**SRI MEENAKSHI GOVT ARTS COLLEGE FOR WOMEN (AUTONOMOUS)**

**MADURAI-625 002**

**(Re-Accredited with "B++" Grade by NAAC 3rd cycle)**


# DEPARTMENT OF GEOGRAPHY

## SYLLABUS FOR M.SC., GEOGRAPHY

## CHOICE BASED CREDIT SYSTEM

## 2024-2025

**SRI MEENAKSHI GOVERNMENT ARTS COLLEGE FOR WOMEN (A),**

**MADURAI -2.**

## DEPARTMENT OF GEOGRAPHY

### INTRODUCTION

Department of Geography was established in the year **1968** with UG course and in the year in **1971** with PG course. At present department have **6** Regular staff members and **2** Guest Lecturers and 289 UG and 30 PG students among its various academic ventures. It produces so many scholars and creates more professionals in various fields. It is one of the centers for Tamil Nadu Open University for B.Sc., Geography Course. The department specializes in Geographical structure in relation to Geomorphology, Bio Geography, Advanced Cartography, Remote Sensing, Geo – Statistical Techniques and Morphogenetic Regions. The department regularly conducts conference and seminars as well as interdisciplinary seminars in collaboration with other departments and association meetings.

### COURSE OFFERED

**PG COURSE** **M.Sc., Geography - English Medium** **CODE: PGEE1**

### VISION OF THE DEPARTMENT

**Geographers study the earth's features in appreciation of the human environment that shaped the distribution of geographical features across the landscape.**

- **To provide knowledge about the Natural Environment and its relationship to society.**
- **To express familiarity about the Cultural Environment and spatial organization.**
- **To equip students with expertise in Modern Technical Skills of the discipline.**
- **To prepare the student for this knowledge appreciation to become Responsible Citizens in India.**

| | |
|---|---|
| **Programme** | **M.Sc GEOGRAPHY CODE:PGEE1** |
| **Duration** | **PG-2YEARS** |
| **Programme Objectives:** | 1. Orient the students towards identifying and analysing different geographical processes and features. |
| | 2. Developing the students' ability to acquire basic skills for conducting field research. |
| | 3. Intended to help students in learning the science and art of collecting, processing, and interpreting data. |
| | 4. Analyze various problems and resolve them through proper management, planning, and sustainability |
| | 5. To expose the students to the new technologies of Remote Sensing, GNSS, Geographical Information System (GIS) and GIS science. |
| **Programme Outcome** | 1. Students will be oriented towards, learning, understanding, and analyzing geographical processes and provide spatial solutions. |
| | 2. To expose students to the use of recent advancements in the field of Geospatial technologies and its application in geographical areas. |
| | 3. Development of ethical aptitudes and dispositions necessary to obtain and hold leadership positions within industry, government, and professional organizations |
| | 4. Capability to undertake research in interdisciplinary studies or on issues or problems beyond the purview of geography. |
| | 5. Empowering students with knowledge and skills for spatial thinking and analysis, to navigate real world problems, and contribute to society in a meaningful way. |

| | |
|---|---|
| | 1. Understand the major biophysical and social patterns in the planet, and the key drivers that give rise to those patterns. |

| | |
|---|---|
| **Programme Specific Outcome** | 2. Demonstrate profound knowledge of theories, concepts, techniques, and technologies in human and physical geography and in geographic information science and technology using real-world applications at the local, regional, and global levels. |
| | 3. Apply systems thinking and critical thinking in socio-economic-ecological systems on the human-environment interface to analyze problems and<br>Potential solutions. |
| | 4. Practice to obtain, analyze, interpret complex geographic data and develop<br>ethical aptitudes, dispositions necessary to acquire and hold leadership positions in industry, government, and professional organizations. |
| | 5. Capability to work with the latest geospatial technologies and handle modern instruments like drones, total stations, GPS and other field devices and also work effectively in interdisciplinary and multicultural real- world contexts to combine theory and practice in responding to local to<br>global issues. |

| Course Type | Sub.Code | Title of the course | Hrs/ Week | Credits | Ex.Hrs | Marks | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | Int | Ext | Total |
| CC1 | P23CG1 | Applied Geomorphology | 6 | 6 | 3 | 25 | 75 | 100 |
| CC 2 | P23CG2 | Applied Climatology | 6 | 6 | 3 | 25 | 75 | 100 |
| CC 3 (P) | P23CG3P | Techniques of Mapping and Map Interpretation. | 6 | 4 | 3 | 25 | 75 | 100 |
| GEC/DSEC 1 CHOICE I | P23DG01 | Population and Settlement Geography | 6 | 3 | 3 | 25 | 75 | 100 |
| GEC/DSEC 1 CHOICE2 | P23DG02 | Urban Geography | 6 | 3 | 3 | 25 | 75 | 100 |
| GEC/DSEC 2 CHOICE1 | P23DG03 | Transport Geography | 6 | 3 | 3 | 25 | 75 | 100 |
| GEC/DSEC 2 CHOICE2 | P23DG04 | Agricultural Geography | 6 | 3 | 3 | 25 | 75 | 100 |
| Total | | | 30 | 22 | | | | 500 |
| **SEMESTER – II** | | | | | | | | |
| CC4 | P23CG4 | Principles of Cartography | 6 | 5 | 3 | 25 | 75 | 100 |
| CC5 | P23CG5 | Hydrology and Oceanography | 6 | 5 | 3 | 25 | 75 | 100 |
| CC6 (P) | P23CG6P | Practical-II Remote Sensing Data Interpretation and GNSS Survey. | 6 | 4 | 3 | 25 | 75 | 100 |
| GEC/DSEC 3 CHOICE 1 | P23DG05 | Discipline Specific Elective – Field Work and Mapping. | 5 | 3 | 3 | 25 | 75 | 100 |
| GEC/DSEC 3 CHOICE 2 | P23DG06 | Geography of Travel and Tourism. | 5 | 3 | 3 | 25 | 75 | 100 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| GEC/DSEC 4 CHOICE 1 | P23DG07 | Remote Sensing and GNSS. | 5 | 3 | 3 | 25 | 75 | 100 |
| GEC/DSEC 4 CHOICE 2 | P23DG08 | Principles of GIS | 5 | 3 | 3 | 25 | 75 | 100 |
| SEC1 | P23SEG1 | Geo-Spatial Statistics | 2 | 2 | 3 | 25 | 75 | 100 |
| | | **Total** | **30** | **22** | | | | **600** |

**SRI MEENAKSHI GOVT. ARTS COLLEGE FOR WOMEN (A), MADURAI-2**

**PG CBCS – Semester wise Paper List**

**(For those who are joined from July 2024 onwards)**

**M.SC GEOGRAPHY -2024-2025**

**SEMESTER-1**

**COURSE STRUCTURE ABSTRACT**

**FOR ALL PG PROGRAMMES**

| COURSES | TOTAL NO OF COURSES | HOURS | CREDITS | MARKS |
|---|---|---|---|---|
| Core Courses | 12 | 71 | 57 | 1200 |
| Core Project with Viva voce | 1 | 10 | 7 | 100 |
| Discipline Specific Elective Courses | 6 | 32 | 18 | 600 |
| Skill Enhancement Courses | 3 | 7 | 6 | 300 |
| Internship/Industrial Activity | 1 | -- | 2 | 100 |
| Extension Activity | 1 | -- | 1 | 100 |
| Total | **24** | **120** | **91** | **2400** |

| S.NO | PART | COURSE | | Sub-Code | COURSE TITLE | Hrs | Credits | Ex. Hrs | Marks | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | Int | Ext |
| SEMESTER –I | | | | | | | | | | |
| 1 | - | Core | CC1 | P23CG1 | APPLIED GEOMORPHOLOY | 6 | 6 | 3 | 25 | 75 |

| | | | | | |
|---|---|---|---|---|---|
| Relevant to Global need | ✔ | Employability Oriented | ✔ | Addresses Professional Ethics | ✔ |
| Relevant to National need | | Entrepreneurship Oriented | ✔ | Addresses Gender Sensitization | |
| Relevant to Regional need | | Skill Development Oriented | ✔ | Addresses Environment and Sustainability | ✔ |
| Relevant to Local need | | | | Addresses Human Values | |

**Course Objectives**

1. To introduce the concepts in Geomorphology in adequate manner, many facets of surface relief features and to understand various aspects of their growth and evolution on the Earth.
2. To understand landscape evolution through time and space
3. To understand the processes that shapes the landforms around us.
4. To apply geomorphologic concepts to identify and analyze the environmental and resources issues for sustainable development
5. To suggest the tools for reading in the landscape the signs of geomorphologic hazards and risks, human interference and geomorphologic resources

**CC-I (T) Applied Geomorphology**

**Unit – 1 Scope of Applied Geomorphology**

Definition – Nature and scope of Applied Geomorphology – Fundamental concepts in Geomorphology – Geosynclines and mountain building process – Hill slope evolution - Geomorphic ideas of Davis, Penck and L.C.King.

**Unit – 2 Energy Flow in Geomorphic System**

System concepts in geomorphologic studies – Structure and composition of earth – Theories of Continental Drift – Plate Tectonics and Isostacy - Seismicity and Volcanism- Climatic and Tectonic changes and impacts.

**Unit – 3 Weathering and Mass Wasting**

Weathering: Mechanical, Chemical and Biological weathering- Structure, Process and Time in weathering- Soil: Soil formation – Types of soils – Soil conservation practices - Mass wasting: causes and classes of mass wasting – Planning and control resources.

