

Parvatibai Chowgule College of Arts and Science
(Autonomous)
Department Of Geography
Three Year B.Sc. Degree Course in Geography
Proposed Course Structure
Updated On 8 June 2022

SEMESTER	CORE		ELECTIVE			
I	GEG-I.SC1: Basic Concepts in Geography	GEG-I.SC2: Biogeography				
II	GEG-II.SC3: Coastal- Fluvial Geography	GEG-II.SC4: Quantitative Techniques in Geography				
III	GEG-III.SC5: Remote Sensing & Photogrammetry		GEG-SE1: Spatial Analysis	GEG-SE2: Raster and Vector Data Models in GIS	GEG-SE3: Participatory GIS	
IV	GEG-III.SC6: GIS & Application		GEG-SE4: Geography of Climate Change	GEG-SE5: Geography of Marine Ecology	GEG-SE6: Watershed Management	
V	GEG-III.SC7: Geography of Soil Studies		GEG-SE7: Geography of Soil Studies	GEG-SE8: Agro- Meteorology: Principles and Applications	GEG-SE9: Field Survey in Physical Geography	
VI	GEG-IV.SC8: Disaster Management		GEG-SE10: Remote Sensing and Forest Ecology	GEG-SE11: Advanced Coastal Geomorphology	GEG-SE12: Ecology of Estuarine Environment	

**SYLLABUS FOR AUTONOMOUS COURSES IN GEOGRAPHY
BACHELOR OF SCIENCE
SEMESTER I
UPDATED ON 08th JUNE 2022**

CORE

Course Title: Basic Concepts in Geography (Theory)

Course Code: DSC- GEG-I.SC1

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 introduce fundamental concepts in geography.
2. To acquaint the students with distinctiveness of Geography as a field of learning.
3. The course focuses of various spheres of the earth and their related concepts

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

- CLO1:** Understand fundamental concepts in geography
- CLO2:** Analyze the interrelationships among fundamental concepts of geography
- CLO3:** Acquire basic cartographical skills such as reading and interpretation of topographical, weather and nautical charts.
- CLO4:** Understand fundamentals of physical geography, climatology and oceanography.
- CLO5:** Apply techniques to represent different relief features, weather phenomena and bathymetry

Unit No.	Course Content	No. of hours
I	Basic concepts in geography: Themes of geography- location, place, interaction, movements and region Branches of geography. Common methods of geography Qualitative and quantitative methods.	15
II	Introduction to Earth science: Origin and motions of Earth, spheres and interior of Earth, Earths Movements. Plate tectonics and Orogeny The lithosphere- Matter and products (Rock, Soil and minerals) Denudation and its processes. Matters of Lithosphere	15
III	Winds and weather: Earth's atmosphere, Composition, structure Distribution of atmospheric heat and pressure. Seasons. Nature and Scope of Oceanography: Topography of ocean floor Characteristics of ocean water: temperature, salinity and density.	15
		45

References:

Mandatory:

1. **Bishop M.S., & et al (1969) Focus on Earth Science. Charles Merrill Pub. Comp. Ohio USA**
2. Goh Cheng Leong (2003): Certificate Physical and Human Geography, Oxford university press, New Delhi

Supplementary:

1. Dikshit R.D (2004): The Arts, Science of Geography, Integrated Readings Prentice Hall of India, New Delhi
2. Lal. D. S. (2007): Climatology, PushtakMahal, Allahabad
3. Das Gupta and Kapoor (2013): Principles of Physical Geography, S. Chand & Company Pvt. Ltd.
4. SinghSavindra (2005): Environmental Geography, PrayagPustakBhavan, Allahabad

Web-based:

1. <https://player.uacdn.net/lesson-raw/7B40WVPQTFRB0H1UF10H/pdf/7647790894.pdf>
2. <https://scied.ucar.edu/atmosphere-layers>
3. https://d43fweuh3sg51.cloudfront.net/media/assets/wgbh/tdc02/tdc02_doc_biomesummary/tdc02_doc_biomesummary.pdf
4. https://www.researchgate.net/publication/225491377_The_early_evolution_of_the_planet_earth_and_the_origin_of_life
5. https://www.nap.edu/resource/12161/origin_and_evolution_of_earth_final.pdf
6. https://www.researchgate.net/publication/315125743_THE_HYDROLOGIC_CYCLE

CORE**Course Title: Basic concepts in Geography (Practical)****Course Code: DSC-GEG-I.SC1****Marks: 25****Credits: 01****Duration: 15 sessions of 2 hours each**

