BHARATHIDASAN UNIVERSITY TIRUCHIRAPPALLI - 620 024.

M.Sc. GEOGRAPHY: CHOICE BASED CREDIT SYSTEM - LEARNING OUTCOMES BASED CURRICULUM FRAMEWORK (CBCS - LOCF)

(Applicable to the candidates admitted from the academic year 2026-27 onwards)

Sem.	Courses	Title	Credit	Exam Hrs.	Marks		Total
					Int.	Ext.	
I	Core Course I (CC)	Geomorphology	5	3	25	75	100
	Core Course II (CC)	Advanced Climatology	5	3	25	75	100
	Core Course III (CC)	Urban Geography	5	3	25	75	100
	Core Practical I (CP)	Representation of Terrain and Climatic Data	4	3	40	60	100
	Elective Course I (EC)	Oceanography	3	3	25	75	100
	Total		**22**	**-**	**-**	**-**	**500**
II	Core Course IV (CC)	Geography of India	5	3	25	75	100
	Core Course V (CC)	Advanced Cartography and GIS	5	3	25	75	100
	Core Course VI (CC)	Agricultural Geography	5	3	25	75	100
	Core Practical II (CP)	Field Techniques, Surveying and Research Methods	4	3	40	60	100
	Elective Course II (EC)	Geography of Asia	3	3	25	75	100
	Non-Major Elective Course I		2	3	25	75	100
	Total		**24**	**-**	**-**	**-**	**600**

SUMMARY OF CURRICULUM STRUCTURE OF PG PROGRAMMES

Sl. No.	Types of the Courses	No. of Courses	No. of Credits	Marks
1.	Core Courses	11	55	1100
2.	Core Practicals	3	12	300
3.	Elective Courses	3	9	300
4.	Project	1	10	100
5.	Non-Major Elective Courses	2	4	200
	Total	**20**	**90**	**2000**

PROGRAMME OUTCOME:

- The M.Sc., Geography program curriculum provides the features of progress, advanced research and employability in the domains of geography
- The program makes familiar higher level geographic concepts
- The program upscales knowledge on human and earth interaction
- The program focused to handle spatial data and non-spatial data available globally
- The program M.Sc., Geography curriculum upscales the use of geospatial software in various geographic domains

PROGRAMME OUTCOME:

- The M.Sc., Geography program inculcate the concepts of application of Geoinformatics in geographic research.
- The program makes familiar geography of India, appaises the sustainable resource management.
- The program provides a comprehensive understanding of geography of Tamil Nadu, the course make the students to undertake case studies for research.
- The M.Sc., Geography program makes familiar to appreciate and interpret the maps published by Survey of India at different scales.
- The M.Sc., Geography program gives confidence to the students to perform geo-statistical analysis and interpretation.
- Geoinfomatics practical courses enhance the employability of the students.

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First Year **CORE COURSE I** **Semester I**

GEOMORPHOLOGY

(Theory)

COURSE OBJECTIVES:

- To introduce the basic concepts geomorphology to the students of geography
- To understand the origin of landforms, Weathering, Erosion and Depositional
- To know the applications of geomorphology is helpful in different fields like civil, mineral and coastal departments.
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UNIT - I:

Basics: Meaning, Scope and development – Basic Concepts and conflicting views – Endogenic process: Diastrophism and volcanism Exogenic process: Weathering and Mass Wasting.

UNIT - II:

River Valley and Drainage pattern: Types of Drainage Patterns: Consequent Drainage, Obsequent Drainage, Antecedent Drainage, Superimposed Drainage – River Valley Classification: Genetic, Controlling structure and Stages – Lakes: Origin, Types: tectonic, volcanic, landslides, glacial, solution, fluvial, wind, marine, organic and meteorite impacts.

UNIT - III:

Concepts: Morphogenetic regions – Concept of cycle of erosion: Davis, Penck - Idealized Fluvial Cycle – Peneplain and Pediplain –Slope development: classification and elements – Theories of slope evolution: Davis, Penck.

UNIT - IV:

Processes and Evolution of Landforms: Fluvial system-, Karst system-, Glacial system-, Aeolian system- and Coastal system-sea waves, tides and currents – sediments and types of coast.

UNIT - V:

Applied Geomorphology: Geomorphology in Mineral Exploration, Engineering projects, Dams and River regulation, Hydrological studies, Coastal Geomorphology, Coastal Hazard Management, Land use.

UNIT – VI Current Contours: (For continuous internal assessment only)

Landforms analysis-aerial and satellite data interpretation, Drainage basin morphometric and slope mapping, integrated approach of land and water resource management.