**Unit – 4 Process Geomorphology**

Drainage: Drainage Basin – Basin morphometry – Fluvial system: erosion, sedimentation and structural adjustments in the fluvial system; Waves: Waves dynamics - evolution of shores and construction and destruction of coastal region; Arid landforms and its evolution- Karst and speleology; Glacial process, erosion and depositional landforms.

**Unit – 5 Applications of Geomorphology**

Landscape and land evaluation - Hazard analysis –Applications in Agriculture, Water resources, urban and mineral exploration.

| Expected Course Outcomes: | | |
|---|---|---|
| 1 | Aclear understanding of the key concepts of geomorphology and dynamic aspects of landform development. | **K1,K2** |
| 2 | Understand the relationship between geomorphologic processes, natural resources and environmental impacts | **K2, K5** |
| 3 | Ability to analyze the geomorphologic hazards and risks associated to geomorphic processes | **K4, K5** |
| 4 | Learn the various tools and techniques relevant to the applied aspects of Geomorphology in various fields. | **K3, K5** |
| 5 | Knowledge on landscape development and skill on the use of geomorphic process, features and event in resources and environmental planning and management | **K3, K6** |
| **K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create** | | |
| **Text Book(s)** | | |
| 1 | Paul R.Bierman, David R.Montgomery (2020), "Key concepts in Geomorphology", Macmillan Pulblications, New York. | |
| 2 | Richard John Huggett (2011), "Fundamentals of Geomorphology", Routledge, Tailor & Francis, London. | |
| 3 | Robert, S.A and Suzanne, P.A (2010),"Geomorphology – The mechanics and chemistry of landscapes, Cambridge University Press. | |
| 4 | Ramkumar, M (2009),"Geological hazards: Causes, Consequences and methods of Containment", New India Publishers, New Delhi. | |
| 5 | Savindra Singh (2019),. "Geomorphology" Pravalika Publications, Allahabad, India | |
| **Reference Book(s)** | | |
| 1. | Abbas Farshad (2006), "Introduction to applied Geomorphology for soil scientists" Earth Systems Analysis (ESA) Surface Processes Group (Geohazards), ITC, Enschede, The Netherlands. | |
| 2. | Andrew Goudie (2003)," Encyclopedia of Geomorphology", Routledge, Tailor & Francis, New York. | |
| 3. | Arthur L. Bloom (2002),"Geomorphology – A Systematic Analysis to Late Cenozoic landforms; Prentice – Hall of India Pvt., Ltd., New Delhi. | |
| 4. | Bridge, J.S., (2003),"Rivers and Floodplains: Forms, Processes, and Sedimentary Record", Blackwell Publishing, Oxford. | |
| 5. | Grotzinger, J., Jordan, T., Press, F. and Siever, R., (2007), "Understanding Earth (5th ed.)", W.H. Freeman and Co., New York, ISBN 0-7167-6682-5 | |
| 6. | Ruhe, R.V. (1982), "Geomorphology", Boston: Honghton Mifflin Company | |
| 7. | William D. Thornbury (1954),"Principles of Geomorphology",John Willy & sons, Inc., London. | |
| **Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]** | | |
| 1 | https://earthsurface.readthedocs.io/en/latest/ | |
| 2 | https://ocw.mit.edu/courses/earth-atmospheric-and-planetary-sciences/12-163- | |

surface-processes-and-landscape-evolution-fall-2004/lecture-notes/

**Mapping with Programme Outcomes (MPO)**

| MPO | PSO 1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|
| **CO1** | 1 | 1 | 2 | 1 | 1 |
| **CO2** | 2 | 1 | 1 | 2 | 2 |
| **CO3** | 1 | 2 | 1 | 1 | 1 |
| **CO4** | 1 | 1 | 1 | 1 | 2 |
| **CO5** | 1 | 2 | 2 | 1 | 1 |

Map **Course Outcomes (CO)** for each Course with **Programme Specific Outcomes (PSO)** in the 3-Point scale of **1,2, 3 (Strong, Medium and Low)**

**METHOD OF EVALUATION**

| Continuous Internal Assessment | End Semester | Examination Total | Grade |
|---|---|---|---|
| **25** | **75** | **100** | |

**SEMESTER –I**

| | |
|---|---|
| Programm : M.S., Geography | Part I Core |
| Semester : I | Hours: 6/W |
| Sub Code : **P23CG2** | Credits: 6 |

**TITLE: APPLIED CLIMATOLOGY**

| | | | | | |
|---|---|---|---|---|---|
| Relevant to Global need | ✔ | Employability Oriented | ✔ | Addresses Professional Ethics | ✔ |
| Relevant to National need | | Entrepreneurship Oriented | ✔ | Addresses Gender Sensitization | |
| Relevant to Regional need | | Skill Development Oriented | ✔ | Addresses Environment and Sustainability | ✔ |
| Relevant to Local need | | | | Addresses Human Values | |

**Course outcome**

1. Gaining basic knowledge about weather elements
2. Learning patterns of global wind circulation
3. Understanding world climatic classification, climate change and global warming
4. Acquiring skills in micro level climate, weather forecasting methods and weather measurement techniques
5. Demonstrate applicable solutions for climate change

**COURSE DETAILS**

**UNIT-1 Nature and Scope of Applied Climatology**

Nature and scope of applied Climatology- the development of applied climatology, Atmosphere: Its composition (gaseous) and structure; Insolation, heating of land and water; temperature and pressure: and pressure distribution; temperature zones, heat balance, and pressure belts.

**UNIT-2 Global Wind System**

Global wind circulation: Tricellular meridional circulation; Planetary winds; trade winds, westerlies and polar winds; Air masses: continental and maritime; fronts and their types; clouds; precipitation: thunderstorms, cyclones (tropical and temperate) and anti-cyclones.

**UNIT-3 Climate Change and Global Warming**

Climatic classifications; Indian climates and climatic zones; micro climates, agro-climates and urban climates; urban air pollution problems- global climate change; global warming and their likely impacts on human life- El Nino, La Nino.

**UNIT-4 Impact of Climate on Environment**

Effects of climate on Natural vegetation, Soil and its erosion, Agriculture, Animal husbandary, Housing and house types, Human health and comfort.

**UNIT-5 Weather Forecasting**

Weather forecasting: Short range and Long-range Forecasting – Weather Satellites and Sensors– Sounding s- Weather Maps – Field Instruments in Forecasts.

| Text Book(s) | | |
|---|---|---|
| **Expected Course Outcomes:** | | |
| 1 | To recall weather elements and its importance | **K1, K2** |
| 2 | Discuss various wind around the world | **K5, K3** |
| 3 | To compare climatic classification for global and regional level | **K3, K4** |
| 4 | Apply various weather forecasting methods | **K4, K5** |
| 5 | Analysing the Characteristics of Urban Heat Island | **K5, K6** |
| **K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create** | | |
| 1 | Perry, Allen, and Russell Thompson. Applied climatology: principles and practice. Routledge, 2013. Thompson, R. (1997). Applied climatology: principles and practice. Psychology Press. | |
| 2 | Hobbs, John E. Applied climatology: a study of atmospheric resources. Elsevier, 2016. | |
| 3 | Rohli, Robert V., and Anthony J. Vega. Climatology. Jones & Bartlett Learning, 2017. | |
| 4 | Khan, A., Chatterjee, S., & Wang, Y. (2020). Urban Heat Island Modeling for Tropical Climates. Elsevier. | |
| 5 | Hartmann, D. L. (2015). Global physical climatology (Vol. 103). Newnes. | |
| **Reference Book(s)** | | |
| 1 | Ahrens, C. D. (2011). Essentials of meteorology: an invitation to the atmosphere. Cengage Learning. | |
| 2 | Ahrens, C. D. (2012). Meteorology today: an introduction to weather, climate, and the environment. Cengage Learning. | |
| 3 | Collins, M., An, S. I., Cai, W., Ganachaud, A., Guilyardi, E., Jin, F. F., ... & Wittenberg, A. (2010). The impact of global warming on the tropical Pacific Ocean and El Niño. Nature Geoscience, 3(6), 391-397. | |
| 4 | Elizabeth Kolbert, (2006) Field Notes from A Catastrophe: Man, Nature and Climate Change, Bloomsbury Publishing Plc. | |
| 5 | Howard J. Critch field (1995); General Climatology; Prentice, Hall of India Pvt. Ltd., New Delhi. | |

| | |
|---|---|
| 6 | Huang, P., Xie, S. P., Hu, K., Huang, G., & Huang, R. (2013). Patterns of the seasonal response of tropical rainfall to global warming. Nature Geoscience |
| 7 | Kelkar, R. R. (2007). Satellite meteorology. BS Publications. |
| 8 | Kidder, S. Q., Kidder, R. M., & Haar, T. H. V. (1995). Satellite meteorology: an introduction. Gulf Professional Publishing. |
| 9 | Lisa F. Schipper and Ian Burton (Ed.) (2008) Adaptation to climate Change, Earthscan Reader Series, |
| 10 | Mather, J. R. (1974): Climatology: Fundamentals and Applications, Mc Graw Hill, New York. |
| 11 | Oliver, John E. (1973): Climate and Man's Environment: An Introduction to Applied Climatology, John Wiley & Sons, New York, London. |
| 12 | Thompson, R. D. and Allen, P. (1997): Applied Climatology: Principles and Practice, Routledge, London and New York. |
| **WEB SOURCE:** | |
| 1 | https://public.wmo.int/en/resources/training |
| 2 | https://metnet.imd.gov.in/phps/imdweb_imdnews.php |
| 3 | https://www.un.org/en/climatechange/speeches |
| 4 | https://www.ipcc.ch/data/ |
| 5 | https://www.greenclimate.fund/publications |
| 6 | https://mausam.imd.gov.in/imd_latest/contents/satellite.php |