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Unit	Title	Practical sessions
I	<ul style="list-style-type: none"> • Scales in Geography • Relief representation • Profile drawing 	05
II	<ul style="list-style-type: none"> • Weather charts-Signs and symbols • Weather instruments – functioning and measurement • Preparation of Weather station model 	05
III	<ul style="list-style-type: none"> • Water analysis-pH, EC, TDS, Salinity. • Nautical chart interpretation • Plotting bathymetric data& hypsometric curve 	05
	Journal & Viva	15

References:**Mandatory:**

1. Misra, R.P. and Ramesh, A., (2005): Fundamentals of Cartography, Concept Pub. Co., New Delhi
2. Brady Nyle. (2002). The nature and properties of soil. MacMillan Publishing company, USA
3. Singh Dhyani, Chhonkar P.K. Dwivedi B.S. (2005): Manual on Soil plant and water analysis. Westville Publishing House, India

Supplementary:

1. Campbell, J.(2004) Introductory Cartography, Prentice Hall, Inc Englewood
2. Monkhouse, I.J. and Wilkinson, H.R., (2009): Maps and Diagram, B.I. Publication, New Delhi
3. R. P Mishra. (2014) Fundamentals of Cartography, Concept Pub. Co., New Delhi
4. Gopal Singh. (2014), : Map Work and Practical Geography, 4th Edition, Sterling Book House Mumbai

Web-based:

1. http://groundwater.fullerton.edu/Maps,_Scale,_GIS_and_GPS/Guide_to_Map_Scale.html
2. <https://www.timeanddate.com/geography/longitude-latitude.html>
3. <https://www.youtube.com/watch?v=ei5FAinKXoY>
4. <https://www.mathopenref.com/squarearea.html>
5. <http://www.fao.org/economic/the-statistics-division-ess/world-census-of-agriculture/conducting-of-agricultural-censuses-and-surveys/chapter-5-cartographic-preparation/en/>

**SYLLABUS FOR AUTONOMOUS COURSES IN GEOGRAPHY
BACHELOR OF SCIENCE
SEMESTER II
UPDATED ON 08th JUNE 2022**

CORE

Course Title: Coastal- Fluvial Geomorphology (Theory)

Course Code: DSC-GEG-II.SC2

Marks: 75

Credits: 3

Duration: 45 lectures of 1 hour each

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Prerequisite Courses: Nil

Course Objectives:

1. To provide the fundamental concepts of geomorphology.
2. To familiarize students about the mechanism of landform development resulting from fluvial and coastal processes.

Course Learning Outcomes (CLO):

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

CLO1: Understand fundamental concepts of geomorphology.

CLO2: Understand the concepts and processes of fluvial and coastal geomorphic landforms.

CLO3: Prepare and interpret coastal landscape maps.

CLO4: Conduct beach profiling using survey instruments.

CLO5: Prepare drainage map and interpret fluvial landscape.

CLO6: Carry out morphometric analysis of a river basin.

Unit	Title	No. of hours
I	Concepts in Geomorphology, River basin and Drainage Network. Major geomorphic concepts related to fluvial and coastal geomorphology.	15
II	Fluvial processes and landforms: Erosion, Transportation and Deposition. Cycle of erosion by W. M. Davis	10
III	Waves: Formation, Drifts and Tides. Coastal processes and landforms: Erosion, Transportation and Deposition. Types of coastlines: Emergence and Submergence Coastal wetlands.	20

References:

Mandatory:

1. Phil Medina (2005) Earth Science. CBS Pub & DST, Bangalore
2. Goh C. L. (2017) Certificate in Physical and Human Geography. Oxford University press, India
3. Bloom, Arthur L., 2008: Geomorphology – A Systematic Analysis of Late Cenozoic Landforms, Prentice Hall, Engle Wood Cliff, New Jersey.
4. Dayal, P. (2nd edition) 2006: A Textbook of Geomorphology, Shukla Book Depot, Patna

5. Strahler, A.N., 2005: Physical Geography, 3rd Ed., Wiley Publications
6. Singh, S. 2005: Physical Geography, Prayag Pustak Bhawan, Allahabad
7. Chorley, Richard J., 2002: Spatial Analysis in Geomorphology, Harper and Row Publishers, New York, London.
8. Kale, V. S. and Gupta, A. (Rep.2011): Introduction to Geomorphology, Orient Longman, Calcutta.
9. Karlekar, S. (2009): Coastal Processes and Landforms: Diamond Publications, Pune

