

# **GOVERNMENT ARTS COLLEGE (AUTONOMOUS)**

**KUMBAKONAM 612 002**

Re - accredited With 'A' Grade by NAAC & Affiliated to Bharathidasan University

## **DEPARTMENT OF GEOGRAPHY**

(Effective for those admitted from 2020-2021 onwards)



## **SYLLABI**

**M.Sc., APPLIED GEOGRAPHY**

**Government Arts College (Autonomous), Kumbakonam 612 002**  
**COURSE STRUCTURE (CBCS) FOR THE SCIENCE STUDENTS ADMITTING 2020-21 ONWARDS**  
**PG AND RESEARCH DEPARTMENT OF GEOGRAPHY- M.Sc., APPLIED GEOGRAPHY**

SEM.	CODE	COURSE		Inst. Hrs./ week	Credit	Exam Hrs.	Marks		Total
							Int.	Ext.	
I	20P1G1	CC I	Geomorphology	6	4	3	25	75	100
	20P1G2	CC II	Geography of Population	6	4	3	25	75	100
	20P1G3	CC III	Elements of Cartography	5	4	3	25	75	100
	20P1G4EC	EC I	Remote Sensing	5	4	3	25	75	100
	20P1GP1	CP I	<b>Terrain and Climatic Data Analysis</b>	4+4	4	3	40	60	100
<b>Total</b>				<b>30</b>	<b>20</b>	-	-	-	<b>500</b>
II	20P2G5	CC IV	Applied Climatology	6	5	3	25	75	100
	20P2G6	CC V	Biogeography	6	5	3	25	75	100
	20P2G7	CC VI	Urban Geography	5	5	3	25	75	100
	20P2G8EC	EC II	Disaster Studies	5	5	3	25	75	100
	20P2GP2	CP II	<b>Socio Economic Data Analysis</b>	4+4	4	3	40	60	100
<b>Total</b>				<b>30</b>	<b>24</b>	-	-	-	<b>500</b>
III	20P3G9	CC VII	Regional Planning	6	5	3	25	75	100
	20P3G10	CC VIII	Geographic Thought	6	5	3	25	75	100
	20P3G11	CC IX	Agricultural Geography	5	5	3	25	75	100
	20P3G12EC	EC III	Research Methodology	5	5	3	25	75	100
	20P3GP3	CP III	<b>Geospatial Analysis I</b>	4+4	4	3	40	60	100
<b>Total</b>				<b>30</b>	<b>24</b>	-	-	-	<b>500</b>
IV	20P4G13	CC X	Geography of Health	5	5	3	25	75	100
	20P4G14EC	EC IV	Fundamentals of GIS	5	5	3	25	75	100
	20P4G15EC	EC V	Terrain and Water Resources Evaluation	5	4	3	25	75	100
	20P4GP4	CP IV	<b>Geospatial Analysis II</b>	4+4	4	3	40	60	100
	20P4GPW		<b>Project</b>	7	4	3	-	-	100
<b>Total</b>				<b>30</b>	<b>22</b>	-	-	-	<b>500</b>
<b>Grand Total</b>				<b>120</b>	<b>90</b>	-	-	-	<b>2000</b>

**P.G. Course Structure**

Core Course Theory (CC)	-	10
Elective Course Theory (EC)	-	5
Core Course Practical (CP)	-	4
Project	-	1
<b>Total Papers</b>		<b>20</b>

**Question Paper Pattern**

Section A: 10 X 2 =	20
Section B: 5 X 5 =	25
Section C: 3 X 10 =	30
<b>Total</b>	<b>75</b>

Core Course I	GEOMORPHOLOGY	Code: 20P1G1
<p><b>Objectives:</b> <i>This course is introduced to understand the geomorphic processes, resultant landforms and various applications of geomorphology.</i></p> <p><b>Course Outcomes:</b>  <i>After completing the course, the student should be able to:</i>  <i>Knowledge and understanding the</i></p> <ol style="list-style-type: none"> <li>1. <i>Fundamentals of geomorphology and its recent trends.</i></li> <li>2. <i>Various concepts regarding earth movements.</i></li> <li>3. <i>Resulting landforms of earth dynamics.</i></li> <li>4. <i>Concepts regarding erosion, slope and morphogenetic region.</i></li> <li>5. <i>Different application areas of geomorphology.</i></li> </ol>		

**Unit I: Basics of Geomorphology:** Nature, Scope and Development of Geomorphology - Recent Trends in Geomorphology - Fundamental Concepts of Geomorphology (Thornbury).

**Unit II: Earth Movements:** Isostasy - Doctrine of Isostasy - Views of Airy and Pratt. - Continental Drift Theory: Concept of Wegener - Plate Tectonics: Concept and Related Views - Mountain Building: Concepts of Kober, Daly and Holmes.

**Unit III: Exogenic Processes:** Physical, Chemical and Biological Weathering, Soil Formation and Mass Wasting: Factors and Types - Dynamics of Fluvial, Glacial, Aeolian and Coastal Processes - Resulting Landforms - Karst Topography.

**Unit IV: Conceptual Development in Geomorphology:** Cycle of Erosion: Concepts of W.M. Davis and W. Penck - Elements of Slope Development: Theories of Davis and Penck: Slope Decline Theory - King's Parallel Slope Retreat Theory - Morphogenetic Region.

**Unit V: Applied Geomorphology:** Applications of Geomorphology in Hydrology, Engineering Projects, Oil Exploration and Land Use planning

**Text Book**

1. Dayal P. A., (1996): A Text Book of Geomorphology, Shukla Book Depot, Patna.
2. Dayal P. A., (2019): A Text Book of Geomorphology, Rajesh Publications, Delhi.

**References**

1. Richard John Huggett (2018): Fundamentals of Geomorphology, T&F India.
2. Singh S., (1998): Geomorphology, Praying Pustakalaya, Allahabad.
3. Small R.J., (1978): The Study of Landforms: A Textbook of Geomorphology, Cambridge University Press, New York.
4. Thornbury W.D., (1954): Principles of Geomorphology, John Wiley and sons, Inc., New York.
5. Thornbury W.D., (2004): Principles of Geomorphology (Second Edition), CBS.
6. Thornbury W.D., (2019): Principles of Geomorphology (Third Edition), New Age International (P) Ltd., Publishers.
7. Worcester P.G., (1948): A Textbook of Geomorphology, Von Nostrand Reinhold, Company, New York.

## Name of the Programme: M.Sc., Applied Geography

### Programme Outcomes:

- PO.1: Student will be able to analyse the problems of physical as well as human / cultural environments and to find out the possible measures to solve those problems.
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- PO.5: Application of geospatial technologies (Remote Sensing, Geographic Information System and Global Navigation Satellite System) to solve the physical as well as human / cultural problems through mapping techniques.

### Programme Specific Outcomes:

- PSO.1. Design and conduct the independent research in their chosen field in the discipline.
- PSO.2. Exhibit knowledge of concepts, theories and methods designed to enhance understanding of the natural world and human society.
- PSO.3. Evaluate how historical events have been influenced by and have influenced physical and human geographic factors in local, regional, national and global settings.
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### Outcomes Mapping (Course Articulation Matrix)

Course Outcomes	Programme Outcomes					Programme Specific Outcomes				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓		✓			✓		✓		
CO2		✓							✓	
CO3				✓			✓			✓
CO4			✓	✓				✓		
CO5					✓			✓		✓

Core Course II	GEOGRAPHY OF POPULATION	Code: 20P1G2
<p><b>Objectives:</b> <i>To introduce the students the complex dimensions of population and to understand and evaluate the association between demographic, environment and socio-economic attributes of population in an ever changing space - time continuum.</i></p> <p><b>Course Outcomes:</b>  <i>After completing the course, the student should be able to:</i>  <i>Knowledge and understanding the</i></p> <ol style="list-style-type: none"> <li>1. <i>Population, sources of data and its limitations.</i></li> <li>2. <i>Concept and theory of population in world and regional distribution and growth.</i></li> <li>3. <i>Population composition and issues.</i></li> <li>4. <i>Population dynamics and its consequences.</i></li> <li>5. <i>Population and development particularly policy and its implication.</i></li> </ol>		

**Unit I: Population Geography:** Nature, Scope and Development - Sources of Population Data - Its level of Reliability - Problems of Mapping of Population Data.