**METHOD OF EVALUATION**

| Continuous Internal Assessment | End Semester | Examination Total | Grade |
|---|---|---|---|
| **25** | **75** | **100** | |

**COURSE OUTCOMES**

**At the End of course, the students will be able to:**

| MPO | PSO 1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|
| **CO1** | 1 | 1 | 2 | 1 | 1 |
| **CO2** | 1 | 1 | 1 | 1 | 2 |
| **CO3** | 3 | 1 | 1 | 1 | 1 |
| **CO4** | 1 | 2 | 2 | 1 | 2 |
| **CO5** | 1 | 1 | 1 | 2 | 1 |

Map **Course Outcomes (CO)** for each Course with **Programme Specific Outcomes (PSO)** in the 3-Point scale of **1,2, 3 (Strong, Medium and Low)**

**SEMESTER –I**

| | |
|---|---|
| Programm : M.Sc., Geography | Part I Core |
| Semester : I | Hours: 6/W |
| Sub Code : **P23CG3P** | Credits: 6 |

**TITLE: PRACTICAL-I TECHNIQUES OF MAPPING AND MAP INTERPRETATION**

| | | | | | |
|---|---|---|---|---|---|
| Relevant to Global need | | Employability Oriented | | Addresses Professional Ethics | |
| Relevant to National need | | Entrepreneurship Oriented | | Addresses Gender Sensitization | |
| Relevant to Regional need | | Skill Development Oriented | | Addresses Environment and Sustainability | |
| Relevant to Local need | | | | Addresses Human Values | |

**Course Objectives:**

1. To introduce the concepts practically in mapping and map analysis
2. To understand the various aspects of map reading, interpretation and representation of various data through maps.
3. To provide a basic understanding in the field of interpretation and interpolation.
4. To understand the theoretical and practical methods pertaining to map making.
5. To understand the concepts and importance of various analysis used in mapping.
6.

| **Unit – 1** | **MAP AND INTERPRETATION** |
|---|---|
| Map appreciation and interpretation: thematic, topographic and atlas maps- mapping and analysis: Relative relief and slope maps; height and hypsometric curves; stream Analysis | |
| **Unit – 2** | **CLIMATE AND HYDROLOGY** |
| Climate and Hydrology: climograph and climatograph; rainfall variability, temperature and rainfall profiles; deviation and dispersion graph; water balance graphs | |
| **Unit – 3** | **POPULATION AND ECONOMIC DATA MAPPING** |

| | |
|---|---|
| Population and economic data mapping: Dot maps: Mono dot, Multiple dot; Density maps; Choropleth and Isopleth - Colour and Grey scale patterns. | |
| **Unit – 4** | **Agricultural data mapping** |
| Index of concentration and diversification; crop combination techniques | |
| **Unit – 5** | **Transport Network Analysis** |
| spatial interaction, measures of transport network analysis | |

| **Expected Course Outcomes:** | | |
|---|---|---|
| 1 | Understanding the importance of various mapping techniques in geographical study | **K1, K2** |
| 2 | Understand the procedures and steps involved in the interpretation of thematic, topographic and atlas maps etc. | **K2, K3** |
| 3 | Learn the quantitative applications involved in mapping and interpolation. | **K3, K6** |
| 4 | Ability to analyze and perform analysis like network analysis, stream analysis, point and line pattern analysis. | **K4, K5** |
| 5 | Capable of creating maps based on appropriate cartographic knowledge. | **K5, K6** |
| **K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 Create** | | |

| **Text Book(s)** | |
|---|---|
| 1 | Tamaskar, B. G., Deshmukh, V. M. (1974): Geographical Interpretation of Indian Topographical Maps, Orient Longman Ltd., Bombay |
| 2 | Lawrence, G.R.P. (1971). Cartographic Methods, Methuen & Co., Canada |

| | |
|---|---|
| 3 | Worthington, B.D.R. and Robert Gent (1975): Techniques in Map Analysis, Ebenzer Baylis and Sons, USA. |
| 4 | Singh, R.L., Singh, R.P.B. 2008. Elements of Practical Geography, Kalyani Publishers. |
| 5 | Ramamurthy, K. (1982): Map Interpretation, Rex Printers, Madras |
| 6 | Understanding Map Projection (2003-2004): GIS by ESRI, Redlands |
| 7 | Chrisman, N. (1997): Exploring Geographic Information systems, John Wiley & Sons., New York |
| 8 | The ESRI Guide to GIS Analysis, by Andy Mitchell, ESRI Press, 1999, 188 pp. |
| **Reference Books** | |
| 1 | Monkhouse, F.J., and Wilkinson, H.R. (1976): Maps and Diagrams, Metheun & Co., London. |
| 2 | Miller, Austin (1953): The skin of the Earth, Methuen & Co. Ltd. London |
| 3 | Pearson II, F. 1990. Map Projections: Theory and Applications 2nd ed, CRC Press. |
| 4 | Kimerling, A.J., Buckley, A.R., Muehrcke, P.C., Muehrcke, J.O. 2011. Map Use: Reading, Analysis, Interpretation, 7th ed, Esri Press. |
| 5 | Sarkar, A. 2015. Practical Geography: A Systematic Approach, 3rd ed, Orient Blackswan Private Ltd. |
| **Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]** | |
| 1 | www.sevenoaks.wa.edu.au/linkpage/geog/copy.html |
| 2 | http://www.esri.com/ |
| 3 | www.gisdevelopment.net/books/mapping/bmap0010.html |

**METHOD OF EVALUATION**

| Continuous Internal Assessment | End Semester | Examination Total | Grade |
|---|---|---|---|
| **40** | **60** | **100** | |

**SEMESTER I**

| | |
|---|---|
| Programm : M.Sc., Geography | Part I Core |
| Semester : I | Hours: 6/W |
| Sub Code : **P23DG01** | Credits: 3 |

**TITLE: POPULATION AND SETTLEMENT GEOGRAPHY**

| | |
|---|---|
| Pre-Requisite | Basic knowledge in population and settlement geography |

| | | | | | |
|---|---|---|---|---|---|
| Relevant to Global need | | Employability Oriented | ✔ | Addresses Professional Ethics | ✔ |
| Relevant to National need | ✔ | Entrepreneurship Oriented | | Addresses Gender Sensitization | |
| elevant to Regional need | ✔ | Skill Development Oriented | ✔ | Addresses Environment and Sustainability | ✔ |
| Relevant to | ✔ | | | Addresses Human | ✔ |

| | | | | | |
|---|---|---|---|---|---|
| Local need | | | | Values | |

**Course Objectives**

1. To explain the arguments and assumptions of dominant theories of population change in time and space
2. understanding of nature, scope and evolution of population geography through spatial and temporal
3. It also helpful in knowing various kinds of demographic problems.
4. Study of population is an essential component in planning of various human related issues.
5. Population Geography also deals in population policies in developed & developing countries.

**UNIT -1 SCOPE OF POPULATION GEOGRAPHY**

Nature and scope of population geography, Sources of population data (census, sample surveys and vital statistics) data reliability and errors. Demographic Transition, Theories of Population Growth (Malthus,Sadler and Ricardo).

**UNIT-2 GROWTH, DISTRIBUTION AND MIGRATION**

Determinants of growth and distribution of world population: Spatial pattern of growth and Distribution – overpopulation, under population and optimum population; Migration: Push and pull factors – Types and consequences.

**UNIT-3 POPULATION COMPOSITION AND CHARACTERISTICS**

Fertility and Mortality Analysis (indices, determinants and world patterns). Population Composition and Characteristics: age, sex, rural-urban, occupational structure and educational levels. Population Policies in Developed and Developing Countries.

**UNIT-4 MORPHOLOGY OF RURAL AND URBAN SETTLEMENT**

Rural settlements: Patterns, morphology, house types and functions; Urban settlements: Morphology of Indian cities; Functional classification of Indian cities; Characteristics of Conurbations and metropolitan regions; Functions of urban settlements; Urban sprawl; Town Planning; Problems of urbanisation and remedies.

