ECOLOGY AND ETHOLOGY

MODULE	TOPICS	CONTACT HOURS
<p>MODULE 1 : 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>MODULE 2 : 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>MODULE 3 : 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>	

PRACTICAL COMPONENT OF ZOO-V.E-14: ECOLOGY AND ETHOLOGY (DURATION -02 HRS /WEEK)		
SR.NO.	PRACTICAL	NO. OF PRACTICALS
1	Field Based practicals: <ul style="list-style-type: none"> • Determination of population density in a natural/ hypothetical community by Quadrats method in intertidal zone. • Report on a visit to National Parks/ Biodiversity Parks/ Wild life sanctuary • Observation of random subjects for understanding human behaviour. 	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 ₂	03
3	Ethology: <ul style="list-style-type: none"> • To study the habituation to light stimulus in earthworm/crabs/snails/ spider web • To demonstrate phototactic and geotactic responses of the animal provided earthworm/crabs 	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 (12th revised edition) -25002.
12. W.H. Thorpe (1979) : *The Origins and rise of Ethology*, Praeger Publishers.

ELECTIVE COURSE: BIOENTREPRENEURSHIP	
COURSE CODE	Elective: ZOO-VI.E- 16
MARKS	100 [25 -Theory; 75- Practice Based]
CREDITS	04
CONTACT HOURS	Theory: 15 HOURS [01 Lectures Per Week] Practice based: 45 HOURS (03 hrs/week) 15 hrs of intervention by teacher.
COURSE OBJECTIVES	<ul style="list-style-type: none"> • To help students recognize the opportunities of enterprises in the field of life sciences • To encourage students to think independently and explore new vistas • To familiarise them with the basic skills required for a start-up
COURSE OUTCOME:	<p>Upon successful completion of the course, students will be able to:</p> <p>CO1: understand concept of business Proposals CO2: familiar with the methodologies and regulations required to start an enterprise CO3: Identify opportunities available in life science for start-ups. CO4: Generate Ideas and initiate a Business Plan.</p>

ZOO-VI.E- 16: BIOENTREPRENEURSHIP		
UNIT	TOPICS	CONTACT HOURS
MODULE 1: Entrepreneurship Development	Unit 1: Introduction to entrepreneurship: <ul style="list-style-type: none"> entrepreneurial competencies and goal setting, bio entrepreneurship, building a bio-enterprise : balance management, capital, technology Unit 2: Introduction to innovation: <ul style="list-style-type: none"> identifying business opportunities 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"> Certification and licensing, acts, regulations and guidelines, marketing and export process, accessing university technology, research and development agencies in India Unit 6: Role of micro, medium and small scale industry sectors	15
MODULE 3: Start-up, quality, safety and procedural compliances in a bio enterprise	Unit 7: Intellectual Property Rights and trademark of biological resources Unit 8: quality, safety and procedural compliances <ul style="list-style-type: none"> Bio safety and its implementations Quality control in entrepreneurship WHO Guidelines for setting up of a contract research organization. Starting a research laboratory in India – guidelines and permits required 	15
MODULE 4: Practice based component	Practice based component: <ol style="list-style-type: none"> Lateral thinking and testing entrepreneurial Activities : <ol style="list-style-type: none"> Brainstorming in Group / market investigation to initiate business ideas for biologists. Preparing Business proposal sketch. Financial Planning. Identifying investors. Developing marketing strategies. Interactions with successful entrepreneur, Banker/ Angel Investors/ Visit to a bio-startup. Formulating and presenting Business model Preparation of final Business execution plan. Submission of the learning process and outcome as Portfolio. 	15

ELECTIVE COURSE: BIOENTREPRENEURSHIP

COURSE CODE	Skill Enhancement Course(SEC): ZOO-SE-2
MARKS	100 [25 -Theory; 75- Practice Based]
CREDITS	04
CONTACT HOURS	Theory: 15 HOURS [01 Lectures Per Week] Practice based: 45 HOURS (03 hrs/week) 15 hrs of intervention by teacher.
COURSE OBJECTIVES	<ul style="list-style-type: none">• To help students recognize the opportunities of enterprises in the field of life sciences• To encourage students to think independently and explore new vistas• To familiarize them with the basic skills required for a start-up
COURSE OUTCOME:	Upon successful completion of the course, students will be able to: CO1: understand concept of business Proposals CO2: familiar with the methodologies and regulations required to start an enterprise CO3: Identify opportunities available in life science for start-ups. CO4: Generate Ideas and initiate a Business Plan.

ZOO-VI-SE-2 : BIOENTREPRENEURSHIP		
UNIT	TOPICS	CONTACT HOURS
MODULE 1: Entrepreneurship Development	Unit 1: Introduction to entrepreneurship: <ul style="list-style-type: none"> entrepreneurial competencies and goal setting, bio entrepreneurship, building a bio-enterprise : balance management, capital, technology Unit 2: Introduction to innovation: <ul style="list-style-type: none"> identifying business opportunities Unit 3: Raising funds: public and private	05
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"> Certification and licensing, acts, regulations and guidelines, marketing and export process, accessing university technology, research and development agencies in India 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.	05
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"> Bio safety and its implementations Quality control in entrepreneurship WHO Guidelines for setting up of a contract research organization. Starting a research laboratory in India – guidelines and permits required 	05
MODULE 4: Practice based component	Practice based component: 3. Lateral thinking and testing entrepreneurial 4. Activities : <ol style="list-style-type: none"> Brainstorming in Group / market investigation to initiate business ideas for biologists. Preparing Business proposal sketch. Financial Planning. Identifying investors. Developing marketing strategies. Interactions with successful entrepreneur, Banker/ Angel Investors/ Visit to a bio-startup. Formulating and presenting Business model Preparation of final Business execution plan. Submission of the learning process and outcome as Portfolio. 	45

REFERENCES:

1. Garg, M.C. (2015) *Entrepreneurial development. Guset User.*
2. Kolchinsky, P. (2004) *The entrepreneurs guide to a biotech startup. 4th edition. www.evelexa.com*
3. Simon, S. 2009. *Start with why: How great leaders inspire everyone to take action. Penguin Group (USA) Inc .*
4. Welch, J. and Byrne, J.A. 2003. *Straight from the gut. Business plus publishers.*

Geography

Syllabus for B.A. Degree Programme in Geography updated on 16th March 2020

ELECTIVE

Course Title: Socio Economic Survey in Human Geography (Theory)

Course Code: GEG-E1

Marks: 75

Credits: 3

Duration: 45 lectures of 1 hour each

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Prerequisite Courses: Nil

Course Objectives:

1. The primary objective is to provide basic methodology in field based socio-economic survey.

Course Outcomes:

At the end of this course, students will be able to:

CO1: Understand basic concepts of Socio Economic Surveying

CO2: Develop the skill of questionnaire formulation

CO3: Independently collect data from field using online apps and manually

CO4: Process, analyze, graphically represent and interpret data

Unit	Topic	No. of hours	Marks
I	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
II	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
III	Based on the objective of the Survey. Pilot Survey, Planning for Main Survey, Pre-Survey and Post Survey Work. E- Survey-Introduction to e-surveying and various sites. Safety Measures, Responsibility Sharing and Plan of Action. (a) Academic report – Literature Survey, structure, layout, reporting language (b) Comprehensive report representation – photos, sketch, maps, etc.	15	25
		45	75

References:

Mandatory:

1. Bagavathi, V. & Pillai R. S. N. (2005) Statistical Theory and Practice, S. Chand Publication, New Delhi.
2. Kothari, C.R., (2004) Research Methodology- Methods and techniques, New Age International (P) Limited, New Delhi.

Supplementary:

1. Gosh, B N (2007) Scientific Methods and Social Research, sterling Publishers Private Limited.
2. Mahmood, A., (2009): Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi.
3. Saravanel, P.,(2014), Research Methodology, Kitab Mahal, New Delhi
4. Singh, Gopal., (2010) Map Work and Practical Geography, Vikas Publishing House, New Delhi

Web-based:

1. <https://www.um.es/empafish/files/Deliverable%209.pdf>
2. https://openjicareport.jica.go.jp/pdf/11810140_03.pdf
3. <https://www.jk.gov.in/jammukashmir/sites/default/files/Socio%20Economic%20Survey%20of%20Village.pdf>
4. <https://stattrek.com/survey-research/sampling-methods.aspx>
5. <https://medcraveonline.com/BBIJ/sampling-and-sampling-methods.html>
6. <https://courses.lumenlearning.com/suny-hccc-research-methods/chapter/chapter-9-survey-research/>
7. <http://www.tools4dev.org/resources/how-to-pretest-and-pilot-a-survey-questionnaire/>

ELECTIVE

Course Title: Socio Economic Survey in Human Geography (Practical)

Course Code: GEG-E1

Marks: 25

Credits: 1

Duration: 15 Sessions of 2 hours each

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Unit	Topic	Practical Sessions	Marks
I	Questionnaire Formulation Field Book Preparation Literature Survey (Cataloging)	04	05
II	Conducting on-field survey (Village, Market, Ward) E- surveying - web mapping	08	05
III	Data analysis using MS Excel and compilation	03	05
IV	Report		10
		15	25

References:

Mandatory:

1. Bagavathi, V. & Pillai R. S. N. (2005) Statistical Theory and Practice, S. Chand Publication, New Delhi.
2. Kothari, C.R., (2004) Research Methodology- Methods and techniques, New Age International (P) Limited, New Delhi.

Supplementary:

1. Gosh, B. N., (2007), Scientific Methods and Social Research, Sterling Publishers Private Limited., New Delhi
2. Mahmood, A., (2009): Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi.
3. Saravanavel, P.,(2014), Research Methodology, Kitab Mahal, New Delhi
4. Singh, Gopal, (2010) Map Work and Practical Geography, Vikas Publishing House, New Delhi

Web-based:

1. <https://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1025&context=geographyfacpub>
2. https://shodhganga.inflibnet.ac.in/bitstream/10603/168485/15/15_chapter%207.pdf
3. <https://europepmc.org/backend/ptpmcrender.fcgi?accid=PMC1491888&blobtype=pdf>
4. <https://www.analyticsvidhya.com/blog/2020/04/excel-tips-tricks-data-analysis/>
5. <https://www.excel-easy.com/data-analysis.html>
6. <https://people.umass.edu/evagold/excel.html>
7. <http://data-analysis-reports.blogspot.com/2020/03/945108-anilgiri702-do-data-analysis-forecasting-compilation-reports-with-ms-excel.html>

ELECTIVE

Course Title: Field Survey in Physical Geography (Theory)

Course Code: GEG- E2

Marks: 75

Credits: 3

Duration: 45 lectures of 1 hour each

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Prerequisite Courses: Nil

Course Objectives:

1. The primary aim of this Course to introduce various surveying instrument used in Physical Geography.
2. Students will learn the operation and the application of the instruments and methods of surveying.

Course Outcomes: At the end of this course, students will be able to:

- CO1:** Understand functions and applications of dumpy level, Plane table and Global Positioning Systems (GPS) in field based studies.
- CO2:** Independently handle survey instruments and prepare maps and field reports.
- CO3:** Have hands-on training on using survey instruments in final year project work
- CO4:** Detect the change in the spatial extension of area, locality and region.

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:

Mandatory:

1. Khullar, D.R. (2007), Essentials of Practical Geography, New Academic Publishing
2. Monkhouse, I.J. and Wilkinson, H.R. (2009), Maps and Diagram, B.I. Publication, New Delhi
3. Sarkar, Ashis (2000), Practical Geography: A Systematic Approach, Orient Longman Pvt. Ltd., Kolkata

Supplementary:

1. Campbell, J. (2004), Introductory Cartography, Prentice Hall, Inc Englewood
2. Co.,Jalandher
3. Misra, R.P. and Ramesh, A. (2005), Fundamentals of Cartography, Concept Pub. Co., New Delhi
4. Singh, R.L. and Singh Rana P.B.(2008), Elements of Practical Geography, Kalyani Publishers, New Delhi

Web-based:

1. <https://explorable.com/types-of-survey>
2. <https://www.slideshare.net/gauravhtandon1/plane-table-survey-27614680>
3. <https://libguides.usc.edu/writingguide/fieldreport>
4. <https://theconstructor.org/surveying/dumpy-level-surveying-components-procedure-advantages/20456/>
5. <https://www.gps.gov/systems/gps/>

ELECTIVE

Course Title: Field Survey in Physical Geography (Practical)

Course Code: GEG-E2

Marks: 25

Credits:1

Duration: 15 Sessions of 2 hours each

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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:

Mandatory:

1. Khullar, D.R. (2007), Essentials of Practical Geography, New Academic Publishing
2. Monkhouse, I.J. and Wilkinson, H.R. (2009), Maps and Diagram, B.I. Publication, New Delhi
3. Sarkar, Ashis (2000), Practical Geography: A Systematic Approach, Orient Longman Pvt. Ltd., Kolkata

Supplementary:

1. Campbell J. (2004), Introductory Cartography, Printice Hall, Inc Englewood
2. Misra, R.P. and Ramesh, A. (2005), Fundamentals of Cartography, Concept Pub. Co., New Delhi
3. Singh, R.L. and Singh Rana P.B.(2008), Elements of Practical Geography, Kalyani Publishers, New Delhi

Web-based:

1. <https://explorable.com/types-of-survey>
2. <https://www.slideshare.net/gauravhtandon1/plane-table-survey-27614680>
3. <https://libguides.usc.edu/writingguide/fieldreport>
4. <https://theconstructor.org/surveying/dumpy-level-surveying-components-procedure-advantages/20456/>
5. <https://www.gps.gov/systems/gps/>

ELECTIVE

Course Title: Participatory Rapid Appraisal Techniques (Theory)

Course Code: GEG-E3

Marks: 75

Credits: 3

Duration: 45 lectures of 1 hour each

=====

Prerequisite Courses: Nil

Course Objectives:

1. To introduce the basics of Participatory Rapid Appraisal techniques in geographical studies.
2. This will facilitate students in their field work and further research.

Course Outcomes: At the end of this course, students will be able to:

CO1: Be familiar with the basic concepts of PRA techniques

CO2: Develop the skill to prepare questionnaires and Schedules for different PRA techniques.

CO3: Understand the application of PRA techniques in geographical studies

CO4: Accurately analyze and interpret the data collected using PRA techniques

Unit	Topic	No. of hours	Marks
I	PRA :Meaning Nature and Scope, evolution Principles of Participatory Rapid Appraisal -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	Mapping Models: 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	PRA techniques: Transect walks and guided field walks, Daily-activity profiles, Semi structured interviewing, Field report writing: techniques and structure.	10	35
		45	75

References:

Mandatory:

1. Mukherjee A, Chambers R,(2004), Participatory Rural Appraisal: Methods and Applications in Rural Planning, Concept Publishing Company, New Delhi
2. Narayanaswamy, N., (2008), Participatory Rural Appraisal: Principles, Methods and Application, SAGE publications, New Delhi

Supplementary:

1. Bartle Phil, (2003),Methods of Participatory Appraisal, CSMED
2. Mikkelsen Britha, (2005), Methods for Development Work and Research: A New Guide for Practitioners, SAGE publications, New Delhi
3. Pokharel Ridish, Balla Mohan, (2003), A Process for Participatory Rural Appraisal, Institute of Forestry, Pokhar.

Web-based:

1. <http://www.fao.org/3/i2495e/i2495e06.pdf>
2. <https://www.participatorymethods.org/resource/participatory-rapid-appraisal-community-development-training-manual-based-experiences>
3. <https://www.nccmt.ca/knowledge-repositories/search/289>
4. <https://www.crs.org/sites/default/files/tools-research/rapid-rural-appraisal-and-participatory-rural-appraisal.pdf>
5. https://getd.libs.uga.edu/pdfs/wolfgang_stephanie_l_201205_mla.pdf

ELECTIVE

Course Title: Participatory Rapid Appraisal Techniques (Practical)

Course Code: GEG-E3

Marks: 25

Credits: 1

Duration: 15 Sessions of 2 hours each

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Unit	Topic	Practical Sessions	Marks
I	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
II	Exercise 6. Time chart Exercise 7. Wealth ranking. Exercise 8. Venn diagram preparation. Exercise 9. Daily activity profiling.	08	10
III	Journal / Viva voce		05
		15	25

Note: This practical is based on field work

References:

Mandatory:

1. Mukherjee A, Chambers R, (2004), Participatory Rural Appraisal: Methods and Applications in Rural Planning, Concept Publishing Company, New Delhi
2. Narayanasamy. N, (2008), Participatory Rural Appraisal: Principles, Methods and Application, SAGE publications New Delhi

Supplementary:

1. Bartle Phil, (2003), Methods of Participatory Appraisal, CSMED
2. Mikkelsen Britha, (2005), Methods for Development Work and Research: A New Guide for Practitioners, SAGE publications, New Delhi
3. Pokharel Ridish, Balla Mohan, (2003), A Process for Participatory Rural Appraisal, Institute of Forestry, Pokhar.

Web-based:

1. <http://www.fao.org/3/i2495e/i2495e06.pdf>
2. <https://www.participatorymethods.org/resource/participatory-rapid-appraisal-community-development-training-manual-based-experiences>
3. <https://www.nccmt.ca/knowledge-repositories/search/289>
4. <https://www.crs.org/sites/default/files/tools-research/rapid-rural-appraisal-and-participatory-rural-appraisal.pdf>
5. https://getd.libs.uga.edu/pdfs/wolfgang_stephanie_l_201205_mla.pdf

ELECTIVE

Course Title: Application of Computer in Geography (Theory)

Course Code: GEG-E4

Marks: 75

Credits: 3

Duration: 45 lectures of 1 hour each

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Prerequisite Courses: Nil

Course Objectives:

1. 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.

Course Outcomes: At the end of this course, students will be able to:

CO1: Understand functioning of different e-sources of geographical data

CO2: Understand and its binary coding

CO3: Prepare cartograms that can be used for various geographical applications using computers

CO4: Represent geo-data using excel

CO5: Identify and apply appropriate cartograms for given data set

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

References:

Mandatory:

1. Wilbanks. J, Thomas. (2004). Geography and Technology. Pg: 3-16. 10.1007/978-1-4020-2353-8_1.

Supplementary:

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.

Web-based:

1. <https://www.loc.gov/rr/geogmap/guide/gmilldma.html>
2. <https://censusindia.gov.in/>
3. http://mowr.gov.in/sites/default/files/AR2015-16_2.pdf
4. <https://mausam.imd.gov.in/>
5. <http://eagri.org/eagri50/STAM101/pdf/lec03.pdf>
6. <https://www.easybiologyclass.com/graphical-representation-of-data-frequency-polygon-frequency-curve-ogive-and-pie-diagram/>
7. http://www.geo.umass.edu/courses/geo494a/Chapter2_GIS_Fundamentals.pdf

ELECTIVE

Course Title: Application of Computer in Geography (Practical)

Course Code: GEG-E4

Marks: 25

Credits: 1

Duration: 15 Sessions of 2 hours each

Unit	Topic	Practical Sessions	Marks
I	Use of computer application in thematic mapping – Map Layouts, choropleth, dot density Cartograms of one, two and three dimensions, One dimensional plot: The Dot plot, Box and Whisker Plot	08	06
II	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	09	14
IV	Journal		05
		15	25

References:

Mandatory:

1. Wilbanks. J, Thomas. (2004). Geography and Technology. Pg: 3-16. 10.1007/978-1-4020-2353-8_1.

Supplementary:

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 BlackswanPvt.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.

Web Based:

1. https://www.researchgate.net/publication/280112742_CHAPTER_5_COMPUTERS_AND_GEOGRAPHY_FROM_AUTOMATED_GEOGRAPHY_TO_DIGITAL_EARTH
2. <https://www.gislounge.com/whats-in-a-map/>
3. <https://datavizcatalogue.com/methods/choropleth.html>
4. <https://www.axismaps.com/guide/univariate/dot-density/>
5. <http://egyankosh.ac.in/bitstream/123456789/20422/1/Unit-14.pdf>
6. <https://www.statisticshowto.com/ogive-graph/>
7. <https://www.easybiologyclass.com/graphical-representation-of-data-frequency-polygon-frequency-curve-ogive-and-pie-diagram/>
8. <https://www.mathsisfun.com/data/data-graph.php>
9. <https://www.igismap.com/gis-tutorial-basic-spatial-elements-points-lines-and-polygons/>

**SYLLABUS FOR AUTONOMOUS COURSES IN GEOGRAPHY
BACHELOR OF ARTS
SEMESTER IV
UPDATED ON 16TH MARCH 2020**

SEMESTER IV

CORE

Course Title: Basics of Geomorphology (Theory)

Course Code: GEG-IV.C6

Marks: 75

Credits: 3

Duration: 45 lectures of 1 hour each

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Prerequisite Courses: Nil

Course objectives:

1. To provide the basic concepts, theories and application in geomorphology

Course outcomes:

At the end of this course, students will be able to:

- C01:** Understand basic concepts of Geomorphology.
- C02:** Understand theories of continental drifts, Isostasy sea floor spreading,
- C03:** Analyze different types of slopes using contouring method.
- C04:** Identify and distinguish geomorphic processes and landforms created by winds, underground water.
- C05:** Analyze river basin based on morphometric parameters.
Identify and independently interpret relief features and their associations on SOI toposheets.

Unit	Topic	No. of hours	Marks
I	<ul style="list-style-type: none"> • Fundamental concepts in geomorphology- detail study of all nine fundamental concepts and their relevance in understanding Geomorphological processes. 	15	25
II	Selected Theories in geomorphology <ul style="list-style-type: none"> • Tetrahedral theory. • Plate tectonics and mountain building. • Theories of slope development. • Slope- their stability and failures. • Drainage systems and patterns. 	15	25
III	Agents, processes and landforms: erosional, transportation and depositional. <ul style="list-style-type: none"> • Fluvial landforms • Glacial landforms 	15	25
		45	75

References:

Mandatory:

1. Singh, S. 2005 : Geomorphology, PrayagPustakBhawan, Allahabad
2. Thornbury, W.D., 2001: Principles of Geomorphology, 2nd Ed., Wiley International Edition, Wiley Eastern Reprint,
3. Sharma, H.S. (ed), 2002: Perspective in Geomorphology, Vol. I & IV, Concept, New Delhi
4. Wooldridge, S.W. and Morgan, R.S., 2000: The Physical Basis of Geography, Longman.
5. Sparks, B.W., 2000: Geomorphology, Longman, London

Supplementary:

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, V.K., 2006: Geomorphology, Earth Surface Processes and Forms, Tata Mc. Graw Hill, New Delhi.
6. Sharma, V.K., 2006: Geomorphology, Earth Surface, Process and forms, Tata McGraw Hill, New York
7. Strahler, A.N. 2006: Physical Geography, 3rd Ed., Wiley
8. Worcestor, P.G., 2005: A Textbook of Geomorphology, Van Nostrand, 2nd Ed., East West Edition, New Delhi.

Web-Based:

1. <http://shaileshchaure.com/Notes/GEOMCON.pdf>
2. <https://www.kean.edu/~csmart/Observing/05.%20Plate%20tectonics.pdf>
3. https://www.researchgate.net/publication/272510857_Main_Drainage_Systems
4. https://www.researchgate.net/publication/309630899_FLUVIAL_PROCESSES_AND_LANDFORMS
5. <https://people.wou.edu/~taylor/g322/glacial.pdf>

CORE

Course Title: Basics of Geomorphology (Practical)

Course Code: GEG-IV.C6

Marks: 25

Credits: 1

Duration: 15 sessions of 2 hours each

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Unit	Title	Practical sessions	Marks
I	Slope analysis – Aspect map and Isotan map Identification of river patterns from SOI toposheet and Satellite Image	6	10
II	Preparation and interpretation of drainage map using SOI toposheet (at least one for humid/tropical and arid/dry region)	9	10
III	Journal and Viva		05
		15	25

References:

Mandatory:

1. Sarkar, Ashis, 2000: Practical Geography: A Systematic Approach, Orient Longman Pvt. Ltd., Kolkata.
2. Kale V.S. and Gupta Avijit (2000): Introduction to Geomorphology, Orient Black Swan Publications
3. Monkhouse, F.J. and Wilkinson, H.R., 2009: Maps and Diagrams, B.I. Publications Pvt. Ltd., New Delhi
4. Singh, R.L. and Singh Rana P.B., 2008, Elements of Practical Geography, Kalyani Publishers, New Delhi
5. Singh, Savindra (2006): Geomorphology, PrayagPustakBhavan, Allahabad

Supplementary

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. 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. Strahler, A.N., 2000: Physical Geography, 3rd Ed., Wiley.

Web-Based:

1. <https://shodhganga.inflibnet.ac.in/bitstream/10603/160201/3/chapter%204.pdf>
2. <http://www.wvca.us/envirothon/pdf/Drainage%20Patterns.pdf>
3. https://www.soilandwater.nyc/uploads/7/7/6/5/7765286/watershed_delineation.pdf
4. <https://www.nrcs.usda.gov/wps/portal/nrcs/detailfull/national/water/manage/?cid=stelprd1046651>
5. <http://www.ncert.nic.in/ncerts/l/iess103.pdf>

Semester IV

ELECTIVE

Course Title: Basics of Climatology (Theory)

Course Code: GEG-E5

Marks: 75

Credits: 3

Duration: 45 lectures of 1 hour each

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Prerequisite Courses: Nil

Course Objective:

1. To introduce key concepts of climatology in general and Indian monsoon in details

Course Outcomes:

At the end of this course, students will be able to:

CO1: Understand and analyze the concepts in atmospheric stability.

CO2: Distinguish different mechanisms of Indian monsoon.

CO3: Associate the indicators of changing climate to the day to day weather dynamics.

CO4: Apply climatic concepts in issues related to agriculture, health and disasters.

CO5: Represent weather phenomenon using weather station model.

CO6: Have hands on experience of handling weather instruments, calibrating, reading, interpretation and forecasting.

Unit	Title	No. of hours	Marks
I	Fundamental of Atmospheric circulation 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	Indian Climatology: Pre monsoon: Cyclonic storms, frequency, cyclone genesis, intensity, landfall and associated weather.	15	25
III	Indian Climatology: South West monsoon : onset and advance of southwest monsoon, links to EI Nino/Southern Oscillation, Indian Ocean Dipole and Madden Julian Oscillation Index. Post monsoon: withdrawal of southwest monsoon, Northeast monsoon, cyclonic storms in the Indian seas, trends in cyclonic disturbances, western disturbances, Easterly waves..	15	25
		45	75

References:

Mandatory:

1. Lal, D.S., 2011: Climatology, ShardaPustakBhavan
2. Monkhouse, F.J., 1975 – Principles of Physical Geography , Hodder Murray Publishers
3. Barry R.G. and Chorley, R. J., 2009: Atmosphere, Weather and Climate, Routledge
4. Tikka - R.N., 1998 - Physical Geography. KedarNath Ram Nath, Meerut
5. Trewartha, G.T., 1968: Introduction to Climate, McGraw-Hill

Supplementary:

1. Bunnett R.B. , 1993: Physical geography in Diagrams, Longman
2. Critchfield, H.J, 1998 : General Climatology, Prentice-Hall
3. P. Birot, 1966: General Physical Geography, Longman, Green & Co Strahler, A.H., 1983: Modern Physical Geography, John Wiley and Sons
4. Strahler A. M. and Strahler A.H., 1983: Elements of Physical Geography, John Wiley and Sons
5. Stringer, E.T., 1972: Foundation of Climatology: An Introduction to Physical, Dynamic, Synoptic, and Geographical Climatology, W.H. Freeman & Co. Ltd.

Web-Based:

1. <https://www.ess.uci.edu/~yu/class/ess5/Chapter.9.airmass.all.pdf>
2. https://www.weather.gov/media/owlie/2018_ENSO.pdf
3. http://www.wmo.int/pages/prog/wcp/wcasp/documents/JN142122_WM01145_EN_web.pdf
4. <http://www.fao.org/3/ca3758en/ca3758en.pdf>
5. <https://www.ias.ac.in/article/fulltext/reso/012/05/0004-0020>

ELECTIVE

Course Title: Basics of Climatology (Practical)

Course Code: GEG-E5

Marks: 25

Credits: 1

Duration: 15 sessions of 2 hours each

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Unit	Title	Practical sessions	Marks
I	Representation and interpretation of weather phenomena using isolines Isohyets map Isotherm map Isobars Wind rose and their types Evapotranspiration(Annual variability) Preparation of weather Station Model.	05	8
II	<ul style="list-style-type: none"> • Study of weather symbols and IMD weather charts. Interpretation of IMD weather charts (at least 1 map of three seasons) • Visit to IMD for hands- on- training: handling of weather instruments, taking readings, temperature, pressure, sunshine chart interpretation and forecasting 	2 + 8=10	12
III	Journal		5
		15	25

References

Mandatory:

1. Misra, R.P. and Ramesh, A., 2009: Fundamentals of Cartography, Concept Publishing Co., New Delhi
2. Singh, R.L., 2000: Elements of Practical Geography, Kalyani Publishers, New Delhi
3. Singh, R ; Singh L.R., 2001: Mapworks in Practical Geography,Central book Depot, Allahabad
4. Bygot, J., 2001: An Introduction to Map Work and Practical Geography
5. Campbell, J., 2004: Introductory Cartography, Prentice Hall, Inc Englewood

Supplementary

1. Chorley, Richard. J. (ed.), 2001: Water, Earth and Man, Methuen & Co., London
2. Monkhouse, F.J. and Wilkinson, H.R., 2009: Maps and Diagrams, B.I. Publications Pvt. Ltd., New Delhi
3. Raisz, E., 2005: General Cartography, McGraw Hills Co., London
4. Robinson, A.H., et al, 2003: Elements of Cartography, John Wiley and Sons, New York

Web-Based:

1. <https://www.ntschoools.org/cms/lib/NY19000908/Centricity/Domain/112/Drawing%20Isotherms.Isobars.pdf>
2. <http://www.huskersk12.org/vimages/shared/vnews/stories/521b6ab5ac56b/isobarandisothermmaplab.pdf>
3. https://www.lakeheadu.ca/sites/default/files/uploads/53/outlines/2017-18/GEOG2331/2331_Manual_W18_forStudents.pdf
4. <http://ncert.nic.in/textbook/pdf/kegy308.pdf>
5. https://www.imdtvm.gov.in/index.php?option=com_content&task=view&id=21&Itemid=35

Semester IV

ELECTIVE

Course Title: Basics of Oceanography (Theory)

Course Code: GEG- E6

Marks: 75

Credits: 3

Duration: 45 lectures of 1 hour each

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Prerequisite Courses: Nil

Course Objective:

1. To provide the basic conceptual framework of oceanography, its dynamism and the contemporary issues associated with Oceans.