**Unit II: Population Distribution:** Theories in Population-Demographic Transition Theory, Malthusian Theory - World Patterns and their Determinants, India: Population Distribution, Density and Growth Profile - Concepts of Under Population - Optimum Population and Over Population.

**Unit III: Population Composition:** Age and Sex, Family and Households, Literacy and Education, Religion, Caste and Tribes, Rural and Urban - Urbanization - Occupational Structure - Gender Issues - Population Composition of India.

**Unit IV: Population Dynamics:** Measurements of Fertility and Mortality - Migration: National and International Patterns - India's Population Dynamics.

**Unit V: Population and Development:** Population Resource Regions - Levels of Population and Socio-Economic Development - Population Policies in Developed and Less Developed Countries - Human Development Index and its Components - India's Population Policies, Population and Environment - Implications for the Future.

#### **Text Books**

1. Chandna R.C., (2014): Geography of Population; concept, Determinants and Patterns. Kalyani Publishers, New York.
2. Sundaram K.V. and Nangia S., (1986): Population Geography, Heritage Publications, Delhi.
3. Garnier B.J., (1970): Geography of Population Longman, London.
4. Mamoria C.B., (1981): India's Population Problem, Kitab Mahal, New Delhi.

#### **References**

1. Bilasborrow, Richard E and Daniel Hogan, (1999): Population and Deforestation in the Humid Tropics, International Union for the Scientific Study of Population, Belgium.
2. Kochhar, Rajesh (2000): The Vedic People: Their History and Geography Orient Longman Ltd., New Delhi.
3. Srinivasan K. and Vlassoff M., (2001): Population Development Nexus in India: Challenges for the New Millennium. Tata McGraw -Hill, New Delhi.
4. Srinivasan, K., (1998): Basic Demographic Techniques and Applications Sage Publications, New Delhi.
5. Siddhartha, K and Mukherjee S., (2017): Theories and Models and in Geography, Kitab Mahal, Allahabad.
6. Woods R., (1979): Population Analysis in Geography. Longman, London.

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CO1	✓	✓	✓		✓	✓	✓	✓		
CO2	✓	✓	✓	✓	✓	✓	✓	✓		✓
CO3	✓	✓	✓	✓	✓	✓	✓	✓	✓	
CO4	✓	✓	✓		✓	✓	✓	✓	✓	✓
CO5	✓	✓	✓		✓	✓	✓	✓	✓	✓

Core Course III	ELEMENTS OF CARTOGRAPHY	Code: 20P1G3
<p><b>Objectives:</b> <i>To enable the students to critically evaluate the concepts and approaches in Cartography and to learn techniques used in cartography. To develop a skill to prepare maps and keeping in view the cartographic techniques of mapping for the user requirement.</i></p> <p><b>Course Outcomes:</b>  <i>After completing the course, the student should be able to:</i>  <i>Knowledge and understanding the</i></p> <ol style="list-style-type: none"> <li>1. <i>Development of cartography and cartography as communication and language.</i></li> <li>2. <i>Dimensions of earth, its co-ordinates and role of remote sensing and GPS / GNSS.</i></li> <li>3. <i>Map compilation and generalisation procedures.</i></li> <li>4. <i>Complex, quantitative and qualitative maps.</i></li> <li>5. <i>Map reproduction procedures using different methods.</i></li> </ol>		

**Unit 1:** Nature and Scope of Cartography - Information Age and Mapping - Web Cartography - Development of Cartography in India and Abroad - Cartography as Language and Communication.

**Unit II:** Shape and Dimensions of Earth – Geographical Data - Scale and Direction - Geographic Co-Ordinate System - Cadastral Surveying and Mapping with Remote Sensing and GPS / GNSS.

**Unit III:** Concept of Base Map - Compilation and Generalization Principles – Map Designing and Layout Principles - Lettering and placing on the Maps based on the Design.

**Unit IV:** Design of Complex Map, Quantitative and Qualitative Maps - Data Presentation Principles - Symbolization Procedures.

**Unit V:** Map Reproduction Principles - Previous Methods for Map Reproduction, Latest Technological Development in Map Reproduction - Web Mapping Resources - Software Technologies used for Indigenous Map Reproduction.

**Text Books**

1. Misra. R.P and A. Ramesh (2002): Fundamentals of Cartography, Concept Publishing Company, New Delhi.
2. Robinson. H Arthur et al., (1985): Elements of Cartography, John Wiley and Sons, New York.

**References**

1. Kraak Menno-Jan, (2002): Cartography Visualization of Geo-spatial Data, Pearson Education, New Delhi.

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	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1			✓	✓	✓					✓
CO2				✓	✓				✓	✓
CO3			✓	✓	✓				✓	✓
CO4					✓					✓
CO5				✓	✓				✓	✓



Elective Course I	REMOTE SENSING	Code: 20P1G4EC
<p><b>Objectives:</b> The course is mainly emphasis on remote sensing technology and its applications in various fields. To impart knowledge mainly on the fundamentals of aerial and satellite remote sensing, digital image processing, image interpretation processes for the students.</p>		
<p><b>Course Outcomes:</b>            After completing the course, the student should be able to:            Knowledge and understanding the</p> <ol style="list-style-type: none"> <li>1. Basic concepts of EMR, spectral reflectance curve and activities of remote sensing centres.</li> <li>2. Significance of aerial remote sensing and its functions.</li> <li>3. Importance of satellite remote sensing, its types and various resolutions.</li> <li>4. Digital image processing technique in remote sensing data.</li> <li>5. Application areas of remote sensing.</li> </ol>		

**Unit I: Fundamentals:** Electromagnetic Radiation (EMR) - Energy Interaction with the Atmosphere and the Earth - Spectral Reflectance Curve - Ideal Remote Sensing System – Platforms - Development of Remote Sensing - Remote Sensing Centers and its activities in India.

**Unit II: Aerial Remote Sensing:** Importance of Aerial Remote Sensing - Aerial Survey - Flight Planning - Camera - Types of Aerial Photographs - Elements of Aerial Photograph Interpretation - Scale - Relief Displacement - Parallax - Stereovision and Photo Mosaic - Digital Photogrammetry.

**Unit III: Satellite Remote Sensing:** Types of Satellites: Based on Orbit, Sensor and Purpose, Resolution Aspects: Spatial, Spectral, Radiometric and Temporal Resolutions of Indian (IRS) and Satellite of LANDSAT, SPOT, IKONOS, QUICKBIRD and GEOEYE.

**Unit IV: Digital Image Processing:** Characteristics of Digital Image - Image Rectification and Restoration - Geometric and Radiometric Corrections - Image Enhancement Techniques - Image Classification: Supervised, Unsupervised and Accuracy Assessment.

**Unit V: Remote Sensing Applications:** Land Use / Land Cover - Agriculture - Forestry - Hydrology - Urban Planning - Environmental Hazardous Assessment.

#### **Text Books**

1. Anji Reddy M., (2001): Remote Sensing and Geographical Information Systems, B.S. Publications, Hyderabad.
2. Lillesand T.M. and Keifer R.W., (2011): Remote Sensing and Image Interpretation, John Willy and Sons, New York.

#### **References**

1. Campbell B. J and Wynne H. R., (2011): Introduction to Remote Sensing (5<sup>th</sup> Edition), the Guilford Press.
2. Rampall K. K., (1999): Handbook of Aerial Photography and Interpretation, Concept Publishing Co., New Delhi.
3. Sabins F. F. J., (1987): Remote Sensing: Principles and Interpretation, W. H., Freeman and Co., New York.
4. Strandberg C. H., (1967): Aerial Discover Manual, John Willey and Sons, New York.