**UNIT-5 URBAN EXPANSION**

Conurbations and metropolitan regions; Urban sprawl; Slums and associated problems; Town planning; Problems of urbanisation and remedies.

| On the successful completion of the course, students will be able to | | |
|---|---|---|
| 1 | Understand population policies & its importance, Population distribution and its problems. | **K1, K2** |
| 2 | Assessment of vital statistics of population data | **K2, K3** |
| 3 | Acquire and interweave theoretical foundation for addressing research issues related to population dynamics in the real world | **K3, K6** |
| 4 | Acquiring, handling and analysing population data both at the grassroots level and secondary sources | **K4, K5** |
| 5 | Recollect types and patterns of urban and rural settlement | **K4, K6** |
| **K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create** | | |
| Text Books | | |

| | |
|---|---|
| 1 | Beaujeu-Garnier, J. (1966). Geography of Population (Translated by Beaver, S.H.) Longmans, London. |
| 2 | Census of India (2001). Series-I India Provisional Population Totals. Published by Registrar General & Census Commissioner, India. |
| 3 | Census of India, (1991). India: A State Profile Published by office of the Registrar General of India, Census Operations, New Delhi |
| 4 | Chandna, R.C. (2000). Geography of Population: Concepts, Determinants and Patterns, Kalyani Publishers, New Delhi. |
| 5 | Clark J.1 (1965). Population Geography, Permagon Press, New York, 1965. |
| Reference Books | |
| 1 | Mohammad Izhar Hassan (2020). Population Geography: A Systematic Exposition, Routledge, India. |
| 2 | Mohammed I. Hassan (2006). Population Geography. Rawat; New title edition. |
| 3 | Peters: G.L. and Larkim R.P (1979). Population Geography: Problems, Concepts and Prospects Kendele-Hunt Iowa. |
| 4 | Sundram K.V. & Nangia Sudesh, (editors) (1986). Population Geography, Heritage Publishers, Delhi. |
| 5 | Trewartha, G.T. (1969). Geography of Population: World Patterns, John Wiley & Sons, Inc., New York. |


| **Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]** | |
|---|---|
| 1 | https://ncert.nic.in/ncerts/l/legy201.pdf |
| 2 | https://www.amyglenn.com/geog-regional/geog1303population.htm |
| 3 | https://www.bdu.ac.in/cde/slm/slm_sample/msc-geography.pdf |
| 4 | https://mu.ac.in/wp-content/uploads/2021/04/t.y.b.a.-paper-7-population-and-economic-geography-e.pdf |
| 5 | https://ncert.nic.in/ncerts/l/legy201.pdf |

**METHOD OF EVALUATION**

| Continuous Internal Assessment | End Semester | Examination Total | Grade |
|---|---|---|---|
| **25** | **75** | **100** | |

| **Mapping with Programme Outcomes (MPO)*** | | | | | |
|---|---|---|---|---|---|
| **MPO** | **PSO 1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** |
| **CO1** | 1 | 1 | 2 | 1 | 2 |
| **CO2** | 1 | 1 | 3 | 1 | 1 |
| **CO3** | 1 | 2 | 1 | 1 | 1 |
| **CO4** | 1 | 1 | 1 | 1 | 1 |
| **CO5** | 1 | 1 | 1 | 2 | 2 |
| Map **Course Outcomes (CO)** for each Course with **Programme Specific Outcomes (PSO)** in the 3-Point scale of **1,2, 3 (Strong, Medium and Low)** | | | | | |

**SEMESTER - 1**

| | |
|---|---|
| Programm : M.Sc., Geography | Part I Core |
| Semester : I | Hours: 6/W |
| Sub Code : **P23DG02** | Credits: 3 |

PREAMBLE: To provide an overview and theoretical framework of urban geography. To learn the internal spatial structure of cities. To analyze pattern of land use, racial and ethnic segregation, economic restructuring, gentrification and new urbanism. Comparative models of internal city and structure of the cities.

| | | | | | |
|---|---|---|---|---|---|
| Relevant to Global need | | Employability Oriented | ✔ | Addresses Professional Ethics | ✔ |
| Relevant to | ✔ | Entrepreneurship | | Addresses Gender | |

| | | | | | |
|---|---|---|---|---|---|
| National need | | Oriented | | Sensitization | |
| elevant to Regional need | ✔ | Skill Development Oriented | ✔ | Addresses Environment and Sustainability | ✔ |
| Relevant to Local need | ✔ | | | Addresses Human Values | ✔ |

**TITLE: URBAN GEOGRAPHY**

| **COURSE OUTCOME**<br>At the end of the Semester, the Students will be able to | Unit | Hrs P/S |
|---|---|---|
| **UNIT 1 CO1**: Understand the nature & scope: urban geography is the study of urban places with reference to their geographical environment. | 1 | 15 |
| **UNIT 2 CO2**: Analyze the Demographic structure: it encompasses the size, structure and distribution with spatial changes. | 2 | 15 |
| **UNIT 3 CO3** Analyze the urban models and the form of human settlements and their process and rebuild the formation and transformation. | 3 | 15 |
| **UNIT 4 CO4**: know the city region concept: Made to formulate certain rules regarding the relationship between population size and size of the city. | 4 | 15 |
| **UNIT 5 CO5**: Analyze urban problems: To estimate the tremendous growth of population and consequences in housing, congestions, civic and infrastructure deteriorating. | 5 | 15 |

**SYLLABUS**

**UNIT I:** Nature, Scope and development of Urban Geography – Urbanization – Factors Affecting Urban growth – World Urbanization – Urbanization in India.

**UNIT II:** Demographic Structure of Cities – Age and Sex Structure –Occupational Structure –Urban Land use models; 1, 2, 3– Central Business District – Delimitation – Residential Land Use.

**UNIT III:** Urban Land Use models – Burges – Hoyt – Harris and Ullman – Urban Expansion – Vertical and Horizontal – Urban Sprawl – Urban Fringe – Suburban Growth – Concept of Satellite Towns.

**UNIT IV:** City Region Concept – Distance Decay – Umland Demarcation – Conurbation – Urban Hierarchy – Rank Size Rule and Central Place Theory.

**UNIT V :** Urban Problems – Slums, Transport, Solid Waste Management – Drinking Water Supply – Pollution – Urban planning.

**BOOKS FOR REFERENCE**


1. Alam, S.M. Hyderabad - Secunderabad Twin Cities - Asia Publishing House, Bombay - 1964.
2. Berry ,B.J.L. and Horton F.F - Geograophic Perspectives on Urban systems - Prentice Hall, Englewood, New Jersey - 1970.
3. Carter - The study of urban geography - Edward Arnold Publishers , London - 1972
4. Chorley, R.J.O., Haggett P – Models in Geography - Methuen, London - 1966.

5. Dickinson, R.E - City and Region, Routledge ,London - 1964.

6. Dwyer ,D.J - The city as a centre of change in Asia - University of Hond kong Press, Hongkong - 1971.

7. Gibbs J.P - Urban Research Methods - D.Van Nostrand Co. Inc. Princeton, New Jersey - 1961.

8. Hall P - Urban and Regional Planning - Routledge, London - 1992.

9. Hauser, Phillp M. and Schnore Leo F - The study of urbanisation, Wiley, New York - 1965.

10. James. P.E. and Jones C.F - American Geography - Inventory and Prospect - Syracuse University Press, Syracuse - 1954.

11. Kundu, A - Urban Development and Urban Research in India - Khanna Publication - 1992.

12. Meyor, H.M. Kohn C.F - Reading in Urban Geography - University of Chicago Press,Chicaga - 1955.

13. Mandal R.B Urban Geography A Text book –Concept publishing Company, New Delhi-1987

14. Mumford, L - Cultural of Cities - McMillan & Co., London - 1958.

15. Nangia , Sudesh - Delhi Metropolitan Region : A Study in Settlement Geography - Rajesh Publication – 1976

16. Smailes A.E - The Geography of Towns, Hutchinnson, London, 1953.

17. Singh K and Steinberg F - Urban India in Crisis. New Age Interns, New Delhi - 1998.

Tewari, Vinod K. Jay A. Weinstein, VLS Prakasa Rao – Indian Cities: Ecological Perspectives - concept Publishing Co., New Delhi – 1986.

| UNITS | TOPIC | LECTURE HOURS | MODE OF TEACHING |
|---|---|---|---|
| UNIT 1 Nature & Scope | | | |
| | Development of Urban geography | 5 | Chalk & talk – student evaluation |
| | World urbanization | 5 | PPt lecture and group discussion |
| | Urbanization in India | 5 | PPT & Reference through Journals |
| UNIT 11 Urban & Demographic structure | | | |
| | Site & Situation | 5 | Chalk & talk – student evaluation |
| | Functional Classification | 5 | Reference – journals |
| | Population structure | 5 | Videos/ ICT |
| UNIT III urban Morphology | | | |

| | | | |
|---|---|---|---|
| | Land use models | 5 | PPT lecture and Group Discussion |
| | Theory | 5 | Chalk & talk and reference |
| | Urban Expansion | 5 | Videos / e- content |
| UNIT IV City region concept: | | | |
| | Concepts | 5 | PPT lecture |
| | Rank size rule | 5 | Reference – Practical assessment |
| | Central place theory | 5 | PPT lecture |
| UNIT V Urban problems | | | |
| | Housing | 5 | Field work – questionnaire |
| | Transport | 5 | Field work & Group Discussion |
| | Planning | 5 | PPT/ e-content |

| Course outcomes(cos) | Programme outcomes (pos) | | | | | Programme specific outcomes (PSOs) | | | | | Mean scores of Cos |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | |
| CO1 | 3 | 4 | 5 | 5 | 5 | 3 | 4 | 4 | 3 | 5 | 3.0 |
| CO2 | 4 | 5 | 5 | 4 | 3 | 4 | 5 | 5 | 4 | 4 | 3.1 |
| CO3 | 3 | 4 | 5 | 5 | 4 | 4 | 5 | 4 | 5 | 4 | 3.1 |
| CO4 | 5 | 4 | 4 | 3 | 5 | 5 | 3 | 4 | 5 | 5 | 3.1 |
| CO5 | 3 | 4 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 5 | 3.2 |
| mean Overall score | | | | | | | | | | | 3.45 |

**METHOD OF EVALUATION**

| Continuous Internal Assessment | End Semester | Examination Total | Grade |
|---|---|---|---|
| **25** | **75** | **100** | |

**SEMESTER –I**

| | |
|---|---|
| Programm : M.Sc., Geography | ELECTIVE (E2) |
| Semester : I | Hours: 6/W |
| Sub Code : **P23DG03** | Credits: 3 |

**TITLE: TRANSPORT GEOGRAPHY**

| **Pre-requisite** | **Basic knowledge in Geography** | | | | |
|---|---|---|---|---|---|
| Relevant to Global need | ✔ | Employability Oriented | | Addresses Professional Ethics | ✔ |

| | | | | | |
|---|---|---|---|---|---|
| Relevant to National need | ✔ | Entrepreneurship Oriented | | Addresses Gender Sensitization | |
| Relevant to Regional need | ✔ | Skill Development Oriented | ✔ | Addresses Environment and Sustainability | |
| Relevant to Local need | ✔ | | | Addresses Human Values | ✔ |

**Course Objectives:**

1. Understand the purpose and importance of Transportation Geography
2. Explain the spatial organization of transport systems
3. Examine the role of transportation system in energy, environment and economy
4. Discuss the modes of transportation and trade and urban transportation
5. Apply and evaluate the concepts in planning and policy for sustainable development

**UNIT-1 INTRODUCTION**

Nature and Scope of Transport Geography – Importance of Transport – Development of Transport Geography – Transport Development.