Supplementary:

1. Ahmed, E., 2005 : Geomorphology , Kalyan Publishers, New Delhi
2. Cooke R. U. and Doornkamp J.C. (1989): Geomorphology in Environmental Management, 2nd Edition, Oxford: Clarendon Press
3. Sharma, H.S. (ed), 2002: Perspective in Geomorphology, Vol. I & Vol. IV, Concept, New Delhi.
4. Sharma, V.K., 2006: Geomorphology, Earth Surface Processes and Forms, Tata Mc. Graw Hill, New Delhi
5. Sparks, B.W., 2000: Geomorphology, Longman, London, 2nd edition.
6. Thornbury W.D, 2001: Principles of Geomorphology , 2nd Ed., Wiley International edition, Wiley Eastern Reprint, 2001
7. Wooldridge, S.W. and Morgan, R.S., 2000: The Physical Basis of Geography, Longman.

Web based:

1. <http://shaileshchaure.com/Notes/GEOMCON.pdf>
2. <https://www.iasj.net/iasj?func=fulltext&aId=16936>
3. <https://www.nps.gov/subjects/geology/aeolian-landforms.htm>
4. <https://www.nps.gov/subjects/geology/glacial-landforms.htm>
5. https://www.researchgate.net/publication/247773175_Geomorphology_Concepts_and_Applications

CORE**Course Title: Coastal- Fluvial Geomorphology (Practical)****Course Code: DSC-GEG-II.SC2****Marks: 25****Credits: 1****Duration: 15 sessions of 2 hour each**

Unit	Title	Practical sessions
I	<ul style="list-style-type: none"> • Preparation of drainage map. • Drainage basin morphometry: Morphometric analysis of drainage basin. • Identification and Interpretation of fluvial landforms, patterns and processes from SOI toposheet. 	9
II	<ul style="list-style-type: none"> • Beach profiling: Using dumpy level • Identification of major and minor coastal features on field and from SOI toposheet. 	6
III	Journal and viva voce	15

References:**Mandatory:**

1. Phil Medina (2005) Earth Science. CBS Pub & DST, Bangalore
2. Goh C. L. (2017) Certificate in Physical and Human Geography. Oxford University press, India
3. Bloom, Arthur L., 2008: Geomorphology – A Systematic Analysis of Late Cenozoic Landforms, Prentice Hall, Engle Wood Cliff, New Jersey.
4. Dayal, P. (2nd edition) 2006: A Textbook of Geomorphology, Shukla Book Depot, Patna
5. Strahler, A.N., 2005: Physical Geography, 3rd Ed., Wiley Publications
6. Singh, S. 2005: Physical Geography, Prayag Pustak Bhawan, Allahabad
7. Chorley, Richard J., 2002: Spatial Analysis in Geomorphology, Harper and Row Publishers, New York, London.
8. Kale, V. S. and Gupta, A. (Rep.2011): Introduction to Geomorphology, Orient Longman, Calcutta.
9. Karlekar, S. (2009): Coastal Processes and Landforms: Diamond Publications, Pune

Supplementary:

1. Ahmed, E., 2005 : Geomorphology , Kalyan Publishers, New Delhi
2. Cooke R. U. and Doornkamp J.C. (1989): Geomorphology in Environmental Management, 2nd Edition, Oxford : Clarendon Press
3. Sharma, H.S. (ed), 2002: Perspective in Geomorphology, Vol. I & Vol. IV, Concept, New Delhi.
4. Sharma, V.K., 2006 : Geomorphology, Earth Surface Processes and Forms, Tata Mc. Graw Hill, New Delhi
5. Sparks, B.W., 2000: Geomorphology, Longman, London, 2nd edition.
6. Thornbury W.D, 2001: Principles of Geomorphology , 2nd Ed., Wiley International edition, Wiley Eastern Reprint, 2001
7. Wooldridge, S.W. and Morgan, R.S., 2000: The Physical Basis of Geography, Longman.