REFERENCES:

1. Dayal, P., (1990). A Text book Geomorphology, Shukla Book Depot, Patna, India.
2. Ollier, C. D. (1981). Tectonics and Landforms. London: Longman.
3. Singh, S. (2002). Geomorphology, Allahabad: PrayagPustakBhawan.
4. Strahler, A. H., &Strahler, A. N. (1992). Modern Physical Geography, New Jersey: John Wileyand Sons.
5. Tarbuck, E. J., &Lutgens, F. K. (2009). Earth Science. New Jersey: Prentice Hall.
6. Huggett, R.J. (2007) Fundamentals of Geomorphology, Routledge, New York.
7. Khullar, D.R., (2012) Physical Geography, Kalyani Publishers, New Delhi.
8. Christopherson, R. W. and Birkeland, G. H., (2012) Geosystems: An Introduction to Physical Geography (8th edition), Pearson Education, New Jersey.
9. Das Gupta, A and Kapoor, A.N., (2001) Principles of Physical Geography, S.C. Chand & Company Ltd. New Delhi.
10. https://pubs.usgs.gov/pp/0500b/report.pdf
11. https://www.wou.edu/las/physci/taylor/g322/intro.pdf

COURSE OUTCOME:

On completion of the course the student are able to

- Understand the concepts of geomorphology
- Familiar about the landforms and its origin in different domains
- Describe about the concept of cycle of erosion and slope development
- Discuss the landforms origin in different geomorphic scenarios like fluvial, karst, coastal and Aeolian systems.
- Apply the geomorphic associations on mineral exploration and disaster management research.

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First Year **CORE COURSE II** **Semester I**

ADVANCED CLIMATOLOGY

(Theory)

COURSE OBJECTIVES:

- To understand Earth's climates and the factors that influence and control them
- To understand the structure, composition and interaction of Atmosphere
- To know how they operate and change over time, and applications of climatology.
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UNIT – I:

Introduction Climatology - Definition – Branches – Nature, Scope and Trends and Development – Atmosphere – Composition and Structure – Insolation, Heat Budget: Mechanisms of Heat Energy Transfer – Heating and Cooling of Atmosphere and Earth – Distribution of Temperature – Horizontal and Vertical Distribution – Temperature Inversion and Albedo.

UNIT – II:

Atmospheric Pressure and Winds: Pressure Gradient and Variations – Vertical , Horizontal and Seasonal Variation of Air Pressure, Winds: Factors affecting Wind Motion – Geostrophic Wind – Gradient Wind – Wind Measurement – Beaufort Scale – Models of General Circulation of Atmosphere: Surface Wind System – Latitudinal Shifting of Wind Belts – Jet Stream – Monsoon – Concepts Of Origin Of Monsoon – Indian Monsoon, Local Winds.

UNIT – III:

Precipitation – Humidity – Definition – Types – Factors affecting Potential Evapotranspiration and Actual Evapo-Transpiration – Dew Point – Atmospheric Equilibrium: Stability and Instability – Adiabatic Process – Temperature Change – Condensation – Forms of Precipitation – Clouds – Mean Annual Precipitation – Variability – Intensity – Artificial Precipitation.

UNIT – IV:

Air masses and Fronts: Definition and Characteristics – Source Regions – Classification. Atmospheric Disturbances: Cyclones and Anticyclones - Temperate Cyclones- Tropical Disturbances, Movement and Track.

UNIT – V:

Climatology – Koppen – Thornthwaite – Trewartha Classification, Climatic System And Changes – Natural and Anthropogenic Causes, Weather Forecasting – Methods And Trends, Agro Climatology: Elements – Heat Island – Air Pollution – Green House Effects – Ozone Depletion – Human Comfort Zones.

UNIT VI Current Contour (For continuous internal assessment only):

Climate Change and Global Warming, UN frame work Convention on Climate Change, Climate Justice and Equity, Global Warming and Population, Dominance and Change in Artic, Global Dimming.

REFERENCES:

1. Lal, D.S. (1996), Chaitanya Publishing House, Allahabad.
2. Collings, V.K. (1987), Weather, Radar and Flood Forecasting, John Wiley & Sons, New York.
3. Critchfield, H.J. (1996), General Climatology, Prentice Hall, New Jersey.
4. Menon, P.A. (1989), Our Weather, National Book Trust, New Delhi.
5. Smith, K., (1975), Principles of Applied Climatology, McGraw Hill Book Co., London.
6. Trewartha, G.T., (1968), An Introduction to Climate, McGraw Hill BooK Co., New York.
7. T.R. Oke, G. Mills, A. Christen and J.A. Voogy, Urban Climates, Cambridge University Press; 1 edition, 2017.
8. Lutgens, Frederic K. &Tarbuck, Edward J. (2010). The Atmosphere: An Introduction to Meteorology. New Jersey: Pearson Prentice Hall.
9. Oliver, John E. &Hidore, John J. (2003). Climatology: An Atmospheric Science. Delhi: Pearson Education.
10. Singh, S. (2005). Climatology. Allahabad: PrayagPustakBhawan.
11. https://swayam.gov.in/course/4242-physical-geography-ii-climatology-oceanography
12. https://www.britannica.com/science/climatology
13. https://www.ncdc.noaa.gov/
14. http://www.realclimate.org/
15. https://serc.carleton.edu/NAGTWorkshops/complexsystems/courses/42415.html
16. https://www.loc.gov/rr/scitech/SciRefGuides/weather.html
17. http://www.globalissues.org/issue/178/climate-change-and-global-warming.

Course Outcome

On completion of the course the student are able to

1. Understand the concepts of climatology, atmospheric composition, and structure.
2. Familiar about the pressure belts, wind movement and general circulation atmosphere.
3. Describe about the various forms of precipitation.
4. Discuss the types of air masses, cyclones and its types
5. Analyze the impact of climatic phenomena on human life, agriculture, and pollution.

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First Year **CORE COURSE III** **Semester I**

URBAN GEOGRAPHY

(Theory)

COURSE OBJECTIVES:

- To provide an overview and theoretical framework of urban geography
- To learn the internal spatial structure and landscapes of cities
- To make understand the patterns of land use, new urbanism. Comparative models of internal city and structure of the cities.
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UNIT – I:

Nature – Scope and development of Urban Geography – Urbanization factors of Urban growth – world urbanization patterns– urbanization in India.

UNIT- II:

Urban demography – Population density models – age and sex structure – Occupational structure – Economic base – Basic and Non basic function – Functional classification.

UNIT- III:

Urban land use – Types – Models – Social area analysis – CBD delimitation – Urban ecology – Quality of urban life.

UNIT- IV:

Urban expansion – Vertical and horizontal – urban sprawl – Rural urban fringe – Suburbs – City region – Umland demarcation. Hierarchy of urban centers – rank size rule – Christaller's andLosch central place concepts.

UNIT- V:

Urban problems (Special reference to Metroplolitan cities in India) – Housing problems - Slums – Pollution – Water supply, transport planning.

UNIT – VI Current Contours: (For continuous internal assessment only):

Smart City Planning and Management, City Greening, MRTS, Green concept.

REFERENCES:

1. Paul L. Knox and Linda McCarthy (2011), *Urbanization: An Introduction to Urban Geography*. Englewood Cliffs, NJ: Prentice Hall, 3rd edition.
2. Misra R.P &K.V.Sundaram(1971) Regional planning and Development, University of Mysore.
3. Mohammed IsharHasan (2014) Population geography, Rawat Publications.

4. Richa Mehta (2014) Population geography, Srishti book distributors, New Delhi.
5. UrvijaShanker (2014) Population pattern and urban development, Rajesh publications.
6. Fyfe, N. R. and Kenny, J. T., (2005): The Urban Geography Reader, Routledge.
7. Graham, S. and Marvin, S., (2001): Splintering Urbanism: Networked Infrastructures, Technological Mobilities and the Urban Condition, Routledge.
8. https://www.e-education.psu.edu/emsc100tsb/node/143
9. https://www.wiley.com/en-us/General+%26+Introductory+Geography/Urban+Geography-c-GE23

COURSE OUTCOME:

On completion of the course the student are able to

1. Understand the functions, sizes, and spatial arrangements of urban areas
2. Differentiate the characteristics of urban settlement in cities
3. Discuss the urbanization and its problems.
4. Analyze the evolving forms of present-day urban area
5. Understand how to use maps and other geographic representations, tools, and technologies to acquire, process, and report information from a spatial perspective.

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First Year **CORE PRACTICAL I** **Semester I**

REPRESENTATION OF TERRAIN AND CLIMATIC DATA

(Practical)

COURSE OBJECTIVES:

- This practical course inculcates critical knowledge of cartographical principles and techniques in representation of terrain and climatic data to the students.