**UNIT-2 TRANSPORTATION AND SPATIAL STRUCTURE**

Geography of Transportation Networks-Transport and Spatial Organization-Transport and Location-Information Technologies and Mobility

**UNIT-3 TRANSPORTATION, ENERGY, ENVIRONMENT, ECONOMY AND SOCIETY**

Transportation and Economic Development- Transportation and Energy- Transportation and Environmental justice- Sustainability and Decarbonisations -Transportation and Society- Transport Costs- Demand of Transportation Services.

**UNIT-4 MODES OF TRANSPORTATION**

Road, Rail and Pipelines, Maritime and Air Transport-Intermodal Transportation and Containerization-Transport Terminals and Hinterlands- Port, Rail and Airport Terminals.

**UNIT-5 TRANSPORTATION TRADE**

Trans-border and Cross-border Transportation- Globalization and International Trade- Freight Transportation and Value Chains- Transport hubs.

| **Expected Course Outcomes:** | | |
|---|---|---|
| 1 | Understand the basics of spatial structure of transportation network | **K2, K6** |
| 2 | Analyse the transport systems and problem from a spatial perspective. | **K2, K3** |
| 3 | Assess the environment, energy and other socio-economic dimensions with reference to transportation development | **K2, K5** |
| 4 | Evaluate different modes of transportation and trade for sustainable developmental activities | **K4, K2** |
| 5 | Evaluate the role of transportation in affecting current patterns of economic development and spatial planning | **K1, K6** |
| **K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create** | | |

| **Text Book(s)** | |
|---|---|
| 1 | Black, W. (2003) Transportation: A Geographical Analysis. New York: Guilford. |
| 2 | Haggett, P. (2001) Geography: A Modern Synthesis, 4th Edition, New York: Prentice Hall. |
| 3 | Jean-Paul Rodrigue (20220) The Geography of Transport System, Routledge Taylor & Francis Group,Newyork |
| 4 | Keeling, D.J. (2007) “Transportation Geography: New Directions on Well-Worn Trails”, Progress in Human Geography, 31(2), 217-225. |
| 5 | Keeling, D.J. (2008) “Transportation Geography – New Regional Mobilities”, Progress in Human Geography, Vol. 32, No. 2, pp. 275-283. |

| | |
|---|---|
| 6 | Knowles, R., J. Shaw and I. Docherty (eds) (2008) Transport Geographies: Mobilities, Flows and Spaces, Malden, MA: Blackwell. |
| **Reference Book(s)** | |
| 1 | Schiller, P.L., and J.R. Ken worthy (2018) An Introduction to Sustainable Transportation: Policy, Planning and Implementation, New York: Rout ledge |
| 2 | Tolley, R. and B. Turton (1995) Transport Systems, Policy and Planning: A Geographical Approach Burnt Mill, Harlow, Essex: Longman. |
| 3 | Ullman, E.L. (1980) Geography as Spatial Interaction, Seattle: University of Washington Press |
| **Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]** | |
| 1 | https://transportgeography.org/ |
| 2 | https://cbpbu.ac.in/userfiles/file/2020/STUDY_MAT/GEO/null.pdf |
| 3 | https://unece.org/transport |

**Mapping with Programme Outcomes (MPO)***

| MPO | PSO 1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|
| **CO1** | 1 | 1 | 1 | 1 | 1 |
| **CO2** | 1 | 3 | 3 | 2 | 1 |
| **CO3** | 2 | 2 | 1 | 2 | 2 |
| **CO4** | 1 | 2 | 1 | 2 | 1 |
| **CO5** | 3 | 1 | 1 | 1 | 2 |

Map **Course Outcomes (CO)** for each Course with **Programme Specific Outcomes (PSO)** in the 3-Point scale of **1,2, 3 (Strong, Medium and Low).**

**METHOD OF EVALUATION**

| Continuous Internal Assessment | End Semester | Examination Total | Grade |
|---|---|---|---|
| **25** | **75** | **100** | |

**SEMESTER –I**

| | |
|---|---|
| Programm : M.Sc., Geography | ICT 1 CHOICE 2 |
| Semester : I | Hours: 6/W |
| Sub Code : **P23DG04** | Credits: 3 |

**TITLE: AGRICULTURAL GEOGRAPHY**

| | | | | | |
|---|---|---|---|---|---|
| Relevant to Global need | ✔ | Employability Oriented | | Addresses Professional Ethics | |
| Relevant to National need | ✔ | Entrepreneurship Oriented | | Addresses Gender Sensitization | |
| Relevant to Regional need | ✔ | Skill Development Oriented | | Addresses Environment and Sustainability | ✔ |
| Relevant to Local need | ✔ | | | Addresses Human Values | ✔ |

PREAMBLE: It is a branch of economic geography; explain the approaches, agricultural types and determinants, modernization of agriculture, green revolution and theories. Analyse the agricultural data agricultural regions.

| **COURSE OUTCOME**<br>At the end of the Semester, the Students will be able to | Unit | Hrs P/S |
|---|---|---|
| **UNIT 1 CO1**: understand nature, scope and significance of agricultural geography | 1 | 18 |
| **UNIT 2 CO2**: acquire knowledge about agricultural determinants modernization of agriculture- green revolution | 2 | 18 |
| **UNIT 3 CO3**: know the significance von thunen's theory and land use and land capability classification | 3 | 18 |
| **UNIT 4 CO4**: evaluate the agricultural productivity | 4 | 18 |
| **UNIT 5 CO5**: understand the regionalization of agriculture | 5 | 18 |

**SYLLABUS**

**Unit 1:** Nature, scope and significance of Agricultural Geography - Approaches to the study of Agricultural geography - Elements of agriculture.

**Unit 2:** Determinants of agriculture - Physical, economic, social, institutional and technological determinants

**Unit 3:** Von Thunen's theory of agricultural location and its recent modifications - Land use - Types - Land use surveys - Land capability classification - Role of Remote Sensing in Land Use Studies.

**Unit 4:** Agricultural productivity - Factors affecting productivity - Measurement of agricultural productivity - Crop combination - Delimitation of crop combination regions - Weaver, Doi, Rafiullah - Crop diversification regions –

**Unit 5:** Agricultural regions of the world - A review of Whittlessey's agricultural classification- Agricultural regions of India - Bhatia's method. – Characteristics of Indian Agriculture - Agricultural regions of Tamil Nadu.

**BOOKS FOR REFERENCE**


1. Jasbir singh & S.S. Dhillon - Agricultural Geography - Tata Mc Graw Hill -1994.
2. Majid Husain - Systematic Agricultural Geography - Rawat Publication Jaipur - 2002.
3. Morgan.W.B& Munton.R.J.C - Agricultural Geography-Methuen&co Ltd - 1981.
4. Sharma.B.L - Applied Agricultural Geography- Rewat Publications Jaipur - 1994.
5. Shaji.Mohammed - Agricultural geography of South Asia - Macmillan India Ltd - New Delhi - 2000.
6. Siddhartha.K - Economic Geography - Kisalya Publications Pvt.Ltd - 2000.
7. Raina.J.L - Agricultural Geography - Pointer Publishing Jaipur - 1997.
8. Yadav.S.S.&Ram Kumar Gurjar - Agricultural Ecology - pointer publishers , Jaipur - 1993


| Course outcomes(cos) | Programme outcomes (pos) | | | | | Programme specific outcomes (PSOs) | | | | | Mean scores of Cos |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | |
| CO1 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| CO2 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| CO3 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| CO4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| CO5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| mean Overall score | | | | | | | | | | | 4.4 |

| UNITS | TOPIC | LECTURE HOURS | MODE OF TEACHING |
|---|---|---|---|
| UNIT 1 | | | |
| | Nature, scope, significance and approaches | 18 | Chalk and talk and PPT |
| UNIT 11 | | | |
| | Agricultural types | 8 | Chalk and talk and PPT |
| | determinants | 8 | Chalk and talk and PPT |
| | Green revolution | 6 | Chalk and talk and PPT |
| UNIT III | | | |
| | Von thunen’s Theory | 5 | Chalk and talk and PPT |

| | | | |
|---|---|---|---|
| | Land use and land capability and classification | 5 | Chalk and talk and PPT |
| UNIT IV | | | |
| | Agricultural productivity determinants | 5 | Chalk and talk and PPT |
| | Agricultural statistics | 5 | Chalk and talk and PPT |
| | Measurements of agricultural productivity | 5 | Chalk and talk and PPT |
| UNIT V | | | |
| | Cropping pattern, crop combination | 7 | Chalk and talk and PPT |
| | Ranking, concentration and diversification | 7 | Chalk and talk and PPT |
| | Agricultural regions of india and tamilnadu | 7 | Chalk and talk and PPT |