Course outcomes:

At the end of this course, students will be able to:

- CO1:** Develop an understanding of the ocean bottom relief features of Indian, Atlantic and Pacific ocean
- CO2:** Understand and test the physical properties of ocean water using scientific instruments.
- CO3:** Understanding the types of marine deposition and its relation with man
- CO4:** Read and interpret bathymetric and hydrographic charts
- CO5:** Prepare bathymetric chart using interpolation method.

Unit	Title	No. of hours	Marks
I	Comparative Study of bottom relief of Indian, Atlantic and pacific ocean Properties of ocean water- Salinity, Temperature, Density and relation among them.	15	25
II	Dynamics of ocean water: -Waves, Tides, and surface currents of Indian and Atlantic Ocean.	15	25
III	Marine Deposits: Classification and sources Man and marine resources	15	25
		45	75

References

Mandatory:

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, ShardaPustakBhavan, Allahabad

Supplementary:

1. Singh, S. 2005 : Geomorphology, PrayagPustakBhawan, Allahabad
2. Ahmed, E., 2005: Geomorphology, Kalyani Publishers, New Delhi
3. Bloom, Arthur L., 2004: Geomorphology – A Systematic Analysis of Late Cenozoic Landforms, Prentice Hall, Engle Wood Cliff, N.J
4. Kale V.S. and Gupta Avijit (2000): Introduction to Geomorphology, Orient Black Swan Publications
5. Strahler, A.N., 2000: Physical Geography, 3rd Ed., Wiley

Web-Based:

1. https://sweethaven02.com/PDF_Lifelong/Oceanography.pdf
2. http://msi.ttu.ee/~elken/IntroOcean_Tomczak.pdf
3. <http://www.geographynotes.com/oceanography/bottom-reliefs-of-various-oceans-oceanography-geography/2592>
4. <https://www.mt-oceanography.info/regoc/pdffiles/colour/single/14P-Atlantic.pdf>
5. https://www.researchgate.net/publication/315191645_Marine_Sediments

ELECTIVE

Course Title: Basics of Oceanography (Practical)

Course Code: GEG- E6

Marks: 25

Credits: 1

Duration: 15 sessions of 2 hours each

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Unit	Title	Practical sessions	Marks
I	Signs and symbols in hydrographic charts and reading of hydrographic chart. Reading of Bathymetric chart Plotting of Bathymetric and Hypsometric curves.	10	15
II	Water analysis – salinity, PH, Conductivity and TDS	05	05
III	Journal and Viva		05
		15	25

References:

Mandatory:

1. Misra, R.P. and Ramesh, A., 2005: Fundamentals of Cartography, Concept Pub. Co., New Delhi
2. Singh, R.L., 2000: Elements of Practical Geography, Kalyani Publishers, New Delhi
3. Singh, R ; Singh L.R., 2001: Mapworks in Practical Geography, Central book Depot, Allahabad
4. Sarkar, Ashis, 2000: Practical Geography: A Systematic Approach, Orient Longman Pvt. Ltd., Kolkata.
5. Khullar, D. R. (2000: Essentials Of Practical Geography, New Academic Publishing Co., Jalandar

Supplementary

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. Monkhouse, I.J. and Wilkinson, H.R., 2001: Maps and Diagram, B.I. Publication, New Delhi
5. Raisz, E., 2005: General Cartography, McGraw Hills Co., London
6. Robinson, A.H., et al, 2003: Elements of Cartography, John Wiley and Sons, New York

Web-based:

1. https://www.researchgate.net/publication/281410339_Bathymetry_History_of_Seafloor_Mapping
2. http://aquaticcommons.org/14702/4/nycmsp_ch2_bathymetry.pdf
3. <https://pubs.usgs.gov/of/2015/1180/ofr20151180.pdf>
4. [http://www.scpscience.com/Company%20Literature/Pdf/Catalogs/wateranalysis%20vol2\(Oct%207\).pdf](http://www.scpscience.com/Company%20Literature/Pdf/Catalogs/wateranalysis%20vol2(Oct%207).pdf)
5. https://www.who.int/water_sanitation_health/dwq/2edvol3d.pdf

SEMESTER IV

ELECTIVE

Course Title: Regional Geography of India (Theory)

Course Code: GEG-E7

Marks: 75

Credits: 3

Duration: 45 lectures of 1 hour each

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Pre-requisite Courses: Nil

Course Objectives:

1. The course is aimed at presenting an integrated and empirically based profile of India and Goa

Course Outcomes:

At the end of this course, students will be able to:

- CO1:** Have an understanding of the inter linkages and interaction between physical aspects and resource base of India and Goa
- CO2:** Learn the skills of choosing appropriate cartographic techniques to quantitatively represent regional aspects of India and Goa
- CO3:** Infer the processes that operate through space and time in different regions of India and Goa
- CO4:** Understand the recent development and changes in context of India.

Unit	Title	No. of hours	Marks
I	India: Location, Geology, Morphological divisions, Drainage System, Soil, Forest	15	25
II	Resource development: Indian Agriculture: New Technology Water Resource Development: multipurpose projects inland waterways plan. Industrialization : IT's, SEZ Trade and Transport: Golden Quadrangle, Konkan Railway	15	25
III	Goa: Location: Absolute and relative. Physiographic divisions, soils, vegetation, mineral resources, Mining and water resources, population, Tourism, Industrialization Trade, Transport and Communication	15	25
		45	75

References:

Mandatory:

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. Tiwari, R.C. (2006): "Geography of India" PrayagPustakBhavan, Allahabad.
4. Singh, R.L.(ed) (1971): India: A Regional Geography. National Geographical Society. India, Varnasi
5. Alvares Claude (2002), Fish, Curry and Rice: A Source Book on Goa, its Ecology and Lifestyle, The Goa Foundation, Goa

Supplementary:

1. Routray, J.K. (1993): Geography of Regional Disparity Asian Institute of technology, Bangkok
2. Learmonth, A.T.A. et.al (ed): Man and Land of South Asia Concept, New Delhi.
3. Shafi, M, (2000): Geography of South Asia, McMillan & Co., Calcutta
4. Spate, O.H.K. and Learmonth, A.T.A. (1967): India and Pakistan - Land, People and Economy Methuen & Co., London,
5. Valdiya, K.S. (1998): Dynamic Himalaya, University Press, Hyderabad
6. Valdiya, K.S. (2004): Geology, Environment and Society, University Press, Hyderabad
7. Wadia, D.N. (1967): Geology of India, McMillan & Co., London,

Web-Based:

1. https://www.researchgate.net/publication/39728980_Agricultural_Development_in_India_since_Independence_A_Study_on_Progress_Performance_and_Determinants
2. <http://ncert.nic.in/ncerts/l/iess102.pdf>
3. https://www.researchgate.net/publication/316644891_Physiographic_Divisions_of_India
4. https://www.researchgate.net/publication/271829967_India's_Golden_Quadrilateral_A
5. https://www.researchgate.net/publication/283721221_WESTERN_GHATS_OF_GOA_STATE_A_GEOGRAPHICAL_DIAGNOSIS

ELECTIVE

Course Title: Regional Geography of India (Practical)

Course Code: GEG-E7

Marks: 25

Credits: 1

Duration: 15 sessions of 2 hours each

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Unit	Title	Practical sessions	Marks
I	Cartographic representation and mapping of physiographic division, Soil, Forest, Climatic Division- examples of India and Goa	8	10
II	Calculation and graphical representation of by using Goa's census data: 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) Preparation of choroschematic map of Goa	7	10
III	Journal and Viva		05
		15	25

References:

Mandatory:

1. Singh, R.L.: Elements of Practical Geography, Kalyani Publishers, New Delhi, 2000
2. Khullar, D.R. (2011): "Indian-A Comprehensive Geography" Kalyani Publishers, New Delhi
3. Monkhouse, I.J. and Wilkinson, H.R., 2001: Maps and Diagram, B.I. Publication, New Delhi
4. Singh, R ; Singh L.R., Mapworks in Practical Geography, Central book Depot, Allahabad, 2001
5. Singh Gopal (2000), Map Work and Practical Geography, 4th Revised Edition, Vikas Publishing House Pvt. Ltd., New Delhi

Supplementary:

1. Bygot, J.: An Introduction to Map Work and Practical Geography, 2001
2. Campbell, J., 2004: Introductory Cartography, Prentice Hall, Inc Englewood
3. Misra, R.P. and Ramesh, A., 2005: Fundamentals of Cartography, Concept Pub. Co., New Delhi
4. Raisz, E.: General Cartography, McGraw Hills Co., London, 2005
5. Robinson, A.H., et al.: Elements of Cartography, John Wiley and Sons, New York, 2003
6. Jackson, R.H. and Hudmar, L.E.: Regional Geography: Issues for today, 2001
7. Tiwari, R.C. (2006): "Geography of India" Prayag Pustak Bhavan, Allahabad.
8. Valdiya, K.S. (2004): Geology, Environment and Society, University Press, Hyderabad

Web-Based:

1. <http://ncert.nic.in/ncerts/l/kegy106.pdf>
2. <http://fsi.nic.in/isfr-2015/isfr-2015-important-characteristics-of-indian-forest-types.pdf>
3. http://censusindia.gov.in/Data_Products/Library/Provisional_Population_Total_link/PDF_Links/chapter6.pdf
4. <https://www.demographic-research.org/volumes/vol4/8/4-8.pdf>
5. <https://www.ifo.de/DocDL/dicereport3-03-database-6.pdf>

SYLLABUS FOR AUTONOMOUS COURSES IN GEOGRAPHY
BACHELOR OF ARTS
SEMESTER V
UPDATED ON 16TH MARCH 2020

CORE

Course Title: Geomorphology: Landforms and Processes (Theory)

Course Code: GEG-V.C7

Marks: 75

Credits: 3

Duration: 45 lectures of 1 hour each

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Prerequisite Courses:

Nil

Course objective:

1. To provide the basic concepts, theories and applications in geomorphology

Course outcomes:

At the end of this course, students will be able to:

C01: Understand the nine fundamental concepts of Geomorphology.

C02: Understand theories of plate tectonics, mountain building, drainage systems and patterns.

C03: Identify and distinguish geomorphic processes and landforms created by rivers.

C04: Identify and distinguish geomorphic processes and landforms created by glaciers.

C05: Prepare Slope map using aspect map and isotan map.

C06: Independently prepare a drainage map.

Unit	Topic	No. of hours	Marks
I	<ul style="list-style-type: none">• Meaning, Nature, Scope and significance of geomorphology• Geological timescale.• Continental Drift Theory• Theory of Isostasy – Airy's & Pratt.• Concept of seafloor spreading.	15	25
II	<ul style="list-style-type: none">• Vulcanicity and the related landforms• Cycle of erosion – Davis and Penck• Concept of rejuvenation.	15	25
III	<ul style="list-style-type: none">• Geomorphic processes and landforms• Study of Aeolian processes and the resultant landforms-erosional, transportational and depositional.• Study of Karst processes and the resultant landforms-erosional, transportational and depositional.	15	25
		45	75

References:

Mandatory:

1. Singh, S. 2005 : Geomorphology, PrayagPustakBhawan, Allahabad
2. Thornbury, W.D., 2001: Principles of Geomorphology, 2nd Ed., Wiley International Edition, Wiley Eastern Reprint,
3. Sharma, H.S. (ed), 2002: Perspective in Geomorphology, Vol. I & IV, Concept, New Delhi
4. Wooldridge, S.W. and Morgan, R.S., 2000: The Physical Basis of Geography, Longman.
5. Sparks, B.W., 2000: Geomorphology, Longman, London

Supplementary:

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, V.K., 2006: Geomorphology, Earth Surface Processes and Forms, Tata Mc. Graw Hill, New Delhi.
6. Sharma, V.K., 2006: Geomorphology, Earth Surface, Process and forms, Tata McGraw Hill, New York
7. Strahler, A.N. 2006: Physical Geography, 3rd Ed., Wiley
8. Worcestor, P.G., 2005: A Textbook of Geomorphology, Van Nostrand, 2nd Ed., East West Edition, New Delhi.

Web-Based:

1. http://www.geo.hunter.cuny.edu/~fbuon/GEOL_231/Lectures/Intro%20Basic%20Concepts.pdf
2. https://courses.ess.washington.edu/ess-306/links/Goudie_Encyclopedia_of_Geomorphology.pdf
3. https://bgc.org.in/pdf/OPEN-EDUCATIONAL-RESOURCES/GEOGRAPHY/Cycle-of-erosion_%20UG_I_AI_1.pdf
4. <https://www.slideshare.net/pramodgpramod/davis-cycle-of-erosion>
5. https://www.researchgate.net/publication/314395551_Karst_Processes_and_Landforms

SEMESTER V

CORE

Course Title: Geomorphology: Landforms and Processes (Practical)

Course Code: GEG-V.C7

Marks: 25

Credits: 1

Duration: 15 sessions of 2 hours each

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Unit	Topic	Practical Sessions	Marks
I	River morphometry Calculation of linear properties of river. Calculation of Aerial properties of river. Calculation of Relief properties of river.	6	10
II	Interpretation of 42 SOI toposheets- physical aspect (relief, vegetation, river)	9	15
III	Journal	15	25

References:

Mandatory:

1. Sarkar, Ashis, 2000: Practical Geography: A Systematic Approach, Orient Longman Pvt. Ltd., Kolkata.
2. Kale V.S. and Gupta Avijit (2000): Introduction to Geomorphology, Orient Black Swan Publications
3. Monkhouse, F.J. and Wilkinson, H.R., 2009: Maps and Diagrams, B.I. Publications Pvt. Ltd., New Delhi
4. Singh, R.L. and Singh Rana P.B., 2008, Elements of Practical Geography, Kalyani Publishers, New Delhi
5. Singh, Savindra (2006): Geomorphology, PrayagPustakBhavan, Allahabad

Supplementary

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. 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. Strahler, A.N., 2000: Physical Geography, 3rd Ed., Wiley.

Web-Based:

1. https://www.researchgate.net/publication/235990109_Morphometric_analysis_of_Morar_River_Basin_Madhya_Pradesh_India_using_remote_sensing_and_GIS_techniques
2. <https://www.tandfonline.com/doi/full/10.1080/24749508.2018.1563750>
3. <http://ncert.nic.in/ncerts/l/kegy305.pdf>
4. https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/earthsciences/pdf/topo101/pdf/mapping_basics_e.pdf
5. https://www.wvgs.wvnet.edu/www/maps/topomapsymbols_MapX1B.pdf

Semester V

ELECTIVE

Course Title: Geography of Climate Change (Theory)

Course Code: GEG-E9

Marks: 75

Credits: 3

Duration: 45 lectures of 1 hour each

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Prerequisite Courses: Nil

Course Objective:

1. To introduce key concepts of climatology in general and Indian monsoon in details.

Course outcomes:

At the end of this course, students will be able to:

C01: Understand and analyze the concepts in urban climate.

C02: Distinguish different mechanisms of city weather modifications.

C03: Associate the indicators of changing climate to the day to day weather dynamics.

C04: Apply climatic concepts in issues related to agriculture, health and disasters.

C05: Understand the working of weather instruments

C06: Set up, calibrate weather instruments, collect readings and interpret weather data

Unit	Title	No. of hours	Marks
I	Urban Climate – introduction, modification of atmospheric composition Modification of heat budget Modifications in city weather conditions	15	25
II	Changing climate – climate system Climate change detection Natural causes of climate change Human impact on global climate	15	25
III	Climate and its applications – agriculture, health and disaster reduction	15	25
		45	75

References:

Mandatory:

1. Lal, D.S., 2011: Climatology, ShardaPustakBhavan
2. Monkhouse, F.J., 1975 – Principles of Physical Geography, Hodder Murray Publishers
3. Barry R.G. and Chorley, R. J., 2009: Atmosphere, Weather and Climate, Routledge
4. Tikka - R.N., 1998 - Physical Geography. KedarNath Ram Nath, Meerut
5. Trewartha, G.T., 1968: Introduction to Climate, McGraw-Hill

Supplementary:

1. Bunnett R.B., 1993: Physical geography in Diagrams, Longman
2. Critchfield, H.J, 1998 : General Climatology, Prentice-Hall
3. P. Birot, 1966: General Physical Geography, Longman, Green & Co Strahler, A.H., 1983: Modern Physical Geography, John Wiley and Sons
4. Strahler A. M. and Strahler A.H., 1983: Elements of Physical Geography, John Wiley and Sons
5. Stringer, E.T., 1972: Foundation of Climatology: An Introduction to Physical, Dynamic, Synoptic, and Geographical Climatology, W.H. Freeman & Co. Ltd.

Web-Based:

1. <http://uccrn.org/files/2014/02/ARC3-Chapter-3.pdf>
2. <https://www.epa.gov/sites/production/files/2014-6/documents/basicscompendium.pdf>
3. http://www.cengage.com/resource_uploads/downloads/0495555061_137181.pdf
4. <https://unfccc.int/resource/docs/publications/impacts.pdf>
5. <http://dels.nas.edu/resources/static-assets/exec-office-other/climate-change-full.pdf>

ELECTIVE

Course Title: Geography of Climate Change (Practical)

Course Code: GEG-E9

Marks: 25

Credits: 1

Duration: 15 sessions of 2 hours each

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Unit	Title	Practical sessions	Marks
I	Study of weather instruments – Barometer, Maximum & Minimum Thermometer, Wind Wane Collection and analysis of data from automatic weather station	05	8
II	Visit to IMD for hands-on training	10	12
III	Journal		5
		15	25

References

Mandatory:

1. Misra, R.P. and Ramesh, A., 2009: Fundamentals of Cartography, Concept Publishing Co., New Delhi
2. Singh, R.L., 2000: Elements of Practical Geography, Kalyani Publishers, New Delhi
3. Singh, R ; Singh L.R., 2001: Mapworks in Practical Geography, Central book Depot, Allahabad
4. Bygot, J., 2001: An Introduction to Map Work and Practical Geography
5. Campbell, J., 2004: Introductory Cartography, Prentice Hall, Inc Englewood

Supplementary

1. Chorley, Richard. J. (ed.), 2001: Water, Earth and Man, Methuen & Co., London
2. Monkhouse, F.J. and Wilkinson, H.R., 2009: Maps and Diagrams, B.I. Publications Pvt. Ltd., New Delhi
3. Raisz, E., 2005: General Cartography, McGraw Hills Co., London
4. Robinson, A.H., et al, 2003: Elements of Cartography, John Wiley and Sons, New York

Web-Based:

1. <https://mausam.imd.gov.in/>
2. <http://ncert.nic.in/textbook/pdf/kegy308.pdf>
3. <https://www.indiawaterportal.org/>
4. <https://www.weather.gov/media/epz/mesonet/CWOP-WM08.pdf>
5. https://nvlpubs.nist.gov/nistpubs/jres/25/jresv25n2p133_A1b.pdf

Semester V

ELECTIVE

Course Title: Oceans: Issues and Challenges (Theory)

Course Code: GEG-E10

Marks: 75

Credits: 3

Duration: 45 lectures of 1 hour each

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Prerequisite Courses: Nil

Course Objectives:

1. To provide the basic conceptual framework of oceanography, its dynamism and the contemporary issues associated with Oceans.

Course outcomes:

At the end of this course, students will be able to:

CO1: Understand causes, effects and remedial measures for issues related to ocean.

CO2: Understand causes and effects of sea level changes and global warming

CO3: Understand the concept of CRZ

CO4: Understand the concept of coral formation, distribution and threats

Unit	Title	No. of hours	Marks
I	Issues related to oceans Exclusive Economic Zone (EEZ) Case study of Indian and Atlantic ocean Sea level change Coastal regulation zone	15	25
II	Ocean acidification – causes, effects and remedies Ballast water Coral reefs	15	25
III	Global warming and oceans	15	25
		45	75

References

Mandatory:

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, ShardaPustakBhavan, Allahabad

Supplementary:

1. Singh, S. 2005 : Geomorphology, PrayagPustakBhawan, Allahabad
2. Ahmed, E., 2005: Geomorphology, Kalyani Publishers, New Delhi
3. Bloom, Arthur L., 2004: Geomorphology – A Systematic Analysis of Late Cenozoic Landforms, Prentice Hall, Engle Wood Cliff, N.J
4. Kale V.S. and Gupta Avijit (2000): Introduction to Geomorphology, Orient Black Swan Publications
5. Strahler, A.N., 2000: Physical Geography, 3rd Ed., Wiley

Web-Based:

1. <https://pubs.usgs.gov/gip/7000049/report.pdf>
2. https://www.ipcc.ch/site/assets/uploads/2018/02/WG1AR5_Chapter13_FINAL.pdf
3. http://curry.eas.gatech.edu/Courses/6140/ency/Chapter10/Ency_Oceans/Sea_Level_Change.pdf
4. http://keralaczma.gov.in/pdfs/Coastal_Zones_of_India.pdf
5. https://oceana.org/sites/default/files/reports/Ocean_Acidification_The_Untold_Stories.pdf

Semester V

ELECTIVE

Course Title: Oceans: Issues and Challenges (Practical)

Course Code: GEG-E10

Marks: 25

Credits: 1

Duration: 15 sessions of 2 hours each

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Unit	Title	Practical sessions	Marks
I	Demarcating CRZ (using SOI Toposheet) Bathymetric studies using Eco sounder	10	15
II	Lab work in NIO - sea water analysis Sea sediment analysis, Sea surface temperature	05	05
III	Journal and Viva		05
		15	25

References

Mandatory:

1. Misra, R.P. and Ramesh, A., 2005: Fundamentals of Cartography, Concept Pub. Co., New Delhi
2. Singh, R.L., 2000: Elements of Practical Geography, Kalyani Publishers, New Delhi
3. Singh, R ; Singh L.R., 2001: Mapworks in Practical Geography, Central book Depot, Allahabad
4. Sarkar, Ashis, 2000: Practical Geography: A Systematic Approach, Orient Longman Pvt. Ltd., Kolkata.
5. Khullar, D. R. (2000: Essentials Of Practical Geography, New Academic Publishing Co., Jalandar

Supplementary

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. Monkhouse, I.J. and Wilkinson, H.R., 2001: Maps and Diagram, B.I. Publication, New Delhi
5. Raisz, E., 2005: General Cartography, McGraw Hills Co., London
6. Robinson, A.H., et al, 2003: Elements of Cartography, John Wiley and Sons, New York

Web-based:

1. <https://teara.govt.nz/files/d11801enz.pdf>
2. <http://www.mpcb.gov.in/sites/default/files/water-quality/reports/LSD-NEERI-%20Water%20Quality%20Analysis.pdf>
3. https://www.who.int/water_sanitation_health/dwq/2edvol3d.pdf
4. <https://sednet.org/download/wg-282-inf-5-rev-1.pdf>
5. <https://www.nio.org/>

ELECTIVE

Course Title: Introduction to Regional Planning (Theory)

Course Code: GEG-E13

Marks: 75

Credits: 3

Duration: 45 lectures of 1 hour each

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Prerequisite Courses: Nil

Course Objectives:

1. 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.
2. To identify the causes of regional disparities in development, perspectives and policy imperatives.

Course Outcomes:

At the end of this course, students will be able to:

CO1: Gain knowledge of basic concepts in regional planning from a geographer's perspectives

CO2: Understand the concept of Regional Planning and its variations across time and space

CO3: Correlate and distinguish various types of regional planning and apply the same to the local settings.

CO4: Delineate formal, functional and planning regions

Unit	Topic	No. Of hours	Marks
I	Definition and methods: Planning – definition, approach, Levels of planning (national, state, local planning) basis of planning.	15	25
II	Types of planning 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	Levels of development, disparities and case studies: Indicators of development, planning unit Economic, social, demographic and ecological implications	15	25
		45	75

References:

Mandatory:

1. Mishra R.P. Regional Planning, a Reader, Concept Tools, Techniques and Case Studies, Mysore University Press.
2. Sundaram K. V. (1977), Urban And Regional Planning In India, Vikas Publishing House, New House, New Delhi.

Supplementary:

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

Web Based:

1. https://shodhganga.inflibnet.ac.in/bitstream/10603/47404/6/06_chapter%201.pdf
2. <https://www.arl-net.de/de/commin/belarus/3-planning-levels-and-specific-aspects>
3. <https://www.drishtias.org.in/multi-level-planning.html>
4. <http://egyankosh.ac.in/bitstream/123456789/31790/1/Unit-3.pdf>
5. <https://www.measureevaluation.org/resources/training/online-courses-and-resources/non-certificate-courses-and-mini-tutorials/population-analysis-for-planners/lesson-1>
6. <http://www.ncert.nic.in/ncerts/l/lebs104.pdf>
7. <https://planningtank.com/development-plan/land-use-planning>
8. <https://www.kullabs.com/classes/subjects/units/lessons/notes/note-detail/5681>
9. <https://www.tutor2u.net/geography/reference/the-8-key-gap-indicators-of-development>

ELECTIVE

Course Title: Introduction to Regional Planning (Practical)

Course Code: GEG-E13

Marks: 25

Credits: 1

Duration: 15 session of 2 hours each

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Unit	Topic	Practical sessions	Marks
I	Delineation of planning region Five functional regions	7	10
II	Delineation of planning region Five formal regions	8	10
III	Journal		5
		15	25

References:

Mandatory:

1. William Ian Morrison, Peter Smith, 1977: Input-Output Methods In Urban And Regional Planning: A Practical Guide; Pergamon Press
2. Chand Mahesh & Puri, V.K. (2000), Regional Planning In India

Supplementary:

1. Kumar, et. Al., (2016): urban and regional planning education-learning for India. Springer, Singapore
2. Matthew Dalbey, (2002): Decentralization And Regional Planning: Practical And Ideological Problems, Springer, U.S.
3. United States. National Resources Planning Board(1940), Is Planning Practical For Your Town?: New England Regional Planning Commission, Boston, Mass

Web Based:

1. <https://planningtank.com/regional-planning/delineation-of-formal-regions>
2. <https://www.coursehero.com/file/31907522/REGIONALISATION-AND-THE-DELINEATION-OF-REGIONSdocx/>
3. <https://planningtank.com/regional-planning/delineation-of-functional-regions>
4. <https://rashidfaridi.com/2017/04/04/planning-regions-of-india-conceptclassification-and-delineation/>
5. <https://unacademy.com/lesson/regionalisation-and-delineation-of-formal-and-functional-regions/DAY7U2XX>

ELECTIVE

Course Title: Geography of Tourism (Theory)

Course Code: GEG-E15

Marks: 75

Credits: 3

Duration: 45 lectures of 1 hour each

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Prerequisite Courses: Nil

Course Objectives:

1. The course aims to understand the basics of tourism and its impact on physical and human environments.

Course Outcomes:

At the end of this course, students will be able to:

CO1: Understand the concepts of travel and tourism.

CO2: Analyze the role of geographic factors in tourism development

CO3: Evaluate the socio-cultural, economic and environmental factors and their impacts on tourism (any two case studies)

CO4: Evaluate the tourism development in Goa (historical to present)

CO5: Analyze the challenges of tourism industry in Goa

Unit	Title	No. of hours	Marks
I	Introduction to Tourism: <ul style="list-style-type: none"> • Meaning, definition and concept of Tourism • Characteristics and types of Tourism • Historical development of Tourism • Scope and importance of Tourism • Careers in Tourism • Trends in Tourism Geography 	15	25
II	Geographic factors in Tourism Development: <ul style="list-style-type: none"> • Physical factors: Relief, climate, vegetation, water bodies • Socio-cultural factors: historical, cultural, economic, religious factors Geographic Areas and tourism impacts: <ul style="list-style-type: none"> • Economic, socio-cultural, environment and sustainable development of tourism 	20	25
III	Tourism resources in Goa <ul style="list-style-type: none"> • Development of tourism in Goa • Types of tourism in Goa • Social Economic and Environmental issues • Emerging careers in tourism in Goa 	10	25
		45	75

References:

Mandatory:

1. Bhatia, A.K., 2002: Tourism Development: Principles and Practices, Sterling Publishers Pvt. Ltd
2. Williams Stephen, 2009: Tourism Geography: A new synthesis, Routledge Taylor and Francis Group, London and New York

Supplementary:

1. Claude Alvares (2002): Fish Curry and Rice; A Goa Foundation Publication
2. Dhar Premnath, 2009: Development Of Tourism & Travel Industry: An Indian Perspective, Kanishka Publishers
3. Hall. C.M, Page Stephen, 2014: The Geography of Tourism and Recreation: Environment, Place, Space, Routledge Taylor and Francis Group, London and New York
4. Velvet Nelson, 2013: An Introduction to Geography of Tourism, Rowman & Littlefield Publishers

Web based:

1. <https://www.economy.gov.ae/Publications/An%20Introduction%20to%20Tourism%200750619562.pdf>
2. <https://opentextbc.ca/introtourism/chapter/chapter-1-history-and-overview/>
3. <https://www.tandfonline.com/doi/full/10.1080/14616688.2017.1307442>
4. <https://www.diva-portal.org/smash/get/diva2:16436/FULLTEXT01.pdf>
5. https://www.researchgate.net/publication/283487046_SUSTAINABLE_TOURISM_PLANNING_IN_GOA
6. https://shodhganga.inflibnet.ac.in/bitstream/10603/33015/11/11_chapter%2004.pdf

ELECTIVE

Course Title: Geography of Tourism (Practical)

Course Code: GEG-E15

Marks: 25

Credits: 1

Duration: 15 sessions of 2 hours each

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Unit	Title	Practical Sessions	Marks
I	Preparation and understanding of Tourist maps Preparation tourist circuit maps	05	10
II	Preparation of Information Charts of tourism sites of India and Goa Field visit, preparing a brochure and presentation	10	10
	Journal		5
		15	25

References:

Mandatory:

1. Bhatia, A.K., 2002: Tourism Development: Principles and Practices, Sterling Publishers Pvt. Ltd
2. Williams Stephen, 2009: Tourism Geography: A new synthesis, Routledge Taylor and Francis Group, London and New York

Supplementary:

1. Claude Alvares (2002): Fish Curry and Rice; A Goa Foundation Publication
2. Dhar Premnath, 2009: Development Of Tourism & Travel Industry: An Indian Perspective, Kanishka Publishers
3. Hall. C.M, Page Stephen, 2014: The Geography of Tourism and Recreation: Environment, Place, Space, Routledge Taylor and Francis Group, London and New York
4. Velvet Nelson, 2013: An Introduction to Geography of Tourism, Rowman & Littlefield Publishers

Web Based:

1. https://www.researchgate.net/publication/317032762_Tourist_maps_-_definition_types_and_contents
2. <http://www.kaleyann.com/create-custom-travel-map/>
3. <https://www.tourismcouncilwa.com.au/guide-planning-tour-itinerary>
4. http://tourism.gov.in/sites/default/files/chapter/PIDCC_scheme.pdf
5. <https://www.india-tourism.net/maps.htm>
6. <https://www.kevinandamanda.com/create-a-custom-travel-map-with-google-maps/>

ELECTIVE

Course Title: Quantitative Techniques in Geography

Course Code: GEG-E16

Marks: 100

Credit: 04

Duration: 60 hours

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Prerequisite Courses: Nil

Course Objectives:

1. To introduce statistical techniques, relevant to geographical research.
2. To acquaint students about the potentials and applications of statistical techniques.