Web based:

1. <http://earthsci.org/mineral/rockmin/identification/identification.html>

2. https://www.nrcs.usda.gov/wps/portal/nrcs/detail/soils/edu/?cid=nrcs142p2_054308
3. <https://study.com/academy/lesson/understanding-interpreting-a-geologic-map.html>
4. <https://www.nps.gov/subjects/geology/aeolian-landforms.htm>
5. <https://www.nps.gov/subjects/geology/glacial-landforms.htm>
6. <https://www.nature.com/scitable/knowledge/library/coastal-processes-and-beaches-26276621/>
7. https://www.brainkart.com/article/Profile-Diagram_33845/
8. <http://www.jsu.edu/dept/geography/mhill/phylabtwo/lab6/profile.html>
9. <https://www.worldatlas.com/articles/how-many-types-of-beaches-are-there-based-on-composition.html>
10. <http://geomorphology.sbg.ac.at/research/map-symbols/>
11. <https://www.nature.com/scitable/knowledge/library/coastal-processes-and-beaches-26276621/>
12. <https://www.marineinsight.com/environment/a-comprehensive-list-of-different-types-of-sea-waves/>
13. <https://geography.name/types-of-coastlines/>
14. <https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/coastal-wetland>
15. http://www.oas.org/cdcm_train/courses/course1/Chapter%204-Coastal%20Hazards%20and%20Vulnerability.pdf

**SYLLABUS FOR AUTONOMOUS COURSES IN GEOGRAPHY
BACHELOR OF SCIENCE
SEMESTER III
UPDATED ON 08th JUNE 2022**

CORE

Course Title: Remote Sensing and Photogrammetry (Theory)

Course Code: DSC-GEG-III.SC3

Marks: 75

Credits: 3

Duration: 45 lectures of 1 hour each

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Prerequisite Courses: Nil

Course Objectives:

1. To introduce key concepts of Remote Sensing and photogrammetry

Course Learning Outcomes (CLO):

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

CLO1: Understand the basic science of remote sensing

CLO2: Understand interaction of EMR with Atmosphere and Earth surface materials.

CLO3: Carry out photogrammetric observations and calculate area, height, depth and detect spatial and temporal changes.

CLO4: Interpret and analyze remotely sensed data.

Unit	Title	No. of hours
I	Concepts of Remote Sensing , Introduction to remote sensing system, stages, types, -Electromagnetic Radiation,,: Characteristics, Spectrum, Energy Interactions and spectral responses, Resolutions, Introduction to Sensors and platforms	15
II	Aerial Photography:- Types, Error In Flying, Geometry, Scale, Relief Displacement, Stereoscopes Parallax	15
III	Visual Interpretation of Satellite Images and Aerial Photographs : Elements of Image interpretation, Interpretation of Multi-Spectral Imagery, Identification of Earth Surface Features Levels of interpretation	15
		45

References:

Mandatory:

1. Lillesand T.M. and Kiefer R.W., (2002) Remote Sensing and Image Interpretation, John Wiley and Sons, New Delhi.

2. George Joseph (2005) Fundamentals of Remote Sensing, University press Private Ltd, Hyderabad.
3. J. R. Jensen, (2003) Remote Sensing of Environment, An Earth Resource Perspective, Pearson Education Pvt. Ltd., New Delhi.

Supplementary:

1. C.P. Lo and Albert K. W. Yeung, (2002) Concepts and Techniques of Geographic Information System, Prentice -Hall, India.
2. Heywood I. (2011) An Introduction to Geographical Information Systems, Pearson Education Pvt. Ltd., New Delhi.
3. Kang - tsung - Chang, (2002) Introduction to Geographical Information System, , McGraw Hill.
4. P. A. Burrough and R. A. McDonnell, (2000) Principles of Geographical Information System, , Oxford University Press.
5. Paul A. Lonfley, et al.(2002), Introduction to Geographic Information Systems and Science, , John Wiley and Sons Ltd

Web Based:

1. <https://www.nrcan.gc.ca/maps-tools-publications/satellite-imagery-air-photos/remote-sensing-tutorials/fundamentals-remote-sensing-introduction/9363>
2. <https://nptel.ac.in/courses/105/108/105108077/>
3. <https://crisp.nus.edu.sg/~research/links/rs-tut.html>
4. <http://www2.geog.ucl.ac.uk/~mdisney/teaching/PPRS/>
5. <https://gisgeography.com/remote-sensing-of-the-environment/>

CORE**Course Title: Remote Sensing and Photogrammetry (Practical)****Course Code: DSC-GEG-III.SC3****Marks: 25****Credits: 01****Duration: 15 sessions of 2 hours each**

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Unit	Title	Practical sessions
I	Determination of scale, coverage, area, distance and height. Determination of parallax using mirror stereoscope.	07
II	Visual interpretation of aerial photo and satellite imageries Identification of physical and cultural features using elements of interpretation and their verification and ground truthing Levels of interpretation- 1 & 2	08
III	Journal	
		15

References:**Mandatory:**

1. Lillesand T.M. and Kiefer R.W., (2002) Remote Sensing and Image Interpretation, John Wiley and Sons, New Delhi.
2. George Joseph (2005) Fundamentals of Remote Sensing, University press Private Ltd, Hyderabad.
3. J. R. Jensen, (2003) Remote Sensing of Environment, An Earth Resource Perspective, Pearson Education Pvt. Ltd., New Delhi.