**METHOD OF EVALUATION**

| Continuous Internal Assessment | End Semester | Examination Total | Grade |
|---|---|---|---|
| **25** | **75** | **100** | |

**SEMESTER –II**

| | |
|---|---|
| Programm : M.Sc., Geography | CC4 |
| Semester : II | Hours: 6/W |
| Sub Code : **P23CG4** | Credits: 5 |

**TITLE: PRINCIPLES OF CARTOGRAPHY**

| | | | | | |
|---|---|---|---|---|---|
| Relevant to Global need | ✔ | Employability Oriented | ✔ | Addresses Professional Ethics | ✔ |
| Relevant to National need | | Entrepreneurship Oriented | ✔ | Addresses Gender Sensitization | ✔ |

| | | | | | |
|---|---|---|---|---|---|
| Relevant to Regional need | | Skill Development Oriented | ✔ | Addresses Environment and Sustainability | ✔ |
| Relevant to Local need | | | | Addresses Human Values | |

| **Pre-requisite** | Basic knowledge in Cartography |
|---|---|

**Course Objectives:**

1. Exploring and defining principles of cartography, emerging trends in cartography and information age
2. Understanding the basics of geodesy and map projections
3. Gaining skills in map symbols, cartographic design, representation and production of maps, and map composition
4. Critically assessing online resources, software and its uses for interactive mapping
5. Discussing the importance of web mapping and geospatial data policy

**UNIT – 1 FUNDAMENTALS OF CARTOGRAPHY**

History and future of cartography - Information age and mapping, Cartography as language and communication -visual thinking and visual communication-spatial information system.

**UNIT-2 MAP PROJECTIONS AND COORDINATE SYSTEMS**

Geodesy, coordinate systems, and map projections- geographical data – spatial objects and attributes – map scale and accuracy.

**UNIT-3 MAP DESIGN AND LAYOUT**

Cartographic design principles – Map compilation – levels of data measurement, generalization – map Symbolization – Quantitative and Quantitative symbols – graphic communication – map elements and Layout.

**UNIT-4 TERRAIN AND SURFACE ANALYSIS**

Production and Map output - Typography & Labelling - Thematic Map Forms - Animation – Isarithm, choropleth and Surface mapping-map reproduction.

**UNIT-5 ONLINE AND WEB SERVICE**

E-Mapping online map data source-Geospatial web services-Dynamic/Interactive Mapping-Cartography and Spatial information policy.

| Expected Course Outcomes | | |
|---|---|---|
| On the successful completion of the course, student will be able to: | | |
| 1 | Understand the cartographic concepts, recent trends and the use of information technology | **K1, K2** |
| 2 | Explain the fundamental importance of map scale and benefits and limitations of map projections | **K2, K3** |
| 3 | Demonstrate cartographic techniques, generalisation regarding map design and layout, graphical and visual variables | **K3, K6** |

| | | |
|---|---|---|
| 4 | Obtain the skills in creating reference and thematic maps using hard copies and web maps | **K4, K5** |
| 5 | Able to generate digital maps from opensource data, analyse and interpret the interactive maps | **K4, K6** |
| **K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create** | | |
| **Text Books** | | |
| 1 | Kraak, M.J. and F.J. Ormeling (1996). Cartography: Visualisation of Spatial data, Longman Ltd., England. | |
| 2 | Robinson, A.H., J.L.Morrison, P.C., Muehrcke, A.J.Kimerling and S.C.Guptill (1995). Elements of Cartography, 6th Edition. New York. John Wiley & Sons. USA. | |
| **Reference Books.** | | |
| 1 | Tyner, J. (1992). Introduction to Thematic Cartography, Prentice-Hall, Englewood Cliff, New Jersey. | |
| 2 | Tyner, J.A. (2014) Principles of Map Design. New York, NY: Guilford Press. | |
| 3 | Misra, R.P. and A.Ramesh (1989). Fundamentals of Cartography, Concepts PublishingCompany, New Delhi. | |
| 4 | Monkhouse, F.J. and Wilkinson, H.R., (1971). Maps and diagrams: their compilation and construction. Methuen. | |
| 5 | Brewer, C. A. (2005). Designing Better Maps. Redlands, CA: ESRI Press. (ISBN 1-58948-089-9) | |
| 6 | Dent, B.D., Torguson, J.S. and Hodler, T.W. (2009). Cartography: Thematic Map Design. Boston: McGraw-Hill. 6th edition. (ISBN: 978-0-07-294382-5) | |
| 7 | Jennings, Ken. (2011). Map head: Charting the Wide, Weird World of Geography Wonks. New York: Scribner | |
| **Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.** | | |
| 1 | http://www.fes.uwaterloo.ca/crs/geog165/cart.htm | |
| 2 | http://www.colorado.edu/geography/gcraft/notes/cartocom/cartocom_ftoc.html#3.0 | |
| 3 | http://www.earthsensing.com/cart/resources/carthelp.html) | |

| Mapping with Programme Outcomes (MPO)* | | | | | |
|---|---|---|---|---|---|
| **MPO** | **PSO 1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** |
| **CO1** | 1 | 1 | 1 | 1 | 2 |
| **CO2** | 1 | 1 | 3 | 1 | 1 |
| **CO3** | 2 | 1 | 1 | 2 | 2 |
| **CO4** | 1 | 1 | 2 | 1 | 1 |
| **CO5** | 1 | 2 | 1 | 1 | 1 |
| Map **Course Outcomes (CO)** for each Course with **Programme Specific Outcomes (PSO)** in the 3-Point scale of **1,2, 3 (Strong, Medium and Low).** | | | | | |

**METHOD OF EVALUATION**

| Continuous Internal Assessment | End Semester | Examination Total | Grade |
|---|---|---|---|
| **25** | **75** | **100** | |

**\SEMESTER –II**

| | |
|---|---|
| Programm : M.Sc., Geography | CC5 |
| Semester : II | Hours: 6/W |
| Sub Code : **P23CG5** | Credits: 5 |

**TITLE: HYDROLOGY AND OCEANOGRAPHY**

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Relevant to Global need | | ✔ | Employability Oriented | | Addresses Professional Ethics | | |
| Relevant to National need | | | Entrepreneurship Oriented | | Addresses Gender Sensitization | | |
| Relevant to Regional need | | ✔ | Skill Development Oriented | | Addresses Environment and Sustainability | ✔ | |
| Relevant to Local need | | ✔ | | | Addresses Human Values | ✔ | |
| **Pre-requisite** | Basic knowledge in Physical Geography | | | | | | |

**Course Objectives:**

1. To Understand the stages of Hydrological cycle
2. To introduce a sound scientific knowledge of how water cycles through the Earth's atmosphere, surface and groundwater systems.
3. To Understand Significance of oceanography and hydrology in earth and atmospheric science, Configuration of the ocean floor and variation of temperature and salinity of oceans and seas.

**UNIT-1 HYDROLOGIC CYCLE**

Hydrological cycle and its sub-cycle; Man's interference on hydrological cycle - elements of hydrological cycle: precipitation - intensity and duration; evaporation; infiltration, surface runoff, urban flooding.

**UNIT-2 CHARACTERISTICS AND FUNCTIONS OF FLUVIAL MORPHOLOGY**

Drainage basin characteristics: human impact on hydrological system - morphometric analysis – fluvial process and analysis.

**UNIT-3 AQUIFERS AND GROUNDWATER**

Ground water - occurrence and types: movement -Principles of water balance and their application, - its relevance in crop geography; water pollution, need for water management.

**UNIT-4 MORPHOLOGY OF OCEAN FLOOR**

Surface configuration of the ocean floor: continental shelf, continental slope, abyssal plain, oceanic ridges and oceanic trenches - relief of Atlantic, Pacific and Indian oceans - distribution of temperature and salinity of oceans and seas.