Ex. 01: Methods of Representation of Relief
Ex. 02: Preparation of a Contour Map
Ex. 03: Representation of Relief Features by Contours

Ex. 04: Drawing of Profiles
Ex. 05: Calculation of Gradient and Slope
Ex. 06: Methods of Average Slope Determination

Ex. 07: Drawing of Hypsometric Curves
Ex. 08: Representation of Relief on a Block Diagram
Ex. 09: Representation of Climatic Data by Isopleths

Ex. 10: Climatic Line Graphs
Ex. 11: Columnar Diagrams
Ex. 12: Rainfall Dispersion Diagrams

Ex. 13: Wind-rose Diagrams
Ex. 14: Climographs
Ex. 15: Synoptic Weather Charts

CURRENT CONTOURS(For continuous internal assessment only):

Digital Elevation Model, Slope, Aspect

REFERENCES:

1. Monk House, F.J. and Wilkinson, H.R. (1973) Maps and Diagrams, Methuen & Co Ltd, London.
2. Saha, P. and Basu, P. (2014) Advanced Practical Geography, Books and Allied Ltd., Kolkatta.
3. Singh, R.L. and Singh, R. P. B. (2009) Elements of Practical Geography, Kalyani Publishers, New Delhi.
4. Gopal Singh (1998) Map Work and Practical Geography (4th Edition), Vikas Publishing House, Ahmedabad.
5. Zulfequar Ahmad Khan, M.D., (1998) Text book of Practical Geography, Concept Publishing Company, New Delhi.
6. King, C. A.M (1966) Techniques in Geomorphology, Edward Arnold, London

COURSE OUTCOME:

On completion of the course the student are able to

- Understand to represent relief data
- Familiar to slope calculation and able to plot profiles
- Acquire the skill to map various methods of relief representation and climatic data plotting
- Enhance the skill of mapping climatic data and rainfall analysis
- Discuss various types of wind-rose diagrams and interpret the daily weather charts.

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First Year **ELECTIVE COURSE I** **Semester I**

OCEANOGRAPHY

(Theory)

COURSE OBJECTIVES:

- The course introduce the basic concepts in physical geography
- This course on physical geography is structured to cover the components of climatology, geomorphology and oceanography.
- By studying this course, students could be able to understand about the different spheres of the earth.
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UNIT - I:

Introduction:Configuration of ocean floor Major expeditions, Ocean Floor Topography and Terminology – Continental Shelf, Continental Slope, Continental Margin, Continental Rise, Submarine Canyons, Mid Ocean Ridges, Trenches, Abyssal Plains.

UNIT- II:

Circulation of oceanic waters:Waves and Tides -Definition ,Wave theories, Classification; progressive waves, shallow water waves, Seismic Sea waves (Tsunami), wind waves, stationary waves, sea and swell, deep and shallow water waves, storm surges, Beaufort scale, spilling and breaking waves, Tides and tide generating forces, type of tides, tidal currents, rip currents.

UNIT- III:

Ocean Currents:Definitions, direct and indirect forces acting on sea waters, surface currents, Coriolis effect, Ekman spirals, geostrophic currents, upwelling, sinking, circulation, El-Nino, La-Nina, currents in Atlantic , Pacific and Indian oceans.

UNIT - IV:

Salinity and Ocean deposits:Distribution of temperature – Vertical Distribution and Horizontal Distribution, salinity and density, Classification of sediments - Lithogenic sediment, biogenic sediments, hydrogenic sediment, Manganese nodules.

UNIT- V:

Marine Resource & Conservation: Coral reefs- Types and distribution, Marine resource-biotic and abiotic resources, Global warming and climate change-Effects of El Nino-Cyclones- Rainfall Rhythm.

UNIT – VI Current Contours: (For continuous internal assessment only):

Fisheries forecasts Interpretation and use of ocean thermal structure in fisheries; Fisheries forecasting system in India and other countries-remote sensing; Global positioning system (GPS) application of remote sensing in fisheries; Application of echo-sounder and SONAR.GNSS application in ocean studies.

REFERENCES:

1. Siddhartha, K (2005) oceanography a brief introduction, Kisalaya Publication Delhi.
2. Moore, J.R (1967) Oceanography W.H Freeman and Company, San Francisco.
3. Khullar, D.R., (2012) Physical Geography, Kalyani Publishers, New Delhi.
4. Das Gupta, A &Kapoor, A.N., (2001) Principles of Physical Geography, S.C. Chand & Company Ltd. New Delhi.
5. Christopherson, R. W. and Birkeland, G. H., (2012) Geosystems: An Introduction to Physical Geography (8th edition), Pearson Education, New Jersey.
6. Strahler, A. H. and Strahler, A N., (2001) Modern Physical Geography (4/E), John Wiley and Sons, Inc., New York.

Course Outcomes:

On completion of the course the student are able to

1. Understand part of the complex coastal environment in which human beings live and Acquire idea regarding basic processes that forms floors of deep ocean
2. Obtain knowledge regarding interactions of cold and warm currents
3. Describe about the submarine topography of major oceans.
4. Comprehend the distribution of ocean deposits
5. Discuss about the ocean deposits and understand about the importance of coral reef in global ecosystem

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