Course Outcomes:

At the end of this course, students will be able to:

CO1: Acquire knowledge of drawing inferences using the geographical database

CO2: Develop an understanding and appreciation of the mutual dependence of different techniques and their relevance.

CO3: Formulate and test the hypothesis

CO4: Use of open source software for Statistical analysis

CO5: Estimate and predict trends and patterns of geographical phenomena.

Unit No.	Course Content	No. of hours	Marks
I	Non- Parametric Statistics 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. Parametric 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:

Mandatory:

1. Zamir Alvi 2000: Statistical Geography: Method and Applications Rawat Publications, New Delhi
2. Gregory, 1963: Statistical methods and the Geographer, Longman S. London
3. Rastogi R.S.(2005): Elementary Statistics: Rohit Publications – Delhi-110 006
4. Johnson R.J. 1980: Multivariate statistical Analysis in Geography, Longman

Supplementary:

1. Gupta S.P.; 1979: Practical Statistics; S. Chand and Co.
2. Khan Z.A 1998: Text book of practical Geography – New Delhi
3. Pal Saroj K. 1982: Statistical Techniques: A basic approach to Geography: Tata –McGraw Hill, New Delhi.
4. P.K. Majumdar 2002: Statistics: A Tool for Social Sciences, Rawat Publications: Jaipur & New Delhi.
5. Succheti D.C. and Kapoor V.K. 2002 - statistics (Theory, methods and application)

Web Based:

1. <https://www.statisticssolutions.com/correlation-pearson-kendall-spearman/>
2. <https://www.statisticssolutions.com/kendalls-tau-and-spearman-rank-correlation-coefficient/>
3. <https://www.toppr.com/guides/economics/index-numbers/index-numbers-in-general/>
4. https://wps.prenhall.com/wps/media/objects/9431/9657451/Ch_16/levine-smume6_topic_16-08.pdf
5. <https://www.nap.edu/read/4913/chapter/6>
6. <https://www.who.int/entity/chp/steps/Part4.pdf?ua=1>

Computer Science

Semester I

Course Title: Mathematical Foundation of Computer Science I

Course Code: COM-I.C-1

Marks: 75

Credits: 3

Duration: 45 Hrs

Course Prerequisites: Nil

Course Objectives:

- To build mathematical foundations that are essential requirement in understanding various concepts related to computer science.

Course Outcome:

Upon completion of the course students will be able to:

CO1: Explain various fundamental concepts.

CO2: Convert a given number from one base to another.

CO3: Apply counting principles to determine probabilities.

CO4: Demonstrate an understanding of relations and functions and determine their properties.

CO5: Evaluate Boolean functions and simplify expressions using the properties of Boolean algebra.

CO6: Write an argument using logical notation and determine if the argument is valid or not.

CO7: Construct and analyze finite state automata.

SYLLABUS

UNIT I: Combinatory and Number systems

[15 HRS]

Permutations; Combinations; Counting; Summation; generating functions; recurrence relations. Binary Number System-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.

UNIT II: Boolean Algebra, Set, Relations and Functions

[15HRS]

Boolean functions, truth table, De Morgan's theorem, logic gates, Realization of Boolean Function using logic gates, Simplification using Karnaugh map. Set-Venn diagram, set operations, relations and properties, closures, equivalence, relations, ordering.

Functions-function types, inverse of functions, composition of Partial functions, recursive functions, growth of functions.

UNIT III: Logic, Grammars, Languages and Automation

[15 HRS]

Propositional logic, first order logic, mathematical induction, deduction, proof by contradiction, program correctness. Grammars and languages, finite automation of finite state machines, regular languages, regular expressions.

REFERENCES:

MANDATORY:

1. Rosen, K. H., & Krithivasan, K. (2012). Discrete mathematics and its applications: with combinatorics and graph theory. Tata McGraw-Hill Education.

SUPPLEMENTARY:

1. Sarkar, S. K. (2016). A Textbook of Discrete Mathematics. S. Chand Publishing.

WED BASED:

1. <https://web.stanford.edu>
2. <https://www.cse.iitb.ac.in>

Practical: Mathematical Foundation of Computer Science I

Credit: 1

Marks: 25

Duration: 30 Hrs

Programs to be written using C Language:

1. Generate all permutations of n symbols, where $2 \leq n \leq 5$ is user defined.
2. Read a number and convert to other number formats.
 - a) Convert an integer into binary number
 - b) Convert a binary number to decimal number.
 - c) Convert a binary number to octal number.
 - d) Convert a number into normalized form.
3. String Manipulation
 - a) Read a string of decimal digits. Find the frequency distribution of digits.
 - b) Read a binary string. Check the occurrence of the pattern 1001 in the string.
 - c) Read two binary numbers. Add them using 1's complement and 2's complement method.
4. Read two integer numbers. Find their GCD using recursion.
5. Read the value of p. Find the p-th Fibonacci number from the following recurrence relation.
 $f(0) = 0, f(1) = 1, f(n) = f(n-1) + f(n-2), n \geq 2$.
6. Given two functions $f(x) = x^3 + 2x + 3$, and $g(x) = 3x^2/4 + 10$, find $f \circ g(x)$.
7. Read an expression containing parentheses and check whether it is properly parenthesized.
 - a) Equal number of (and) brackets

- b) Equal number of { and } brackets
- c) Equal number of [and] brackets

8. Applications of set theory

- a) Read a set and check whether a given number is a member of the set.
- b) Read two sets. Find their union.
- c) Read two sets. Find their intersection.

9. Applications of finite state machines, matrices, Boolean algebra, gates.

10. Bit-wise operations using C.

SEMESTER III

Course Title: Object Oriented Programming

Course Code: COM-III.C-5A

Marks: 75

Credits: 3

Duration: 45 Hrs

Course Prerequisites: Nil

Course Objectives:

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

Course Outcomes:

Upon completion of the course students will be able to:

CO1: Apply fundamental object-oriented concepts in problem solving.

CO2: Analyse problem scenario and identify classes/objects, their properties/functionalities and associations.

CO3: Analyse the problem scenario and model the system using UML diagrams.

CO4: Implement the object oriented model in any object oriented language.

SYLLABUS:

**UNIT I: Introduction
Principles of OOP**

[15 HRS]

Programming paradigms. Basic concepts in OOP. OOP: major principles - encapsulation, abstraction, inheritance, polymorphism. Benefits of OOP. Applications of OOP.

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.

UNIT II Principles of OOP

[15 HRS]

Basics of objects and classes in java, Constructors, Finalizer, Visibility modifiers, Methods and objects, object serialization, Inbuilt classes like String, Character, String Buffer, File, this reference.

Inheritance and Polymorphism:

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.

UNIT III: Exceptions, Multi-threading and GUI programming:

[15 HRS]

Event and GUI programming

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.

Multi-threading in java

Multi-threading in java, Thread life cycle and methods, Runnable interface, Thread synchronization.

Exception handling

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.

REFERENCES:

MANDATORY:

1. Deitel, P., & Deitel, H. (2011). Java How to program. Prentice Hall Press.

SUPPLEMENTARY:

1. Naughton, P., Schildt, H. (2000), Java 2 – The Complete Reference TMH publications
2. Patrick, N. (1997). The Java Handbook – TMH publications
3. Mughal, K. A., & Rasmussen, R. W. (2003). A programmer's guide to Java certification: a comprehensive primer. Addison-Wesley Professional.
4. Flanagan, D. (2004). Java examples in a nutshell.
5. Arnold, G., H. (2005) "The Java Programming Language" Addison-Wesley Professional.

WEB BASED:

1. www.javapoint.com

2. www.tutorialspoint.com

3. www.gurugg.com

docs.logout.org > Programmation > Java > Programming with Java_A primer

Practicals: Object Oriented Programming

Credit: 1

Marks: 25

Duration: 30 Hrs

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) Utilizing the java.util package

- 8) Event handling and GUI
- 9) Applets
- 10) I/O programming
- 11) Exception handling
- 12) Multi-threading
- 13) Collections framework

Course Title: Software Engineering
Course Code: COM-E1
Marks: 75
Credits: 3
Duration: 45 Hrs

Course Prerequisites: Nil

Course Objectives:

- To understand the various software development methodologies and estimation of software projects.
- To analyse and design software projects.
- To study the various phases of a S/W Development Project.

Course Outcomes:

Upon completion of the course students will be able to:

CO1: Understand the various Software Development Methodologies.

CO2: Apply Estimation techniques to live projects.

CO3: Analyse Software Projects.

CO4: Design Software Projects.

SYLLABUS:

UNIT I:

[15 HRS]

SOFTWARE PROCESS:

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:

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.

UNIT II:

[15 HRS]

OOAD and UML:

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.

SOFTWARE ARCHITECTURE PATTERNS:

Major Architectural Styles (patterns) like Layered Architecture, Pipe and Filter, Shared (Central)Data Store, Event Driven, Model-View-Controller (MVC), “Distributed & Emerging” Service Oriented Architecture (SOA) and Elementary GRASP Patterns.

UNIT III

[15 HRS]

HUMAN COMPUTER INTERACTION:

HCI Definition; User categories, Interface Design-Internal & External Interface design, user interface design, Interface design guidelines.

CODING:

Coding styles, standards, peer reviews, checklist.

TESTING:

Testing Fundamental, Functional Testing, Structural Testing, Testing Object-Oriented Programs, Testing Process and Metrics.

DOCUMENTATION and MAINTENANCE:

Need for Software Documentation. Types of documentation, Need for Maintenance; Types of Maintenance.

REENGINEERING:

Business Process Reengineering, Software Reengineering, Reverse Engineering, Restructuring, Forward Engineering, The Economics of Reengineering.

REFERENCES:

MANDATORY:

1. Pressman, R. S. (2005). Software engineering: a practitioner's approach. Palgrave Macmillan.
2. Larman C.,(2015) Applying UML and patterns. Addison Wesley.
3. Bourque, P., & Fairley, R. E. (2014). Guide to the software engineering body of knowledge (SWEBOK (R)): Version 3.0. IEEE Computer Society Press.

SUPPLEMENTARY:

- 1.Jalote, P. (2012). An integrated approach to software engineering. Springer Science & Business Media.
2. Sommerville I.,(2015) Software Engineering .Adison Wesley.
3. Fowler, M. (2003). UML Distilled: A Brief Guide to the Standard Modelling Object Language. Object Technology Series, 3rd edition, Addison-Wesley.

WEB BASED:

- 1.https://www.tutorialspoint.com/software_engineering
- 2.<https://www.w3schools.in/sdlc-tutorial>
- 3.<https://www.geeksforgeeks.org/software-engineering>
- 4.<https://www.javatpoint.com/software-engineering-tutorial>

Practicals : Software Engineering

Credit : 1

Marks : 25

Duration: 30 Hrs

List of suggested PRACTICALS :

For a given project/case study

- 1) Requirements Gathering Techniques [2P]
- 2) Gantt Chart [2P]
- 3) USE Case diagram and Use Case descriptions for the Use Cases [3P]
- 4) Class Diagram [2P]
- 5) Sequence Diagram [2P]
- 6) Activity Diagram [2P]
- 7) State Chart Diagram [2P]

Course Title: Digital Logic Design
Course Code: COM - E2
Marks: 75
Credits: 3
Duration: 45 Hours

Course Prerequisites: Nil

Course Objectives:

- To understand the basics of Boolean algebra and the operation of logic components, combinational, sequential circuits and design of digital systems.

Course Outcomes:

Upon completion of the course students will be able to:

CO1: Convert values between various number systems/codes.

CO2: Simplify the logical expression using Boolean algebra.

CO3: Design, simplify and implement combinational logic circuits.

CO4: Design and implement the sequential logic circuit and their applications.

CO5: Explain the methods of D/A converter and A/D converters (Successive Approximation method).

CO6: Explain the classifications and characteristics of semi conductor memories with memory expansion.

SYLLABUS:

UNIT I: Number Systems, Boolean Algebra and Convertors: [15 HRS]

Number Systems: Decimal, Binary, Hexadecimal, and Octal number systems; BCD Code, Gray Code, Excess-3 Code, ASCII code, Unicode.

Boolean Algebra: Basic Boolean functions, Postulates and theorems of Boolean Algebra, logic gates, Sum-of-Products and Product-of-Sums forms of Boolean functions; Canonical and Standard forms. Simplification of Boolean Functions, Plotting of K-Maps, POS and SOP Simplification, NAND and NOR implementation.

D/A & A/D Converters: Digital to Analog converter – Introduction, Weighted-Resistor & R-2R Ladder , Analog to Digital Converter – Introduction, Successive Approximation method.

UNIT II: Combinational and Sequential Circuits: [15 HRS]

Combinational Circuits: Design procedure for combinational logic circuits; design and analysis of Half Adder, Full Adder; their use in designing other combinational logic circuits; Analysis & Design of Encoders and Decoders; Multiplexer and demultiplexers; their use in designing combinational circuits. Sequential Circuits (Registers): SR, JK, T, D Flip-flops and Latches, their schematic symbols, Truth tables. Shift Registers - SISO, SIPO, PISO, PIPO, Bi-directional Shift Registers, Loading methods for Shift, Registers.

UNIT III: Sequential Circuits(Counters) and Semiconductor memories: [15 HRS]

Counters: Design and analysis of Counters: Synchronous Counters, Modulo Counters ,Asynchronous, Ripple and Ring Counters; Application of Counters.

Semiconductor memories: Memory organization and operation, expanding memory size, Classification and characteristics of memories, RAM, ROM, Synchronous DRAM (SDRAM), Double Data Rate SDRAM, Synchronous SRAM, DDR and QDR SRAM, Content Addressable Memory.

REFERENCES:

MANDATORY:

1. Jain, R. P. (2003). Modern digital electronics. Tata McGraw-Hill Education.

SUPPLEMENTARY:

1. Leach, D., Malvino, M., Saha, G., Digital Principles and Applications, Mc. Graw Hill (SiE).
2. Mano, M. M. (2017). Digital logic and computer design. Pearson Education India.
3. Taub, H., & Schilling, D. L. (1977). Digital integrated electronics. McGraw-Hill College.

WEB BASED:

1. <https://nptel.ac.in/courses/117/106/117106114/>
2. <https://www.geeksforgeeks.org/digital-electronics-logic-design-tutorials/>
3. <https://logisim.en.uptodown.com/windows>
4. <https://www.edutechlearners.com/download/books/Morris%20Mano%20Digital%20Design%203rd%20Edition.pdf>
5. [https://books.google.co.in/books?id=dnq3HmDN1ZAC&printsec=frontcover&redir_esc=y#v=one page &q & f=false](https://books.google.co.in/books?id=dnq3HmDN1ZAC&printsec=frontcover&redir_esc=y#v=one%20page&q&f=false)

Practicals: Digital Logic Design

Credits: 1

Marks: 25

Duration: 30 Hrs

Practicals:

1. Introduction to digital ICs, specifications, verification of the truth tables of logic gates1 (2 Lab sessions)
2. Introduction to digital ICs, specifications, verification of the truth tables of logic gates2. (2 Lab sessions)
3. Implementation of the given Boolean function using logic gates in SOP form.(adder/subtractor -2 sessions)
4. Decoder and Encoder (2 sessions).
5. Multiplexer –Demultiplexer (2 sessions).
6. Verification of state tables of RS, JK, T and D flip-flops.
7. Design and verification of the 4-bit asynchronous and Synchronous counter (3 sessions)

Course Title: Web Designing
Course Code: COM-E4
Marks: 75
Credits: 3
Duration:45 Hrs

Course Prerequisites: Nil

Course objectives:

- Design good user interfaces.
- Apply design principles such as learnability, visibility, error prevention, efficiency and graphic design.

Course Outcomes:

On completion of the course students will be able to:

CO1: Design Content for a web application.

CO2: Style content so as to provide an effective User Interface.

CO3: Provide for dynamism in the User Interface to enhance usability.

CO4: Develop a static web application.

SYLLABUS:

UNIT I: Structuring the UI with HTML/HTML5 **[15 HRS]**

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.

HTML - Introduction. The development process, basic HTML, formatting and fonts, commenting code, colour, hyperlink, lists, tables, images, simple HTML forms, web site structure, Meta tags, Character entities, frames and frame sets.

HTML5 - Introduction, New Elements, Canvas, SVG, Drag/Drop, Geolocation, Video, Audio, Input types, form elements, form attributes, semantic, web storage, app cache, web workers, SSE

UNIT II : Styling the UI with CSS/CSS3 **[10 HRS]**

CSS - 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 - Introduction, Borders, Backgrounds, Gradients, Text Effects, Fonts, 2D Transforms, 3D Transforms, Transitions, Animations, Multiple Columns.

UNIT III: Dynamism in UI **[20 HRS]**

JavaScript - 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 – get Element ById, get Elements ByName,

getElementsByTagName, innerHTML property, inner Text property. Validation- form validation, email validation.

JQuery : Introduction - Syntax, Selectors, Events. Effects- Hide/Show, Fade, Slide, Animate, stop(), Call back, Chaining. HTML/CSS- Add, Remove, CSS Classes, css(), Dimensions, slider. Traversing – ancestors, descendants, siblings, filtering.

REFERENCES:

MANDATORY:

1. D.T,(2018) Web Technologies, Black Book, Dream Tech

WEB BASED:

1. <https://www.w3schools.com>
2. <https://www.tutorialspoint.com/html/index.htm>
3. <https://www.tutorialspoint.com/css/index.htm>
4. <https://www.tutorialspoint.com/javascript/index.htm>
5. <https://www.tutorialspoint.com/jquery/index.htm>
6. <https://www.udemy.com/courses/development/web-development/>

Practicals : Web Designing

Marks: 25

Credits: 1

Duration: 30 Hrs

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 J Query 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.

SEMESTER V

Course Title: Operating Systems

Course Code: COM-V.C-7

Marks: 75

Credits: 3

Duration:45 Hrs

Course Prerequisites: Nil

Course Objectives:

- To understand different functions of an operating system.
- To study various aspects of operating system like Process Management, Memory Management, Storage management etc.
- To understand different algorithms used for CPU scheduling, Memory allocation.

Course Outcomes:

Upon completion of the course students will be able to:

CO1: Identify the functions of operating system.

CO2: Describe process management and process coordination.

CO3: Implement various CPU scheduling algorithms and compare their performance.

CO4: Explain deadlock handling and recovery from deadlock.

CO5: Implement various Memory Allocation algorithms.

CO6: Describe implementation of Virtual memory.

CO7: Describe storage management and storage structure.

SYLLABUS:

UNIT I : Introduction to Operating System and Process Management [15HRS]

Introduction to Operating System: 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.

Process Management: Process Definition, Process Control Block, Process States, Operations on Process; Inter process communication, Threads and Microkernels: Definition, Multi-threading Model Process Scheduling, Scheduling Criteria, Scheduling Algorithms, Multi-Processor Scheduling.

UNIT II : Process Coordination [15HRS]

Process Coordination

Process Synchronization, Principles, Mutual Exclusion, The Critical-Section Problem, Petersons Solution, Semaphores, Monitors, Readers/Writers Problem; Classic Problems of Synchronization, Dining Philosopher's problem.

Deadlocks- system models, Deadlock characterization, Deadlock Handling Methods, Prevention, Avoidance, Detection, Recovery From Deadlock.

UNIT III: Memory Management and Storage Management

[15HRS]

Memory Management: Introduction, Swapping, Contiguous Memory Allocation, Paging, Page Table, Segmentation, Virtual Memory: Introduction, Demand Paging, Page Replacement, Allocation of Frames, Thrashing

Storage Management : File System, Concepts, File Organization and Access Methods, Directory and Disk Structure.

Secondary Storage Structure : Overview, disk structure, Disk attachment, Disk scheduling Reading.

MANDATORY:

1. Silberchatz, A., Galvin, , & Gagne. (2008). Operating System Concepts (8th ed.). Wiley publication.

SUPPLEMENTARY:

1. Stallings, W. (2001). Operating systems: Internals and design principles.(6th ed.). Upper Saddle River, N.J: Prentice Hall.

WEB BASED:

1. <https://www.geeksforgeeks.org/operating-systems/>
2. Video Links and Animations
3. <https://www.youtube.com/watch?v=WP3uDglbPiI>
4. <http://williamstallings.com/OS-Animation/Animations.html>
5. Linux Tutorial for Practical
6. <https://www.tutorialspoint.com/unix/index.htm>

Practical : Operating Systems

Credit : 1

Marks : 25

Duration:30 Hrs

Any 8 from the following can be done.

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.
4. Shell Programming – advanced.
5. Menu Driven Shell scripting.
6. Filters and Pipes in LINUX.
7. Implementation of Inbuilt Linux/UNIX commands like cp, rename etc.
8. Implementation of CPU scheduling policies.
9. Implementation of Memory allocation techniques.
10. Implementation of Banker's algorithm. (Resource Allocation Graph).

Course Title: Embedded Systems
Course Code: COM-V.E-9
Marks: 75
Credits: 3
Duration: 45Hours

Course Prerequisites:

- Knowledge of Programming

Course Objectives:

- To have a thorough understanding of major components of Embedded Systems.
- Implement small modules of programs to solve well defined problems in an Embedded Systems.
- To familiarize with the tools to develop applications in an Embedded Environment.

Course Outcomes:

Upon completion of the course students will be able to:

CO1: Describe Embedded Systems and its characteristics.

CO2: Classify the Embedded processors and their design metrics.

CO3: Summarize the performance of ARM processors and various components of Embedded Systems.

CO4: Classify Sensors and Actuators and identify their functions and applications.

CO5: Categorize I/O devices, I/O Interfacing and Communication protocols along with their functions.

CO6: Generalize the functionality of IoT and RTOS.

CO7: Design and develop Embedded / IoT Applications using Arduino/Raspberry-Pi boards.

SYLLABUS:

UNIT I: Introduction to Embedded Systems and System Hardware

[15 HRS]

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.

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.

UNIT II: Input/output Devices and Internet of Things

[15 HRS]

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, I2C, CAN, USB & ZigBee – Protocol Architecture, Topology, Packets, Communication Cycle, Arbitration, Applications and comparison.

Introduction to IoT, M2M to IoT-The Vision-Introduction, M2M towards IoT- the global context, IoT Architectural Overview, Potential and Challenges.

UNIT III: Sensors, Actuators and RTOS

[15 HRS]

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 Magneto resistors.

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.

RTOS: Introduction to RTOS, architecture of kernel, task and task scheduler, interrupt service routines in RTOS Environment.

REFERENCES:

MANDATORY:

- 1.Rajkamal, (2010), Embedded Systems – Architecture, Programming and Design, (2nd ed.), Tata McGraw Hill.
- 2.D. Patranabis, (2013), Sensors and Actuators, (2nd ed), PHI.

SUPPLEMENTARY:

1. David E Simon, (2004),An Embedded Software Primer, (1st ed.), Pearson India.
2. Tammy Noergaard, (2012), Embedded Systems Architecture, (2nd ed.), Elsevier
3. D. Patranabis, (2010),Sensors and Transducer, (2nd ed.), PHI Learning Private Limited.
4. Jan Holler, VlasiosTsiatsis, Catherine Mulligan, Stefan Avesand, Stamatis Karnouskos, David Boyle, (2014), From Machine-to-Machine to the Internet of Things: Introduction to a New Age of Intelligence, (1st ed), Academic Press,.

WEB BASED:

- 1.https://www.tutorialspoint.com/internet_of_things/index.htm
- 2.<https://www.arduino.cc/>
- 3.<http://www.zdnet.com/article/m2m-and-the-internet-of-things-a-guide>
- 4.<https://www.raspberrypi.org/>
- 5.www.thingspeak.com
- 6.<https://blynk.io/>

Practicals: Embedded Systems

Credit: 1

Marks: 25

Duration: 30 Hrs

Programs to be executed on some of the embedded boards like Arduino, Intel Edison, Raspberry Pi, Bolt, etc that covers the following tasks (Any 10 experiments):

- 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.

Course Title: Mobile Application Development
Course Code: COM-E10
Marks: 75
Credits: 3
Duration:45 Hrs

Course Prerequisites: Nil

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.

Course Outcome:

Upon completion of the course students will be able to:

CO1: Explain mobile devices, including their capabilities and limitations.

CO2: Review current mobile platforms and their architectures.

CO3: Develop mobile applications on a popular mobile platform.

CO4: Evaluate development with another mobile platform.

SYLLABUS:

UNIT I: Introduction to mobile devices: **[15 HRS]**

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, Phone GAP, Native vs. web app, Browser-detection, Touch interfaces, Geolocation, Screen orientation, Mobile browser? interpretations? (Chrome/IE). 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. Win RT), Security. Introduction to Android Operating System, Overview of android stack, Android features. Linux Kernel, Libraries, Android Runtime, Application Framework, Dalvik VM, Multithreading in Android-Async Task, Handler Post

UNIT II: Android Components: **[15 HRS]**

Activities, Services, Broadcast Receivers, Creating Broadcast receiver, Receiving System Broadcast, Understanding Broadcast action, category and data, Sending Broadcast. Content Providers, Views, layouts and Common UI components, Creating UI through code and XML, Activity life cycle, Intents-,Intent Filters, Intent-matching rules, Filters in your manifest. Communicating data among Activities. Selection components (Grid View, List View, Spinner), Adapters, Custom Adapters, Menus, Toast, Custom Toast, Dialogs, Status bar Notifications. 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.

UNIT II: Data Storage:**[15 HRS]**

Shared Preferences, Android File System, Internal storage, External storage. SQLite- Introducing SQLite, SQLite Open Helper and creating a database, Opening and closing a database, working with cursors, inserts, updates, and deletes.

Content Provider-Accessing built in content providers, Content provider MIME types, searching for content, Adding, changing, and removing content, creating content provider, Working with content files.

REFERENCES:**MANDATORY:**

1. Lee, W. M. (2010). Beginning iPad application development. John Wiley & Sons.
2. Satya. K, Pro Android 4 ; Dave MacLean (Apress).
3. Burnette, E. (2009). Hello, Android introducing Google's mobile development platform 2nd.
4. Cinar, O. (2012). Android apps with Eclipse. Apress.
5. Dimarzio, J.F. Android- A Programmer's Guide (Tata McGraw Hill)

WEB BASED:

1. <http://developer.android.com/index.html>
2. <http://www.appinventor.org/>

Practicals: Mobile Application Development**Credit: 1****Marks: 25****Duration: 30 Hrs**

1. Getting Started with Android – Installing the Development Environment, Configuring Android Stack.
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.
3. Android application development - Use of GUI components to implement a simple application such as a Calculator.
4. Review the earlier application making use of the advanced UI components.
5. Implementing Data storage application - an application to make Insert ,update, Delete and retrieve operation on the database.

Course Title: Software Testing

Course Code: COM-V.E-12

Marks: 75

Credits: 3

Duration:45 Hrs

Course Prerequisites:

- Knowledge of Software Engineering

Course Objectives:

- To understand the fundamental concepts in software testing
- To study the various software testing strategies
- To learn how to design test cases and execute them.

Course Outcomes:

Upon completion of the course students will be able to:

CO1: Understand the different software testing strategies.

CO2:Apply testing strategies to live projects.

CO3: Design test cases.

CO4: Execute test cases using software testing tools.

SYLLABUS:

UNIT I:

[15HRS]

Software testing principles - Software Testing- Need for testing, Psychology of testing ,Testing economics, SDLC and Testing, Verification & Validation. Quality Assurance, Quality Control.

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 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.

UNIT II:

[20HRS]

Integration Testing Waterfall - Top-down ,Bottom up ,Big bang, Sandwich 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 for performance testing.

Regression Testing - Purpose ,Timing, Choice of tests ,Smoke tests ,Best practices Internationalization and Localization testing - Preliminary concepts, Adhoc testing, Pair testing, Extreme testing, Agile testing, Exploratory testing, Defect seeding.

Usability Testing - Factors in usability testing, Aesthetics testing, Accessibility testing, Tools for usability testing.

Testing object oriented software - Definitions and Challenge differences from testing non-OO Software, Class testing strategies Class Modality, State-based Testing, Message Sequence Specification.

UNIT III:

[10HRS]

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 and success factors.

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, Progress Metrics. Use of metrics in ascertaining product release.

REFERENCES:

MANDATORY:

1. Srinivasan D.,Gopalaswamy R.:(2009) Software Testing- Principles and Practices, 4th Edition: Pearson Publication.

SUPPLEMENTARY:

1. Jalote P., (2010)An Integrated Approach to Software Engineering, 3rd Edition :Narosa Publishing House
2. Pressman R., (2017) ,Software Engineering: A Practitioners Approach, 6th Edition :McGraw Hill Publication.

WEB BASED:

1.<https://www.guru99.com>

Practicals: Software Testing

Credit: 01

Marks: 25

Duration: 30 Hrs

1. Planning Test Cases
2. Generating Test Cases/Test Suite
3. Enhancing Tests
4. Debugging Tests
5. Running Tests
6. Analysing Results
7. Reporting Defects

Course Title: Programming in Python

Course Code: COM-SEC5

Marks: 75

Credits: 3

Duration: 45 HRS

Course prerequisite: Nil

Course Objectives:

To provide 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 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, Lists and Dictionaries:

[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: Functions, Modules and Input-Output [15HRS]

Introduction, Accessing values in dictionaries, Working with dictionaries, Properties, Functions. Defining a function, Calling a function, Types of functions, Function Arguments, Anonymous functions, Global and local variables.