**UNIT-5 MOVEMENT OF OCEAN WATER AND OCEAN RESOURCES**

Circulation of oceanic waters: waves, tides and currents; currents of the Atlantic, Pacific and Indian oceans. Marine deposits and coral reefs; - Oceans as storehouse of resources.

| **Expected Course Outcomes** | | |
|---|---|---|
| 1 | Recall hydrological cycle, surface runoff and urban flooding | **K1, K2** |
| 2 | Knowledge on fluvial process and morphometry of drainage basin | **K2, K5** |
| 3 | Explain groundwater occurrence, types, movement, pollution and need for water management | **K3, K5** |

| | | |
|---|---|---|
| 4 | Recall ocean waters movements, ocean deposits, coastal environment and coral reefs and discuss the global warming and Sea level rising | **K5, K6** |
| **K1 - Remember; K2 - Understand; K3 - Apply; K4 -Analyse; K5 -Evaluate; K6 - Create** | | |

| **Text Book(s)** | |
|---|---|
| 1 | Thurman, H. V. (2019). Essentials of oceanography. |
| 2 | Talley, L. D. (2011). Descriptive physical oceanography: an introduction. Academic press. |
| 3 | Donnet, S., & Canadian Science Advisory Secretariat. (2018). Coast of bays metrics: Geography, hydrology and physical oceanography of an aquaculture area of the South Coast of Newfoundland. Canadian Science Advisory Secretariat (CSAS). |
| 4 | Cracknell, A. P. (1981). Remote sensing in meteorology, oceanography and hydrology. |
| 5 | Park, S. K., & Xu, L. (Eds.). (2013). Data Assimilation for Atmospheric, Oceanic and Hydrologic Applications (Vol. II) (Vol. 2). Springer Science & Business Media. |
| 6 | Diaz, H. F. (2000). El Niño and the Southern Oscillation: multiscale variability and global and regional impacts. Cambridge University Press. |

| **Reference Book(s)** | |
|---|---|
| 1 | Manheim, F. T. (1966). Soviet Books and Publications on Geological and Chemical Oceanography, Hydrology, and Other Subjects Acquired During the Second International Oceanographic Congress, Moscow, June 1966: Titles and Some Translated Contents and Notes. Woods Hole Oceanographic Institution. |
| 2 | Addison, H. (1961). Land Water and Flood, Chapman and Hall, London. |
| 3 | Anikouchine, W.A. and Sternberg, R.W. (1973). The World Oceans - An Introduction to Oceanography, Englewood Cliffs, N.J. |
| 4 | Chorley, R.J. (ed) (1969). Introduction to Physical Hydrology, Methuen, London. |
| 5 | Chorley,R.J. (1967). Water, Earth and Man, methuen, London. |
| 6 | Grald, S. (1980). General Oceanography - An Introduction, John Wiley & Sons, New York. |
| 7 | Sharma, R.C. Vatel M (1970). Oceanography for Geographers, Chetnya Publishing House, Allahabad |

| | |
|---|---|
| 8 | Singh, R.A. and Singh, S.R. (1972). Water Management: Principles and Practices. Tara Publication, Varanasi. |
| 9 | Thurman, H.B. (1984). Introductory Oceanography, Charles Webber E. Merril Publishing Co. |
| 10 | Todd, D.K. (1959). Ground Water Hydrology, John Wiley, New York. |
| **Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]** | |
| 1 | https://online-learning.tudelft.nl/courses/introduction-to-water-and-climate/ |
| 2 | https://www.mooc-list.com/tags/hydrology |
| 3 | https://www.usgs.gov/special-topic/water-science-school/science/what-hydrology |
| 4 | https://www.nationalgeographic.org/encyclopedia/hydrology/ |
| 5 | https://www.sciencedirect.com/topics/earth-and-planetary-sciences/hydrology |

**Mapping with Programme Outcomes (MPO)***

| MPO | PSO 1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|
| **CO1** | 1 | 1 | 1 | 1 | 2 |
| **CO2** | 1 | 2 | 1 | 1 | 1 |
| **CO3** | 1 | 1 | 2 | 1 | 1 |
| **CO4** | 1 | 1 | 1 | 1 | 1 |
| **CO5** | 1 | 1 | 3 | 2 | 2 |

Map **Course Outcomes (CO)** for each Course with **Programme Specific Outcomes (PSO)** in the

3-Point scale of **1, 2, 3 (Strong, Medium and Low).**

**METHOD OF EVALUATION**

| Continuous Internal Assessment | End Semester | Examination Total | Grade |
|---|---|---|---|
| **25** | **75** | **100** | |

**SEMESTER –II**

| | |
|---|---|
| Programm : M.Sc., Geography | CC6 |
| Semester : II | Hours: 6/W |
| Sub Code : **P23CG5** | Credits: 4 |

**PRACTICAL-II REMOTE SENSING DATA INTERPRETATION AND GNSS SURVEY**

| | | | | | | |
|---|---|---|---|---|---|---|
| Relevant to Global need | Basic | ✔ | Employability Oriented | ✔ | Addresses Professional Ethics | ✔ |
| Relevant to National need | | ✔ | Entrepreneurship Oriented | ✔ | Addresses Gender Sensitization | |
| Relevant to Regional need | | ✔ | Skill Development Oriented | ✔ | Addresses Environment and Sustainability | ✔ |
| Relevant to Local need | | ✔ | | | Addresses Human Values | ✔ |
| **Pre-requisite** | knowledge in Remote sensing and soft skill of basic computing | | | | | |

**Course Objectives**

1. To train students on remote sensing data type and formats imagery products and their availability.
2. To give insights on processing methods and techniques for handling radiometric and geometric properties of remotely sensed
3. To give principles and methods of multi-resolutions and multi-spectral data fusion, multi- temporal processing and accuracy assessment.
4. To develop data processing automation through batch processing
5. To create necessary skills to generate and analyze high level remote sensing products

**UNIT-1** Sources of Remote sensing Data**.** Interpretation of aerial photos and images
**UNIT-2** Visual Image Interpretation-LISS-IKONOS-QUICK BIRD images
**UNIT-3** Image display-digital value display- band differention
**UNIT-4** Data collection using schedule method and questionaire method.
**UNIT-5** Field data collection-point-line-area-using GNNS**.**

| **Expected Course Outcomes** | | |
|---|---|---|
| 1 | Understand quantitative remote sensing principles and integrate different tools for remote sensing data analysis. | **K2, K1** |
| 2 | Perform image corrections and enhancements and generate high level remote sensing products | **K2, K4** |
| 3 | Manipulate and process remote sensing data using manual and automated techniques | **K3, K5** |
| 4 | Critically compare different type of remote sensing data products and analysis technique and select the more appropriate to solve a real-world problem. | **K3, K6** |
| 5 | Create and analyze digital images using remote sensing technologies | **K5, K6** |

**K1 - Remember; K2 - Understand; K3 - Apply; K4 -Analyse; K5 -Evaluate; K6 – Create**

| | |
|---|---|
| **Text Book(s)** | |
| 1 | Congalton R.G and K. Green (2009),” Assessing the Accuracy of Remotely Sensed Data: Principles and Practices”, Second Edition, Boca Raton, CRC |
| 2 | Floyd F.Sabins (2020),”Remote Sensing: Principles of Interpretation and applications”, 4th Edition, Waveland Press, Inc., Long Grove, Illinois, USA. |
| 3 | John A. Richards (2013),” Remote Sensing Digital Image Analysis – An Introduction”, (Fifth Edition). Springer-Verlag Berlin |
| 4 | John R.Jensen (2017),”Introductory Digital Image Processing : A Remote Sensing Perspective”, 4th Edition, Pearson Series in Geographic Information Science |
| 5 | Robert, A. Schowengergt (1983),” Techniques for Image Processing and classification in Remote Sensing”, Office of Arid Lands Studies, University of Arizona, Tucson, Arizona |
| 6 | Lilesand and Keifer (2000). Introduction to Remote sensing and Image Interpretation; John Willy & sons Ltd., New York. |
| **Reference Book(s)** | |
| 1 | Robert, G. Reeves (1983),”Manual of Remote Sensing Vol. I and II”, American Society of Photogrammetry, Falls, Church, USA. |
| 2 | Richards (1993),”Remote sensing digital Image Analysis – An Introduction”, Springer –Verlag. |
| 3 | Rafael C. Gonzalez,Richard Eugene Woods (2008),”Digital Image Processing,” Pearson/ Prentice Hall. |
| 4 | Annadurai (2007),”Fundamentals of Digital Image Processing”,Pearson Education. |
| **Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]** | |
| 1 | http://mohua.gov.in/upload/uploadfiles/files/guideline_satellite.pdf |
| 2 | https://onlinecourses.nptel.ac.in/noc19_ce38/preview |

| Mapping with Programme Outcomes (MPO)* | | | | | |
|---|---|---|---|---|---|
| **MPO** | **PSO 1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** |
| **CO1** | 1 | 1 | 2 | 1 | 2 |
| **CO2** | 1 | 1 | 3 | 1 | 1 |
| **CO3** | 1 | 2 | 1 | 2 | 1 |
| **CO4** | 1 | 1 | 1 | 1 | 1 |
| **CO5** | 1 | 1 | 1 | 2 | 2 |
| Map **Course Outcomes (CO)** for each Course with **Programme Specific Outcomes (PSO)** in the 3-Point scale of **1,2, 3 (Strong, Medium and Low)** | | | | | |

**METHOD OF EVALUATION**

| Continuous Internal Assessment | End Semester | Examination Total | Grade |
|---|---|---|---|
| **25** | **75** | **100** | |

**SEMESTER –II**

| | |
|---|---|
| Programm : M.Sc., Geography | ELECTIVE (E2) |
| Semester : II | Hours: 5W |
| Sub Code : **P23DG05** | Credits: 3 |

**TITLE: FIELD WORK AND MAPPING**

| | | | | | | |
|---|---|---|---|---|---|---|
| Relevant to Global need | ✔ | Employability Oriented | | Addresses Professional Ethics | | |
| Relevant to National need | ✔ | Entrepreneurship Oriented | | Addresses Gender Sensitization | | |
| Relevant to Regional need | ✔ | Skill Development Oriented | | Addresses Environment and Sustainability | ✔ | |
| Relevant to Local need | ✔ | | | Addresses Human Values | ✔ | |

**Course Objectives**

1. To impart knowledge about basic principles of field surveying procedures and practices.
2. Geospatial applications and also to impart knowledge on advanced surveying, photogrammetry, remote sensing, and Geographic Information Systems (GIS).
3. The purpose of fieldwork is to prepare students for a professional career by providing them with a "real world" experience.
4. Writing report papers on the structure demonstrated analytical and research talents.