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CO1					✓					
CO2					✓					
CO3		✓			✓	✓	✓	✓	✓	✓
CO4					✓					
CO5					✓		✓	✓	✓	✓

<b>Core Practical I</b>	<b>TERRAIN AND CLIMATIC DATA ANALYSIS</b>	<b>Code: 20P1GP1</b>
<p><b>Objectives:</b> To enable the students to evaluate the slope and morphology of landforms and to prepare various climatic maps.</p> <p><b>Course Outcomes:</b> After completing the course, the student should be able to:</p> <p>Knowledge and understanding the</p> <ol style="list-style-type: none"> <li>1. Importance of relief features.</li> <li>2. Topographic conditions using with different methods.</li> <li>3. River morphometric character.</li> <li>4. Climatic conditions using with different methods.</li> </ol>		

#### **Unit I: Drawing Profiles**

- 1.1 Serial Profile
- 1.2 Superimposed Profile
- 1.3 Projected Profile
- 1.4 Composite Profile
- 1.5 Longitudinal Profile of the River (Thalweg)

#### **Unit II: Slope Analysis**

- 2.1 Wentworth Method
- 2.2 Smith Method
- 2.3 Altimetric Frequency Curve
- 2.4 Hypsometric Curve and Integral

#### **Unit III: Morphometric Analysis**

- 3.1 **Linear Aspects**
  - 3.1.1 Stream Ordering
  - 3.1.2 Bifurcation Ratio
  - 3.1.2 Stream Length Ratio
- 3.2 **Areal Aspects**
  - 3.2.1 Drainage Shape Geometry
    - 3.2.1.1 Circularity Ratio
    - 3.2.1.2 Boyce Clark Method
    - 3.2.1.3 Elongation Ratio

#### **Unit IV: Climatic Data Analysis**

- 4.1 Climograph
- 4.2 Climatograph
- 4.3 Rainfall Dispersion Diagram
- 4.4 Water Surplus-Deficit Graph
- 4.5 Cyclone Tracking

#### **Text Books**

1. Monkhouse, F.J., and Wilkinson, H.R., (1963): Maps and Diagrams: Their Compilation and Construction, Methuen and Co., London.

#### **References**

1. Singh R.L., and Dutt, P.K., (1978): Elements of Practical Geography, Students and Friends, Allahabad.
2. Gopal Singh, Map work and Practical Geography, Vikas Publishing House Pvt., Ltd., New Delhi.
3. Mishra R. P. and A. Ramesh, (2002): Fundamentals of Cartography, Concept Publishers, New Delhi.
4. Pijshkanti Saha and Partha Basu, (2010): Advanced Practical Geography, Books and Allied (P), Ltd., Kolkatta.

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	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓								✓	
CO2		✓		✓		✓				
CO3		✓			✓			✓		✓
CO4			✓							
CO5							✓			

<b>Core Course IV</b>	<b>APPLIED CLIMATOLOGY</b>	<b>Code: 20P2G45</b>
<p><b>Objectives:</b> <i>To acquire knowledge and understand the origin and composition of atmosphere, air pressure, wind, moisture, atmospheric disturbances, climatic types and weather forecasting for applied activities</i></p> <p><b>Course Outcomes:</b>  <i>After completing the course, the student should be able to:</i></p> <p><i>Knowledge and understanding the</i></p> <ol style="list-style-type: none"> <li>1. <i>Structure and composition of atmosphere and distribution of temperature.</i></li> <li>2. <i>Informations of atmospheric pressure and winds.</i></li> <li>3. <i>Atmospheric moisture and its controlling factors.</i></li> <li>4. <i>Air masses and types of cyclones.</i></li> <li>5. <i>Planning and execution of weather forecasting techniques.</i></li> </ol>		

**Unit I: Introduction:** Applied Climatology: Definition - Nature and Scope - Climate and Human Affairs - Atmosphere: Composition and Structure - Insolation - Heat Budget - Distribution of Temperature: Horizontal and Vertical Distribution - Inversion of Temperature.

**Unit II: Atmospheric Pressure and Winds:** Pressure Gradient, Vertical, Horizontal and Seasonal Variation in Pressure Pattern - General Circulation of Atmosphere: Surface Wind System - Geostrophic Wind - Gradient Wind - Jet Streams - Origin of Monsoon - Indian Monsoon - Local Winds.

**Unit III: Atmospheric Moisture:** Potential Evapotranspiration and Actual Evapotranspiration - Humidity and Precipitation: Forms and Types - Controlling Factors - Atmospheric Equilibrium: Stability and Instability - Latent Heat and Adiabatic Process.

**Unit IV: Air Masses:** Definition and Characteristics - Source Region and Classification - Fronts: Frontogenesis, Types, Characteristics - Frontolysis: Origin, Morphology and Occurrences – Temperate, Tropical Cyclones and Anticyclones.

**Unit V: Applied Climatology:** Climatic Classification of Koppen and Thornthwaite - Length of Growing Period - Crop Calendar - Water Balance - Heat Island - Human Comfort Zone – Types of Weather Forecasting.

#### **Text Books**

1. Lal D.S., (1986): Climatology, Chaitanya Publishing House, Allahabad.
2. Lal D.S., (2011): Climatology, Sharda Pustak Bhawa, Allahabad.

#### **References**

1. Critchfield H. J., (1975): General Climatology, Prentice Hall, New Delhi.
2. Richmond W. Longley, (1970): Elements of Meteorology, John Willey and sons inc. New York.
3. Siddhartha K., (2005): Atmosphere, Weather and Climate, Kisalaya Publications Pvt. Ltd., New Delhi.
4. Tewartha G.T., (1968): Introduction to Climate, McGraw Hill, New York.

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Course Outcomes	Programme Outcomes					Programme Specific Outcomes				
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CO1	✓									✓
CO2		✓				✓		✓		✓
CO3			✓						✓	✓
CO4				✓						✓
CO5					✓		✓			✓

Core Course V	BIOGEOGRAPHY	Code: 20P2G6
<p><b>Objectives:</b> <i>The purpose of this course is to appraise the students of the interrelationships among the living organisms within the environment and the importance of conservation of biosphere and biodiversity.</i></p> <p><b>Course Outcomes:</b>  <i>After completing the course, the student should be able to:</i></p> <p><i>Knowledge and understanding the</i></p> <ol style="list-style-type: none"> <li>1. <i>Vegetation and ecosystem.</i></li> <li>2. <i>Role of physical to determine the distribution of flora and fauna.</i></li> <li>3. <i>Various types of biomes.</i></li> <li>4. <i>Biodiversity and its future possibilities.</i></li> <li>5. <i>Wild management and conservation. .</i></li> </ol>		

**Unit I:** Meaning, Scope and History of Biogeography - Seres and Climax Vegetation - Ecosystem: Energy Flows and Biogeochemical Cycles.

**Unit II:** Factors Affecting Distribution of Flora and Fauna: Atmospheric, Edaphic and Biotic Factors - Soils: Formation, Properties, Profile - Soil Classification: Zonal, Azonal and Intra-Zonal Soils - Soil Erosion and Conservation.

**Unit III:** Biomes: Tropical Rainforests - Monsoon Forests - Tropical Grasslands - Hot Deserts - Mediterranean - Temperate Grasslands - Temperate Deciduous Forests - Coniferous Forests - Tundra.

**Unit IV:** Biogeographical Regions: Phytogeographical and Zoogeographical Regions of the World - Biodiversity: Concept, Recent Trends and Impact of Climatic Change.

**Unit V:** Wildlife Management and Conservation: Problems of Deforestation and Conservation Measures: Social Forestry - Agroforestry - Wildlife: Major Gene Pool Centres - Conservation - Wildlife in India and Management.

#### **Text Book**

1. Mathur, H. S. (2003): Essentials of Biogeography, Pointer Publishers, Jaipur.

#### **References**

1. Barry C., (1977): Biogeography-An Ecological and Evolutionary Approach, Cox Blackwell, Oxford.
2. Hagget R.J., (1988): Fundamentals of Biogeography, Routledge, London.
3. Panna Lal (2015): Biogeography, Anmol Publications Pvt. Ltd.
4. Robinson H., (1982): Biogeography, McDonald and Evans, London.