Modules

Importing module. Math module. Random Module.

Exception Handling

Exception.ExceptionHandling-

Exceptclause, Try,except,finallyclause.UserDefined Exceptions

Input-Output

Printing Onscreen,Reading data from Keyboard,Opening and closing file,Reading and writing files, Functions. Printing Onscreen,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. WesMc Kinney,(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>

Practicals: Programming in Python

Credit: 01

Marks: 25

Duration:30 Hrs

List of Experiments using Python Language:

1. Write a python program to compute a given formula.
2. Write a python program to implement an if else statement.
3. Write a python program to implement nested if else statements.
4. Implement for and while loop in python. [2P]
5. Write a string manipulation in python. [2P]
6. Write a program to implement lists in python.
7. Write a python program to implement tuple.
8. Write a python program to implement a dictionary.
9. Write a python program to implement a function.
10. Implement Module in python
11. Write a python program to implement exception handling.
12. Write a python program to implement Input-Output File operations in python. [2P]

Paper Title : Web Development with FLASK

Paper Code : COM-SEC6

Marks : 75

Credits : 3

Hours:45Hrs

Course Prerequisites: Programming in Python, Database Management System

Course Objectives:

To develop skills to build dynamic web applications, ensuring security and scalability. Train students to deploy web applications and configure the same for a development and production environment.

Course Outcome:

At the end of the course students will be able to:

CO1: Understand the basic of server client architecture on how request are made, handling those requests and providing an appropriate response.

CO2: Understand how to scale a web application.

CO3: Secure a web application from CSRF, Sql injection and XSS .

CO4: Handle dependencies management across multiple web application using python virtual environment.

CO5: Configure a web application for development and production.

CO6: Build a dynamic web site / web app.

CO7: Create API .

CO8: Deploying a web application

Syllabus:-

UNIT I : Introduction to Web Development: [15 HRS] Client-Server architecture, Requests: GET, POST. Web addresses and URL, Dynamic Websites, Static Websites, Database Servers and Web Servers. MVC and MVT.

Introduction to Flask. Flask and Other web frameworks. Introduction to python modules and pip. Python venv module, Installing modules using pip, dependency management.

Configuration and Deployment Flask configuration basic , Built in Configuration Values: SECRET_KEY, SESSION_COOKIE_PATH, LOGGER_NAME, APPLICATION_ROOT Development / Production configuration, Configuration Best Practices. Deployment on Apache HTTP server.

Jinja 2.

Introduction to Jinja, Jinja Setup, Standard Context , Standard Filters , Controlling Auto escaping. Registering Filters, Context Processors.

UNIT II : Building a Minimal Application: [15 HRS]

Routing, Starting a flask server, URL building, Rendering Templates, Debugging, Accessing request data,HTML methods: GET POST, Cookies Sessions Handling. Redirecting and Errors. Message Flashing. Logging. Building a salable project structure.

FLASK WT Forms and FLASK SQL Alchemy (ORM):

WT Forms Introduction, Creating Forms, Validating Forms , Securing Forms, File Uploads, CSRF protection. SQL Alchemy setup and installation, Creating database using Sql Alchemy, Simple Relationship, One to many and many to many relationship, Inserting records , Deleting records , Editing Records , Querying Records

UNIT III: Flask Security [15 HRS]

Session based authentication, Role management , Password hashing , Basic HTTP authentication Token based authentication ,Token based account activation ,Token based password recovery / resetting , User registration, Login tracking , JSON/Ajax Support

Flask Admin:

Getting Started Authorization & Permissions, Customizing Built-in Views Adding Your Own Views Working With the Built-in Templates .

REFERENCES:

MANDATORY:

1.Miquel Grinberg , “Flask Web Development “, O’REILLY

SUPPLEMENTARY:

1.Gareth Dwyer “Flask By Example “, Packt Publishing Limited

WEB BASED:

1. <https://flask.palletsprojects.com/en/2.1.x/>
2. <https://dl.acm.org/doi/10.5555/2621997>
3. <https://www.fullstackpython.com/flask.html>
4. https://coddyschool.com/upload/Flask_Web_Development_Developing.pdf 5. <https://www.packtpub.com/product/mastering-flask-web-development-second-edition/9781788995405>

Practicals: Web Development with FLASK

Credit: 01

Marks: 25

Duration:30 Hrs

- 1) Creating a basic application. (1P)
- 2) Working with the requests and jinja. (1P)
- 3) Form creating and validation with WT Forms. (1P)
- 4) Creating an admin panel with FLASK Admin. (1P)
- 5) Customizing FLASK admin panel. (1P)
- 6) Connecting database through SQL Alchemy. (1P) 7)
- Insert/Update/Delete/Query data using SQL Alchemy. (4P) 8)
- Securing your application with FLASK Security. (1P) 9)
- Creating a scalable project structure. (1P)
- 10) Build your own API (REST API). (2P)
- 11) Deploying and Configuring FLASK. (1P)

Course Title: Introduction to Data Science

Course Code: COM-V.E-11

Marks: 75

Credits: 3

Duration:45 Hrs

Course Prerequisites:

- 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 analyse large and unstructured data with different tools.

Course outcomes:

Upon completion 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 modelling. 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 modelling.

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 modelling 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 modelling, 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 Neighbours (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, Neighbourhood 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.
- 3.Provost, F., & Fawcett, T. (2013). Data Science for Business: What you need to know about data mining and data-analytic thinking. " O'Reilly Media, Inc."
- 4.Hastie, 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

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.

B.Voc Software Development

Course Title : Object Oriented Paradigm

Course Code : CSD-SK7

Marks : 75

Credits : 3

Duration: 45 hrs

Prerequisite : Nil

Course Objectives:

- To learn the basic concepts and techniques of object oriented programming paradigm
- To introduce object oriented programming (OOP) using Java.

Course Outcomes: On successful completion of this course students will be able to:

CO1 : Explain the benefits of object oriented design and understand when it is an appropriate methodology to use.

CO2 :Differentiate between the top-down and bottom-up approach.

CO3:Develop problem-solving and programming skills using the OOP concept.

CO4 :Apply the concepts of object-oriented programming using Java.

CO5: Design object oriented solutions for small systems involving multiple objects. CO6: Develop GUI for an application.

SYLLABUS:

Unit 1: Principles of OOP

[15Hrs]

Programming Paradigms, Basic concepts, OOP: major principles - encapsulation, abstraction, inheritance, polymorphism. Benefits of OOP, Applications of OOP.

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.

Unit 2:

[15Hrs]

Objects and Classes

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.

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.

Unit 3:

[15Hrs]

Event driven and GUI programming

Windows and Layout Manipulation, Dialogs (Message, confirmation, input), Event Handling: Event sources, Listeners, Mouse and Keyboard Event Handling.

Exception Handling

Exception handling – what and why? Try and catch block. Multiple catch blocks. Nested try, finally block, throw keyword, throws keyword. Custom Exception.

Multithreading

Running and starting thread using Thread class. Thread priorities. Running multiple threads. The Runnable interface. Synchronization and inter thread communication.

Mandatory Reading:

1. Matha, M. P. (2011). *Core Java: a comprehensive study*. PHI Learning. **Supplementary Reading:**

1. Balaguruswamy, E. (2014). *Programming with Java-A Primer*. McGraw-Hill Professional.

Web References:

1. www.tutorialspoint.com/java/index.htm
2. https://www.w3schools.com/java/java_intro.asp
3. <https://www.geeksforgeeks.org/java/>

Practical: Object Oriented Paradigm

Credit: 3

Duration: 45 hrs

Marks: 75

Programs using Java language that covers the following concepts:

1. Classes and instances (2P)
2. Working with the java.Math class (1P)
3. Inheritance (1P)
4. Polymorphism, abstract classes and interfaces (2P)
5. Utilising the java.util package (1P)
6. Collections framework (2P)
7. Event handling and GUI (2P)
8. Exception handling (2P)
9. Mini Project (2P)

Course Title: Server Side programming

Course Code: CSD-SK9

Marks: 75

Credits: 03

Duration: 45hrs

Course Prerequisite: Object Oriented Programming

Course Objectives:

1. Provide an in depth understanding of a server side language, and use it to develop applications
2. Design and implement basic server-side scripts.
3. Create responsive and interactive web applications using frameworks

Course Outcomes:

On successful completion of this course students will be able to:

CO1: Explain the core features and functionalities of PHP

CO2: Design interactive web application using core PHP

CO3: Develop basic server side script to interact with users and the database

CO4: Build a web application using laravel framework

CO5: Utilize MVC model

UNIT 1:

[15 Hrs]

Static vs. Dynamic web pages, Need for Server Side technologies, Multi Tier Web Architecture, file architecture of a web server, Use of PHP Tags, Tag Styles, include, Processing GET and POST request, uploading

files to server, cookies, sessions, Difference between MySQLi and PDO, CRUD - Create, Read, Update, Delete, records in database, pagination, login.

UNIT 2

[15 Hrs]

Introduction to Laravel, Routing in Laravel, MVC in Laravel, Caching in Laravel, Event subscribers in Laravel, Package Development, Templates, XML and AJAX, defining AJAX array, parse AJAX using JQuery, AJAX request, AJAX response.

UNIT 3

[15 Hrs]

Creating an Application, Database Configuration, Helpers in Laravel, Laravel Pagination, Laravel Security, Authentication Facade, Validation in Laravel, Eloquent ORM, Artisan Command Line Interface, Deploy Application using Laravel.

REFERENCE

Mandatory Reading:

1. Leon A, Zee S(2004), *Core PHP Programming* (3rd ed.).Prentice Hall Professional
2. Stauffer, M. (2019). *Laravel: Up & Running: A Framework for Building Modern PHP Apps*. O'Reilly Media.

Supplementary Reading:

1. Williams, H. E., & Lane, D. (2004). *Web Database Applications with PHP and MySQL: Building Effective Database-Driven Web Sites*. O'Reilly Media, Inc.
2. Brinzarea, B., & Hendrix, A. (2009). *Ajax and PHP: Building modern Web applications*. Packt Publishing Ltd.

Publishing Ltd.

Web References:

6. <https://www.w3schools.com/php/>
7. <https://www.tutorialspoint.com/php/index.htm>
8. <https://laravel.com/docs/6.x> <https://www.tutorialspoint.com/laravel/index.htm>

Practical :Server Side programming

Marks: 75

Duration: 45hrs

Credits: 03

1. 1. PHP Classes and instances,PHP Controls Structures [1P]
2. PHP Array Programming, Inheritance [1P]
3. CRUD using PHP database API's. [3P]
4. Fetch data from a form, validate and insert in the database,Delete data in the database,Update data in the database, Display data from the database.Uploading files and session management. [1P]
5. Implementing MVC [2P]
6. Migrations in Laravel [1P]
7. Using Forms and Gathering Input in Laravel [1P]
8. Creating a registration & user login form in Larvael [1P]
9. Using Controllors and Routes for URLs and APIs in Laravel
10. [1P] Eloquent ORM in Laravel [1P]
11. Creating and Using Composer Packages [1P]
12. Security & Session [1P]

Course Title: Software Testing

Course Code: CSD-SK14

Marks: 75

Credits: 3

Duration: 45hrs

Prerequisite Courses: Nil

Course Objectives:

1. To study fundamental concepts in software testing, including software testing objectives, process, criteria, strategies, and methods.
2. To discuss various software testing issues and solutions in software unit test; integration, regression, and system testing.
3. 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.

Course Outcomes:

On successful completion of this course students will be able to:

CO1: Define Software Testing process for an applications.

CO2: Apply Software Testing process in relation to Software Development and Project Management.

CO3: Create Test Strategies and plans, design test cases, prioritize and execute them. CO4: Identify various Software Testing problems and solve them.

CO5: Identify the needs of software test automation, and define and develop a test tool to support test automation.

CO6: Use software testing methods and modern software testing tools for their testing projects

SYLLABUS

Unit 1

[15Hrs]

Software Testing principles

Software testing principles, Levels of software testing, Test activities, SDLC and Testing, Verification & Validation, Quality Assurance, Quality Control.

White Box Testing Techniques

Statement coverage, Branch Coverage, Condition coverage, Decision/Condition coverage, Multiple condition coverage, Inspections, Walk-throughs Code Review.

Black Box Testing

Boundary value analysis, Equivalence partitioning, Cause Effect Graphing.

Unit 2:

[20Hrs]

Functional Testing

Performance Testing, Stress testing, Configuration Testing, Security Testing, Recovery Testing, In- tegration Testing, Regression Testing, and Acceptance Testing.

Unit 3:

[10Hrs]

Testing process

Comparison of different techniques, Test Plan, Test case Design Procedure Specification, Test Case Execution and Analysis, Test Documentation, Reporting test results

Testing web Application

Testing concepts for web apps, Content Testing, User Interface Testing, Component Level Testing, Navigation Testing, Configuration Testing, Security Testing, and Performance Testing.

REFERENCES

Mandatory Reading:

1. Desikan, S., & Ramesh, G. (2006). *Software testing: principles and practice*. Pearson Education India.

Supplementary Reading:

1. Kit E. *Software Testing in the Real World*, United States: Addison-Wesley Publishing Co.

2. Lewis, W. E. (2017). *Software testing and continuous quality improvement*. Auerbach publications.

Web References :

1. www.guru99.com/software-testing.html
2. https://www.tutorialspoint.com/software_testing/index.htm
3. <https://www.javatpoint.com/software-testing-tutorial>

Practical: Software Testing

Credit: 3

Duration: 45hrs

Marks: 75

List of suggested PRACTICALS using any testing tool such as Selenium or equivalent:

1. Planning Test Cases (2P)
2. Generating Test Cases/Test Suite (2P)
3. Enhancing Tests (3P)
4. Debugging Tests (2P)
5. Running Tests (2P)
6. Analyzing Results (2P)
7. Test Reporting (2P)

PGDCA

Course Title: Problem Solving and Introduction to Programming

Course Code: PGD-CA.C.1

Marks: 75

Credits: 3

Duration: 45 Hrs

Prerequisite Courses: Nil

Course Objectives:

To understand the concept of basic computer algorithm and flowchart and use the algorithm for various problem solving.

To implement algorithms using high level programming language.

To understand basic principles of programming – example Python.

To understand the concept of Object Oriented Programming

Course Outcomes:

At the end of the course students will be able to:

CO1: Explain problem solving strategies.

CO2: Draw a flowchart for a given problem.

CO3: Write an algorithm for a given problem.

CO4: Implement sorting and searching algorithms.

CO5: Recognize and incorporate programming elements such as loops, decision making, functions, string, list, tuple, dictionary and files in to applications that solve real world problems.

CO6: Develop problem-solving and programming skills using the OOP concept.

SYLLABUS:

UNIT I:

[15 HRS]

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

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

Introduction to Python

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

[15 HRS]

String Manipulation

Accessing Strings, Basic Operations, String slices, Function and Methods.

Lists

Introduction, Accessing list, Operations, Working with lists, Function and Methods.

Tuple

Introduction, Accessing tuples, Operations, Working, Functions and Methods.

Dictionaries

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.

Modules

Importing module. Math module. Random module. Packages. Composition.

Input-Output

Printing on screen, Reading data from keyboard, Opening and closing file, Reading and writing files, Functions.

Exception Handling

Exception. Exception Handling - Except clause, Try ?finally clause. User Defined Exceptions.

UNIT III

[15HRS]

Principles of OOP

Programming Paradigms, Basic concepts, OOP: major principles - encapsulation, abstraction, inheritance, polymorphism. Benefits of OOP, Applications of OOP.

Objects and Classes

Basics of objects and classes in python, Constructors, Visibility modifiers, Methods and objects, python built-in functions.

Inheritance and Polymorphism

Inheritance in python, super and sub class, Overriding, Polymorphism, Dynamic binding, Casting objects, Abstract class, Interface in python.

REFERENCES:

MANDATORY:

1. Mark Lutz, Learning Python, O'Reilly Media, Third Edition, 2008
2. Dromey R.G., How to solve it by computer, Prentice Hall of India, 2nd Edition, 2004.
3. Alex Martelli ,Python – A Nutshell, O'Reilly Media, Second Edition, 2006

4.Wes McKinney, Python for Data Analysis, O'Reilly Media, 2012

5.Phillips, Dusty. Python 3 Object Oriented Programming. United Kingdom, Packt Pub., 2010.

WEB BASED:

1. <https://www.w3schools.com><http://www.w3schools.com/>
2. <https://www.tutorialspoint.com><http://www.tutorialspoint.com/http://www.tutorialspoint.com/>
3. <https://www.javatpoint.com><http://www.javatpoint.com/>
4. <https://www.geeksforgeeks.org><https://www.geeksforgeeks.org/>
5. <https://www.guru99.com><http://www.guru99.com/>

Practicals : Problem Solving and Introduction to Programming

Credit: 01

Marks: 25

Duration: 30 Hrs

List of Experiments using Python Language:

- 1) Write a python program to compute given formula.
- 2) Write a python program to implement if else statement.
- 3) Write a python program to implement nested if else statement.
- 4) Implement for and while loop in python.
- 5) Write a string manipulation in python.
- 6) Write a program to implement list in python.
- 7) Write a python program to implement tuple.
- 8) Write a python program to implement dictionary.
- 9) Write python program to implement function.
- 10) Write a python program to implement exception handling.
- 11) Implement Classes and Instance in python.
- 12) Implement Inheritance in python.
- 13) Implement Polymorphism, abstract classes and interfaces in python. [3P]

Course Title: Web Design
Course Code: PGD-CA.C.2
Marks: 75
Credits: 3 Duration: 45 Hrs

Prerequisite Courses: Nil

Course Objective:

To develop a high degree of competence as a web designer.

Course Outcomes:

At the end of the course students will be able to:

CO1: Design Content for a web application.

CO2: Style content so as to provide an effective User Interface.

CO3: Provide for dynamism in the User Interface to enhance usability.

CO4: Develop a static web application.

SYLLABUS:

Unit I: The Internet and Content Development

[20HRS]

Computer Networks: LAN, MAN, WAN, etc., Layout (Ring, bus, star, etc.), IP address: public, private,static, dynamic, Internet protocols and services: http, https, FTP, SMTP, Telnet, DNS, DHCP, Intranet &Extranet, Internet Infrastructure, Search Engines, Web Browser, Web server.

Basic HTML : Introduction, importance, Basic: HTML Tag, HEADER Tag, META Tag, TITLE Tag, BODY Tag, Text Formatting: PRE Tag, FONT Tag, entities, Image: IMG tag, image maps, Hyperlinks: Anchor tag, Lists: Unordered Lists, Ordered Lists, Definition Lists, Table tags: TABLE, TR and TD Tags, Cell Spacing and Cell Padding, Colspan and Rowspan. End user Interaction: FORM and INPUT Tag, Text Box, Radio Button ,Checkbox, SELECT Tag and Pull Down Lists, TEXTAREA, Hidden, Submit and Reset, Special Tages: COLGROUP, THREAD, TBODY,TFOOT, blank, self, parent, top, IFRAME,LABEL, Attribute for <SELECT>.

HTML5: The <canvas> element for 2D drawing, The <video> and <audio> elements for media playback, Support for local storage, New content-specific elements, like <article>, <footer>, <header>, <nav>,<section>, New form controls, like calendar, date, time, email, url, search.

UNIT II: Styling UI

[15HRS]

CSS: Introduction to CSS, Advantages, Types of style sheets: Inline, Internal, External, Multiple Style sheets and Cascading order, Grouping or nesting, Syntax, ID and Class, Pseudo-class, Pseudo- element, CSS units of measurement, Colors.

New features in CSS3: Selectors, Box Model, Backgrounds and Borders, Image Values and Replaced Content, Text Effects, 2D/3D Transformations, Animations, Multiple Column Layout, User Interface.

UNIT III: Dynamic UI

[10HRS]

Client side scripting: Introduction to Java script, HTML DOM, Core Java script, form validations.

REFERENCES:

MANDATORY:

1. DT Editorial Services, Web Technologies, Black Book, 2018, Dream Tech

WEB BASED:

1. <https://www.w3schools.com>
2. <https://www.tutorialspoint.com/html/index.htm>
3. <https://www.tutorialspoint.com/css/index.htm>
4. <https://www.tutorialspoint.com/javascript/index.htm>
5. <https://www.udemy.com/courses/development/web-development/>

Practicals: We b D e s i g n

Credit: 1

Marks: 25

Duration: 30 Hrs

HTML: [2 P]

1. Text formats.
2. Image formats.
3. Hyperlink and Listings
4. Table formats
5. Forms

Cascading Style Sheet: [2 P]

1. Internal and External style implementations
2. Creating Dynamic pages using CSS.

Java script: [4 P]

1. Implementing functions in java script (alert(); confirm(); prompt())
2. Form Validations using Java script
3. Creating Dynamic pages using Java script.
4. HTML5:

Web site design using HTML5. [4 P]

Implementation of canvas.

Embedding Audio and Video in a Webpage.

Implementation of additional form controls.

Course Title: Database Management Systems

Course Code: PGD-CA.C.5

Marks: 75

Credits: 3

Duration: 45 Hrs

Prerequisite Courses: Nil

Course Objectives:

- To provide basic knowledge of a database management system.
- To understand the importance of ER diagrams.
- To formulate queries in Relation Algebra and SQL for Database Manipulations.
- Develop database systems using RDBMS.

Course outcome:

At the end of the course students will be able to:

- CO1:** Explain database concepts and the need for the same.
- CO2:** Identify different entities and relationship between them.
- CO3:** Represent the given system diagrammatically using ER diagram.
- CO4:** Convert an ER diagram to a schema and effectively represent it using appropriate RDBMS.
- CO5:** Formulate queries in Relational Algebra, SQL to manipulate the database.
- CO6:** Analyze the schema to see if they fulfill Normalization criterion

SYLLABUS:

UNIT I

[15HRS]

Overview of database management: 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: 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.

UNIT II

[15HRS]

Relational model: Relation, properties of relational model; Entities, integrity constraints, referential integrity constraints; Relational algebra – select, project, cross product, set operations, rename operation;

Functional dependency and normalization: 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.

UNIT III

[15HRS]

SQL: 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.

Introduction to transactions: Transaction concept, Transaction state, ACID properties, Concurrent Transactions, Serializability.

MANDATORY:

1. A Silberschatz, H F Korth, S Sudarshan, Database system concepts, McGraw-Hill ,sixth Edition.

SUPPLEMENTARY:

1.Ramakrishan, J Gehrke, “Database management systems”, McGraw-Hill , 3rd edition.

2.R Elmasri, S B Navathe, “Fundamentals of database Systems”, Pearson Education , 5th Edition.

WEB BASED:

1. <https://www.tutorialspoint.com/dbms>
2. <https://beginnersbook.com/2015/04/dbms-tutorial/>
3. <https://www.guru99.com/dbms>
4. <https://www.javatpoint.com/dbms>
5. <https://www.allabout-engineering.com/database-management-system-by-rajiv-chopra/>

Practicals: Database Management Systems Credit: 1

Marks: 25

Duration: 30 Hrs

List of Practical

- 1.ER diagram.(1P)
- 2.ER diagram with specialization/generalization and aggregation.(1P)
- 3.Converting ERD into Schema. (2P)
- 4.4 SQL (2P)
- 5.Nested Queries (2P)
6. Normalization(2P)
7. Report Writing (1P)
8. Mini project (4P)

ELECTIVES

Course Title: Multimedia

Course Code: PGD-CA.E.1.

Marks: 75

Credits: 3

Duration: 45 Hrs

Prerequisite Courses: Nil

Course Objectives:

To learn the basic Multimedia concepts

To develop skills and competencies to design graphical images.

To develop skills to Capture and Edit Audio and Video, using Software tools.

To build a Multimedia product.

Course Outcomes:

At the end of the course students will be able to:

CO1: Explain the concept of Multimedia – Components, Team members and their roles.

CO2: Identify and describe the function of the general skill sets in the multimedia industry.

CO3: Classify and realize the types of Authoring tools and their functions.

CO4: Analyze the requirements of Multimedia product.

CO5: Perform the editing features for Images, Sound and Video.

CO6: Create animation using basic features.

CO7: Develop a multimedia product using any authoring tools.

CO8: Assemble and deliver multimedia projects.

SYLLABUS:

UNIT I: Multimedia and Architecture:

[15 HRS]

Introduction: Overview of multimedia, Multimedia building blocks, Digital representation, Interaction techniques and devices, 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 architecture: Introduction to multimedia architectures, User interfaces, Windows multimedia support, Windows API for Multimedia, Multimedia Database Systems, Media streaming, Multimedia authoring tools, Multimedia OS.

UNIT II: Building Blocks I:

[15 HRS]

Text: Visual representation of text, Digital representation of text, Text file formats: TXT, DOC, RTF, PDF, ODT Conversion to and from of various text formats, Hypermedia and Hypertext.

Image: Basic Image fundamentals, Importance of graphics in multimedia, Vector and Raster graphics, image capturing methods – scanner, digital camera and its types, etc. various attributes of Images – size, color, depth, resolution, etc, Image data types, image file formats (BMP, JPEG, GIF, TIFF, PNG, DIB, EPS, CIF, PEX, PIC), their features and limitations, graphic file formats conversions.

Sound: Sound and its Attributes, Mono V/s Stereo sound, Sound channels, Sound and its effect in multimedia, Analog V/s Digital sound, Basics of digital sound-Sampling, Frequency, Sound Depth, Creation of Digital Audio files – recording & editing. Overview of various sound file formats on PC – WAV, VOC, AVI, MP3, MP4, Ogg, Verbose etc. Digital audio vs MIDI and MIDI File format, CD and DVD formats.

UNIT III: Building Blocks II:

[15 HRS]

Animation: Basics of animation, Principle and use of animation in multimedia, Effect of resolutions, pixel depth, Images size on quality and storage. Overview of 2-D and 3-D animation techniques and software. Animation on the Web – features and limitations, creating simple animations for the Web. Animation file formats.

Video: Analog and Digital Video, Video on PC. Introduction to graphics accelerator cards, Video Broadcast Standards - NTSC, PAL, SECAM, HDTV. Introduction to video capturing, Media & Instrument – Videodisk, DVCAM, Camcorder.

Recording Formats like S-VHA Video, Component (YUV), Component Digital, Composite Digital, and Video Hardware Resolutions.

Video Tips like shooting platforms, Lighting, Chroma Key or Blue Screen.

Data Compression: Types of compression: Lossy & Lossless, Symmetrical & Asymmetrical, Intraframe & Interframe, Hybrid.

Assembling and delivering a project: The four primary navigational structures used in multimedia like linear, hierarchical, non-linear and composite.

REFERENCES:

MANDATORY:

1. Vaughan Tay, (2011), Multimedia: Making it Work, (8th Ed), Tata McGraw-Hill.

SUPPLEMENTARY:

1. Prabhat K. Andleigh/ Kiran Thakrar, (2015), Multimedia Systems Design, (1st Ed), Pearson Education India.
2. Jeffcoate Judith, (2006), Multimedia in Practice, Technology and Applications, (1st Ed) Prentice Hall India.

WEB BASED:

1. https://www.tutorialspoint.com/multimedia/multimedia_introduction.htm
2. <https://www.gimp.org>
3. <https://www.audacityteam.org/>
4. <https://www.topwin-movie-maker.com/tutorials.html>
5. <https://www.minitool.com/moviemaker/use-movie-maker.html>
6. <https://www.coursepath.com/powerpoint-as-e-learning-authoring-tool>
7. <https://elearningindustry.com/powerpoint-as-an-authoring-tool>

Practicals: Multimedia Credit : 1

Marks: 25

Duration: 30 Hrs

Multimedia Software Tools like GIMP, Audacity, Windows Movie Maker, Blender. iMovie (the numbers in brackets indicate number of practical's):

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. 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) like E-Book Design, Product Design. **[2P]**

Course Title: E-Learning
Course Code:PGD-CA.E.2.
Marks : 75
Credits : 3
Duration:45
Hours

Prerequisite Courses: Nil

Course Objective:

This course is an introduction to ICT (Information Communications Technology) in education.

It aims at exploring the Instructional Design principles, developing and applying the various concepts of Instructional Design skills learnt wrt E-Learning and develop E-content in various application areas related to ICT and Education.

Course Outcomes:

At the end of the course students 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 & Course Development **[20HRS]**

Scope and form of E-learning, Role of an E-learning project, Phases in an E-learning project. Instructional Design, The process of Designing Instruction, Developing Materials.(Storyboarding ,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).

UNIT II: E-learning & Pedagogical Approaches **[15HRS]**

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. Bloom's 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.

UNIT III: E-learning Strategies & Assessment Design **[10HRS]**

E-LEARNING STRATEGIES:

Simulation, Drill, Interactive Learning, Problem Solving, Tutorials.

ASSESSMENT DESIGN:

Online formative and summative assessment, Rubrics for Assessment- Analytic and Holistic Rubrics, Rubrics for Assessment, Security and Authentication.

REFERENCES:**MANDATORY:**

1. 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(4th 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/>

4. Better learning (Bloom's Taxonomy): <https://www.plesyoutube.com/watchv=0flnAoX9QEw>

5. https://nptel.ac.in/content/storage2/nptel_data3/html/mhrd/ict/text/121106012/lec1_3.pdf

Practicals: E-Learning

Credit: 01

Marks: 25

Duration: 30 Hrs

List of suggested **PRACTICALS** using any Multimedia Software (the numbers in brackets indicate number of practicals):

- (1) Installing, Creating and Running a complete course using LMS **[3P]**
Course Administration: Creation and using Resources and Planning Activities
Case Study: Create a complete course and work on all the resources and activities. Also The various grade book options etc.
- (2) Creating Storyboards (using Movie Maker/PPT or similar FOSS) **[1P]**
- (3) Construct a Mind Map (using Free mind or any other FOSS) **[1P]**

- (4) Prepare a 10-minute Video tutorial on some system (e.g. how to search for free images in Google) using screen cast. Example tool that can be used: screencast-o-matic. [2P]
- (5) Study a virtual world system like Why ville, and make a 10 slide presentation (using PPT or FOSS on it). [2P]
- (6) Create a fully tagged 10-question QB on a topic and load onto Moodle. [2P]
- (7) Build a course using WISE [2P]
- (8) Design Rubrics (for a given scenario) [2P]

Course Title : Data Structures

Course Code: PGD- CA. E. 9

Marks : 75

Credits: 3

Duration:45 Hrs.