Supplementary:

1. C.P. Lo and Albert K. W. Yeung, (2002) Concepts and Techniques of Geographic Information System, Prentice -Hall, India.
2. Heywood I. (2011) An Introduction to Geographical Information Systems, Pearson Education Pvt. Ltd., New Delhi.
3. Kang - tsung - Chang, (2002) Introduction to Geographical Information System, , McGraw Hill.
4. P. A. Burrough and R. A. McDonnell, (2000) Principles of Geographical Information System, , Oxford University Press.
5. Paul A. Lonfley, et al.(2002), Introduction to Geographic Information Systems and Science, , John Wiley and Sons Ltd

Web Based:

1. <https://www.nrcan.gc.ca/maps-tools-publications/satellite-imagery-air-photos/remote-sensing-tutorials/fundamentals-remote-sensing-introduction/9363>
2. <https://nptel.ac.in/courses/105/108/105108077/>
3. <https://crisp.nus.edu.sg/~research/links/rs-tut.html>
4. <http://www2.geog.ucl.ac.uk/~mdisney/teaching/PPRS/>
5. <https://gisgeography.com/remote-sensing-of-the-environment/>

**SYLLABUS FOR AUTONOMOUS COURSES IN GEOGRAPHY
BACHELOR OF SCIENCE
SEMESTER IV
UPDATED ON 08th JUNE 2022**

Core

Course Title: GIS and Application (Theory)

Course Code: DSC-GEG-SC4

Marks: 75

Credits: 3

Duration: 45 lectures of 1 hour each

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Prerequisite Courses: Nil

Course Objectives:

1. To introduce basic concepts and principles of GIS and emphasize on the role of raster and vector data models.
2. To introduce students to GPS, VPS and AR

Course Learning Outcomes (CLO):

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

CLO1: Process raster and vector data in open source software

CLO2: Integrate raster and vector data models and also appreciate the role of these models in visualizing graphical outputs through GIS.

CLO3: Apply GIS in spatial analysis.

CLO4: Use GPS for surveying and mapping.

Unit	Topic	No. of hours
I	GIS technology: An overview Hardware and software components of GIS Data acquisition procedure Data models and structure Coordinate system and projection	15
II	Digitization editing and topography Concept DBMS Spatial analysis: Raster and vector	20
III	GPS and application Spatial decision support system VPS: Visual positioning system AR: Augmented Reality	10
		45

References:

Mandatory:

1. Alias A. Rahman and MorakotPilouk (2008) Spatial Data Modeling for 3D GIS, Springer New York

2. Thurston, J., Poiker, T.K. and J. Patrick Moore. (2003). *Integrated Geospatial Technologies: A Guide to GPS, GIS, and Data Logging*. Hoboken, New Jersey: Wiley.

Supplementary:

1. Longley, P.A., Goodchild, M.F., Maguire, D.J. and Rhind, D.W. (2005). *Geographic Information Systems and Science*. Chichester: Wiley. 2nd edition.
2. M Goodrich (2000). *Data Structures and Algorithms in Java*, 2nd Edition Wiley.
3. Malczewski, J. (1999). *GIS and Multicriteria Decision Analysis*. New York: John Wiley and Sons
4. Ott, T. and Swiaczny, F. (2001). *Time-integrative GIS. Management and analysis of spatio-temporal data*. Berlin / Heidelberg / New York: Springer.