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CO1	✓					✓				
CO2		✓					✓			
CO3		✓					✓			
CO4			✓						✓	
CO5		✓							✓	



Core Course VI	URBAN GEOGRAPHY	Code: 20P2G7
<p><b>Objectives:</b> This course examine the process of urbanization and origin, growth, classification of urban settlements with relevant theories and models and understand the changing economic base, structure of the cities, contemporary urban issues by emphasizing new urban planning and urban policy perspectives.</p> <p><b>Course Outcomes:</b> After completing the course, the student should be able to: Knowledge and understanding the</p> <ol style="list-style-type: none"> <li>1. Approaches of urban geography and its developments.</li> <li>2. Theories of urban growth.</li> <li>3. Morphology and land use structure of urban place.</li> <li>4. Distinctiveness of urban issues.</li> <li>5. Urban policy and planning.</li> </ol>		

**Unit I: Nature and Scope of Urban Geography:** Approaches and Recent Trends in Urban Geography - Urban Places - Bases and Process of Urbanization and Development - Classification of Urban Settlements on the basis of Size and Function.

**Unit II: Organization of Urban Space:** Urban Morphology and Land Use Structure: City Core, Commercial, Industrial and Residential Areas, Cores-Country Variations - City-Region Relations - Modern Urban Landscape - Morphology of Urban Settlements of India and its Comparison with Western Countries - Urban Expansion - Umland and Periphery.

**Unit III: Theories of Urban Growth:** Central Place Theory - Theories of Peroux and Boudeville- Concentric Zone Theory - Sector Theory and Multiple Nuclei Theory.

**Unit IV: Contemporary Urban Issues:** Urban Poverty - Urban Renewal - Urban Sprawl – Slums – Transportation – Housing - Urban Infrastructure - Urban Finance - Environmental Pollution: Air, Water, Noise, Solid Waste - Urban Crime - Issues of Environmental Health.

**Unit V: Urban Policy and Planning:** Development of Small and Medium Sized Towns - Planning for New Wards - City Planning - Green Belts, Garden Cities - Urban Policy - Contemporary Issues in Urban Planning - Globalization and Urban Planning in the Third World - Urban Land Use Planning.

#### **Text Books**

1. Carter H., (1972): The study of Urban Geography, Edward Arnold, London.
2. Misra R.P and K.V. Sundaram, (1971): Regional Planning and Development, University of Mysore, Mysore.
3. Northam R.M., (1975): Urban Geography, John Wiley sons, New York.
4. Robert G. Putnam, Frank J. Taylor, (1970): A Geography of Urban Places, Methuen Publications, Tornato, London.
5. Singh R. Y., (1994): Geography of Settlements, Rawat Publications, Jaipur and New Delhi.
6. Verma L.N., (2016): Urban Geography, Rawat Publications, Jaipur.

#### **References**

1. Berry B. J. L and Horton F.F., (1970): Geographic Perspectives on Urban Systems, Prentice Hall, Englewood Cliffs, New Jersey.
2. Chorley R. J. O., Haggett P., (1966): Models in Geography, Methuen, London.
3. Dickinson R. E., (1964): City and Region, Routledge, London.
4. Rao V. L. S. P., (1983): Urbanisation in India: Spatial Dimensions, Concept Publishing Co. New Delhi.

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CO1			✓	✓	✓	✓			✓	✓
CO2	✓		✓	✓	✓	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO4	✓	✓		✓	✓	✓	✓	✓	✓	✓
CO5	✓	✓		✓	✓	✓	✓	✓	✓	✓

Elective Course II	DISASTER STUDIES	Code: 20P2G8GE
<p><i>Objectives: The philosophy and methodology of the subject is discussed in such a way that students can develop a keen interest in the study of natural disasters and man-made disasters.</i></p>		
<p><b>Course Outcomes:</b></p>		
<p><i>After completing the course, the student should be able to:</i></p>		
<p><i>Knowledge and understanding the</i></p>		
<ol style="list-style-type: none"> <li>1. Principles of natural disaster and its importance.</li> <li>2. Various natural disasters and their effects on environment.</li> <li>3. Manmade disasters and their effects on environment.</li> <li>4. How to plan and execute the preparedness for disasters.</li> <li>5. Knowledge for disaster management and planning.</li> </ol>		

**Unit I: Principles of Natural Disasters:** Hazards and Disasters - Basic Concepts of Disaster, Risk and Vulnerability in Disasters - Types of Disasters - Natural Forces and Life Increasing Importance of Disasters.

**Unit II: Natural Disasters:** Earthquakes, Volcanoes, Landslides, Land Subsidence, Tsunami, Avalanches, Cyclone, Flood, Drought, Global Climate Extreme - Casual Factors and Impact Assessment.

**Unit III: Man-Made Disasters:** Hazardous, Wastes, Radioactivity, Toxicity, Nuclear War, Biological Weapons, Landmines, Pollution: Land, Water, Air and Noise Pollution.

**Unit IV: Disaster Preparedness:** Disaster Preparedness and Mitigation - Training and Drills for Disaster Preparedness - Early Warning Systems - Building Design and Construction in Highly Seismic Zones - Retrofitting of Buildings - Managing Natural and Anthropogenic Disasters - Risk Assessment and Analysis.

**Unit V: Disaster Management:** Basic Principles of Disasters Management - Disaster Management Cycle - Disaster Management Policy - National and State Bodies for Disaster Management - Awareness Generation Program – Applications of Remote Sensing and GIS Techniques in Disaster Management.

#### **Text Books**

1. Gupta H.K., (2003): Disaster Management, Indian National Science Academy, Orient Blackswan.
2. Savindra Singh (1991): Environmental Geography, Kalyan Publications, New Delhi.
3. Sharma V.K., (2001): Disaster Management, National Centre for Disaster Management, India

#### **References**

1. Bryant Edwards (2005): Natural Hazards, Cambridge University Press, U.K.
2. Carter W. Nick, (1991): Disaster Management, Asian Development Bank, Manila.
3. Government of India (1997): Vulnerability Atlas of India, New Delhi.
4. National Disaster Management Division, Ministry of Home Affairs, Government of India  
<http://www.ndmindia.nic.in/>
5. Sahni, Pardeep et. al., (eds.) (2002): Disaster Mitigation Experiences and Reflections, Prentice Hall of India, New Delhi.

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CO2		✓			✓			✓	✓	✓
CO3			✓				✓			✓
CO4				✓						✓
CO5					✓				✓	✓

Core Practical II	SOCIO ECONOMIC DATA ANALYSIS	Code: 20P2GP2
<p><b>Objectives:</b> To prepare population maps and to evaluate the spatial distribution of various attributes of population. To prepare agricultural maps from the available data and to analyze the crop combinations in different regions.</p> <p><b>Course Outcomes:</b> After completing the course, the student should be able to: Knowledge and understanding the</p> <ol style="list-style-type: none"> <li>1. Various graphs in map making.</li> <li>2. Preparation of population and agricultural maps.</li> <li>3. Agricultural data and its mapping.</li> <li>4. Mapping of location and settlements.</li> <li>5. Transport network analysis.</li> </ol>		

### Unit I: Graphs

- 1.1. Simple Graph
- 1.2. Semi Logarithmic Graph
- 1.3. Log-Log-Graph
- 1.4. Triangular Graph
- 1.5. Lorenz Curve.

### Unit II: Distribution Maps

- 2.1. Choropleth Map
- 2.2. Dasymetric map
- 2.3. Chrochrometic Map
- 2.4. Population Potential map

### Unit III: Mapping of Agricultural Data

- 3.2. Crop Concentration
- 3.3. Crop Diversification
- 3.4. Crop Combination:
  - 3.4.1 Weaver's Method
  - 3.4.2 Doi's Method

### Unit IV: Location and Settlement Analysis

- 4.1. Nearest Neighbour Analysis
- 4.2. Mean Centre
- 4.3. Weighted Mean Centre
- 4.4. Median Centre
- 4.5. Standard Distance

### Unit V: Transport Network Analysis

- 5.1 Connectivity
- 5.2 Accessibility

### References

1. Gopal Singh, (1983): Map work and Practical Geography, Vikas Publishing House Pvt., Ltd., New Delhi.
2. Mishra R. P. and A. Ramesh (2002): Fundamentals of Cartography, Concept Publishers, New Delhi.
3. Monkhouse F. J., (1963): Maps and Diagrams, Methuen and Co. Ltd., London.
4. Rampal K.K. Mapping and Compilation - Methods and Techniques, Concepts Publishing Co., New Delhi
5. Robinson A. R., (1995): Elements of Cartography, Chapman and Hall.
6. Singh R. L., (1978): Elements of Practical Geography, Kalyani Publishers.