Prerequisite Courses: Problem Solving and Introduction to Programming

Course Objectives:

To understand different methods of organizing data and efficiently implement different data structures.

Course outcome:

At the end of the course students will be able to :

CO1: Define relevant standard algorithms for various data structures. Learn various applications of data structures.

CO2: Implementation of data structures.

CO3: Use various data structures for sorting and searching.

CO4: Analyze and compare algorithms for efficiency using Big-O notation.

CO5: Formulate new solutions for programming problems.

SYLLABUS:

UNIT I

[15HRS]

Introduction to data structures:

Concept, Data type, Data object, ADT, Need of Data Structure, Types of Data Structure.

Algorithm analysis:

Algorithm – definition, characteristics, Space complexity, time complexity, Asymptotic notation(Big O).

Linked List:

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.

Stacks:

Introduction, Representation-static & dynamic, Operations

UNIT II

[15HRS]

Stack Applications :

Application - infix to postfix & prefix, postfix evaluation, Simulating recursion using stack.

Queues:

Introduction, Representation -static & dynamic, Operations, Circular queue, priority queue (with implementation), Concept of doubly ended queue.

Trees:

Concept & Terminologies, Binary tree, binary search tree, Representation – static & dynamic, Operations on BST – create, Insert, delete, traversals (preorder, in order, post order), counting leaf, non-leaf & total nodes, non recursive in order traversal, Expression Tree. Introduction to AVL Trees.

UNIT III**[15HRS]****M-Way Search Trees** : Introduction, B Tree, B+ Tree.**Searching and Sorting :**

Use of various data structures for searching and sorting, selection sort, merge sort, quick sort, heapsort and hashing.

Graph :

Concept & terminologies, Graph Representation – Adjacency matrix, adjacency list, Traversals – BFS& DFS, Application of BFS, DFS – Shortest path, Backtracking.

REFERENCES:**MANDATORY:**

1.Data Structures and Algorithms in Python Roberto Tamassia, Michael H. Goldwasser Michael T.Goodrich, Wiley Student Edition

SUPPLEMENTARY:

1. Horowitz Ellis, Sahni Sartaj, Fundamentals of Data Structures in C, University Press, 2nd Edition,2008.
- 2 . Michael T. Goodrich, Roberto Tamassia , Data Structures and algorithms in Java, John Wiley & sons inc.,5th 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++, CengageLearning, Second Edition

WEB BASED:

1. https://www.tutorialspoint.com/python_data_structure/python_data_structure_introduction.htm
2. <https://runestone.academy/runestone/books/published/pythonds/index.html>
3. <https://www.w3schools.in/data-structures-tutorial>
4. <https://www.datacamp.com/community/tutorials/data-structures-python>
5. <https://www.programiz.com/dsa>
6. <https://www.geeksforgeeks.org/data-structures/>
7. <https://www.javatpoint.com/data-structure-tutorial>

Practical: Data Structures

Credit: 1

Marks: 25

Duration: 30 Hours

Programs using a Programming Language that covers the following concepts:

1.Stack: Static/Dynamic stack implementation.

2.Stack: infix to postfix.

Stack: Evaluation of Postfix expression.

3.Queues: Static and Dynamic Queue Implementation

Queues: Circular queue 4.List:

Singly Linked List, 5.List:

Doubly Linked List 6.List:

Circular Linked List

7. Linked List: Polynomial addition

8. Trees: Binary Search Tree: create, add, delete, display nodes.

9. Trees: BST traversal.

10.Graph: Representation of Graphs, Graph Traversals.

Graph: DFS, BFS

M.Sc. Information Technology

Course Title: Data Structures and Algorithms

Course Code: PGM-IT.C.1

Marks: 100

Credits: 4

Duration: 48 Hrs

Course Prerequisites:

Familiarity with basic data structures like Stacks, Queues, Linked Lists and Binary Trees.

Course Objectives:

The objective of the course is to understand the real-life applications of data structures and be familiar with writing recursive and iterative methods using data structures.

Course Outcomes:

At the end of the course students will be able to:

CO1: Design an algorithm for the use case.

CO2: Choose efficient data structures and apply them to solve problems.

CO3: Design and analyze the time and space efficiency of the data structure.

CO4: Formulate new solutions for programming problems or improve existing code using learned algorithms and data structures,

Syllabus:

Unit I:

[8 Hrs]

Overview of Linear Data Structures

ADT, Sparse matrices, Linked Lists:, Doubly linked list, Circular linked list. Stack and Queues: Need and justification of the study, Multiple stacks and queues, Implementation of recursion using stack, Application of stacks, queues and linked lists.

Unit II:

[16 Hrs]

Non Linear Data Structures

Trees: Definitions, terminologies and properties, Binary tree representation and traversals , AVL Trees, Red Black Tree, suffix trees, Segment Tree, Splay trees ,M-way Search Trees, B-trees, B*- trees, B+- trees. Graphs: Graph representations; Graph Traversals , Eulerian Graphs , Hamiltonian Graphs. Priority Queues, Heap Structures.

Unit III:

[9 Hrs]

Complexity of Sorting and Searching Algorithms

Mathematical Background, Big-O notation, Running Time computation, Radix Sort, Heapsort, Quick Sort, Merge Sort ,Shell Sort, Interpolation search, Symbol Tables.

Unit IV:

[15 Hrs]

File Organization and Processing

Dynamic memory management. Sequential files, Hashing techniques: Approaches to collision problem, Indexed sequential files: organization, Creation, Update and Maintenance, Multi-key files, Inverted file,

Multi-list file, Tries: Standard Tries and Compressed Tries,, Huffman Algorithm.

REFERENCES:

Mandatory:

1. R. Venkatesan , S. Lovelyn Rose (2019) "Data structures" (2nd Ed) Wiley.
2. Prof Peter Brass (2014) "AdvancedData Structures ",(1st Ed), Cambridge University Press.

Supplementary:

1. Alfred V. Aho, John E Hopcroft, Jeffrey D. Ullman, "Data structures and algorithms",(2nd Ed) Pearson Education India Delhi,
2. Jean-Paul Tremblay, Paul Sorenson (2017), An Introduction to Data Structures with Application, (2 nd Ed), McGraw Hill Education.

Web References:

- 1: <http://www.cs.cmu.edu/~ab/15-121N11/>
- 2: <https://www.cse.iitb.ac.in/~ranade/cs213/>
- 3: <http://cse.iitrpr.ac.in/ckn/courses/f2015/cs1201/w4.pdf>
- 4: <https://www.cpp.edu/~ftang/courses/CS241/notes/b-tree.html>
- 5: <https://www.cs.usfca.edu/~galles/visualization/Algorithms.html>

Course Title: Operating Systems and Networks

Course Code: PGM-IT.C.2

Marks: 100

Credits:4

Duration: 48 Hrs

Course Pre-Requisites:

- Basics of Operating Systems and Networks

Course Objectives:

- To understand Real time operating systems
- To gain understanding in specific areas of networking such as the design and maintenance of individual networks.

Course Outcomes:

At the end of the course students will be able to:

CO1: Analyze the structure of Operating system.

CO2: Analyze various Resource management and fault tolerance techniques for real time systems.

CO3: Discuss the fundamentals of IP addressing.

CO4: Apply subnet masking concepts to allocate space for host in subnet.

CO5: Examine techniques to protect the network.

Syllabus:

Unit I: Overview of Operating Systems

[12Hrs]

Processes and Threads - Process Scheduling -Synchronization Mechanisms -Deadlocks – Models of Resources – Memory Management Techniques.

Real time Operating systems: Basic model of real time systems, Characteristics, Applications of real time systems, Real time task scheduling, handling resource sharing, Micro kernel design, Processes and Threads, Memory Management, File system. Failure Recovery and Fault Tolerance, Approaches of fault tolerance

Unit II: Network Service Design

[12Hrs]

Introduction, Strategy for Network Service Implementation

TCP/IP:Introduction to TCP/IP, Benefits of using TCP/IP,IP addressing, IP Network and Host addressing, Classfull and classless IP addresses, IPV6, Subnet mask, Subnetting and supernetting

Switch Technology:Switch fundamentals (Bridges vs. Switches) – Spanning Tree Protocol: Overview, Spanning tree protocol, Rapid Spanning tree protocol.

Unit III: Routed Networks

[12Hrs]

VLANs and VLAN Trunking:VLAN- concepts, broadcast domains with VLANs and routers, preventing broadcast storms. VLAN Trunking Protocol, VTP modes of operation, Routing between VLANs, Inter-VLAN routing issues.

Routing:Static V/s Dynamic routes, Adding and deleting static routes, Routing protocol, RIP, OSPF, IGP, Secure IP routing.

Unit IV: Network Administration

[12Hrs]

Network administration:SNMP& RMON - Overview and features, MIB Management Information base Installing SNMP Servers, SNMP communities, Authentication and securing Monitoring and analysis and troubleshooting, Overview and installation: fire wall, NAT, E-mail (Send mail), Radius, Remote access servers, proxy servers.

Wireless Networking:Overview, Infrastructure mode, Ad Hoc Mode, ESSID, wireless channels, wireless security, Authentication.

References:

Mandatory:

1. Singhal, M. &Shivaratri, N.G (2000), *Advanced concepts in operating systems*. Delhi, India: McGraw-Hill.
2. Beasley, J S. &Nilkaew, P. (2015), *A practical guide to advanced networking*,Chennai, India: Pearson.

Supplementary:

1. Stallings, W.(2009), *Wireless communications and networks*, (2nd Ed), New Delhi, India: Prentice Hall of India

Web Resources:

1. https://swayam.gov.in/nd1_noc20_cs16/preview
2. https://swayam.gov.in/nd1_noc20_cs23/preview
3. <http://study-ccna.com/>
4. <http://www.packettracernetwork.com/>

Course Title: Data Structures and Algorithms Lab

Course Code: PGM-IT.C.3

Marks: 50

Credits: 2

Duration: 48 Hrs

Course Prerequisites:

Theoretical Knowledge of Data Structures

Course Objective:

- Introduce students to a number of highly efficient algorithms and data structures for fundamental computational problems across a variety of areas.
- Analyze a problem and determine the appropriate data structure for the problem.
- Analyze the asymptotic performance of algorithms .

Course Outcomes:

At the end of the course students will be able to:

CO1: Select algorithm design approaches in a problem specific manner.

CO2: Become proficient in applying knowledge from the theory of Data Structures to various application areas.

CO3: Design Algorithms to solve the problems.

CO4: Discuss different Data Structures to represent real world problems.

List of suggested assignments:

1. Implementation of Basic Data Structure such as Stack, Queue, Linked List etc. [6 Hrs]
2. Implementation of a Huffman code for the text file. [5 Hrs]
3. Implementation of AVL Tree. [6 Hrs]
4. Implementation of Red Black tree. [6 Hrs]
5. Implementation of Sorting Techniques(Quick Sort and Merge Sort) [4 Hrs]
6. Implementation of Graph Traversal Techniques. [4 Hrs]
7. Implementation of linear probing, quadratic hashing and Double hashing. [6 Hrs]
- 8: Implementation of Trie. [5 Hrs]

9. Implementation of B Trees and B+ Trees
Mini Project on the application of Data Structures.

[6 Hrs]

Course Title: Operating Systems and Networks Lab

Course Code: PGM-IT.C.4

Marks: 50

Credits: 2

Duration: 48 Hrs.

Course Pre-Requisites:

- Theoretical Knowledge of operating systems and networks.

Course Objectives:

- To provide practical base in operating system and networks.

Course Outcomes:

At the end of the course students will be able to:

CO1: Manage processes, memory and file system using system calls.

CO2: Illustrate socket communication involving sender process and receiver process using TCP and UDP.

CO3: Analyze network traffic by using network analyzer tool.

CO4: Design and demonstrate VLAN's by using simulation tool.

Syllabus:

Implementation of:

1. File operations. [4Hrs]
2. Identifiers, fork, exec, and wait functions [4Hrs]
3. Iterative TCP client and server application [4Hrs]
4. Concurrent TCP client and server application [4Hrs]
5. UDP client and server application [4Hrs]
6. Using nmap for port scanning and vulnerability detection. [4Hrs]
7. Configuration of a Firewall. [4Hrs]
8. Configuration of Intrusion detection system. [4Hrs]
9. Using ethereal or tcp dump to analyze network traffic. [4Hrs]
10. Creating subnets and supernets using simulation tools. [4Hrs]
11. Configuring static and dynamic route using routing tools. [4Hrs]
12. Configuring VLANs. [4Hrs]

Course Title: Cloud Computing

Course Code: PGM-IT.E.3

Marks: 100

Credits: 4

Duration: 48 Hrs

Course Pre-Requisites: None

Course Objectives:

- To study important approaches in the field of Cloud Computing.

Course Outcomes:

At the end of the course students will be able to:

- CO1: Define main concepts, key technologies, strengths, and limitations of cloud computing and the possible applications for cloud computing.
- CO2: Identify the architecture and infrastructure of cloud computing, including SaaS, PaaS, IaaS, public cloud, private cloud, hybrid cloud, etc.
- CO3: Explain the core issues of cloud computing such as security, privacy, and interoperability.
- CO4: Provide the appropriate cloud computing solutions and recommendations according to the applications used.
- CO5: Implement Virtualization

Syllabus:

Unit I: Introduction to cloud computing and Developing cloud services

[12 Hrs]

How it all began, Grid computing, utility computing-automatic computing, dynamic data centre alliance-hosting/outsourcing, Cloud computing defined, the SPL frame work for cloud computing, traditional software model, virtualization, the cloud services delivery model, cloud deployment model, key drivers to adopting the cloud, the impact of cloud computing on users, governance in the cloud-the barrier to cloud computing adoption in the enterprise, Cloud infrastructure models-types of cloud service development, software as a service, platform as a service, infrastructure as a service-web services, on-demand computing, discovering cloud services deployment services and tools, amazon EC2, google app engine , Microsoft azure.

Unit II: Programming google app engine with python

[12 Hrs]

The java runtime environment-the python runtime environment – the data store-development workflow- Setting up a google app engine account –setting development environment –starting to program in python with app engine. A first real cloud application –the basic example –chat application-the basics of HTTP – mapping chat into HTTP.

Unit III: Programming google app engine with java and Amazon cloud computing

[12 Hrs]

Google app engine and java-managing server side data – building user interface in java – building the server side of java application. Amazon s3-amazon EC2-the simple storage service simple queuing services.

Unit IV: Window Azure Platform and Security

[12 Hrs]

Windows azure-SQL azure-windows azure app fabric- additional online services. Data security – network security-host security –compromise –response.

References

Mandatory :

1. Hill, R., Hirsch, L., Lake, P., & Moshiri, S. (2012). *Guide to cloud computing: principles and practice*. Springer Science & Business Media.

Supplementary:

1. Buyya, R., Broberg, J., & Goscinski, A. M. (Eds.). (2010). *Cloud computing: Principles and paradigms* (Vol. 87). John Wiley & Sons.

Web References

1. <https://www.geeksforgeeks.org/cloud-computing/>
2. https://www.tutorialspoint.com/cloud_computing/index.htm
3. <https://www.javatpoint.com/cloud-computing-tutorial>

Course Title: Data Mining

Course Code: PGM-IT.E.9

Marks: 100

Credits: 4

Duration: 48 Hrs.

Course Pre-Requisites:

- **Fundamental knowledge of Database Management System concepts**

Course Objectives:

- Identify the key processes of data mining, data warehousing and knowledge discovery process
- Describe the basic principles and algorithms used in practical data mining and understand their strengths and weaknesses
- Apply data mining methodologies with information systems and generate results which can be immediately used for decision making in well-defined business problems

Course Outcomes:

At the end of the course students will be able to:

CO1: Identify appropriate data mining algorithms to solve real world problemsCO2:

Apply various Association Rules Mining Algorithms.

CO3: Use Decision Trees, Bayesian Classification, Artificial Neural Networks and Fuzzy Set Theory while solving classification problems.

CO4: Apply various types of Clustering Algorithms, Web Mining Techniques and techniques of mining complex types of data.

Syllabus:

Unit I

[12 Hrs]

Introduction

Introduction to data mining, Motivation and importance, Data Mining on various data types, Types of patterns to be mined, Interestingness of patterns, Classification of Data Mining systems, Major issues in Data Mining.

Data Warehouse and OLAP Technology

Introduction to a data warehouse, a multi-dimensional data model, Data warehouse architecture, Data warehouse implementation, Relationship between data warehouse and data mining Data Preprocessing Reasons for preprocessing data, Data cleaning, Data integration and transformation, Data reduction, Discretization and Concept-hierarchy generation

Unit II

[15 Hrs]

Association Analysis

Problem definition, Frequent itemset generation, Rule generation, Compact representation of frequent itemsets, alternative methods for generating frequent itemsets, FP-Growth algorithm, Evaluation of Association patterns, Handling categorical and continuous attributes, Handling a concept hierarchy, Sequential patterns, Subgraph patterns, Infrequent patterns

Classification and Prediction

Introduction to classification and prediction, Decision Tree Induction, Bayesian classification, Neural network technique of Back Propagation, Fuzzy set theory and Genetic Algorithms, Linear, Multiple and Non-Linear Regression

Unit III

[12 Hrs]

Cluster Analysis

Introduction to Cluster Analysis, Data types in ClusterAnalysis, Partitioning , Hierarchical and Density-based methods, Model based methods

Web Mining

Introduction to Web Mining, Web content mining, Web structure mining, Web usage mining

Unit IV

[09 Hrs]

Mining other type of data

Data mining in Object oriented, Multimedia data bases, Time-series and text data bases

Data Mining Applications

Data Mining in Biomedical, Finance, Retail and Telecommunication industry

References:**Mandatory:**

1. Han J & Kamber M (2011), *Data Mining Concepts and Techniques* (3rd Ed), New Delhi, India: Morgan Kaufmann Publishers.

Supplementary:

1. Kumar V & Dunham M (2006), *Data Mining: Introductory and Advanced Topics* (1st Ed), New Delhi, India: Prentice Hall (Pearson Publication).
2. Tan P, Steinbach M & Kumar V (2016), *Introduction to Data Mining* (1st Ed), New Delhi, India: Pearson Education.

Web References:

1. <https://nptel.ac.in/courses/106/105/106105174/>
2. <https://www.coursera.org/specializations/data-mining>
3. https://www.tutorialspoint.com/data_mining/

Course Title: Software Metrics & Project Management

Course Code: PGM-IT.E.11

Marks: 100

Credits: 4

Duration: 48 Hrs

Course Pre-Requisites: None

Course Objectives:

Provide a deeper understanding of various software metrics and project management concepts

Course Outcomes:

At the end of the course students will be able to:

- CO1: Identify and describe the key phases of project management.
- CO2: Apply Scope, Time and Cost Management process to Software Development.
- CO3: Define software metrics and quality standards.
- CO4: Plan a metrics measurement program
- CO5: Enforce Quality standards in projects

SYLLABUS:

Unit I:

[12 Hrs]

Introduction Introduction to Project and Project management, Project phases and project life cycle, organizational structure, Qualities of Project Manager. Project Management Components Project Integration Management-Project plan development and execution, change controls, configuration management Scope and Time Management Strategic planning, scope planning, definition ,verification and control, Activity planning, schedule development and control.

Unit II:

[12 Hrs]

Cost and Quality Management Cost estimation and Control, Quality planning and assurance Human Resource and Communication Management. Organizational planning, staff acquisition, Information distribution, reporting.

Unit III:

[12 Hrs]

Risk Management Risk identification, Quantification and control. Procurement Management Solicitation, contract administration Software Metrics The scope of software metrics, software metrics data collection, analyzing software data, measuring size, structure, external attributes.

Unit IV:**[12 Hrs]**

Software Reliability Measurement and prediction, resource measurement, productivity, teams and tools. Planning a measurement program Metrics plan: Developing goals, questions and metrics. Where and When: Mapping measures to activities. How: Measurement tools. Who: Measurers , analyst, tools revision plans. Quality Standards – CMM, PSP/TSP.

References:**Mandatory:**

1. Kathy S. Information Technology Project Management, Boston : Course Technology Press.

Supplementary:

1. Norman F., James B. (2014). Software Metrics A rigorous and practical approach(Third Edition), CRC Press.
2. Roger P. Software Engineering – A Practitioner’s Approach, United States : McGraw Hill.

Web References:

1. www.tutorialspoint.com/software_engineering/software_project_management.htm
2. <https://www.javatpoint.com/software-engineering-software-metrics>
3. <https://www.geeksforgeeks.org/software-measurement-and-metrics/>

Course Title: Educational Technology

Course Code: PGM-IT.E.17

Marks: 100

Credits: 4

Duration: 48Hrs

Course Pre-Requisites: None

Course Objectives:

- To introduce the classroom applications of Educational Technologies.

Course Outcomes:

At the end of the course students will be able to:

CO1: Identify the role of educational technology in teaching.

CO2: Integrate technology in the classroom after determining technology requirements CO3: Perform research in the Educational Technology domain.

CO4: Use ICT tools in a particular course.

Syllabus:

Unit I Educational Technology in Instructional Planning

[15 Hrs]

- 1) Technology in Education: Meaning, Evolution and Development,
- 2) Multiple Intelligence, Learning Metaphors: information acquisition, response strengthening, knowledge construction
- 3) Cognitive Information Processing, Peer Instruction
- 4) Learning Theories: Constructivist and situated theories of learning – social activism, stages of development, Constructionism, Inquiry based learning, Social constructivism, Discovery learning, Cognitive apprenticeship. Behaviorism & Symbolic Cognition (Skinner's defense of behaviorism, Watson's argument against introspection), Pavlov's classic physical conditioning, Operant conditioning, Miller's proposal on planning.
- 5) Role of Cognition in education: Distributed Cognition, Situated Cognition, Embodied Cognition.

Unit II ICT in Education, Educational Tools

[14Hrs]

- 1) Computer, Internet, Multimedia/Hypermedia, Multimedia Principles, Animations, Simulations, Projected Materials, Audio Materials, Interactive Materials: LOGO, SCRATCH, LMS tools, Digital storytelling.
- 2) Type of contents: content types (fact, concept, process, procedure, principle) and graphic types (representational, organizational, transformational, interpretive).

Unit III Lesson planning and Instructional Design Models

[12 Hrs]

- 1) Learning Objectives/Outcomes: LO (what why and how), Blooms Taxonomy, Learning outcomes and assessment (action verbs for Los).
- 2) Assessment: Diagnostic assessment, Formative assessment, Summative assessment, Rubrics (what, how when, benefits).
- 3) Instructional design models: theoretical frameworks and models i.e. ADDIE, LCM model; relevant tools for designing instructional material for online and blended mode.

Unit IV: Research Methods in Educational Technology

[7Hrs]

- 1) Content of educational research: scientific method, planning educational research, ethics, identifying problem, variables, hypothesis. Strategies of data collection, Data analysis (distribution, statistical significance, statistical tests, SPSS).

References:

Mandatory:

1. Shelly G, Gunter G & Gunter R (2015), *Teachers Discovering Computers* (8th Ed), Kentucky, USA: Cengage Learning.

Supplementary:

1. Roblyer M & Doering A (2019), *Integrating Educational Technology into Teaching* (8th Ed), New Delhi, India: Pearson.

Web References:

1. <https://nptel.ac.in/courses/121105010/>
2. <https://scratch.mit.edu/explore/projects/tutorials/>
3. <https://www.tutorialspoint.com/logo/index.htm>
4. <http://www.et.iitb.ac.in/ResearchResources.html>

M.A. Hindi

Course Title: नाटक एवं रंगमंच

Course Code: PGM-HIN-C-6

Marks: 100

Credits: 4 (48 lectures)

Course Objective:

इस पाठ्यक्रम के माध्यम से विद्यार्थियों को नाटक और रंगमंच की ओर जुड़ने के लिए प्रेरित करना है। ऐसा करके विद्यार्थी नाटक और रंगमंच के सैद्धांतिक पक्ष और व्यावहारिक पक्ष दोनों से जुड़ेंगे।

Learning Outcome:

- 1) विद्यार्थी नाटक के स्वरूप एवं तत्वों से परिचित होंगे।
- 2) हिन्दी नाट्य परंपरा के क्रमिक विकास का ज्ञान होगा।
- 3) लोकनाट्य परंपरा से अवगत होंगे।
- 4) भारतीय नाट्य परंपरा से अवगत होंगे।
- 5) अभिनय कौशल में कुशलता प्राप्त करेंगे।
- 6) हिन्दी रंगमंच की जानकारी प्राप्त होगी।
- 7) नाट्य रचना का तात्विक विवेचन करेंगे।

Syllabus:

इकाई एक - नाटक एवं रंगमंच

(12 Hours)

1. संस्कृत नाट्य परंपरा।
2. लोकनाट्य की परंपरा
3. हिन्दी नाटक: स्वरूप एवं विकास
4. हिन्दी रंगमंच का विकास

इकाई दो -विशेष अध्ययन हेतु (निर्धारित नाटक)

(12 Hours)

1. अंधेर नगरी भारतेन्दु हरिश्चंद्र –।
 1. 'अंधेर नगरी' का व्यंग्य।
 2. 'अंधेर नगरी' नाटक की समसामयिकता।
 3. 'अंधेर नगरी' का सामाजिक यथार्थ।
 4. नाट्य शिल्प।
2. ध्रुवस्वामिनी जयशंकर प्रसाद –।
 1. इतिहास दृष्टि एवं राष्ट्रीय चेतना।
 2. रंगमंचीयता।
 3. तात्विक मूल्यांकन।
 4. नाट्य शिल्प।

इकाई तीन-

(12 Hours)

1. सिंदूर की होली-लक्ष्मीनारायण मिश्र।
 1. सामाजिक यथार्थ।
 2. नारीत्व की समस्या।
 3. तात्विक मूल्यांकन।
 4. नाट्य शिल्प।
2. अंधा युग – धर्मवीर भारती।
 1. अंधा युग की मिथकीय चेतना।
 2. समसामयिकता।
 3. तात्विक मूल्यांकन।
 4. नाट्य शिल्प।

इकाई चार-

(12 Hours)

1. आधे अधूरे – मोहन राकेश।
 1. सामाजिक यथार्थ।
 2. समसामयिकता।
 3. तात्विक मूल्यांकन।
 4. नाट्य शिल्प।
2. बकरी – सरवेशवरदयाल सक्सेना।
 1. नाटक और गांधीवादी चेतना।
 2. समसामयिकता।
 3. तात्विक मूल्यांकन।
 4. नाट्य शिल्प।

प्रश्नपत्र का प्रारूप

1. आंतरिक मूल्यांकन – पूर्णांक 40

- आंतरिक मूल्यांकन के अंतर्गत बीस-बीस अंकों की तीन परीक्षाएँ ली जाएँगी जिनमें से श्रेष्ठ दो को परीक्षा परिणाम में शामिल किया जाएगा।
 - तीनों परीक्षाओं के नाम हैं – प्रस्तुतीकरण, बहुविकल्पीय प्रश्न, प्रकल्प।
2. सत्रांत परीक्षा – पूर्णांक 60 (समय 3 घंटे)
- पहला प्रश्न संदर्भ सहित व्याख्या (4 में से कोई दो) 12
 - दूसरा दीर्घोत्तरी प्रश्न (कोई -1) 12
 - तीसरा दीर्घोत्तरी प्रश्न (कोई -1) 12
 - चौथा दीर्घोत्तरी प्रश्न (कोई -1) 12
 - पाँचवाँ प्रश्नटिप्पणियाँ- (चार में से किन्ही दो पर) 12

संदर्भ ग्रंथ

1. डॉ,एल .लीना बी. 'हिन्दी नाटक और रंगमंच', मथुरा ,जवाहर पुस्तकालय ,2012
2. डॉ ,प्रेमदत्त शर्मा . 'प्रसाद साहित्य की सांस्कृतिक पृष्ठभूमि' ,जयपुर ,जयपुर पुस्तक सदन ,1968
3. गिरीश रस्तोगी , 'हिन्दी नाटक का आत्म संघर्ष'इलाहाबाद ,लोक भारती प्रकाशन ,, 2002
4. डॉ ,बनवीर प्रसाद शर्मा . 'आधुनिक हिन्दी नाटक' ,अनंग प्रकाशन दिल्ली ,2001
5. के ,नारायण .वी. 'साठोत्तर हिन्दी नाटक'लो ,कभारती प्रकाशन ,इलाहाबाद ,2007
6. डॉ ,आशाराम बेवले . 'समकालीन हिन्दी नाटकों में नारी के विविध रूप' ,कानपुर ,समता प्रकाशन , 2006

Course Title: प्रयोजनमूलक हिन्दी

Course Code: PGM-HIN-E-10

Marks: 100

Credits: 4 (48 lectures)

Course Objective:

विद्यार्थियों को प्रयोजनमूलक हिन्दी से परिचित कराना इस पाठ्यक्रम का लक्ष्य है। विद्यार्थी यह समझ पाएँगे कि आज के युग में साहित्य के साथ साथ प्रयोजनमूलक हिन्दी का भी महत्वबढ़ रहा है।-विद्यार्थियों को यह भी ज्ञात होगा कि हमारे संविधान में हिन्दी को क्या स्थान दिया गया है और वास्तविक रूप में आज उसकी क्या स्थिति है।

Learning Outcome:

- 1) विद्यार्थी प्रयोजनमूलक हिन्दी का परिचय प्राप्त करेंगे।
- 2) राजभाषा संबंधी प्रमुख प्रावधानों की जानकारी प्राप्त करेंगे।
- 3) रोजगार की प्राप्ति की दिशा में कुशलता प्राप्त करेंगे।
- 4) विद्यार्थी व्यावसायिक एवं कार्यालयीन पत्राचार में सक्षम होंगे।
- 5) हिन्दी के प्रचारप्रसार में इंटरनेट की भूमिका को समझ सकेंगे।-

Syllabus:

इकाई एक - प्रयोजनमूलक हिन्दी

(12 Hours)

1. परिभाषा, स्वरूप एवं व्यवहार क्षेत्र।
2. प्रयोजनमूलक हिन्दी का ऐतिहासिक परिप्रेक्ष्य।
3. राजभाषा: स्वरूप एवं विकास।

इकाई दो –राजभाषा

(12 Hours)