Web based:

1. https://www.usna.edu/Users/oceano/pguth/md_help/html/mapb38f5.htm
2. https://www.researchgate.net/publication/311953089_An_integrated_algorithm_to_evaluate_flow_direction_and_flow_accumulation_in_flat_regions_of_hydrologically_corrected_DEMs
3. <https://www.slideshare.net/RohitKumar431/topology-in-gis>
4. <http://www.geography.hunter.cuny.edu/~jochen/GTECH361/lectures/lecture07/concepts/07%20-%20Topology.htm>
5. <https://www.slideshare.net/SumantDiwakar/spatial-vs-non-spatial>

Course Title: GIS and Applications (Practical)

Course Code: DSC- GEG-SC4

Marks: 25

Credits: 1

Duration: 15 sessions of 2 hour each

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Unit	Topic	Practical Sessions
I	Vector Operations: Digitization, editing, Buffer. Raster Operations: Georeferencing, extraction clip and mosaic,	6
II	Network Analysis Basics of Point analysis Spatial Interpolation Map layout	05
III	GPS survey and Map preparation : field and lab work	4
		15

References:

Mandatory:

1. Alias A. Rahman and MorakotPilouk (2008) Spatial Data Modeling for 3D GIS, Springer New York
2. Thurston, J., Poiker, T.K. and J. Patrick Moore. (2003). Integrated Geospatial Technologies: A Guide to GPS, GIS, and Data Logging. Hoboken, New Jersey: Wiley.

Supplementary:

1. Longley, P.A., Goodchild, M.F., Maguire, D.J. and Rhind, D.W. (2005). Geographic Information Systems and Science. Chichester: Wiley. 2nd edition.
2. M Goodrich (2000). Data Structures and Algorithms in Java, 2nd Edition Wiley.
3. Malczewski, J. (1999). GIS and Multicriteria Decision Analysis. New York: John Wiley and Sons
4. Ott, T. and Swiaczny, F. (2001). Time-integrative GIS. Management and analysis of spatio-temporal data. Berlin / Heidelberg / New York: Springer.

Web Based:

1. <https://mgimond.github.io/Spatial/spatial-operations-and-vector-overlays.html>
2. <https://onlinelibrary.wiley.com/doi/10.1002/9781118826171.ch9>
3. [http://webhelp.esri.com/arcgisdesktop/9.2/index.cfm?TopicName=How_Inverse_Distance_Weighted_\(IDW\)_interpolation_works](http://webhelp.esri.com/arcgisdesktop/9.2/index.cfm?TopicName=How_Inverse_Distance_Weighted_(IDW)_interpolation_works)
4. <https://mgimond.github.io/Spatial/spatial-interpolation.html>
5. <https://webapps.fundp.ac.be/geotp/SIG/interpolating.pdf>

**SYLLABUS FOR AUTONOMOUS COURSES IN GEOGRAPHY
BACHELOR OF SCIENCE
SEMESTER V
UPDATED ON 08th JUNE 2022**

Core

Course Title: Geography of Soil Studies (Theory)

Course Code: DSC-GEG-SC5

Marks: 75

Credits: 3

Duration: 45 lectures of 1 hour each

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Prerequisite Courses: Nil

Course Objectives:

1. To understand the process of soil formation, development and distribution.
2. To equip students with basics of soil structure, composition, content and conservation practices.

Course Learning Outcomes:

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

CL01: Identify and differentiate between various soils profiles and types

CL02: Understand different types of processes of soil formation, characteristics and importance in agricultural practices

CL03: Test the soil properties and quality of collected soil samples using various instruments and prepare lab reports.

CL04: Map various soil types in terms of physical and chemical properties.

Unit	Topic	No. of hours
I	Introduction to soil: Concept , soil formation, Soil structure – composition, Soil profile, Texture, Soil water dynamic.	15
II	Soil and organisms - Organic matter of soil, Sources of organic matter – Biomass, Termites, worms, ants, algae, fungi, bacteria, Carbon cycle – simple decomposition, Agricultural importance of soils - Nitrogen fixation	15
III	Soil Conservation and management Soil erosion, degradation and pollution, its sources and impacts : Soil conservation and management practices traditional and modern Case studies	15
		45

References:

Mandatory:

1. Brady Nyle. (2002). The nature and properties of soil. MacMillan Publishing company, USA

Supplementary:

1. Foth Henry. (1984). Fundamentals of soil science. John Wiley & Sons, Inc. USA

2. Munns Donald and Singer Michael. (1996). Soils – An introduction. Prentice-Hall Inc, New Jersey, USA
3. Lal R and Stewart B.A. (1990). Advances in soil sciences. Springer-Verlag New York.
4. White Robert. (2005). Principles and Practice of Soil Science: The Soil as a Natural Resource, 4th Edition. Wiley & Sons, Inc – Blackwell. USA

Web based:

1. <https://www.nature.com/scitable/knowledge/library/soil-water-dynamics-103089121/>
2. <http://www.fao.org/3/a0100e/a0100e0d.htm>
3. <https://www.sare.org/Learning-Center/Books/Building-Soils-for-Better-Crops-3rd-Edition/Text-Version/The-Living-Soil/Soil-Microorganisms>
4. <https://www.britannica.com/science/soil-organism>
5. <https://www.soils4teachers.org/biology-life-soil>
6. <https://www.infonet-biovision.org/EnvironmentalHealth/Introduction-soil-conservation-measures>

CORE**Course Title: Geography of Soil Studies (Practical)****Course Code: DSC-GEG-SC5****Marks: 25****Credits: 1****Duration: 15 Sessions of 2 hours each**

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Unit	Topic	Practical sessions
I	Field visit: Pre field work- planning and sample site selection On field work - Soil Sample collection	10
II	Post fieldwork: Testing of Soil samples 1. Moisture content calculation 2. Texture analysis 3. Electric Conductivity 4. Soil pH levels 5. Carbon testing	
III	6. Journal and Viva and	05
		15

References:**Mandatory:**

1. Brady Nyle. (2002). The nature and properties of soil. MacMillan Publishing company, USA

Supplementary:

1. Foth Henry. (1984). Fundamentals of soil science. John Wiley & Sons, Inc. USA
2. Munns Donald and Singer Michael. (1996). Soils – An introduction. Prentice-Hall Inc, New Jersey, USA
3. Lal R and Stewart B.A. (1990). Advances in soil sciences. Springer-Verlag New York.
4. White Robert. (2005). Principles and Practice of Soil Science: The Soil as a Natural Resource, 4th Edition. Wiley & Sons, Inc – Blackwell. USA

Web based:

1. <https://www.nature.com/scitable/knowledge/library/soil-water-dynamics-103089121/>
2. <http://www.fao.org/3/a0100e/a0100e0d.htm>
3. <https://www.sare.org/Learning-Center/Books/Building-Soils-for-Better-Crops-3rd-Edition/Text-Version/The-Living-Soil/Soil-Microorganisms>
4. <https://www.britannica.com/science/soil-organism>
5. <https://www.soils4teachers.org/biology-life-soil>
6. <https://www.infonet-biovision.org/EnvironmentalHealth/Introduction-soil-conservation-measures>

**SYLLABUS FOR AUTONOMOUS COURSES IN GEOGRAPHY
BACHELOR OF SCIENCE
SEMESTER VI
UPDATED ON 08th JUNE 2022**

CORE

Course Title: Disaster Management (Theory)

Course Code: DSC-GEG-SC6

Marks: 75

Credits: 3

Duration: 45 lectures of 1 hour each

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Prerequisite Courses: Nil

Course Objectives:

1. To provide insights of basics and applications of landscape and disaster management.

Course Learning Outcomes:

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

CLO1: Understand the concepts of disaster management.

CLO2: Assess the risks of urban hazards and their management.

CLO3: Evaluate coastal hazard risks and their management.

CLO4: Prepare hazard management and mitigation plan for any one local site.

Unit	Title	No. of hours
I	<p>Introduction to Disaster Types of disaster: Natural -flood, cyclone, earthquake, landslide etc. Manmade- Fire, Industrial pollution, dam failure Introduction to Disaster Management:</p> <ul style="list-style-type: none"> • Definition, Types, Concepts of Disaster Management • Importance of Disaster Management • Introduction to mitigation methods 	15
II	<p>Urban Landscape & Disaster Management:</p> <ul style="list-style-type: none"> • Understanding Risk of Urban hazard • Climate change: Introduction and current practices • Case study 	15
III	<p>Coastal Landscape & Disaster Management:</p> <ul style="list-style-type: none"> • Understanding Risk of coastal hazards • Coastal risk, mitigation and planning. • Resilience • Case study 	15
		45

References:**Mandatory:**

1. Ban Wisner, (2005), At Risk: Natural Hazards, People's Vulnerability and Disasters, Routledge
2. Chowdhury Emdadul. Haque, (2005), Mitigation of Natural Hazards And Disasters: International Perspectives, Springer
3. FitzGerald. M. Duncan, (2003), Beaches and Coasts, Blackwell Publishing

Supplementary:

1. Asian Development Bank, (2016), Reducing Disaster Risk by managing Urban Landuse- Guidance notes for planners, Metro Manila, Philippines
2. Natural Hazards and Disaster Management, (2006), A Supplementary Textbook in Geography for Class XI on Unit 11: Natural Hazards and Disasters, Published by: The Secretary, Central Board of Secondary Education, 2, Community Centre, PreetVihar, Delhi-110092
3. Vernberg. F. John, Vernberg. Winona B, (2001), The Coastal Zone: Past, Present, and Future, University of South Carolina Press