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CO1	✓									
CO2			✓		✓		✓			
CO3		✓				✓		✓		
CO4				✓					✓	
CO5					✓		✓			✓

Core Course VII	REGIONAL PLANNING	Code: 20P3G9
<p><b>Objectives:</b> This course is devoted to study the region, planning, significance, various planning methods and evolution of planning activities in India and Tamil Nadu.</p>		
<p><b>Course Outcomes:</b></p>		
<p>After completing the course, the student should be able to:</p>		
<p>Knowledge and understanding the</p>		
<ol style="list-style-type: none"> <li>1. Region and its planning, regional imbalances, how to analyse the regions using different theories, planning in India and Tamil Nadu.</li> <li>2. Govt. plans like five year plans, annual plans and multi level plan.</li> <li>3. Role of Indian planning commission, State planning commission and planning regions of India and Tamil Nadu.</li> <li>4. Regional planning in different level.</li> <li>5. Development of regions and its management.</li> </ol>		

**Unit I: Region and Planning:** Meaning - Elements and Types of Regions: Homogeneous, Nodal and Administrative Regions - Planning Region: Objectives and Characteristics of Planning Region - Regional Processes - Regionalism vs. Sectionalism.

**Unit II: Regional Imbalances and Problems in India:** Problem in the Distribution of Natural Resources (Soil, Forest, Water and Mineral) - Agricultural Development - Industrial Concentration and Population Distribution - Social and Infrastructure Indicators of Regional Disparities.

**Unit III: Regional Analysis:** Theories of Spatial Interaction and Regional Disparities: Spread and Backwash theory of Myrdal - Trickle Down and Polarization Effect theory of Hirschman - Urban Hierarchy theory of Berry - Growth Pole theory of Perraux, Baudville and Richardson - Spatial Diffusion of Haggerstrand and Growth Foci of Misra.

**Unit IV: Planning in India:** History of Regional Planning Activity in India - Indian Planning Commission and its Role - Planning Regions in India - Five-Year Plans - Annual Plans and Multi Level Planning - Objectives and Achievements of Special Development Programs: Drought Prone Area, Tribal and Hill Area, Backward Area and Watershed Development.

**Unit V: Planning in Tamil Nadu:** State Planning Commission - Planning Regions of Tamil Nadu - District Planning - Metropolitan Area Planning - Panchayat Raj System - Power and Functions of Town Panchayat - Municipality and Corporation.

### **Text Books**

1. Jayasri Ray Chandhuri (2015): An Introduction to Development of Regional Planning with Special Reference to India, Published by Orient Blackswan Pvt. Ltd., New Delhi.
2. Misra R.P., (1992): Regional Planning: Concepts, Techniques, Policies and Case Studies, Concept Publishing Company, New Delhi.
3. Misra R.P., (2002): Regional Planning: Concepts, Techniques, Policies and Case Studies, Concept Publishing Company, New Delhi.
4. Misra R. P, Sundaram K. V and Prakasrao V. L. S., (1947): Regional Development Planning in India, Vikash Publishing House, New Delhi.
5. Nath V (2011): Administration and Development Planning in India, Concept Publishing Company Pvt. Ltd. New Delhi.

### **References**

1. Mahesh Chand and Vinay Kumar Puri, (1985): Regional Planning in India, Allied Publishers Pvt. Ltd., Delhi.
2. Prakasa Rao, V.L.S., (1963): Regional Planning, Asia Publishing House, Calcutta.
3. Rengasamy S., (2009): Regional Planning and Development, Madurai Institute of Social Sciences.

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CO1	✓	✓		✓			✓	✓	✓	✓
CO2	✓	✓		✓		✓	✓		✓	✓
CO3				✓			✓			✓
CO4	✓	✓		✓	✓	✓		✓	✓	✓
CO5	✓	✓	✓		✓	✓		✓		✓



Core Course VIII	GEOGRAPHIC THOUGHT	Code: 20P3G10
<p><b>Objectives:</b> <i>The course is aimed at presenting a comprehensive, integrated and empirically based profile of the origin and development of geographical thought from ancient to modern period.</i></p>		
<p><b>Course Outcomes:</b></p>		
<p><i>After completing the course, the student should be able to:</i></p>		
<p><i>Knowledge and understanding the</i></p>		
<ol style="list-style-type: none"> <li>1. <i>The pre-history of geographical ideas of Greeks, Romans, Arabs and Indians.</i></li> <li>2. <i>The contributions of Modern Geographers to the development of Geography.</i></li> <li>3. <i>Dualism and Dichotomies in Geography.</i></li> <li>4. <i>Recent trends and approaches in geographical studies.</i></li> <li>5. <i>The theories related to global strategic views.</i></li> </ol>		

**Unit I: Pre History of Geographical Ideas:** Greeks, Romans, Arabs and Ancient Indians - Impact of Explorations and Discoveries.

**Unit II: Founders of Modern Geography:** (i) Alexander Von Humboldt, (ii) Carl Ritter, (iii) Friedrich Ratzel, (iv) Vidal de la Blache, (v) Halford J. Mackinder, (vi) W. M. Davis, (vii) Ellen Churchill Sample and (viii) Richard Hartshorne.

**Unit III: Dualism and Dichotomies in Geography:** (i). Determinism vs. Possibilism, (ii). Physical vs. Human, (iii). General vs. Regional and (iv). Quantitative vs. Qualitative.

**Unit IV: Recent Trends in Geography:** Four Traditions in Geography: (i). Man-Land, (ii). Area Studies, (iii). Spatial and (iv). Earth Science, Quantitative Revolution, Paradigms in Geography, Systems Approach, Regional Concept.

**Unit V: Political Geography:** Development of Political Geography - Geopolitics, Global Strategic Views: Heartland and Rimland Theories - Concept of Nation - State and Intra-State - Boundaries and Frontiers - Politics of World Resources - Geography of Federalism.

### **Text Books**

1. Dikshit, R.D., (1996): Political Geography: A Contemporary Perspective. Tata McGraw Hill, New Delhi.
2. Dikshit, R.D., (2015): Geographical Thought – A Contextual History of Ideas, Asoke K Ghosh, Delhi.
3. Majid Hussain, (2001): Evolution of Geographical Thought, Rawat Publication, Jaipur.
4. Negi B. S., (1994): Geographical Thought, Kedar Nath and Ram Nath Publications, Meerut, Uttra Pradesh.

### **References**

1. Dikshit R.D., (1997): Geographical Thought, Prentice Hall of India, New Delhi.
2. Eayne K. Davis, (1972): Conceptual Revolution in Geography, Edward Arnold Publications, London.
3. Sudepta Adhikari, (2004): Fundamentals of Geographical Thought, Chaitanya Publishing House, Allahabad.

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CO1	✓			✓	✓			✓		✓
CO2			✓			✓			✓	
CO3		✓			✓		✓			✓
CO4				✓				✓	✓	
CO5					✓					✓

Core Course IX	AGRICULTURAL GEOGRAPHY	Code: 20P3G11
<p><b>Objectives:</b> To impart the knowledge to the students of the development, characteristics, regionalization and significance of agricultural geography with emphasizing Indian context.</p> <p><b>Course Outcomes:</b> After completing the course, the student should be able to:</p> <p><i>Knowledge and understanding the</i></p> <ol style="list-style-type: none"> <li>1. Historical perspectives and various approaches in agriculture.</li> <li>2. Role of physical and socio-economic factors in agriculture.</li> <li>3. Identify various agricultural systems of the world.</li> <li>4. Land capability, suitability and its classification, models in geography.</li> <li>5. Role of green revolution in Indian agriculture.</li> </ol>		

**Unit I: Nature of Agricultural Geography:** Objectives and Historical Perspective - Approaches to Agricultural Geography: Empirical (Inductive) and Normative (Deductive) - Major Gene Centres - Domestication of Animals - Diffusion of Crops - Pastoralism and Development.