1. राजभाषा संबंधी संवैधानिक प्रावधान
 1. अनुच्छेद 343-344 संघ की राजभाषा एवं संसद का आयोग एवं समिति
 2. अनुच्छेद 345-347 राज्य की राजभाषा या राजभाषाएँ

3. अनुच्छेद 348 न्यायालय से संबंधित भाषा
4. अनुच्छेद 349-350 भाषा संबंधी कुछ अधिनियमित विशेष प्रक्रिया
5. अनुच्छेद 351 हिन्दी का प्रचार प्रसार
6. राष्ट्रपति के निर्देश 1952,1955,1960
7. राजभाषा आयोग।
8. संसदीय समिति।
9. राजभाषा क्रियान्वयन की व्यावहारिक समस्याएँ।

इकाई तीन - राजभाषा के प्रमुख प्रकार्य - कार्यालयीन हिन्दी

(12 Hours)

1. प्रारूपण (कार्यालयीन ज्ञापन, कार्यालयीन आदेश, कार्यालयीन अनुस्मारक, परिपत्र, अधिसूचना)
2. टिप्पण।
3. संक्षेपण।
4. पल्लवन।

इकाई चार -

1. पारिभाषिक शब्दावली

(12 Hours)

- स्वरूप, महत्व एवं भेद।
- प्रमुख सिद्धांत एवं समस्याएँ।
- प्रशासनिक, वैज्ञानिक एवं तकनीकी शब्दावली।

2. इंटरनेट और हिन्दी

- यूनिकोड, ब्लाग, ई-मेल, वेबसाइट।

प्रश्नपत्र का प्रारूप

1. आंतरिक मूल्यांकन - पूर्णांक 40
 - आंतरिक मूल्यांकन के अंतर्गत बीस-बीस अंकों की तीन परीक्षाएँ ली जाएँगी जिनमें से श्रेष्ठ दो को परीक्षा परिणाम में शामिल किया जाएगा।
 - तीनों परीक्षाओं के नाम हैं - प्रस्तुतीकरण, बहुविकल्पीय प्रश्न, प्रकल्प।
2. सत्रांत परीक्षा - पूर्णांक 60 (समय 3 घंटे)
 - पहला दीर्घोत्तरी प्रश्न (कोई -1) 12
 - दूसरा दीर्घोत्तरी प्रश्न (कोई -1) 12
 - तीसरा दीर्घोत्तरी प्रश्न (कोई -1) 12
 - चौथा दीर्घोत्तरी प्रश्न (कोई -1) 12
 - पाँचवाँ प्रश्नटिप्पणियाँ- (पाँच में से किन्हीं तीन पर) 12

संदर्भ ग्रंथ

1. डॉ, अम्बादास देशमुख . 'प्रयोजनमूलक हिन्दी', कानपुर, शैलजा प्रकाशन, 2006
2. जोगेन्द्र सिंह, 'राजभाषा हिन्दी: विश्व संदर्भ', नयी दिल्ली, वत्सल प्रकाशन, 2003

3. विनोद गोदरे , 'प्रयोजनमूलक हिन्दी' ,नयी दिल्ली ,वाणी प्रकासन ,2007
4. डॉ ,प्रसन्नकुमारी .जे .सी . 'राजभाषा हिन्दी के विविध आयाम'अम ,न प्रकाशन ,कानपुर ,2009
5. डॉ ,नागलक्ष्मी .सु . 'संचारकम्प्यूटर और प्रयोजनमूलक हिन्दी जगत ,सूचना ,' ,जवाहर पुस्तकालय ,
,मथुरा2012
6. डॉ ,अनिल कुमार तिवारी . 'प्रयोजनशील हिन्दी' ,कानपुर ,विश्वभारती प्रकाशन ,2004

Course Title: हिन्दी भाषा, लिपि ,व्याकरण एवं सर्वेक्षण

Course Code: PGM-HIN-E-12

Marks: 100

Credits: 4 (12 lectures)

Course Objective:

विद्यार्थियों को हिन्दी भाषा, लिपि और व्याकरण का ज्ञान कराना ताकि वे वाक्य रचना करने में और आवश्यकता पड़ने पर बोलने में दक्षता प्राप्त कर सकें। विद्यार्थियों को सर्वेक्षण के क्षेत्र में भी आत्मविश्वास पैदा कराना और ऐसा करके हिन्दी के प्रति उनमें रूचि पैदा कराना।

Learning Outcome:

- 1) विद्यार्थी हिन्दी भाषा की पृष्ठभूमि एवं उसके विकास से परिचित होंगे।
- 2) देवनागरी लिपि के विकास एवं मानकीकरण का ज्ञान प्राप्त होगा।
- 3) हिन्दी की वर्णरचना से परिचित होंगे।-व्यवस्था एवं रूप-
- 4) विद्यार्थियों में भाषा कौशल का विकास होगा।
- 5) सर्वेक्षण के माध्यम से स्थानीय भाषा एवं संस्कृति को समझ सकेंगे।

Syllabus:

इकाई एक - हिन्दी भाषा का इतिहास

(12 Hours)

1. प्राचीन भारतीय आर्य भाषा : वैदिक संस्कृत एवं लौकिक संस्कृत
2. मध्यकालीन भारतीय आर्यभाषा पालि, प्राकृत एवं अपभ्रंश।
3. आधुनिक भारतीय आर्य भाषाएँ और हिंदी।

इकाई दो - लिपि

(12 Hours)

1. देवनागरी लिपि : उद्भव एवं विकास।
2. देवनागरी लिपि की वैज्ञानिकता।
3. देवनागरी लिपि: वर्तनी का मानकीकरण
4. कंप्यूटर और इंटरनेट देवनागरी लिपि का अनुप्रयोग और प्रभाव। :

इकाई तीन - व्याकरण

(12 Hours)

भाषा और व्याकरण

1. शब्द साधन : विकारी एवं अविकारी शब्द का सामान्य परिचय
2. हिन्दी की रूप रचना – उपसर्ग, प्रत्यय, संधि और समास के आधार पर रूपान्तरण
3. संज्ञा क्रिया, विशेषण, सर्वनाम, का रूपान्तरण
4. हिन्दी वाक्य रचना : पदक्रम एवं अध्याहार

इकाई चार - भाषा एवं संस्कृति सर्वेक्षण

(12 Hours)

1. सर्वेक्षण का स्वरूप, प्रविधि एवं प्रक्रिया (सैद्धांतिक पक्ष – 4 lect)
2. दस घंटे की रिपोर्ट (व्यावहारिक पक्ष 8 lect)

Note - भाषा और संस्कृति से संबंधित विषय पर किसी स्थान विशेष का शब्दों में 5000 सर्वेक्षण रिपोर्ट प्रस्तुत करना होगा।

प्रश्नपत्र का प्रारूप

1. आंतरिक मूल्यांकन – पूर्णांक 40

- आंतरिक मूल्यांकन के अंतर्गत विद्यार्थी भाषा एवं संस्कृति से संबंधित विषय पर किसी स्थान विशेष का 5000 शब्दों का सर्वेक्षण रिपोर्ट तैयार करेंगे।

2. सत्रांत परीक्षा – पूर्णांक 60 (समय 3 घंटे)

- पहला दीर्घोत्तरी प्रश्न (कोई -1) 12
- दूसरा दीर्घोत्तरी प्रश्न (कोई -1) 12
- तीसरा दीर्घोत्तरी प्रश्न (कोई -1) 12
- चौथा दीर्घोत्तरी प्रश्न (कोई -1) 12
- पाँचवाँ प्रश्नटिप्पणियाँ - (पाँच में से किन्हीं तीन पर) 12

संदर्भ ग्रंथ

1. मानक हिन्दी के शुद्ध प्रयोग, रमेशचंद्र महरोत्रा, राधाकृष्ण प्रकाशन, नयी दिल्ली, 2019
2. भोलानाथ तिवारी, 'भाषा विज्ञान', इलाहाबाद, किताब महल, 1951
3. कामता प्रसाद गुरू, 'हिन्दी व्याकरण', नागपुर, मराठी प्रकाशन-हिन्दी, 2009
4. डॉ, विजय लक्ष्मण वर्धे, 'हिन्दी व्याकरण', कोल्हापुर, फडके बुकसेलर्स, 1992
5. डॉ, रामप्रकाश, 'मानक हिन्दी: स्वरूप एवं संरचना', नयी दिल्ली, राधाकृष्ण प्रकाशन, 1991
6. डॉ, नरेश मिश्र, 'भाषा और भाषा विज्ञान', दिल्ली, निर्मल पब्लिकेशन्स, 2001
7. डॉ, ब्रजकिशोर प्रसाद सिंह, 'हिन्दी व्याकरण', नयी दिल्ली, नमन प्रकाशन, 2009
8. देवनागरी लिपि तथा हिन्दी वर्तनी का मानकीकरण, केंद्रीय हिन्दी निदेशालय, भारत सरकार, 1989

Course Title: आधुनिक गद्य (नाटक, उपन्यास, निबंध, कहानी)

Course Code: PGM-HIN-C-8

Marks: 100

Credits: 04 (48 Lectures)

Course Objective:

विद्यार्थियों को उपन्यास, कहानी, नाटक एवं निबंध की जानकारी देना। साथ ही उन्हें प्रत्येक विधा की एक – एक रचना से परिचित कराना। इन विधाओं में साहित्यकार किन प्रश्नों को उठाता है उससे विद्यार्थियों को अवगत कराना।

Learning Outcome:

- 1) गद्य की प्रतिनिधि विधाओं से परिचित होंगे।
- 2) विद्यार्थियों को रचनाओं के माध्यम से समाज की विभिन्न स्थितियों का ज्ञान होगा तथा उनमें संवेदनशीलता विकसित होगी।
- 3) व्यावहारिक दृष्टि विकसित होगी।

4) विद्यार्थी सृजन की दिशा में प्रेरित होंगे।

Syllabus:

इकाई एक - नाटक – माधवी, भीष्म साहनी (12 Hours)

इकाई दो - उपन्यास – धरती धन न अपना, जगदीशचंद्र (12 Hours)

इकाई तीन - चिन्तामणि भाग-1 (निर्धारित पाँच निबंध: श्रद्धा-भक्ति, लोभ और प्रीति, क्रोध, कविता क्या है), आचार्य रामचंद्र शुक्ल। (12 Hours)

इकाई चार –कहानी– अस्मितामूलक विमर्श केंद्रित कहानियाँ (12 Hours)

1. अपना गाँव - मोहनदास नैमिषराय।
2. हरी बिंदी - मृदुला गर्ग।
3. रात बाकी - रणेन्द्र।
4. जीना तो पड़ेगा- अब्दुल बिस्मिल्लाह।

प्रश्नपत्र का प्रारूप

1. आंतरिक मूल्यांकन – पूर्णांक 40
 - आंतरिक मूल्यांकन के अंतर्गत बीस-बीस अंकों की तीन परीक्षाएँ ली जाएँगी जिनमें से श्रेष्ठ दो को परीक्षा परिणाम में शामिल किया जाएगा।
 - तीनों परीक्षाओं के नाम हैं – प्रस्तुतीकरण, बहुविकल्पीय प्रश्न, प्रकल्प।
2. सत्रांत परीक्षा – पूर्णांक 60 (समय 3 घंटे)
 - पहला प्रश्न संदर्भ सहित व्याख्या (4 में से कोई दो) 12
 - दूसरा दीर्घोत्तरी प्रश्न (कोई -1) 12
 - तीसरा दीर्घोत्तरी प्रश्न (कोई -1) 12
 - चौथा दीर्घोत्तरी प्रश्न (कोई -1) 12
 - पाँचवाँ प्रश्न टिप्पणियाँ (चार में से किन्हीं दो पर) 12

संदर्भ ग्रंथ

1. आचार्य रामचंद्र शुक्ल, 'हिन्दी साहित्य का इतिहास', लोकभारती प्रकाशन इलाहाबाद, 2009
2. डॉबच्चन सिंह, 'हिन्दी साहित्य का दूसरा इतिहास', राधाकृष्ण प्रकाशन, नई दिल्ली, 2004
3. डॉइन्द्रनाथ मदान, 'आधुनिकता और हिन्दी उपन्यास', राजकमल प्रकाशन दिल्ली, 1973
4. डॉगोपाल राय, 'हिन्दी उपन्यास का इतिहास', राजकमल प्रकाशन दिल्ली, 2010
5. डॉविभुराम मिश्र, 'प्रतिनिधि हिन्दी निबंधकार', अभिनव भारती प्रकाशन इलाहाबाद, 1975
6. डॉपुष्पाल सिंह, 'समकालीन कहानी - युगबोध का संदर्भ', नेशनल पब्लिशिंग हाउस, नई दिल्ली, 1986
7. डॉसुरेंद्र चौधरी, 'हिन्दी कहानी - प्रक्रिया और पाठ', राधाकृष्ण प्रकाशन नई दिल्ली, 1995

Course Title: मीडिया लेखन
Course Code: PGM-HIN-C-13
Marks: 100
Credits: 04 (48 lectures)

Course Objective:

विद्यार्थियों को मीडिया लेखन की जानकारी देना, दूरदर्शन, रेडियो, जिसमें समाचार पत्र लेखन इंटरनेट आदि प्रमुख हैं। इस पाठ्यक्रम से विद्यार्थियों को साहित्य के अलावा प्रयोजनमूलक हिन्दी से जोड़ना और उन्हें रोजगार हेतु प्रवृत्त करना।

Learning Outcome:

- 1) विद्यार्थियों को मीडिया लेखन के सैद्धान्तिक एवं व्यावहारिक पक्ष का ज्ञान होगा।
- 2) रेडियो के विविध कौशल की ओर प्रवृत्त होंगे।
- 3) विद्यार्थियों को टेलीविज़न समाचार या धारावाहिक लेखन संबंधी व्यावहारिक अनुभव होगा।
- 4) रोजगार की दृष्टि से सिनेमालेखन से परिचित होंगे।-
- 5) इलेक्ट्रॉनिक मीडिया में रोजगार का मार्ग प्रशस्त होगा।

Syllabus:

इकाई एक - समाचार पत्र लेखन (समाचार लेखन, संपादकीय, विज्ञापन लेखन, फीचर लेखन)	(12 Hours)
इकाई दो - रेडियो लेखन (रेडियो समाचार, रेडियो नाटक, रेडियो विज्ञापन, रेडियो वार्ता)	(12 Hours)
इकाई तीन - टेलिविज़न लेखन (समाचार, धारावाहिक, रूपक, विज्ञापन, वृत्तचित्र)	(12 Hours)
इकाई चार - सिनेमा लेखन (पथकथा लेखन, संवाद लेखन, साहित्यिक कृतियों का फिल्मांकन)	(12 Hours)

प्रश्नपत्र का प्रारूप

1. आंतरिक मूल्यांकन – पूर्णांक 40
 - आंतरिक मूल्यांकन के अंतर्गत बीस-बीस अंकों की तीन परीक्षाएँ ली जाएँगी जिनमें से श्रेष्ठ दो को परीक्षा परिणाम में शामिल किया जाएगा।
 - तीनों परीक्षाओं के नाम हैं – प्रस्तुतीकरण, बहुविकल्पीय प्रश्न, प्रकल्प।
2. सत्रांत परीक्षा – पूर्णांक 60 (समय 3 घंटे)
 - पहला दीर्घोत्तरी प्रश्न (कोई -1) 12
 - दूसरा दीर्घोत्तरी प्रश्न (कोई -1) 12
 - तीसरा दीर्घोत्तरी प्रश्न (कोई -1) 12
 - चौथा दीर्घोत्तरी प्रश्न (कोई -1) 12
 - पाँचवाँ प्रश्नटिप्पणियाँ- (पाँच में से किन्हीं तीन पर) 12

संदर्भ ग्रंथ

1. विनोद गोदरे, *प्रयोजनमूलक हिन्दी*, वाणी प्रकाशन, नयी दिल्ली, 2007
2. डॉ. सी. जे. प्रसन्नकुमारी, *राजभाषा हिन्दी के विविध आयाम*, अमन प्रकाशन, कानपुर, 2009
3. डॉ. योगेन्द्र प्रताप सिंह, *मीडिया और साहित्य*, अमन प्रकाशन, कानपुर, 2010
4. डॉ. शांति विश्वनाथन, *मीडिया और साहित्य*, अमन प्रकाशन, कानपुर, 2009
5. सत्यदेव त्रिपाठी, *समकालीन फिल्मों के आइने में समाज*, शिल्पायन प्रकाशन, दिल्ली, 2013
6. डॉ. श्याम कश्यप, *टेलीविजन की कहानी राजकमल प्रकाशन*, नयी दिल्ली, 2008

Course Title: स्त्री विमर्श

Course Code: PGM-HIN-E-14

Marks: 100

Credits: 04 (48 Lectures)

Course Objective:

इस पाठ्यक्रम द्वारा विद्यार्थियों को स्त्री विमर्श की अवधारणा नारीवादी आन्दोलन और नारी लेखन, की भूमिका से अवगत कराना है। साथ ही लेखिकाओं द्वारा लिखित कविता, कहानी, उपन्यास, आत्मकथा से परिचित कराना है।

Learning Outcome:

- 1) नारी आंदोलन एवं उसमें नारी लेखन की भूमिका से अवगत होंगे।
- 2) इसके माध्यम से स्त्रीवादी चेतना का स्वरूप एवं महत्त्व से परिचित होंगे।
- 3) स्त्री की दशा एवं उनके संघर्षमय लेखन से परिचित होंगे।
- 4) परंपरागत साहित्य लेखन एवं महिला लेखन के अंतर को समझेंगे।
- 5) महिला रचनाकारों एवं उनकी रचनाओं से अवगत होंगे।
- 6) महिलाओं की सामाजिक समस्याओं एवं नारी चेतना का ज्ञान होगा।

Syllabus:

इकाई एक - सैद्धांतिक पक्ष

(12 Hours)

1. स्त्री विमर्श की अवधारणा।
2. स्त्री विमर्श की पृष्ठभूमि।
3. नारीवादी आंदोलन भारतीय एवं पाश्चात्य संदर्भ –।
4. हिन्दी में नारी लेखन का स्वरूप और विकास।

इकाई दो –उपन्यास- चाक, मैत्रेयी पुष्पा

(12 Hours)

इकाई तीन – कविता- अनामिका

(12 Hours)

बेजगह, स्त्रियाँ, एक औरत का पहला राजकीय प्रवासतुलसी , घूँघट के पट खोल रे ,हरियाली है ,
आम्रपाली ,बीजगणित ,का झोला। (कुल 8 कविताएँ)

इकाई चार - आत्मकथा प्रभाखेतान – अन्या से अनन्या

(12 Hours)

प्रश्नपत्र का प्रारूप

1. आंतरिक मूल्यांकन – पूर्णांक 40
 - आंतरिक मूल्यांकन के अंतर्गत बीस-बीस अंकों की तीन परीक्षाएँ ली जाएँगी जिनमें से श्रेष्ठ दो को परीक्षा परिणाम में शामिल किया जाएगा।
 - तीनों परीक्षाओं के नाम हैं – प्रस्तुतीकरण, बहुविकल्पीय प्रश्न, प्रकल्प।
2. सत्रांत परीक्षा – पूर्णांक 60 (समय 3 घंटे)
 - पहला प्रश्न संदर्भ सहित व्याख्या (4 में से कोई दो) 12
 - दूसरा दीर्घोत्तरी प्रश्न (कोई -1) 12
 - तीसरा दीर्घोत्तरी प्रश्न (कोई -1) 12
 - चौथा दीर्घोत्तरी प्रश्न (कोई -1) 12

- पाँचवाँ प्रश्न टिप्पणियाँ (चार में से किन्हीं दो पर) 12

संदर्भ ग्रंथ

1. डॉजगदीश्वर चतुर्वेदी ., 'स्त्री विमर्श', अनामिका पब्लिशर्स नई दिल्ली ,,2000
2. सुमन राजे, 'हिन्दी साहित्य का आधा इतिहास', भारतीय ज्ञानपीठ नई दिल्ली ,,2004
3. राधा कुमार, 'स्त्री संघर्ष का इतिहास', वाणी प्रकाशन ,नई दिल्ली ,2002
4. प्रभा खेतान, 'उपनिवेश में स्त्री', राजकमल प्रकाशन ,नई दिल्ली ,2003
5. ममता जैतलीश्री प्रकाश शर्मा ,, 'आधी आबादी का संघर्ष' नई दिल्ली ,राजकमल प्रकाशन ,,2006
6. क्षमा शर्मा, 'स्त्रीत्ववादी विमर्श समाज और साहित्य -' नई दिल्ली ,राजकमल प्रकाशन ,,2008

Course Title: गद्य की अन्य विधाएँ

Course Code: PGM-HIN-E-15

Marks: 100

Credits: 04 (48 Lectures)

Course Objective:

इस पाठ्यक्रम में गद्य की मुख्य विधाओं के अतिरिक्त अन्य विधाओं को पाठ्यक्रम में रखा गया है। इन विधाओं में आत्मकथा, डायरी, यात्रा वृत्तांत और जीवनी प्रमुख हैं। इन सभी की विद्यार्थियों को जानकारी देना।

Learning Outcome:

- 1) विद्यार्थी कथेतर अन्य विधाओं से परिचित होंगे।
- 2) संस्मरण और यात्रावृत्तांत लेखन के मूलभूत अंतर की जानकारी प्राप्त करेंगे।-
- 3) आत्मकथा एवं जीवनी विधाओं का अंतर एवं उनके विकास क्रम-को समझेंगे।
- 4) अन्य विधाओं के अद्यतन साहित्य से जुड़ सकेंगे।

5) विद्यार्थियों में सृजनात्मक प्रतिभा का विकास होगा।

Syllabus:

इकाई एक –आत्मकथा:

(12 Hours)

क्या भुलूँ क्या याद करूँ हरिवंशराय बच्चन –।

इकाई दो - डायरी:

(12 Hours)

एक साहित्यिक की डायरी- मुक्तिबोध।

इकाई तीन – यात्रावृत्तांत:

(12 Hours)

मेरी तिब्बत यात्रा- राहुल सांकृत्यायन।

इकाई चार –जीवनी:

(12 Hours)

प्रेमचंद घर में - शिवरानी देवी।

प्रश्नपत्र का प्रारूप

1. आंतरिक मूल्यांकन – पूर्णांक 40
 - आंतरिक मूल्यांकन के अंतर्गत बीस-बीस अंकों की तीन परीक्षाएँ ली जाएँगी जिनमें से श्रेष्ठ दो को परीक्षा परिणाम में शामिल किया जाएगा।
 - तीनों परीक्षाओं के नाम हैं – प्रस्तुतीकरण, बहुविकल्पीय प्रश्न, प्रकल्प।
2. सत्रांत परीक्षा – पूर्णांक 60 (समय 3 घंटे)
 - पहला प्रश्न संदर्भ सहित व्याख्या (4 में से कोई दो) 12
 - दूसरा दीर्घोत्तरी प्रश्न (कोई -1) 12
 - तीसरा दीर्घोत्तरी प्रश्न (कोई -1) 12
 - चौथा दीर्घोत्तरी प्रश्न (कोई -1) 12
 - पाँचवाँ प्रश्न टिप्पणियाँ (चार में से किन्हीं दो पर) 12

संदर्भ ग्रंथ

1. हिंदी आत्मकथा साहित्य का अनुशीलनडॉ० हरिवंशराय बच्चन के विशेष संदर्भ में, डॉ० विजया, शब्द सृष्टि प्रकाशन, नई मुंबई, 2008
2. महामानव महापंडितराहुल सांकृत्यायन ; कमला सांकृत्यायन, नयी दिल्ली,
3. मुक्तिबोध की समीक्षाई, अशोक चक्रधर, राधाकृष्ण प्रकाशन, नयी दिल्ली, 2003
4. डॉ० ब्रिजपाल सिंह गहलोत . 'मुक्तिबोध के काव्य में युग चेतना' ,कानपुर ,विद्या प्रकाशन ,2016
5. प्रेमचंद की आत्मकथा, मदन गोपाल, प्रभात प्रकाशन, नयी दिल्ली, 2002

6. कलम का मजदूर, मदन गोपाल, राजकमल प्रकाशन, नयी दिल्ली,2006
7. प्रेमचंद और उनका युग, डॉ० रामविलास शर्मा, राजकमल प्रकाशन, नयी दिल्ली,2008
8. राहुल सांकृत्यायन : 'धुमकड़ शास्त्र' और यात्रावृत्त, डॉ० जानकी पाण्डेय, ज्ञान भारती प्रकाशन, नयी दिल्ली,2001

Course Title: शोध प्रविधि

Course Code: PGM-HIN-E-16

Marks: 100

Credits: 04 (48 Lectures)

Course Objective:

विद्यार्थियों को शोध प्रक्रिया से परिचित कराना। शोध के समय क्याक्या समस्याएँ आती हैं उनकी - जानकारी देना। शोध की रूपरेखा तैयार कराना। शोध कार्य के विभिन्न क्षेत्रों से उन्हें अवगत कराना। साथ ही आज हिन्दी में शोध की क्या स्थिति है उसके बारे में बताना।

Learning Outcome:

- 1) विद्यार्थी शोध की पूरी प्रक्रिया से अवगत होंगे।
- 2) शोध के दौरान आने वाली समस्याओं के प्रति जागरूक होंगे।
- 3) शोध के सैद्धान्तिक एवं व्यावहारिक पक्षों का ज्ञान होगा।
- 4) विद्यार्थी भविष्य में शोध कार्य में प्रवृत्त होंगे।

Syllabus:

इकाई एक—1.शोध का स्वरूप एवं महत्व **(12 Hours)**

2.शोध और आलोचना

3.शोध छात्रों की योग्यता

4.शोध एवं साहित्य

5.शोध के प्रकार (वर्णनात्मक, ऐतिहासिक, तुलनात्मक, साहित्यिक एवं साहित्येतर शोध)

इकाई दो - शोध पद्धति एवं प्रक्रिया

(12 Hours)

शोध पद्धति – मनोवैज्ञानिक, समाजशास्त्रीय, भाषा वैज्ञानिक, और तुलनात्मक पद्धति

शोध प्रक्रिया – शोध की समस्या, शोध विषय का चयन, सामग्री संकलन एवं स्रोत (प्रकाशित-अप्रकाशित सामग्री, पुस्तकालय, संदर्भ ग्रंथ, पाण्डुलिपियों का संकलन और उपयोग, साक्षात्कार, प्रश्नावली)

इकाई तीन - शोध कार्य विभाजन एवं - कम्प्यूटर अनुप्रयोग

(12 Hours)

(शोध की समस्या, शोध की रूप रेखा, प्रस्तवना, अध्याय विभाजन, शोध शीर्षक, मुक्या भाग, विवेचन, विश्लेषण, उपसंहार, संदर्भ- सूची, पाद टिप्पणी, परिशिष्ट, टंकण लेखन, वर्तनी सुधार)

इकाई चार - लघु शोध प्रकल्प लेखन

(12 Hours)

(अधिकतम 10000 शब्दों का लघु शोध प्रकल्प)

प्रश्नपत्र का प्रारूप

1. आंतरिक मूल्यांकन – पूर्णांक 40

- आंतरिक मूल्यांकन के अंतर्गत विद्यार्थी अधिकतम 10000 हजार शब्दों का लघु शोध प्रकल्प तैयार करेंगे।

2. सत्रांत परीक्षा – पूर्णांक 60 (समय 3 घंटे)

- पहला दीर्घोत्तरी प्रश्न (कोई -1) 12
- दूसरा दीर्घोत्तरी प्रश्न (कोई -1) 12
- तीसरा दीर्घोत्तरी प्रश्न (कोई -1) 12
- चौथा दीर्घोत्तरी प्रश्न (कोई -1) 12
- पाँचवाँ प्रश्न टिप्पणियाँ (पाँच में से किन्हीं तीन पर) 12

संदर्भ ग्रंथ

1. डॉ. रावत खंडेलवाल, 'शोधप्रविधि और प्रक्रिया -', जवाहर पुस्तकालय मथुरा, 1976
2. डॉ. रावत खंडेलवाल, 'शोध तत्व और दृष्टि', जवाहर पुस्तकालय मथुरा, 1976
3. डॉ. राजेन्द्र मिश्र ., 'अनुसंधान की प्रविधि और प्रक्रिया', तक्षशिला प्रकाशन नई दिल्ली, 2012
4. डॉ. विजयपाल सिंह ., 'हिन्दी अनुसंधान', लोकभारती प्रकाशन इलाहाबाद, 2007
5. डॉ. मधुकर पाडवी, 'साहित्य चिंतन: समीक्षा एवं शोध', अमन प्रकाशन कानपुर, 2010
6. डॉ. विनयमोहन शर्मा, 'शोध प्रविधि', नेशनल पब्लिसिंग हाउस, दिल्ली, 2008



Parvatibai Chowgule College of Arts and Science
(Autonomous)

Accredited by NAAC with Grade 'A+'
Best Affiliated College-Goa University Silver Jubilee Year Award



**POST GRADUATE DIPLOMA PROGRAMME IN
CLINICAL GENETICS AND MEDICAL
LABORATORY TECHNIQUES
(PGDCG&MLT)**

2022-2023

COURSE SYLLABUS: SEMESTER I

(03 Core + 1 Elective course)

Semester I:

Core courses:

1. Clinical Genetic Techniques I
2. Clinical Biochemistry I
3. Clinical Microbiology (General and Systemic)

Elective courses (Any one)

1. Clinical Pathology and Histopathology
2. SWAYAM course: Analytical Techniques
3. SWAYAM course: Essentials Of Biomolecules: Nucleic Acids And Peptides

CORE COURSE: CLINICAL GENETICS- I	
COURSE CODE:	PGD-CGMLT-C1
MARKS:	100 [50 – Theory : 50 – Practical]
CREDITS:	04 [02 – Theory : 02 – Practical]
CONTACT HOURS	THEORY :30 HOURS (02 LEC/WEEK) PRACTICALS :60 HOURS (02 PRACTICAL / WEEK)
COURSE OBJECTIVES:	<ul style="list-style-type: none"> • Acquaint students with recent genetic techniques • Know about the structure and function of genetic material • Learn about structural and numerical abnormalities their inheritance pattern and pedigree analyses.
COURSE OUTCOME	<p>On completion of the course the student should be able to:</p> <p>CO 1: Understand the functions of the genetic material. CO 2: Correlate genetic mutations to diseases in human population. CO 3: Perform Karyotyping using software. CO 4: Construct and analyse human pedigrees.</p>