Web based:

1. https://www.academia.edu/8610063/An_Introduction_to_Disaster_Management_Concept_and_Meaning
2. https://www.researchgate.net/publication/320126456_Concepts_and_Practices_of_Disaster_Management_Concepts_and_Practices_of_Disaster_Management
3. https://www.adrc.asia/publications/LWR/LWR_abridged/definitions.pdf
4. <http://www.nzdl.org/gsdmod?e=d-00000-00---off-0aedl--00-0----0-10-0---0---0direct-10---4-----0-1l--11-en-50---20-about---00-0-1-00-0-0-11-1-0utfZz-8-10&cl=CL1.4&d=HASHcd2bae0c8381ef0542840a.2>=1>
5. <https://www.samhsa.gov/find-help/disaster-distress-helpline/disaster-types>
6. <https://www.linkedin.com/pulse/disaster-management-definition-process-various-phases-chatterjee>
7. <https://www.uu.nl/en/research/department-of-physical-geography/research/landscape-functioning-and-natural-hazards>
8. <https://www.intechopen.com/books/sea-level-rise-and-coastal-infrastructure/revealing-landscape-planning-strategies-for-disaster-prone-coastal-urban-environments-the-case-of-is>
9. <https://pennur.upenn.edu/initiatives/disaster-in-urban-landscapes-preparedness-response-and-recovery>
10. https://www.iitk.ac.in/nicee/wcee/article/14_S08-032.PDF
11. <https://www.sutori.com/story/how-do-natural-hazards-affect-landforms-and-landscapes--ZsqHdntyog8jiGrgAZDi212d>
12. <http://www.fao.org/3/AG127E10.htm>
13. <https://www.orfonline.org/research/making-indias-coastal-infrastructure-climate-resilient-challenges-and-opportunities-54330/>

Course Title: Disaster Management (Practical)

Course Code: DSC- GEG-SC6

Marks: 25

Credits: 1

Duration: 15 sessions of 2 hours each

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Unit	Title	Practical sessions
I	Mapping : Using satellite data and Toposheet 1. Flood risk area 2. Mapping Landslide and Erosion prone sites 3. Mapping Rock fall prone sites	07
II	1. Mapping the urban land surface temperature (Urban Heat Islands) 2. Risk sensitive land use map 3. Calculating permissible density of hazards.	8
III	Journal	
		15

Note: Data can be taken from IPCC report.

References

Mandatory:

1. Ban Wisner, (2005), At Risk: Natural Hazards, People's Vulnerability and Disasters, Routledge
2. Chowdhury Emdadul. Haque, (2005), Mitigation of Natural Hazards And Disasters: International Perspectives, Springer

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4. Vernberg. F. John, Vernberg. Winona B, (2001), The Coastal Zone: Past, Present, and Future, University of South Carolina Press

Web based:

1. <https://www.hindawi.com/journals/amete/2016/4891015/>
2. <https://www.sciencedirect.com/science/article/pii/S1110982314000209>
3. <http://www.oas.org/dsd/publications/unit/oea66e/ch10.htm>
4. [https://www.preventionweb.net/files/65868_f222odhiambolandslidessouthafrica\[1\].pdf](https://www.preventionweb.net/files/65868_f222odhiambolandslidessouthafrica[1].pdf)
5. <https://journals.openedition.org/geomorphologie/12778>
6. <https://www.sciencedirect.com/science/article/pii/S2226585619300445>
7. <https://www.sciencedirect.com/science/article/pii/S1110982317301114>
8. [http://dpnet.org.np/public/uploads/files/Learning%20Document%20Issue%207%20-%20Risk%20Sensitive%20Land%20Use%20Planning%20for%20Urban%20Risk%20Management%20\(002\)%202019-05-16%2010-15-42.pdf](http://dpnet.org.np/public/uploads/files/Learning%20Document%20Issue%207%20-%20Risk%20Sensitive%20Land%20Use%20Planning%20for%20Urban%20Risk%20Management%20(002)%202019-05-16%2010-15-42.pdf)
9. <https://ngs.org.np/demo/wp-content/uploads/2019/09/Geo-disaster-and-risk-sensitive-land-use-planning-in-Nepal-Thapa-2018.pdf>