**Unit II: Physical Factors:** Topography, Altitude, Climatic Elements: Temperature, Sunshine, Frost, Moisture, Snow and Winds, Soil: Characteristics and Types, **Socio-Economic Factors:** Land tenancy, Size of Land Holdings and Fragmentation, Co-Operative Farming Methods and Operational Efficiency, Labour, Capital, Mechanization and Government Policy.

**Unit III: Agricultural Systems of the World:** Nomadic Herding, Livestock Ranching, Commercial Grazing, Shifting Cultivation, Sedentary Agriculture, Subsistence, Intensive, Extensive Agriculture, Mixed Farming, Dairy Farming, Horticulture, Collective Farms and State Farms.

**Unit IV: Agricultural Regionalization:** Models in Agricultural Geography: Vonthunen and Jonoson - Crop Combination, Crop Diversification and Land Capability - Land Suitability and Land Use Classification - Agro-climatic Regions of India – Applications of Remote Sensing for Crop Management.

**Unit V: Agriculture in India:** Characteristics of Indian Agriculture - Rural Development in India - Policy and Programme - Green Revolution I and II - Socioeconomic Constraints - Social Tension and Ecological Implications of the Green Revolution.

#### **Text Books**

1. Alka Gautam (2016): Agricultural Geography, Sharda Pustak Bhawan, Allahabad.
2. Majid Hussain, (1999): Systematic Agricultural Geography, Rawat Publications, Jawahar Nagar, Jaipur.
3. Hussain, M., (1979): Agricultural Geography, Inter India Publications, New Delhi.
4. Singh J and Dhillon S.S., (2006): Agricultural Geography, Tata McGraw Hill Publication Company, New Delhi.

#### **References**

1. Morgan, W.B. and Munton, R.J., (1972): Agricultural Geography, Methuen & Co., London.
2. Sing, Jasbir and S.S. Dhillon, (1994): Agricultural Geography, Tata McGraw-Hill Publications, New Delhi.

**Name of the Programme: M.Sc., Applied Geography****Programme Outcomes:**

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- PO.5: Application of geospatial technologies (Remote Sensing, Geographic Information System and Global Navigation Satellite System) to solve the physical as well as human / cultural problems through mapping techniques.

**Programme Specific Outcomes:**

- PSO.1. Design and conduct the independent research in their chosen field in the discipline.
- PSO.2. Exhibit knowledge of concepts, theories and methods designed to enhance understanding of the natural world and human society.
- PSO.3. Evaluate how historical events have been influenced by and have influenced physical and human geographic factors in local, regional, national and global settings.
- PSO.4. Examine social and environmental processes with a particular focus on space and place, critical theory, practical application, analysis and intervention in the chosen field within the subject.
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**Outcomes Mapping (Course Articulation Matrix)**

Course Outcomes	Programme Outcomes					Programme Specific Outcomes				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓						✓			
CO2		✓						✓		
CO3			✓					✓		
CO4		✓						✓		
CO5			✓					✓		

Elective Course III	RESEARCH METHODOLOGY	Code: 20P3G12EC
<p><b>Objectives:</b> <i>The course is to introduce scientific way of executing research, methods, evaluation, and producing research articles.</i></p>		
<p><b>Course Outcomes:</b></p>		
<p><i>After completing the course, the student should be able to:</i></p>		
<p><i>Knowledge and understanding the</i></p>		
<ol style="list-style-type: none"> <li>1. <i>Types of research and approaches to geographical research.</i></li> <li>2. <i>Concepts and facts, principles, hypothesis, theory, model, law and their implications.</i></li> <li>3. <i>Types of research design in terms of exploratory, descriptive and experimental.</i></li> <li>4. <i>Specific statistical techniques for data analysis - correlation, regression and hypothesis testing.</i></li> <li>5. <i>Report / thesis writing.</i></li> </ol>		

**Unit I Research:** Meaning, Need for Scientific Research - Types of Research - Approaches to Geographical Research - Identification of Fields - Sub -Fields and Themes - Research Ethics.

**Unit II Logic in Research:** Concepts and Facts, Principles, Hypothesis, Theory, Model, Law and their Implications in Geographical Research - the Science of Geography - Research Trends in Geography.

**Unit III Research Design:** Meaning and Need - Features of Good Design - Types of Research Design: Exploratory, Descriptive and Experimental.

**Unit IV Data Acquisition and Analysis:** Collection of Data, Sources of Data: Primary and Secondary, Structuring the Data, Data Transformation - Sampling Techniques - Simple Quantitative Techniques: Correlation, Regression and Hypothesis Testing.

**Unit V Report and Thesis Writing:** Structure and Components of Scientific Repots – Types of Report: Technical Reports and Thesis – Different Steps in the Preparation: Layout, Structure and Language of typical Reports – Citation Methods: Foot Note, Text Note, End Note, References.

#### **Text Books**

1. Kothari C.R., (1990): Research Methodology, Methods and Techniques, Wishwa Prakasan Pvt. Ltd., New Delhi.
2. Kothari C.R. and Garg G., (2019): Research Methodology, Methods and Techniques, New Age International Publishers, Delhi.
3. Mishra R.P., (1998): Research Methodology in Geography, Concept Publishing Company, New Delhi.
4. Najma Khan, (1998): Quantitative Methods in Geographical Research, Concept Publishing Company, New Delhi.

#### **References**

1. John A. Mathews (1981): Quantitative and Statistical Approaches to Geography, Pregamon Press, Oxford.
2. Drwajma Khan (1998): Quantitative Methods in Geographical Research, Concept Publications, New Delhi.
3. Amodeo D and C. College (1975): An Introduction to Scientific Reasoning in Geography, John Willy and Sons, New York.
4. Davi K.D., (1971): Conceptual Revolution in Geography, University of London, London.
5. Hang I. L. and J. P., Leonenburg (1973): An Introduction to Scientific Geographic Research, Brown Co., Iowa.
6. Lal Das, D.K., (2000): Practice of Social Research, Rawat Publications, Jaipur.

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CO1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO2	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓	✓		✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓	✓		✓	✓	✓

Core Practical III	GEOSPATIAL ANALYSIS I	Code: 20P3GP3
<p><b>Objectives:</b> Introduce the students to the recent advances in the application of remote sensing techniques in Geography and to impart training using simple photogrammetric instruments, visual and digital interpretation of aerial and satellite imageries.</p> <p><b>Course Outcomes:</b> After completing the course, the student should be able to:</p> <p>Knowledge and understanding the</p> <ol style="list-style-type: none"> <li>1. Importance of aerial remote sensing through practical.</li> <li>2. Significance of satellite remote sensing through practical.</li> <li>3. Digital image processing</li> <li>4. Visual interpretations of physical and cultural features.</li> <li>5. Digital analysis using remote sensing data.</li> </ol>		

### Unit I: Aerial Remote Sensing

- 1.1 Marginal Information of Aerial Photograph
- 1.2 Scale, Parallax and Height Measurement
- 1.3 Elements of Aerial Photo Interpretation
- 1.4 Interpretation of Physical Features
- 1.5 Interpretation of Cultural Features

### Unit II: Satellite Remote Sensing

- 2.1 Marginal Information of IRS Standard products
- 2.2 Path and Row Identification
- 2.3 Digital data sources and downloading
- 2.4 Band identification and combinations

### Unit III: Visual Interpretation of satellite images

- 3.1 Visual Interpretation Keys
- 3.2 Interpretation using Toposheets
- 3.3 Interpretation of Physical Features
- 3.4 Interpretation of Cultural Features

### Unit IV: Digital Image Processing

- 4.1 Lookup table, Image Histogram and Pixel table
- 4.2 Image to Image Registration
- 4.3 Image to Map registration
- 4.4 Image Sub- setting

### Unit V: Digital Analysis

- 5.1 Vegetation Indices
- 5.2 Un-supervised classification
- 5.3 Supervised classification
- 5.4 Accuracy Assessment

### References

1. Chang, Kang-tsung (2002): Introduction to Geographic Information Systems. New Delhi:
2. Chouhan T. S. and Joshi K. N., (1996): Applied Remote Sensing and Photo Interpretation, John Wiley and Sons, New York.
3. Floyd F and Sabins J. R., (1986): Remote Sensing Principles and Interpretation (Second Edition) W. H. Freeman and Company New York.
4. Lawrence H. L and Ray G. R., (1965): Aerial Photographs in Field Geography, Holt. Rinehart and Winston, New York.
5. Lillesand T. M. and Kiefer W., (1987): Remote Sensing and Image Interpretation, John Wiley and Sons, New York.