PGD-CGMLT-C1:CLINICAL GENETICS I		
MODULE	TOPICS	CONTACT HOURS
Module 1: Introduction to Human Genetics	<ul style="list-style-type: none"> • Growth of human genetics; levels of genetics. • Structure and composition of the human chromosome: basic structure of DNA; molecular structure and organisation. • Classification of Human chromosomes: Paris nomenclature / ISCN; methods of studying chromosomes; identification of individual chromosomes; Flow Karyotyping (Quantification on DNA of individual chromosomes); FACS – Fluorescence activated cell sorter. 	10
Module 2: Chromosomal Abnormalities	<ul style="list-style-type: none"> • Numerical abnormalities (somes; ploidies; mosaic; chimera; syndromes.) • Structural: Translocations; Deletions; Duplications; Inversion; isochromosomes; Ring chromosomes; causes for genetic abnormalities-meiotic and mitotic nondisjunction; uniparental disomy; mutations; single gene disorders. 	10
Module 3: Pattern Of Inheritance	<ul style="list-style-type: none"> • Autosomal Dominant, Autosomal Recessive, X-linked Dominant, X-linked Recessive, Y-linked, sexlimited inheritance, sex influenced inheritance, X inactivation, Multifactorial inheritance, mitochondrial inheritance, imprinting 	10

PRACTICAL COMPONENT OF PGD-CGMLT-C1: CLINICAL GENETICS I
[DURATION - 04HRS/WEEK]

Practical	No. of Practicals
Lab Based Practical works: <ol style="list-style-type: none"> 1. Specimen procurement and logging for cytogenetic procedure. (01 practical) 2. Sterilization of requirements required for culture media preparation. (01 Practical) 3. Culture media preparation & sterilization by filtration method. (01 Practical) 4. Identification of Chromosomes. (02 Practicals) 5. Inoculation of Lymphocyte culture/peripheral blood culture. (01 practical) 6. Harvesting of Lymphocyte culture to obtain metaphase plates. (02 Practicals) 7. Chromosomal banding technique: GTG Banding. (02 Practicals) 8. Karyotyping of Human chromosomes: (03 practical) <ul style="list-style-type: none"> - use of Cytovision / any other Karyotyping software - Microphotography - Image capturing, image processing, and analysis 9. Study of Karyotypes: Normal male and female(2 practical) 	15
Activity Based Practical Works: <ol style="list-style-type: none"> 1. Application of banding techniques in detection of human disorders. (02 Practical). 2. Application of different types of Medias used for genetic analysis. (02 Practicals). 3. Construction of Pedigree(02 Practicals). 4. Analysis of pedigree charts to determine the mode of inheritance(03 practicals). 5. Case Studies: Pedigree analysis (06 Practicals) <ul style="list-style-type: none"> - Haemophilia, - Color blindness, - Duchenne Muscular Dystrophy (DMD), - Achondroplasia - PKU. - Cystic Fibrosis 	15

REFERENCE BOOKS:

1. Jorde L, Carey J and Bamshad M (2016). *Medical Genetics. Fifth edition. Elsevier Publication imprint. eBook ISBN: 9780323391979.*
2. Singh BD (2014): *Fundamentals of Genetics. Second Edition, Kalyani Publishers, New Delhi.*
3. Matheiesen A and Roy K (2018). *Foundation of Perinatal Genetic counseling. eISBN: 9780190681111*
4. Gardner EJ, Simmons MJ and Snustad DP (2013): *Principles of Genetics, Eighth Edition, John Wiley Publication, Singapore*
5. De Robertis EDP, De Robertis EMF (2012): *Cell and Molecular Biology, Eighth Edition. Wolter Kluwer Publication, Philadelphia.*
6. Thompson JS, Thompson MW (1966): *Thompson & Thompson Genetics in Medicine, Elsevier Publication, Philadelphia.*

REFERENCE BOOKS FOR PRACTICALS:

7. Arumuga N, Meyyan RP (2016): *Advances in Genetics Volume 1 (Dr. N. Arumugam, R P Meyyan, Saras Publication, Nagercoil, Tamil Nadu.*
8. Gardner A and Davies T (2010) *Human Genetics 2nd Edition, Viva books publication, Delhi.*

CORE COURSE: CLINICAL BIOCHEMISTRY I

COURSE CODE:	PGD-CGMLT-C2
MARKS:	100 [50 – Theory : 50 – Practical]
CREDITS:	04 [02 – Theory : 02 – Practical]
CONTACT HOURS	THEORY :30 HOURS (02 LEC/WEEK) PRACTICALS :60 HOURS (02 PRACTICALS / WEEK)
COURSE OBJECTIVES:	<ul style="list-style-type: none"> • Understanding concepts of human cell organization for further study of its role in metabolic functions • Study of chemistry of various body enzymes, vitamins, minerals, carbohydrates, proteins and lipid for further estimation of the same from blood and body fluid samples such as urine etc.
COURSE OUTCOME	<p>On completion of the course the student should be able to:</p> <p>CO 1: Explain the chemical organization of cells</p> <p>CO2: Compare and contrast the chemistry of biomolecules.</p> <p>CO 3: Perform quantitative and qualitative tests for biomolecules.</p> <p>CO4: Estimate enzymes and minerals from serum.</p>

PGD-CGMLT-C2:CLINICAL BIOCHEMISTRY I

MODULE	TOPICS	CONTACT HOURS
Module 1: The scope of biochemistry	<ul style="list-style-type: none"> • Chemical organization of the cell. • Organic and inorganic components of the cell. • Marker enzymes of the cell. • Hydrogen ion concentration and buffers: pH • Blood buffers, regulation of blood pH. • Acid base metabolism. 	10
Module 2: Carbohydrate, Proties, Lipid (Chemistry)	<ul style="list-style-type: none"> • Carbohydrate chemistry. • Protein chemistry. • Lipid chemistry. 	10
Module 3: Enzymes, Vitamins and Minerals)	<ul style="list-style-type: none"> • Enzymes: Definition, classification, factors affecting enzyme action. • Enzyme inhibition, • Isoenzymes, • Regulation of enzyme activity. • Vitamins. • Minerals. 	10

PRACTICAL COMPONENT OF PGD-CGMLT-C2: CLINICAL BIOCHEMISTRY I
[DURATION - 04 HRS/WEEK]

Practical	No. of Practicals
Lab Based Practical works: <ol style="list-style-type: none"> 1. Estimation of pH. Use of pH meter. 2. Estimation of haemoglobin by 'cyanmethhaemoglobin' 3. Qualitative and quantitative Carbohydrate chemistry(02 Practicals) 4. Qualitative and quantitative Protein chemistry (02 Practicals) 5. Qualitative and quantitative Lipid chemistry(02 Practicals) 6. Estimation of chloride in serum (02 Practicals) 7. Estimation of serum calcium (02 Practicals) 8. Estimation of serum inorganic phosphorus. 	15
Activity Based Practical Works: <ol style="list-style-type: none"> 1. Estimation of serum Na⁺/ K⁺ ions by Flame photometer-Demonstration 2. Separation of amino acid and its identification by paper chromatography -Demonstration. 3. Case studies: <ul style="list-style-type: none"> - Diabetes - Atherosclerosis - Cardiac arrest - Calcium deficiency - Salts in normal functioning of the body 	15

REFERENCE BOOKS:

1. Lieberman MA and Ricer R(2019). BRS Biochemistry, Molecular Biology, and Genetics. WolterKulver Publication.
2. Nelson DL and Cox MM(2019). Lehninger Principles of Biochemistry, Seventh edition. Wiki publications.
3. Panini RS(2013). Medical biochemistry – an illustrated review. Thieme Medical Publishers, New York.
4. Vasudevan DM(1995): Textbook of Biochemistry for medical student's first edition: Jaypee Brothers Medical Publishers Pvt Ltd, New Delhi.
5. Vasudev DM(2013): Textbook of Biochemistry for medical student's seventh edition Jaypee Medical Publishers Pvt Ltd, New Delhi.
6. Sood R (1999) fifth edition: Medical Laboratory Technology, Jaypee Brothers Medical Publishers Pvt Ltd, New Delhi.
7. SoodR(1985) first edition: Medical Laboratory Technology, Jaypee Brothers Medical Publishers Pvt Ltd, New Delhi.

REFERENCE BOOKS FOR PRACTICALS:

8. Mukherjee KL (1988) Volume II: Medical Laboratory Technology, Tata McGraw-Hill Publishing Company Ltd. New Delhi.
9. KamatG(2011). Practical manual of Hematology. Jaypee Brothers Medical Publishers Pvt Ltd, New Delhi.

CORE COURSE: CLINICAL MICROBIOLOGY (GENERAL AND SYSTEMATIC)

COURSE CODE:	PGD-CGMLT-C3
MARKS:	100 [50 – Theory : 50 – Practical]
CREDITS:	04 [02 – Theory : 02 – Practical]
CONTACT HOURS	THEORY :30 HOURS (02 LEC/WEEK) PRACTICALS :60 HOURS (02PRACTICALS / WEEK)
COURSE OBJECTIVES:	<ul style="list-style-type: none"> • Hands on training on preparation of culture medias for isolation of bacterias from blood or body fluid samples provided. • To be aware of diagnostic features of bacteria for reporting the correct results observed after analyses using definite proceddures • Learning about the advanced techniques used in recent time to obtain better and faster results to provide immediate treatment.
COURSE OUTCOME	<p>On completion of the course the student should be able to:</p> <p>CO 1: Explain the basis of bacterial culture and identification.</p> <p>CO2: Correlate the microbial techniques with clinical conditions in humans.</p> <p>CO 3: Perform various staining techniques and tests for microbial analysis</p> <p>CO4: Process body samples to detect pathogenic bacteria.</p>

PGD-CGMLT-C3: CLINICAL MICROBIOLOGY (GENERAL AND SYSTEMATIC)		
MODULE	TOPICS	CONTACT HOURS
Module 1: Introduction to microbiology	<ul style="list-style-type: none"> • Historical prospective, principle of microbiology, microscopes (types and uses) • Bacteria: Classification, anatomy, reproduction, growth and nutrition. • Sterilization: - methods employed, both physical and chemical. • Media used in Microbiology: - Classification, types, constituents, methods of preparation, adjustment of pH, sterilization. 	10
Module 2: Serology	<ul style="list-style-type: none"> • Serology: Antigen, antibody, antigen-antibody reaction. • Newer methods of diagnosis: PCR, Bactec, Flow cytometry. 	10
Module 3: Systemic (Individual Bacteria)	<ul style="list-style-type: none"> • Systemic (Individual Bacteria): Diagnosis features (morphology, cultured characters, biochemical reaction,, antigenic characters, pathogenicity and laboratory diagnosis) of Staphylococcus, Streptococcus, Pneumococcus, Neisseria, Corynebacteria, Clostridia, Escherichia coli, Klebsiella species, Salmonella, Shigella, Proteus, Pseudomonas, Mycobacterium tuberculosis, Treponema pallidum. 	10

**PRACTICAL COMPONENT OF PGD-CGMLT-C3:CLINICAL MICROBIOLOGY
(General and Systematic)
[DURATION – 04 HRS/WEEK]**

Practical	No. of Practicals
<p>Lab Based Practical works:</p> <ol style="list-style-type: none"> 1. Preparation of smears for staining and fixation from samples and culture media (both liquid and solid media). 2. Care and use of microscopes (including Fluorescent microscope). 3. Staining techniques: (Gram staining, zeihl nelson, Fluorescent method): preparation of satins, procedure, reporting of smears, principle involved (02 Practicals). 4. Equipments used in sterilization: Description (structure), working principle involved, articles sterilized, advantages and disadvantages. 5. Widal, VDRL, RPR. 6. Culture media: types, constituents of each media, method of preparation, adjustment of pH, sterilization, uses. (02 Practicals). 7. Culture techniques: different methods of inoculation from clinical samples and bacterial growth from media. (02 Practicals). 8. Preparation of wet mount and motility of organisms. 9. Sputum examination: Physical examination, wet preparation, smear examination, concentration techniques for mycobacteria. 	15
<p>Activity Based Practical Works:</p> <ol style="list-style-type: none"> 1. Systemic bacteriology: Practical demonstration of diagnostic features of <ol style="list-style-type: none"> i. Gram positive organisms. ii. Gram negative organisms. iii. Anaerobes, spirochetes. iv. Mycobacteria. 2. Case studies <ol style="list-style-type: none"> i. Meningitis ii. Gonorrhoea iii. Tetanus iv. Botulinum v. Tuberculosis vi. UTI vii. Food poisoning viii. Pneumonia 	15

REFERENCE BOOKS:

1. Wilson J(2000). *Clinical Microbiology. Eighth edition, Elsevier Publication. Baillière Tindall imprint.*
2. Willey JL(2017). *Prescott's Microbiology. 10 edition. McGraw-Hill Education / Europe, Middle East & Africa;*
3. Firkin F (1958) *Clinical Haematology: Blackwell publishings, Wiley India*
4. Ramnik Sood (1985) *first edition: Medical Laboratory Technology, Jaypee Brothers Medical Publishers Pvt Ltd, New Delhi.*
5. Vasudev DM(2013): *Textbook of Biochemistry for medical student's seventh edition Jaypee Brothers Medical Publishers Pvt Ltd, New Delhi.*
6. Sood R(1985) *first edition: Medical Laboratory Technology, Jaypee Brothers Medical Publishers Pvt Ltd, New Delhi.*

REFERENCE BOOKS FOR PRACTICAL:

7. Chakraborty P(1995): *A text book of microbiology, New Central Book Agency Pvt Ltd, Calcutta.*
8. Sood R(1985) *first edition: Medical Laboratory Technology, Jaypee Brothers Medical Publishers Pvt Ltd, New Delhi*

COURSE CODE:	PGD-CGMLT-E1
MARKS:	100 [50 – Theory : 50 – Practical]
CREDITS:	04 [02 – Theory : 02 – Practical]
CONTACT HOURS	THEORY :30 HOURS (02 LEC/WEEK) PRACTICALS :60 HOURS (02 PRACTICALS / WEEK)
COURSE OBJECTIVES:	<ul style="list-style-type: none"> • Learning techniques of collection of samples such as body fluids and tissues for studying cytological aspect. • Hands on training in learning techniques of processing the tissue samples for further analyses and treatment of particular disease.
COURSE OUTCOME	<p>On completion of the course the student should be able to:</p> <p>CO 1: Describe and demonstrate staining techniques for pathological evaluations.</p> <p>CO2: Explain different techniques used for examining body fluids.</p> <p>CO 3: Process tissue and Perform histopathological techniques</p> <p>CO4: Examine body sample for pathological analysis.</p>

PGD-CGMLT-E1: CLINICAL PATHOLOGY AND HISTOPATHOLOGY

MODULE	TOPICS	CONTACT HOURS
Module 1: Histo- pathological techniques	<ul style="list-style-type: none"> • Fixatives and fixation, clearing, embedding, microtome knives, section cutting, errors, decalcification, frozen section, mounting media, automation. • Staining: Theory of staining, dyes and stains, mordants, differentiation, haematoxylin and eosin staining-principles and procedures, special stains P.A.S., Verhoff's, Massons trichrome, Von Giessons, fat stains and other stains. 	10
Module 2: Examination of body fluids	<ul style="list-style-type: none"> • Sample collection, physical and chemical tests, principles and methods, reagent strip method, microscopic examination- crystals, casts, sediments, pregnancy tests. • Stool examination, semen analysis, sputum examination. 	10
Module 3: Cytological techniques	<ul style="list-style-type: none"> • Exfoliative cytology, fixation, pap staining, cytological processing of fluids. Fine needle aspiration cytology (FNAC): procedure, staining of slides, automation, H & E and MGG staining. • Examination of CSF and other body fluids: pleural, peritoneal, synovial fluid. 	10

PRACTICAL COMPONENT OF PGD-CGMLT-E1:CLINICAL PATHOLOGY AND HISTOPATHOLOGY[DURATION - 02 HRS/WEEK]

Practical	No. of Practicals
Lab Based Practical works: <ol style="list-style-type: none"> 1. Histopathological techniques: fixation, dehydration, clearing, impregnation, embedding, decalcification. 2. Microtomes knives and their sharpening, section cutting, errors in section cutting, frozen sectioning, mounting media. 3. Routine staining techniques: routine staining, hematoxylin and eosin (H &E) staining. 4. Grossing and Museum techniques. 5. Examination of urine: Physical and chemical. 6. Examination of urine: multiple reagent strips methods, microscopic. 7. Pregnancy tests. 8. Sputum examination 9. Stool examination 10. Semen analysis. 	15
Activity Based Practical Works: <ol style="list-style-type: none"> 1. Special staining virtual demonstrations (05 Practicals) <ol style="list-style-type: none"> i. P.A.S., Verhoeff's, ii. Massons trichrome, iii. Von Giessons, iv. Fat stains and other stains. 2. C.S.F. examination (02 Practicals) 3. Examination of body cavity fluids: pleural, peritoneal and synovial. (04Practicals) 4. Exfoliative cytology: principles, Papanicolauo staining procedure. (02 Practicals). 5. Fine needle aspiration cytology (F.N.A.C): hematoxylin and eosin (H &E), MGG staining. 	15

REFERENCE BOOKS:

1. KawthalkarSM(2018). *Essential of Clinical Pathology. Second Edition.* Jaypee Medical publishers, New Delhi.
2. Vasudev DM(2013): *Textbook of Biochemistry for medical student's seventh edition* Jaypee Brothers Medical Publishers Pvt Ltd, New Delhi.
3. SoodR(1985) *first edition: Medical Laboratory Technology*, Jaypee Brothers Medical Publishers Pvt Ltd, New Delhi.
4. Chakraborty P(1995): *A text book of microbiology*, New Central Book Agency Pvt Ltd, Calcutta.
5. Dereck AC and Cameron IR(2012). *Histopathology Specimens: Clinical, Pathological and Laboratory Aspects.* Springer publication.

REFERENCE BOOKS FOR PRACTICAL:

6. Mohan H(2017).*Practical pathology.* Jaypee Medical publishers, New Delhi.
7. Mukherjee KL (1988) *Volume II:Medical Laboratory Technology*,Tata McGraw-Hill Publishing Company Ltd. New Delhi.
8. Chatterjee MN (2013): *Textbook of Medical Biochemistry eight edition:* Jaypee Brothers Medical Publishers Pvt Ltd, New Delhi.

ELECTIVE COURSE: ANALYTICAL TECHNIQUES

COURSE CODE:	PGD-CGMLT-E2
MARKS:	Theory : 100
CREDITS:	04
CONTACT HOURS	THEORY : SWAYAM Course (15 Wks)
COURSE OBJECTIVES:	This course deals with various techniques their principles, experimental details etc., including general Laboratory techniques, separation techniques based on hydrodynamic properties, centrifugation (sub-cellular fractionation etc), and Chromatographic, and Electrophoretic techniques , HPLC, Purification methods, ELISA etc. Application in biomedical research and some clinical diagnostic methods RIA, ELISA, PET etc., Molecular diagnostics ,PCR, etc., Microscopic techniques and clinical biochemistry
COURSE OUTCOME	On completion of the course the student should be able to: CO 1: Discuss and explain the cell techniques and their principles. CO2: Explain the cytological techniques used in biomedical research. CO 3: Compare and contrast molecular diagnostic techniques. CO4: Describe Microscopic techniques and clinical biochemistry procedures.

ELECTIVE COURSE: PGD-CGMLT-E2: ANALYTICAL TECHNIQUES

By Dr. MOGANTY R. RAJESWARI | All India Institute of Medical Sciences, New Delhi-110029

The analytical techniques routinely used in Biochemistry take a very important place in Biochemistry, learning them is not just a requirement but, absolutely essential. This is because, the understanding of the subject mainly comes from the strong basis of the experiments and techniques on which the theories are built.

COURSE LAYOUT

- Week 1
Aqueous solutions , Acids, Bases, buffers systems and pH meter, Colorimetry and UV-VIS absorption spectroscopy Introduction to Hydrodynamic Techniques
- Week 2
Centrifugation: Principles & Methodology Density Gradient centrifugation : Rate Zonal and isopycnic Differential centrifugation for Sub-cellular Fractionation
- Week 3
Gel filtration: Principle, Methodology & Applications Planar Chromatography: Principles and Applications
- Week 4
Ion-exchange chromatography, Affinity chromatography
- Week 5
Gas chromatography, HPLC, Protein Estimation Techniques
- Week 6
Electron Microscopy, TEM and SEM Fluorescence Microscopy : Application to live cell imaging
- Week 7
IHC and IF, Flow cytometry: Theory and concept Flow cytometry: Application in

biology and medicine

- Week 8
Light Microscopy and Confocal Microscopy, SDS-PAGE
- Week 9
Western Blotting Techniques, 2D Electrophoresis and DIGE, Principles of Mass spectrometry
- Week 10
Clinical Proteomics Methods to quantify and Integrity check of DNA
- Week 11
Methods to quantify and Integrity check of RNA, PCR and Real Time PCR, Blotting techniques for Nucleic acids
- Week 12
Sequencing techniques of nucleic acids, Introduction to Recombinant DNA Technology
- Week 13
Expression techniques of recombinant proteins using Bacteria and yeast, Expression techniques of recombinant proteins by insects and mammalian cells, Introduction to Genomic Techniques
- Week 14
Techniques for studying Nucleic acid, Protein interactions, ELISA, RIA :Diagnostic applications
- Week 15

CLIA and its Diagnostic application, PET and its Diagnostic applications, Single cell Biology.

REFERENCE BOOKS:

1. Ghosal S and Sharma AA(2018). Fundamentals of Bioanalytical techniques and instrumentation. Second edition. PHI Learning Pvt Ltd. New delhi.
2. Ternynck T and S. Avrameas S(1990). Immunoenzymatic Techniques (Techniques in Immunology) . INSERM publication

ELECTIVE COURSE: ESSENTIALS OF BIOMOLECULES: NUCLEIC ACIDS AND PEPTIDES

COURSE CODE:	PGD-CGMLT-E3
MARKS:	Theory : 100
CREDITS:	04
CONTACT HOURS	SWAYAM Course of 12 weeks
COURSE OBJECTIVES:	To provide essentials of chemistry and biology of two very important classes of biomolecules: nucleic acids (DNA/RNA) and proteins.
COURSE OUTCOME	On completion of the course the student should be able to: CO 1: Explain how structural features are translated into biological functions CO2: Describe the process of DNA replication CO 3: Mechanism of step-wise synthesis of specific sequence of proteins; CO4: Know the application of recent molecular techniques used for disease detection

ELECTIVE COURSES PGD-CGMLT-E3: ESSENTIALS OF BIOMOLECULES: NUCLEIC ACIDS AND PEPTIDES

By Prof. Lal Mohan Kundu | IIT Guwahati

The proposed course aims to provide essentials of chemistry and biology of two very important class of biomolecules: nucleic acids (DNA/RNA) and proteins. The course allows to decipher: how structural features are translated into biological functions; how highly organized and selective chemical reactions are adopted that allows DNA to replicate or dictates step-wise synthesis of specific sequence of proteins; how organic chemistry tools in combination with enzymes were ingeniously applied to determine sequences of DNA and proteins and how chemical modifications could be done to mimic similar biological properties. The course also includes modern techniques, development of biomolecular probes as high-throughput detection of biomolecules, single nucleotide polymorphisms and disease diagnosis. Overall, the course falls within the domain of organic chemistry and chemical biology.

COURSE LAYOUT

Week 1: Introduction, Nucleic acids and proteins

Week 2: Synthesis of nucleobases, nucleotides and oligonucleotides

Week 3: Solid phase synthesis of oligonucleotides

Week 4: DNA replication, Polymerases, DNA sequencing and PCR

Week 5: DNA damage, mutations and cancer

Week 6: DNA to proteins: transcription, translation and genetic code

Week 7: Peptides, sequencing and applications in therapeutics

Week 8: Solution phase and solid phase peptide synthesis

Week 9: Expansion of genetic code: PNA, LNA and molecular probes

Week 10: Modern techniques for biomolecules and disease diagnosis

Week 11: Structures and chemistry of sugars and carbohydrates

Week 12: Carbohydrate based polymers as biomolecular probes and therapeutics; conclusion

BOOKS AND REFERENCES

1. Essentials of Chemical Biology by A. Miller and J. Tanner

2. Biochemistry by Berg, Tymoczko and Stryer
3. Molecular Biology of The Cell by Bruce Alberts, Alexander Johnson, Julian Lewis, Martin Raff, Keith Roberts, and Peter Walter
4. Molecular Biology of The Gene by James D. Watson, Tania A. Baker, Stephen P. Bell, Alexander Gann, Michael Levine, Richard Losic

COURSE SYLLABUS: SEMESTER II (02 Core + 2 Elective course + Internship)

Core courses: 02

1. Clinical Genetic Techniques II
2. Clinical Biochemistry II

Elective courses: Any 02

1. Clinical Parasitology, Mycology and Virology
2. Hematology and Transfusion Medicine
3. SWAYAM course- Biomolecules: Structure, Function In Health And Disease
4. SWAYAM course- Immunology

Internship/hands-on training:

- At Hospital/Clinics.

PRO-CORE OF CLINICAL GENETICS II

MODULE	TOPICS	COURSE Ct HOURS
Module 1: Molecular genetic Diagnosis of Genetic Dermatologic Dis	<ul style="list-style-type: none"> • Molecular genetic techniques used in genetic diagnosis. Cloning techniques - Southern, Northern and Western Blot / RFLP, FISH, DNA sequencing & DNA fingerprinting. • Genetics of Cancer: introduction, characteristics of tumor cells, origin of cancer cells, genes associated with cancer, environmental causes of cancer, tumor genome and tumor diagnosis and treatment. • Dermatology: Inborn errors, classification, clinical course. Dermatology in clinical disorders. Clinical application & its advantages and limitations. 	10
Module 2: Reproductive technology Genetics and Screening	<ul style="list-style-type: none"> • Reproductive technologies: infertility and assisted origin reproductive technologies (ART, in vitro fertilization, IVF, ZIFT, ZMIFT), preimplantation genetic diagnosis. • Genetics of Consanguinity in Human genome protection. For carrier screening and DNA fingerprinting applications. 	10

CORE COURSE: CLINICAL GENETICS II	
COURSE CODE:	PGD-CGMLT-C4
MARKS:	100 [50 – Theory : 50 – Practical]
CREDITS:	04 [02 – Theory : 02 – Practical]
CONTACT HOURS	THEORY :30 HOURS (02 LEC/WEEK) PRACTICALS :60 HOURS (02 PRACTICAL / WEEK)
COURSE OBJECTIVES:	<ul style="list-style-type: none"> • To get acquainted with recent procedures used in artificial reproductive techniques and their acceptance in the society. • Techniques for analysis of samples for success of procedures conducted • Knowledge of recent techniques used for better results and treatment • To learn about genetic counseling and steps to help guide patient for particular medical treatment available.
COURSE OUTCOME	<p>On completion of the course the student should be able to:</p> <p>CO 1: Describe and explain the molecular genetic techniques used in genetic diagnosis and reproductive techniques which can be recommended to overcome infertility.</p> <p>CO2: Demonstrate the application of dermatoglyphic prints in disease detection.</p> <p>CO 3: Perform procedures of DNA isolation, Molecular size determination, and disease detection for inborn errors of metabolism.</p> <p>CO4: Analyze FISH images and DNA fingerprints.</p>

PGD-CGMLT-C4: CLINICAL GENETICS II		
MODULE	TOPICS	CONTACT HOURS
Module 1: Molecular genetic, Genetics of Cancer, Dermatoglyphics	<ul style="list-style-type: none"> • Molecular genetic techniques used in genetic diagnosis: Blotting techniques – Southern, Northern and Western, PCR / RFLP, FISH, DNA sequencing & DNA fingerprinting. • Genetics of Cancer: introduction, characteristics of cancer cells, origin of cancer cells, genes associated with cancer, environmental causes of cancer, human genome data tailor diagnosis and treatment. • Dermatoglyphics: Introduction, classification, Flexion creases. Dermatoglyphics in clinical disorders, Clinical application & its advantages and limitations. 	10
Module 2: Reproductive technologies, Genetics and Society	<ul style="list-style-type: none"> • Reproductive technologies: infertility and subfertility, assisted reproductive technologies (IUI, surrogate motherhood, IVF, GZIT, ZIFT), preimplantation genetic diagnosis. • Genetics and Society : (i) Human genome project : (ii) Forensic science (iii) DNA finger printing application (iv) Gene therapy (v) Eugenics. vi) Stem cell research. 	10

Module 3: Prenatal Diagnosis, Genetic Counselling	<ul style="list-style-type: none"> • Prenatal Diagnosis: Definition: Various procedures - Amniocentesis, Chorionic villus sampling, Ultrasonography and Fetoscopy. • Genetic Counselling (Stage 1: History and Pedigree Construction, Stage 2: Examination, Stage 3: Diagnosis, Stage 4: Counselling; and Stage 5: Follow up). 	10
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PRACTICAL COMPONENT OF PGD-CGMLT-C4: CLINICAL GENETICS II [DURATION - 02 HRS/WEEK]	
Practical	No. of Practicals
Lab Based Practical works: <ol style="list-style-type: none"> 1. Introduction to molecular genetic lab: general rules. (02 Practical) 2. Handling of chemicals, equipment. (02 Practical). 3. Handling biological materials and waste disposal. (01 Practical). 4. Isolation of DNA from human blood. (02 Practical) 5. Determination of molecular size of DNA. (02 Practical) 6. Analysis of DNA fingerprints and FISH images (02 Practical) 7. Dermatoglyphics: Recording of print of fingertips and palm. (01 Practical). 8. Manual DNA sequencing and data analysis. (01 Practical). 9. Disease suspicion by spot tests: Fanconis syndrome, PKU, maple syrup urine disease, Tryptophanuria (02 Practical) 	15
Activity Based Practical Works: <p>Case studies of Genetic disorders:</p> <ul style="list-style-type: none"> - Duplication - Translocation - Deletion <p>Case studies of Prenatal testing for Genetic disorders:</p> <ul style="list-style-type: none"> - Down's syndrome - Edward syndrome - Patau's syndrome - Klinefelter's syndrome - XXX syndrome - Cri-du-chat syndrome 	15

REFERENCE BOOKS:

1. Jorde L, Carey J and Bamshad M (2016). *Medical Genetics. Fifth edition. Elsevier Publication imprint. eBook ISBN: 9780323391979.*
2. Singh BD (2014): *Fundamentals of Genetics. Second Edition, Kalyani Publishers, New Delhi.*
3. Matheiesen A and Roy K (2018). *Foundation of Perinatal Genetic counseling. eISBN: 9780190681111*
4. Gardner EJ, Simmons MJ and Snustad DP (2013): *Principles of Genetics, Eighth Edition, John Wiley Publication, Singapore*
5. De Robertis EDP, De Robertis EMF (2012): *Cell and Molecular Biology, Eighth Edition. Wolter Kluwer Publication, Philadelphia.*
6. Thompson JS, Thompson MW (1966): *Thompson & Thompson Genetics in Medicine, Elsevier Publication, Philadelphia.*

REFERENCE BOOKS FOR PRACTICALS:

7. Arumuga N, Meyyan RP (2016): *Advances in Genetics Volume 1 (Dr. N. Arumugam, R P Meyyan, Saras Publication, Nagercoil, Tamil Nadu.*
8. Gardner A and Davies T (2010) *Human Genetics 2nd Edition, Viva books publication, Delhi.*

CORE COURSE: CLINICAL BIOCHEMISTRY II	
COURSE CODE:	PGD-CGMLT-C5
MARKS:	100 [50 – Theory : 50 – Practical]
CREDITS:	04 [02 – Theory : 02 – Practical]
CONTACT HOURS	THEORY :30 HOURS (02 LEC/WEEK) PRACTICALS :60 HOURS (02 PRACTICAL / WEEK)
COURSE OBJECTIVES:	<ul style="list-style-type: none"> • Testing, observing and analyzing blood function test • Knowledge about the Clinical aspects and use of it during performance of test.
COURSE OUTCOME	<p>On completion of the course the student should be able to:</p> <p>CO 1: Understand and explain clinical significance of metabolism of biomolecules.</p> <p>CO2: Explain the significance of function tests of body systems</p> <p>CO 3: Perform Chemical examination of body fluids.</p> <p>CO4: Conduct Liver, Thyroid and Kidney function tests.</p>

PGD-CGMLT-C5: CLINICAL BIOCHEMISTRY II		
MODULE	TOPICS	CONTACT HOURS
Module 1: Carbohydrate, Protein, Lipid Metabolism	<ul style="list-style-type: none"> • Carbohydrate metabolism: Clinical aspects of Regulation of Blood sugar and Diabetes • Protein metabolism: starvation, and protein energy malnutrition • Lipid metabolism : Clinical aspects of lipid profile, arteriosclerosis. 	10
Module 2: Function Tests 1	<ul style="list-style-type: none"> • Gastric function tests. • Pancreatic function tests. • Cardiac function test 	10
Module 3: Function Tests 2	<ul style="list-style-type: none"> • Liver function tests. • Thyroid function tests. • Kidney function test 	10

REFERENCE BOOKS FOR PRACTICALS:

1. *Aspirin & Co., Young's Medical Laboratory Technology, 10th Edition, Butterworths Publishing Company Ltd, New Delhi.*
2. *Parsons, H., Practical Manual of Biochemistry, 10th Edition, Medical Research Press, New Delhi.*

PRACTICAL COMPONENT OF PGD-CGMLT-C5: CLINICAL BIOCHEMISTRY II
[DURATION – 02 HRS/WEEK]

Practical	No. of Practicals
Lab Based Practical works: <ol style="list-style-type: none"> 1. Chemistry of saliva. (01 Practical) 2. Chemistry of gastric juices (01 Practical) 3. Estimation of glucose in blood. GTT and its interpretation (03 Practical) 4. Normal urine (01 Practical) 5. Full urine report (02 Practicals) 6. Serum lipid profile (02 Practicals) 1. Estimation of bilirubin. (01 Practical) 2. Estimation of serum proteins. (01 Practical) 3. Estimation of blood urea. (01 Practical) 4. Estimation of creatinine in blood. (01 Practical) 5. Estimation of uric acid in blood. (01 Practical) 	15
Activity Based Practical Works: <ol style="list-style-type: none"> 1. Different methods for estimation of glucose. (03 Practicals) 2. virtual demonstration : <ul style="list-style-type: none"> • Clearance tests – (02 Practicals) • Demonstration of liver function test(03 Practicals) • Demonstration of cardiac function (02 Practicals) • Demonstration of kidney function tests. (03 Practicals) • C.S.F. examination. (02 Practicals) 	15

REFERENCE BOOKS:

1. Lieberman MA and Ricer R(2019). *BRS Biochemistry, Molecular Biology, and Genetics.* WolterKulver Publication.
2. Nelson DL and Cox MM(2019). *LehningerPrinciples of Biochemistry, Seventh edition.* Wiki publications.
3. Panini RS(2013). *Medical biochemistry – an illustrated review.* Thieme Medical Publishers, New York.
4. Vasudevan DM(1995): *Textbook of Biochemistry for medical student's first edition: Jaypee Brothers Medical Publishers Pvt Ltd, New Delhi.*
5. Vasudev DM(2013): *Textbook of Biochemistry for medical student's seventh edition Jaypee Medical Publishers Pvt Ltd, New Delhi.*
6. Sood R (1999) *fifth edition: Medical Laboratory Technology, Jaypee Brothers Medical Publishers Pvt Ltd, New Delhi.*
7. Chatterjee MN (2013): *Textbook of Medical Biochemistry eight edition: Jaypee Brothers Medical Publishers Pvt Ltd, New Delhi.*

REFERENCE BOOKS FOR PRACTICALS:

8. Mukherjee KL (1988) *Volume II:Medical Laboratory Technology, Tata McGraw-Hill Publishing Company Ltd. New Delhi.*
9. KamatG(2011). *Practical manual of Hematology. Jaypee Brothers Medical Publishers Pvt Ltd, New Delhi.*

ELECTIVE COURSE: CLINICAL PARASITOLOGY, MYCOLOGY AND VIROLOGY	
COURSE CODE:	PGD-CGMLT-E4
MARKS:	100 [50 – Theory : 50 – Practical]
CREDITS:	04 [02 – Theory : 02 – Practical]
CONTACT HOURS	THEORY :30 HOURS (02 LEC/WEEK) PRACTICALS :60 HOURS (02 PRACTICAL / WEEK)
COURSE OBJECTIVES:	<ul style="list-style-type: none"> • Learning about the parasitological, mycological and virological aspects, their life cycle and understanding clinical aspects about the same for analyses and treatment. • Awareness of virus spread and tests performed for the same for their analyses
COURSE OUTCOME	<p>On completion of the course the student should be able to:</p> <p>CO 1: Describe the pathogenecity and aboratory diagnosis of protozoans, Cestodes and Helminthes.</p> <p>CO2: Know the basis of identification and classification of Fungi and viruses.</p> <p>CO 3: Perform Gross and microscopic observation procedures for detecting endoparasites.</p> <p>CO4:</p>

PGD-CGMLT-E4: CLINICAL PARASITOLOGY, MYCOLOGY AND VIROLOGY		
MODULE	TOPICS	CONTACT HOURS
Module 1: Parasitology	<ul style="list-style-type: none"> • Introduction to parasitology, terminologies, definitions, relationships. • Protozoa: geographic distribution, habitat, morphology, life cycle, pathogenecity, laboratory diagnosis of the following parasites:<i>Entamoeba histolytica, Giardia lamblia, Trichomonas vaginalis, Leishmania donovani, Plasmodium</i> • Cestodes: On the same line as protozoan parasites for the following:<i>Taenia sagenata, Taenia solium, Echinococcus granulosus</i> • Helminths: On the same line as protozoan parasites for the following:<i>Trichuris trichiura, Ankylostoma duodenale, Ascaris lumbricularis, Enterobius vermicularis</i> 	10
Module 2: Mycology	<ul style="list-style-type: none"> • Introduction to mycology including classification • <i>Candida albicans</i> and other candida species • Dermatophytes • <i>Cryptococcus</i> • Oppotunistic fungi (<i>Aspergillus, Pencillium, Mucor</i>) <p><i>NB: Serial no: ii-v will be on the basis of morphology, cultural characters, biochemical (if any), antigens, pathogenecity and laboratory diagnosis.</i></p>	10
Module 3: Virology	<ul style="list-style-type: none"> • General virology: Definations, classification, properties of viruses, viral replication, cultivation, laboratory diagnosis. • Systemic virology: On the basis of structure, cultivation, pathogenicity, Laboratory diagnosis of the following viruses:<i>Bacteriophage; Picomaviruses (Polio viruses); Rhabdoviruses (Rbies virus); Arboviruses(Dengue, Chikungunya, JE); Influenza virus; Hepatitis virus; HIV; Herpes virus</i> 	10

**PRACTICAL COMPONENT OF PGD-CGMLT-E4:CLINICAL PARASITOLOGY,
MYCOLOGY AND VIROLOGY[DURATION – 02 HRS/WEEK]**

Practical	No. of Practicals
<p>Lab Based Practical works:</p> <ol style="list-style-type: none"> 1. Stool examination: gross, microscopic, for adult parasite, segment of Taenia, ova, cysts, and larvae of parasite (02 Practicals) 2. Gross and microscopic features (<i>whenever applicable</i>)of intestinal/vaginal protozoa (02 Practicals). 3. Laboratory diagnosis of malaria: demonstration of whole parasite, parasite antigen, enzymes, serology, (04 Practicals) 4. Gross and microscopic features of cestodes: to include adult worms, segment, larvae, eggs. (02 Practicals) 5. Gross and microscopic features of Helminthes: to include adult worms, eggs, larvae. (03 practicals) 6. Diagnostic features- practical demonstration of gross and microscopic features (wet mount, slide culture) and other tests whenever applicable for following: Candida, Cryptococcus, Dermatophyte, Oppurtunistic fungi. (02 Practicals) 7. Laboratory diagnosis of the following viruses: HIV, Hepatitis. 	15
<p>Activity Based Practical Works:</p> <ol style="list-style-type: none"> 1. General virology: types of symmetry, morphology of virus models, cultivation in embryonated egg. (03 Practicals) 2. Laboratory diagnosis of the following viruses: Poliovirus, Rhabdovirus. (03 Practicals). 3. Bacteriophage—structure using a model. (01 Practical). 4. Case studies: (08 Practicals) <ol style="list-style-type: none"> i. Candida ii. Aspergillosis iii. Dermatophytes iv. Whipworm v. Hookworm vi. Pinworm/Seatworm vii. Roundworm 	15

REFERENCE BOOKS:

1. Procop GW and KonemanEW(2016).Koneman's Color Atlas and Textbook of Diagnostic Microbiology. Seventh Edition. Wolters Kluwer publications.
2. Ward KN, Mc Cartney AC and ThakkerB(2008).Notes on Medical Microbiology: Including Virology, Mycology and Parasitology. Second edition. Churchill livingstone Publishers.
3. Bhushan V, Tao L and Pali V(2005). Microbiology: Virology, Immunology, Parasitology, Mycology. Fourth Edition. "Blackwell Underground Clinical Vignettespublication.
4. Swanson TA, Kim SL and FlominOE(2007).Underground Clinical Vignettes Step 1: Microbiology I: Virology, Immunology, Parasitology, Mycology (Underground Clinical Vignettes Series). Wolters Kluwer publications.

REFERENCE BOOKS FOR PRACTICAL:

5. P.Chakraborty (1995): A text book of microbiology, New Central Book Agency Pvt Ltd, Calcutta.
6. Kanai L. Mukherjee (1988) Volume III:Medical Laboratory Technology,Tata McGraw-Hill Publishing Company Ltd. New Delhi.

ELECTIVE COURSE: HEMATOLOGY AND TRANSFUSION MEDICINE

COURSE CODE:	PGD-CGMLT-E5
MARKS:	100 [50 – Theory : 50 – Practical]
CREDITS:	04 [02 – Theory : 02 – Practical]
CONTACT HOURS	THEORY :30 HOURS (02 LEC/WEEK) PRACTICALS :60 HOURS (01 PRACTICAL / WEEK)
COURSE OBJECTIVES:	<ul style="list-style-type: none">• To get acquainted to blood collection and analyses of blood.• To learn various components of blood• Understanding importance of blood donation and learn grouping systems.
COURSE OUTCOME	On completion of the course the student should be able to: CO 1: Explain the composition of blood and changes in Hemolytic disorders. CO2: Describe the structure and functions of WBCs and explain the tests associated with detection of Hemolytic disorders. CO 3: Perform various hemocytometric procedures. CO4: Perform various hematological tests for disease detection.

PGD-CGMLT-E5: HEMATOLOGY AND TRANSFUSION MEDICINE

MODULE	TOPICS	CONTACT HOURS
Module 1: Hematology – Blood composition and Hemolytic disorders	<ul style="list-style-type: none">• Blood: composition, haemopoiesis, RBC'S- structure function, synthesis: Hemoglobin- structure, function, abnormal haemoglobin, reticulocytes, blood indices, peripheral blood smear, parasites in blood.• Hemolytic disorders: investigations, screening tests, sickling, osmotic fragility, Heinz bodies, G-6-P-D screening, Hb electrophoresis, Hb-F estimation.	10
Module 2: WBCs and Platelets	<ul style="list-style-type: none">• White blood corpuscles: Description, morphology, leucocyte counts, leucopenia, leucocytosis, leukemia, leukemoid reaction, absolute count, differential count, bone marrow iron staining, special stains for leukemias.• Platelet structure and function: Bleeding disorders and investigations, coagulation process and theory, disorders.	10
Module 3: Transfusion medicine	<ul style="list-style-type: none">• Blood groups: ABO and sub groups, antigen and antibodies, Rh blood grouping, other blood group systems, compatibility testing, antihuman globulin test.• Blood transfusion: Selection of blood donors, blood transfusion procedures, Complications of blood transfusion, Blood component therapy, organization and administration of blood bank, blood safety.	10

PRACTICAL COMPONENT OF PGD-CGMLT-E5: HEMATOLOGY AND TRANSFUSION MEDICINE [DURATION – 02 HRS/WEEK]	
Practicals	No. of Practical
<p>Lab Based Practical works:</p> <ol style="list-style-type: none"> 1. Use and care of microscopes, study of improved neubaur chamber (01 Practical). 2. Anticoagulants and blood collection (01 Practical) 3. Haemoglobinometry: Sahli's method, Cyanmethemoglobin method. (01 Practical). 4. Haemocytometry: Erythrocyte count (01 Practical). 5. Haemocytometry: Total WBC count (01 Practical). 6. Blood smear preparations: Staining, differential WBC count (01 Practical). 7. Peripheral bloods smear examination and morphological abnormalities (01 Practical). 8. Reticulocyte count- absolute eosinophil count (02 Practicals) 9. E.S.R, P.C.V, Blood indices (02 Practicals) 10. Platelet count, BT, CT, CRT (02 Practicals) 11. Prothrombin time, A.P.P.T, FDP estimation (01 Practical) 12. ABO grouping and Rh typing. (01 Practical) 	15
<p>Activity Based Practical Works:</p> <ol style="list-style-type: none"> 1. Activity on- Bone marrow examination- staining of smear, special stains- PAS, Sudan black, Myeloperoxidase. (02 Practicals) 2. Hemolytic work-up osmotic fragility test, Heinz bodies, sickling, G-6-P-D estimation, Hb-electrophoresis, Hb-F estimation. (03 practicals) 3. Case studies: (10 Practicals) <ol style="list-style-type: none"> i. Iron deficiency anemia ii. Pernicious anemia/ Vitamin B12 deficiency anemia iii. Leukemia iv. Bleeding disorders v. Thrombocytopenia vi. Neutrophilia vii. Eosinophilia viii. Basophilia ix. Monocytosis x. Lymphocytosis 	15

REFERENCE BOOKS:

1. Rao GH, Eastlund T and Jagannath L(2006).Handbook Of Blood Banking & Transfusion Medicine. Jaypee Medical Publishers, New Delhi.
2. A.B. Dutta (2006) :BloodBanking and Transfusion, Satish Kumar Jain for CBS Publishers, New Delhi.
3. RudmannSV(2005).Textbook of Blood Banking and Transfusion Medicine. Second Edition. Elsevier Saunders Publication.
4. Bharadwaj K(2015).Transfusion Update. Indian Society of Blood Transfusion and Immunohaematology. Jaypee Medical Publishers, New Delhi.

REFERENCE BOOKS FOR PRACTICAL:

5. Mukherjee KL (1988) Volume II:Medical Laboratory Technology,Tata McGraw-Hill Publishing Company Ltd. New Delhi.

ELECTIVE COURSE: BIOMOLECULES: STRUCTURE, FUNCTION IN HEALTH AND DISEASE	
COURSE CODE:	PGD-CGMLT-E6
MARKS:	Theory : 100
CREDITS:	04
CONTACT HOURS	15 Week SWAYAM Course
COURSE OBJECTIVES:	To give an overview of importance of biomolecules starting from the simplest molecule, water to complex biomolecules.
COURSE OUTCOME	On completion of the course the student should be able to: CO 1: Explain 3D Structure, separation and sequencing of proteins. CO2: Describe and identifying biomarkers using clinical proteomics CO 3: Discuss the detailed structure of genetic material and its interactive role in disease. CO4: understand and explain the cellular function of biomolecules in physiology and pathology.
ELECTIVE COURSE PGD-CGMLT-E6: BIOMOLECULES: STRUCTURE, FUNCTION IN HEALTH AND DISEASE	
By Prof. M.R Rajeswari Department of Biochemistry, All India Institute of Medical Sciences, New Delhi	
<p>This course on Biomolecules is one of the basic course for all PG Students of Biological Sciences.</p> <ol style="list-style-type: none"> 1. Gives an overview of importance of biomolecules starting from the simplest molecule, water. 2. Elaborate the need to study proteins: Their 3D Structure, protein separation, sequencing etc. 3. To understand the pathology and identifying biomarkers using clinical proteomics. 4. Explain in detail DNA, RNA their structures, interactions role in disease, genomics, epigenetics. 5. Enumerate the role of carbohydrates, lipids and their cellular function in physiology and pathology. 6. To briefly introduce to system biology 	
COURSE LAYOUT	
<p>Week 1 Chemical bonds: Different types of Bonds, Bond energies, Bond Angles etc, Water: The molecule of life, Aqueous Solution, Acids & Bases, Measurements of pH, Henderson Haselbatch equation, Titration Curve & pK values, Buffers</p>	
<p>Week 2 Amino acids, chirality, peptide bond and polypeptides, Structural levels of proteins and Stabilizing forces, Conformational properties of polypeptides and Ramachandran plot</p>	
<p>Week 3 Turns, loops, Super secondary structures, motifs and domains in proteins, Structures and function of Fibrous Proteins, Structure and function of Actin and myosins</p>	

Week 4

Hemoglobin, Myoglobin and Oxygen binding, Role of Protein Structure in Health and Disease, Assessment 1

Week 5

Protein Separation Techniques: Centrifugation & Chromatography, Protein sequencing

Week 6

Methods of structure determination of proteins : X-ray, NMR, CD etc, Clinical Proteomics

Week 7

Antigen-Antibody Complex and their Applications in Immunology, Protein-Ligand (Small Molecules including drugs) interaction

Week 8

Components of Nucleic Acids, Conformational parameters of Nucleic acids and DNA double helix, DNA Polymorphism

Week 9

Circular DNA, Supercoil DNA

Week 10

Interactions of small molecules (ions, drugs) with DNA, Different types and structures of RNA

Week 11

DNA-Protein interactions, Assessment 2

Week 12

Introduction to Carbohydrates, Structures of polysaccharides, Saturated and unsaturated fatty acids, Nomenclature of fatty acids and Essential and non-essential fatty acids

Week 13

Glycoproteins and Proteoglycans, Classification of Lipids: simple and compound lipids, phospholipids, Cholesterol, Micelles and Liposomes : Applications in biology and medicine

Week 14

Lipids: extraction, separation and analysis, Components and architecture of Cell membrane, Various membrane models including Fluid-mosaic model

Week 15

Cholesterol and its role in health and disease, Interrelationship of Biomolecules : System Biology, Epigenetics and Human Diseases, Final Assessment

BOOKS AND REFERENCES

1. *An Introduction to Biophysics* by Moganty R Rajeswari, 2013.
2. *Biophysical Chemistry, Part II, Techniques for the study of biological structure and function*, by Cantor C.R. and Schimmel P R., W.H. Freeman and Company, 1980.
3. *Nucleic Acids in chemistry and Biology*, by Blackburn G.M. and Gait M.J., IRL Press, 1990.
4. *Biochemistry*, by Voet D. and Voet J.G., John Wiley and sons, 1995.
5. *Physical Biochemistry*, by Freifelder D., W.H. Freeman and company, 1976-1982.

ELECTIVE COURSE: IMMUNOLOGY

COURSE CODE:	PGD-CGMLT-E7
MARKS:	Theory : 100
CREDITS:	04
CONTACT HOURS	12 week SWAYAM Course
COURSE OBJECTIVES:	To supplement and enhance the understanding of students about different dimensions of Immunology starting from defense systems of the body, immunity, antigens, antibodies, hypersensitivity, cytokines, complement system, vaccines and how our body continuously defends us from various pathogens and maintains homeostasis against many environmental challenges.
COURSE OUTCOME	On completion of the course the student should be able to: CO 1: Explain the mechanisms adopted to impart immunity CO2: Describe the Organization and functioning of the immune organs. CO 3: Discuss the Structure and functions of different classes of immunoglobulins CO4: identify and correlate Immunoassays to Immune dysfunctions.

ELECTIVE COURSE PGD-CGMLT-E7: IMMUNOLOGY

By Dr. Manzoor Ahmad Mir | University of Kashmir

The course is specially designed to supplement and enhance the understanding of students about different dimensions of Immunology starting from defense systems of the body, immunity, antigens, antibodies, hypersensitivity, cytokines, complement system, vaccines and how our body continuously defends us from various pathogens and maintains homeostasis against many environmental challenges.

The objectives of this course is to give the target students/audience an understanding of:

- Fundamentals of the immunology and how our body responds to different environmental challenges.
- Early theories of Immunology, Cells , organs and molecules of the Immune system.
- Different types of immunity (innate and adaptive) employed by the immune system to defend us from foreign pathogenic attacks.
- Organization and functioning of the immune organs, cells and molecules like antibodies, cytokines and chemokines.
- Structure and functions of different classes of immunoglobulins, Antigen-antibody interactions
- Immune dysfunctions (Rheumatoid Arthritis and AIDS)
- Immunoassays (ELISA, RIA, immunoblotting and Hybridoma technology)
Monoclonal antibodies in therapeutics and diagnosis
- Hypersensitivity and complement system Vaccines and their developmen

COURSE LAYOUT

- WEEK 1
 - Historical Perspective of Immunology
 - Early Theories of Immunology
 - Cells of the Immune System
 - Organs of the Immune System
- WEEK 2
 - Anatomical barriers of Immune system
 - Inflammation
 - Cells and Molecules of Innate Immunity

- Cell Mediated and Humoral Immunity
- WEEK 3
 - Passive and active Immunity (Artificial and Natural)
 - Immune Dysfunction (Rheumatoid Arthritis and AIDS)
 - HIV-AIDS a Global Health Emergency
 - Antigenicity and Immunogenicity
- WEEK 4
 - Immunogens (Factors influencing immunogenicity)
 - Adjuvants and Haptens
 - Types of Antigens
 - B and T-cell Epitopes
- WEEK 5
 - Types of Immunoglobulin's
 - Antigen antibody interactions
 - Immunoassays
 - Hybridoma Technology
- WEEK 6
 - Monoclonal Antibodies in Therapeutics and Diagnostics
 - ELISA, RIA and Immunofluorescence
 - Alexa floure tagging of antibodies and Flow cytometry
 - Structure and function of MHC Molecules
- WEEK 7
 - Endogenous and Exogenous pathways
 - Antigen Presenting cells
 - Antigen processing
 - Antigen presentation
- WEEK 8
 - B Cell and T cell Signalling in antigen presentation
 - Costimulation and reverse costimulation in presentation
 - Cytokines and their types
 - Properties and Functions of cytokines
- WEEK 9
 - Therapeutic cytokines
 - Chemokines and cytokines in infectious diseases
 - Complement System and its components
 - Pathways of Complement system
- WEEK 10
 - Hypersensitivity and Allergy
 - Gell and Coombs classification of Hypersensitivity
 - Aeroallergens and their control
 - Various types of hypersensitivities
- WEEK 11
 - Vaccines and their properties
 - Live Vaccines
 - Attenuated and Heat killed Vaccines
 - DPT, Influenza and Polio vaccines

BOOKS AND REFERENCES

At the End of every module reference materials are given in quadrant 3 INSTRUCTOR BIO

POST GRADUATE DIPLOMA PROGRAMME IN CLINICAL GENETICS AND MEDICAL LABORATORY TECHNIQUES

COURSE DESCRIPTION:

Overall the course is designed to provide a strong foundation in all areas of Human genetics and medical lab techniques with opportunities for hands-on laboratory and clinical experience. The curriculum includes lectures, practicals, classroom discussions and intensive practical training (Internship). The Objective of the courses is to enable the students in having job opportunities in Research and Development and in medical field. The course syllabus is designed considering the need for trained technicians and technologists in the genetic and pathological field. This self financed, job oriented course will meet the demand for genetic and pathological technicians in diagnostic labs and hospitals.

ELIGIBILITY FOR ADMISSION:

To be eligible for admission to the programme leading to the award of Post Graduate Diploma in Clinical Genetics and Medical Laboratory Techniques/ Certificate Programme, the candidate must have passed the Bachelor's Degree examination of this University or the equivalent examination of any other recognized University, securing a minimum of 45% marks on aggregate or equivalent Grade or as specified for a specific Programme in Biological Science (Science graduate with Zoology, Microbiology, Biotechnology -6 units / or 3 units).

CAPACITY:

Admission is open for 15 candidates (maximum).

COURSE DURATION:

Duration for the PG Diploma in "Clinical Genetics and Medical Laboratory techniques" is a two semester programme followed by Hands on training in Clinical Laboratories / Pathology Lab / Genetic Lab for a period of three months equivalent to 240 hours.

COURSE STRUCTURE:

The PG Diploma is a two semester programme followed by A student shall be eligible for the award of Post-Graduate Diploma on successful completion of 32 Credits. 08 Credits of Internship is compulsory besides Core and elective Courses. Ordinarily a Diploma Programme shall consist of eight courses with four courses per semester.

One (1) Credit (Theory) shall be equivalent to 15 clock hours of contact teaching. One (1) Credit (Practical) shall be equivalent to 30 clock hours of contact teaching. A student shall obtain 20 credits from Core Courses and 20 Credits from elective courses, which includes 08 credits of Internship/Hands on training.

COURSE EVALUATION:

To pass PGD programme in Clinical Genetics and Medical Laboratory Techniques, candidate shall secure a minimum of 40% marks in theory as well as practical component of each course / paper separately, and followed by Hands on Training. The final grade shall be computed based on the candidate's best performance in the minimum number of credits required for the award of the Diploma. 08credits, of internship, shall be depicted in the form of grade in the final mark sheet. The assessment of the Courses shall be based on the examination at the end of each semester. The examination shall consist of comprehensive written exam (theory) or a comprehensive laboratory examination (practicals) and continuous assessments for theory and practicals. The examination of the Core/elective Courses shall carry maximum of 100 marks (Theory = 50 mks, Practical = 50 mks). Continous assessment and semester end examination for theory with be 40:60 weigtage. Practical assessment will consist of continuous assessmment and semester end comprehensive laboratory examination with 50:50 weigtage.

A report is to be submitted by the candidate after completion of the internship/hands-on training. Submission may be in the form of a report or Portfolio which shall be evaluated for 200 marks and indicated as grades. Every student shall have to secure a minimum of 'P' grade to pass the Course.

COURSE STRUCTURE
POST GRADUATE DIPLOMA PROGRAMME IN
CLINICAL GENETICS AND MEDICAL LABORATORY TECHNIQUES
(PGDCG&MLT)

SEMESTER	COURSE CODE	CORE COURSES	ELECTIVE COURSES (Any One)	NUMBER OF CREDITS	CONTACT HOURS	MARKS
SEMESTER I	PGD-CGMLT-C1	Clinical Genetic Techniques I		Theory = 02 Practical = 02	Theory = 30 Practical = 60	Theory = 50 Practical = 50
	PGD-CGMLT-C2	Clinical Biochemistry I		Theory = 02 Practical = 02	Theory = 30 Practical = 60	Theory = 50 Practical = 50
	PGD-CGMLT-C3	Clinical Microbiology (General and Systemetic)		Theory = 02 Practical = 02	Theory = 30 Practical = 60	Theory = 50 Practical = 50
	PGD-CGMLT-E1		Clinical Pathology and Histopathology	Theory = 02 Practical = 02	Theory = 30 Practical = 60	Theory = 50 Practical = 50
	PGD-CGMLT-E2		SWAYAM course: Analytical Techniques	Theory = 04 credits	Swayam Online	Theory = 100
	PGD-CGMLT-E3		SWAYAM course: Essentials Of Biomolecules: Nucleic Acids And Peptides	Theory = 04 credits	Swayam Online	Theory = 100
SEMESTER	COURSE CODE	CORE COURSES	ELECTIVE COURSES (Any 02)	NUMBER OF CREDITS	CONTACT HOURS	MARKS
SEMESTER II	PGD-CGMLT-C4	Clinical Genetic Techniques II		Theory = 02 Practical = 02	Theory = 30 Practical = 60	Theory = 50 Practical = 50
	PGD-CGMLT-C5	Clinical Biochemistry II		Theory = 02 Practical = 02	Theory = 30 Practical = 60	Theory = 50 Practical = 50
	PGD-CGMLT-E4		Clinical Parasitology, Mycology, and Virology	Theory = 02 Practical = 02	Theory = 30 Practical = 60	Theory = 50 Practical = 50
	PGD-CGMLT-E5		Hematology and Transfusion Medicine	Theory = 02 Practical = 02	Theory = 30 Practical = 60	Theory = 50 Practical = 50
	PGD-CGMLT-E6		SWAYAM course- Biomolecules: Structure, Function In Health And Disease	Theory = 04 credits	Swayam Online	Theory = 100
	PGD-CGMLT-E7		SWAYAM course- Immunology	Theory = 04 credits	Swayam Online	Theory = 100
Internship (Elective)	03-06 months internship at Hospital/Clinics.			08 credits		Report/Portfolio = 100