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CO1	✓	✓				✓	✓	✓		✓
CO2				✓	✓					
CO3		✓	✓					✓	✓	✓
CO4							✓			✓
CO5	✓	✓	✓	✓	✓	✓		✓	✓	✓



Core Course X	GEOGRAPHY OF HEALTH	Code: 20P4G13
<p><b>Objectives:</b> <i>To acquaint the students by relating geographical factors with nutrition, health, spatial distribution of diseases and disease pattern and significance of health care facilities and policies of the government.</i></p> <p><b>Course Outcomes:</b>  <i>After completing the course, the student should be able to:</i></p> <p><i>Knowledge and understanding the</i></p> <ol style="list-style-type: none"> <li>1. <i>Concept of health and development.</i></li> <li>2. <i>Developed linkages between spatial patterns of the disease with geographical parameters affecting human health.</i></li> <li>3. <i>World's classification and distribution of major diseases.</i></li> <li>4. <i>Ecology, etiology and transmission of major diseases.</i></li> <li>5. <i>Healthcare planning and policies of various organizations in terms of eradication of diseases.</i></li> </ol>		

**Unit I:** Nature, Scope and Significance of Geography of Health - Development of this area of Specialization and its distinction from Medical Science.

**Unit II:** Geographical Factors Affecting Human Health and Diseases arising from them, viz.

- i. Physical Factors, Relief, Climate, Soils and Vegetation.
- ii. Social Factors: Population Density, Literacy, Social Customs and Poverty.
- iii. Economic Factors: Food and Nutrition Occupation and Standard of Living.
- iv. Environmental Factors: Urbanization and Congestion, Water, Air and Noise Pollution and Solid Waste.

**Unit III:** Classification of Diseases: Genetic, Communicable and Non-Communicable, Occupational and Deficiency Diseases - World Health Organisation (WHO) Classification of Diseases - Pattern of World Distribution of Major Diseases.

**Unit IV:** Ecology, Etiology and Transmission of Major Diseases: Cholera, Malaria, Tuberculosis, Hepatitis, Leprosy, Cardiovascular, Cancer, AIDS and STDS - Diffusion of Diseases and Causes for the Same - Deficiency Disorders and Problems of Mal-Nutrition in India.

**Unit V:** Health-Care Planning:

- i. International level: WHO, UNICEF, Red Cross
  - ii. National level: Government and NGOs,
- Health Care Planning and Policies, Availability, Accessibility and Utilization of Healthcare Services; Primary Health Care, Inequalities in Health Care Services in India, Family Welfare, Immunization, National Disease Eradication and Health for All Programs.

#### **Text Books**

1. Hazra J. (ed.) (1997): Health Care Planning in Developing Countries. University of Calcutta, Calcutta.
2. Learmonth A. T. A., (1978): Patterns of Disease and Hunger. A Study in Medical Geography, David and Charles, Victoria.
3. Meade M.S. and Earickson R.J., (2006): Medical Geography, Rawat Publication, Jaipur
4. Phillips R., (1990): Health and Health Care in the Third world, Longman, London.
5. Pyle G., (1979): Applied Medical Geography, Winston Halsted Press, Silver Springs, Md, U.S.A.

#### **References**

1. May J. M., (1970): The World Atlas of Diseases, Nat. Book Trust, New Delhi.
2. Narayan K. V., (1997): Health and Development, Inter-Sectoral Linkages in India, Rawat Pub., Jaipur.
3. Phillips D. R., (1990): Health and Health Care in the Third world. Longman, London.

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CO1	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO2	✓	✓	✓		✓	✓	✓	✓	✓	✓
CO3	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO4	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CO5	✓	✓	✓	✓	✓	✓	✓	✓		✓

Elective Course IV	FUNDAMENTALS OF GIS	Code: 20P4G14EC
<p><b>Objectives:</b> <i>Introducing the technique of GIS, availability of data, data handling, analysis and modeling for various spatial problems and also emphasize the significance of GPS/GNNS augmentation, survey and applications.</i></p> <p><b>Course Outcomes:</b>  <i>After completing the course, the student should be able to:</i></p> <p><i>Knowledge and understanding the</i></p> <ol style="list-style-type: none"> <li>1. <i>Functions of GIS and its components.</i></li> <li>2. <i>Knowledge of GIS database.</i></li> <li>3. <i>Spatial analysis in GIS.</i></li> <li>4. <i>Importance of GIS modelling in geographical studies.</i></li> <li>5. <i>Significance of Global Positioning System (GPS) / GNSS (Global Navigation Satellite System)</i></li> </ol>		

**Unit I: Introduction:** Definition - Scope - Functional Requirements of GIS - Components of GIS – Cartography in GIS - GIS Interface - Recent Trends and Applications of GIS - Open Sources of GIS.

**Unit II: GIS Database:** Spatial and Non-Spatial Data - Data Models: Raster and Vector - Database Management System (DBMS) - Data Structures - Relational, Hierarchical and Network - Data Input - Digitization of Maps and Imageries - Coordinate Transformation - Attribute Data Generation.

**Unit III: Spatial Analysis:** Spatial Overlay Operations - Network Analysis and Proximity Analysis - 3D Models, TIN, DEM, DTM and Query in GIS.

**Unit IV: GIS Modeling:** Models of Spatial Processes - Natural and Scale Analogue Models - Conceptual Models - Mathematical Model - Models of Physical and Environmental Processes - Modeling Human Process - Gravity Model - Problems related to using GIS in Spatial Model Process - GIS Models and Maps as Spatial Decision Support System.

**Unit IV: Global Navigation Satellite System:** Introduction - GNNS Augmentation Systems of India and other Countries - Satellites Constellations and Segments - Types of Positioning - Post Processing and Data - Accuracy of Positioning - Applications of GNSS.

#### **Text Books**

1. Burrough P.A., (1986): Principles of GIS for Land Resources Assessment, Clarendon Press, Oxford.
2. Chang Kang-tsung, (2002): Introduction to Geographic Information Systems, New Delhi, Tata McGraw-Hill Publishing Company Limited.
3. Ram Mohan Rao and Afzal Sharieff (2018): Geographical Information System – Theory and Practice, Rawat Publications, Jaipur.

#### **References**

1. Lo C.P. and Yeung, Albert K.W., (2002): Concepts and Techniques of Geographic Information Systems (Eastern Economy Edition), Prentice-Hall of India, Private Limited, New Delhi.
2. Haywood L., Comelius. S and S Carver, (1988): An Introduction Geographical Information Systems, Addison Wiley Longmont, New York.
3. Longly Paul A., Goodchild Michael F., Maguire, David J. and David W. Rhind., (2005): Geographic Information System and Science, Second ed., John Wiley and Sons, Toronto.

#### **Web Sources**

- <http://www.gespatialworld.net>, [www.earthmapping.com/](http://www.earthmapping.com/)  
<http://www.esri.com/> and <http://www.innovativegis.com/basis/>

## **Name of the Programme: M.Sc., Applied Geography**

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CO1					✓	✓		✓	✓	✓
CO2		✓			✓	✓			✓	
CO3			✓	✓		✓	✓	✓		✓
CO4	✓	✓			✓					
CO5	✓		✓	✓	✓	✓	✓	✓	✓	✓

<b>Elective Course V</b>	<b>TERRAIN AND WATER RESOURCES EVALUATION</b>	<b>Code: 20P4G15EC</b>
<p><b>Objectives:</b> <i>This course focuses on understanding the aspects of terrain and water resources, evaluation of land and water resources, research approaches and mapping techniques for land and water resources.</i></p> <p><b>Course Outcomes:</b>  <i>After completing the course, the student should be able to:</i></p> <p><i>Knowledge and understanding the</i></p> <ol style="list-style-type: none"> <li>1. <i>Significance of land use data, land use classification and land use survey.</i></li> <li>2. <i>Evaluate the land and water resources.</i></li> <li>3. <i>Groundwater occurrences and water balance.</i></li> <li>4. <i>Sustained use of land and water resources.</i></li> <li>5. <i>Geospatial technology for land and water resources mapping</i></li> </ol>		

**Unit I: Land Use Inventory:** Definition and Concept - Significance - Land Use Data: G-return, Topographic Sheets, Satellite Imageries - Land Use Classification: USGS, NRSC, Nine Fold Classification – Land Use Survey at Village Level.

**Unit II: Land Evaluation:** Objectives, Procedures and Approaches: Genetic, Parametric – Land Quality and Land Use – Land Suitability Classification

**Unit III: Water Resources Inventory:** Surface and Groundwater Occurrence - Analysis of Precipitation: Spatial and Temporal – Concept of Potential and Actual Evapotranspiration – Measurements and Computation – Water Balance Approach.

**Unit IV: Groundwater:** Origin and Occurrence - Aquifers - Groundwater Movement - Analysis Groundwater Level - Assessment of Groundwater Quality for Various Uses - Data Sources.

**Unit V: Mapping Techniques of Land Use and Water Resources:** Geospatial Techniques and Field Checks - Mapping Procedures of Land Use Change - Surface Water - Graph for Groundwater Fluctuation - Water Quality.

**Text Books**

1. Burrough P. A., (1986): Principles of GIS for Land Resources Assessment, Clarendon Press, Oxford.
2. Chang, Kang-tsung (2002): Introduction to Geographic Information Systems. New Delhi: Tata McGraw-Hill Publishing Company Limited.
3. Todd D. K., (1959): Groundwater Hydrology, New York, McGraw Hill Book Company.
4. Ward R. C., (1970): Principles of Hydrology, London: McGraw Hill Book Company.

**References**

1. Campbell, J.B., (1983) Mapping of Land: Aerial Imagery for Land Use Information, Scientific Publisher, Jodhpur.
2. Food and Agricultural Organisation (FAO, 1976): A Frame Work for Land Evaluation, FAO Soil Bulletin 32, Food and Agricultural Organisation of the United Nations, Rome.
3. Fabos J. Gy., (1985): Land Use Planning Global to Local Challenge, Chapman and Hall, New York.

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CO2	✓			✓	✓			✓	✓	✓
CO3	✓	✓	✓		✓	✓	✓		✓	✓
CO4	✓	✓	✓		✓	✓		✓	✓	✓
CO5	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

Core Practical IV	GEOSPATIAL ANALYSIS II	Code: 20P4GP4
<p><b>Objectives:</b> This course emphasis the techniques of geospatial analysis right from data processing, statistical analysis, testing, spatial database generation, editing and spatial analysis using GIS tools.</p>		
<p><b>Course Outcomes:</b></p>		
<p>After completing the course, the student should be able to:</p>		
<p>Knowledge and understanding the</p>		
<ol style="list-style-type: none"> <li>1. Data editing and its analysis in statistical software.</li> <li>2. Analysis of variance and hypothesis.</li> <li>3. Data generation and editing in GIS.</li> <li>4. Data analysis in GIS.</li> <li>5. Planning for preparation of various thematic maps using GIS.</li> </ol>		

### Unit I: Data Editing and Analysis using Statistical Software

- 1.1 Data Entry and Recoding.
- 1.2 Measures of Central Tendency - Mean, Median and Mode.
- 1.3 Measures of Dispersion - Range, Quartile and Standard Deviation.
- 1.4 Measures of Relationship - Correlation and Regression.

### Unit II: Analysis of Variance and Hypothesis

- 2.1 Measures of Variance (ANOVA).
- 2.2 Chi-square test.
- 2.3 't'-test.
- 2.4 'F'-test.

### Unit III GIS data Generation and Editing

- 3.1 Base Map Registration.
- 3.2 Point Data Generation and Editing.
- 3.3 Line Data Generation and Editing.
- 3.4 Polygon Data Generation and Editing.

### Unit IV GIS Analysis

- 4.1 Interpolation – IDW and Spline.
- 4.2 Buffering.
- 4.3 Overlay.
- 4.4 Digital Terrain Model (DTM).

### Unit V GIS and GNSS Mapping

- 5.1 GNSS Data Collection (Point, Line and Polygon), Mapping and Layout.

### References

1. Ajai S. G., (2006): Statistical Methods for Practice and Research a Guide to Data Analysis Using SPSS. (First edition) Sage Publications, New Delhi.
2. Burrough P.A. (1986): Principles of GIS for Land Resources Assessment, Clarendon Press, Oxford.
3. Chang, Kang-tsung, (2002): Introduction to Geographic Information Systems. New Delhi: Tata McGraw-Hill Publishing Company Limited
4. Cole J. P., et al., (1968): Quantitative Techniques, Association of American Geographers.
5. Field A., (2009): Discovering statistics using SPSS (Third edition), Sage Publications, Los Angeles.

**Name of the Programme: M.Sc., Applied Geography****Programme Outcomes:**

- PO.1: Student will be able to analyse the problems of physical as well as human / cultural environments and to find out the possible measures to solve those problems.
- PO.2: They will be eligible to conduct the physical as well as social survey to measure the status of a natural resources and the development of the society.
- PO.3: They will be capable to develop their observation power through field experiences and to identify the physical and socio-economic problems of the locality.
- PO.4: Understanding the management principles and apply these to their own work and multidisciplinary settings and acquire knowledge in societal and environmental contexts.
- PO.5: Application of geospatial technologies (Remote Sensing, Geographic Information System and Global Navigation Satellite System) to solve the physical as well as human / cultural problems through mapping techniques.

**Programme Specific Outcomes:**

- PSO.1. Design and conduct the independent research in their chosen field in the discipline.
- PSO.2. Exhibit knowledge of concepts, theories and methods designed to enhance understanding of the natural world and human society.
- PSO.3. Evaluate how historical events have been influenced by and have influenced physical and human geographic factors in local, regional, national and global settings.
- PSO.4. Examine social and environmental processes with a particular focus on space and place, critical theory, practical application, analysis and intervention in the chosen field within the subject.
- PSO.5. A geographer has better job opportunities in government departments, cartographer, researcher, teacher / professor, competitive examinations, Government employer and Surveyor.

**Outcomes Mapping (Course Articulation Matrix)**

Course Outcomes	Programme Outcomes					Programme Specific Outcomes				
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	✓						✓			
CO2		✓		✓		✓			✓	
CO3			✓		✓			✓		
CO4							✓			
CO5				✓						✓



## M.Sc., Applied Geography 2020-21 Onwards

### PROJECT WORK (Code: 20P4GPW)

1. In the IV<sup>th</sup> semester 7 hours per week have been allotted as per the course structure.
2. The students have to submit an individual project report by selecting a specific topic in Geography and allied fields by means **field work and field techniques**.
3. The project work should be based on either primary data or secondary data or both as required.
4. The project report should be between 20 and 25 pages.
5. Sufficient maps, diagrams and graphs with precise interpretation are the mandatory components of the project report.
6. The project report should be divided as:
  - I. Problem and Procedure
  - II. Aims and Objectives
  - III. Review of Literature
  - IV. Data and Techniques used
  - V. Result and discussion
  - VI. Summary and Conclusion
  - VII. References
7. Evaluation and Viva -Voce:

Candidates have been evaluated individually by means of viva-voce exam using the following marking pattern both by Internal and External Examiners. The average mark has been taken into account for the award of mark for the project.

Sl.No.	Area of Work	Maximum Marks
1.	Plan of the Project	10
2.	Execution of the Plan / Collection of Data / Organization of Materials / Application of Tools / Experiment / Study / Hypothesis Testing etc., and Presentation of Report	50
3.	Individual Initiative	20
4.	Viva – Voce Performance	20
<b>Total Marks</b>		<b>100</b>