**UNIT-1 FIELD WORK**

The students will go for a field work in the Second and Fourth semester, which is compulsory and on the basis of that, each student has to submit a field work report as part of the second and fourth semester course work

**UNIT-2 PLAN AND SCHEDULE**

This course work contains - Plan and schedule of the work carried out and comprehensive report on the field work

.**UNIT-3FIELD DATA COLLECTION**

The Student should prepare an individual report based on primary and secondary data collected during field work. Field and digital techniques for map making including use of GIS, GPS, and digital tablets

**UNIT-4 REPORT WRITING**

The maximum length of the report should not exceed 12000 words, excluding figures, tables, photographs, maps, references and appendices.

**UNIT-5 SUBMISSION**

Each report must be accompanied by field notebook, a fair copy of map, related cross sections and other relevant documents.

| **Expected Course Outcomes** | | |
|---|---|---|
| 1 | Understand various methods of Geospatial surveying | **K1, K2** |
| 2 | Estimate the observation outcomes based on field truth verification and getting | **K2, K5** |

| | | |
|---|---|---|
| | exposure in field work documentation. | |
| 3 | Calculate area and volume and to generate various cartographic techniques. | **K3, K4** |
| 4 | Adopt appropriate survey method to address various field problems. | **K5, K6** |
| 5 | In this course, students will perform credible and original geographical research. | **K4, K6** |
| **K1 - Remember; K2 - Understand; K3 - Apply; K4 -Analyse; K5 -Evaluate; K6 – Create** | | |

| **Text Book(s)** | |
|---|---|
| 1 | Arora, K.R., Surveying, Vol-I, II and III, Standard Book House. |
| 2 | Punmia BC et al: Surveying Vol. I, II, Laxmi Publication |
| 3 | Manoj, K. Arora and Badjatia, Geomatics Engineering, Nem Chand & Bros, 2011 |
| 4 | Chandra, A.M., Higher Surveying, Third Edition, New Age International (P) Limited, 2002 |
| 5 | Caton, D. 'Real world learning through geographical fieldwork' in Balderstone, D. (ed) (2006) Secondary Geography Handbook. Sheffield: Geographical Association. |
| **Reference Book(s)** | |
| 1 | Andersen, D. E. (2007). Survey techniques. Raptor research and management techniques. Hancock House Publishers, Blaine, WA USA, 89-100. |
| 2 | Roelfsema, C. M., Phinn, S. R., & Joyce, K. E. (2006, June). Evaluating benthic survey techniques for validating maps of coral reefs derived from remotely sensed images. In Proc 10th Int Coral Reef Symp (Vol. 1, pp. 1771-1780). |
| 3 | Demers, J. (2004). Depth of field: A survey of techniques. Gpu Gems, 1(375), U390. |
| 4 | A. M. Chandra, Plane Surveying, New Age International. |
| 5 | S. K. Duggal, Surveying Vol. I, Tata Mcgraw-Hill. |
| **Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]** | |
| 1 | https://flapflap.ep.mk16.de/rrmt/Chapter-5.pdf |
| 2 | https://ascelibrary.org/doi/abs/10.1061/(ASCE)0733-9453(2004)130:2(56) |
| 3 | https://onlinelibrary.wiley.com/doi/book/10.1002/9781119147770 |
| 4 | https://cdnsciencepub.com/doi/abs/10.5623/geomat-1996-0046 |
| 5 | https://ui.adsabs.harvard.edu/abs/2016EGUGA..18.7033M/abstract |

| **Mapping with Programme Outcomes (MPO)*** | | | | | |
|---|---|---|---|---|---|
| **MPO** | **PSO 1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** |
| **CO1** | 2 | 1 | 1 | 1 | 2 |
| **CO2** | 1 | 2 | 1 | 1 | 1 |

| | | | | | |
|---|---|---|---|---|---|
| **CO3** | 2 | 3 | 1 | 1 | 1 |
| **CO4** | 1 | 1 | 2 | 2 | 3 |
| **CO5** | 1 | 2 | 1 | 1 | 1 |
| Map **Course Outcomes (CO)** for each Course with **Programme Specific Outcomes (PSO)** in the 3-Point scale of **1,2, 3 (Strong, Medium and Low)** | | | | | |

**METHOD OF EVALUATION**

| Continuous Internal Assessment | End Semester | Examination Total | Grade |
|---|---|---|---|
| **25** | **75** | **100** | |

## SEMESTER II

| | |
|---|---|
| Programm : M.Sc., Geography | Choice -2 |
| Semester : I | Hours: 5/W |
| Sub Code : **P23DG06** | Credits: 3 |

**TITLE: GEOGRAPHY OF TRAVEL AND TOURISM**

| | | | | | |
|---|---|---|---|---|---|
| Relevant to Global need | ✔ | Employability Oriented | ✔ | Addresses Professional Ethics | ✔ |
| Relevant to National need | ✔ | Entrepreneurship Oriented | ✔ | Addresses Gender Sensitization | |
| Relevant to Regional need | ✔ | Skill Development Oriented | ✔ | Addresses Environment and Sustainability | ✔ |
| Relevant to Local need | ✔ | | | Addresses Human Values | ✔ |

| **COURSE OUTCOME** At the end of the Semester, the Students will be able to | Unit | Hrs P/S |
|---|---|---|
| **UNIT 1 CO1**: Know the idea about the Travel – Motivation - Meaning and Nature of Tourism - Types of Tourism – development in India. | 1 | 15 |
| **UNIT 2 CO2**: Know about History of Tourism- determinants and motivation of tourism. | 2 | 15 |
| **UNIT 3 CO3**: Understand the Elements of Tourism – Attraction, Accessibility, Accommodation and Amenities | 3 | 15 |
| **UNIT 4 CO4**: Acquire more knowledge about the Travel formalities – Tour Itinerary – Travel Agencies – Travel Abroad Facilities – Visa, Passport, Bank Restrictions – Traveller's Cheques. | 4 | 15 |
| **UNIT 5 CO5**: observe and recognize Tourism Potentials of India - The role of India Tourism Development Corporation (ITDC) and World Tourism Corporation (WTO) | 5 | 15 |

## SYLLABUS

**UNIT I:** History of Tourism – Ancient, Medieval and Modern Periods – Determinants and motivation of tourism.

**UNIT II:** Types of Tourism – Significance of Tourism, Tourism development in modern society – Tourism development in India.

**UNIT III:** Role of transport in tourism development – Travel formalities – Tour itinerary – Travel agency – Documents required for International Tourism, – Passport, visa– Traveler's cheques – Credit and debit cards – Tourism and environment – Eco tourism.

**UNIT IV:** Elements of tourism – Attraction, Accessibility and Amenities – Classification of tourist spots – Accommodation – Primary and supplementary accommodation – Hotels, inns and motels

**UNIT V:** Tourism Organization – WTO – ITDC - TTDC and their functions– Tourism promotion: advertisement.

REFERENCES 1.Tourism development – Bhatia, Sterling Publishers, 1986
2. Tourism: Past, Present and Future – Burkart & Madlik, Heinemann, 1976
3. Geography of Tourism – Robinson, Mcdonald and Evans, 1976
4. Geography of Recreation and Leisure, - Consgrove, Hutchinson, 1972

| UNITS | TOPIC | LECTURE HOURS | MODE OF TEACHING |
|---|---|---|---|
| **UNIT 1 - Concept of Leisure and Tourism** | | | |
| Concept of Leisure and Tourism – Principles and Purpose | | 5 | Group discussion, VLC and PPT lecture |
| Types of Tourism – Significance of Tourism development in modern society | | 5 | Group discussion, VLC and PPT lecture |
| Tourism development in the world – Tourism in India. | | 5 | Reference / PPT |
| UNIT 11 History of Tourism | | | |
| History of Tourism – Ancient | | 5 | chalk and talk and usage of maps ,PPT and VLC |
| Medieval and Modern Periods | | 5 | chalk and talk and usage of maps ,PPT and VLC |
| Determinants and motivation of tourism | | 5 | chalk and talk and usage of maps ,PPT and VLC |
| **UNIT III Elements of tourism** | | | |
| Attraction, Accessibility and Amenities | | 5 | Group discussion, VLC and PPT lecture |
| Accommodation | | 5 | Group discussion, VLC and PPT lecture |
| Hotels and Motels | | 5 | Group discussion, VLC and PPT lecture |
| **UNIT IV Transport and Eco Tourism** | | | |
| Travel formalities – tour itinerary | | 5 | Group discussion, chalk and talk and usage of maps VLC and PPT lecture |

| | | |
|---|---|---|
| Travel Agencies – Travel Abroad Facilities – Visa, Passport. Bank Restrictions | 5 | Group discussion, chalk and talk and usage of maps VLC and PPT lecture |
| Eco tourism | | |
| **UNIT V - Tourist Organization** | | |
| World Tourism Organization- promotion and advertisements. | 5 | chalk and talk ,Group discussion, , Maps and Atlas and PPT lecture |
| Tourism Potentials of India (India Tourism Development Corporation-ITDC) | 5 | chalk and talk ,Group discussion, Maps and Atlas and PPT lecture |
| tourism in India Problems of tourism development | 5 | |

**GEOGRAPHY OF TRAVEL AND TOURISM**

| Course outcomes(cos) | Programme outcomes (pos) | | | | | Programme specific outcomes (PSOs) | | | | | Mean scores of Cos |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | PO1 | PO2 | PO3 | PO4 | PO5 | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 | |
| CO1 | 4 | 4 | 5 | 5 | 5 | 3 | 4 | 4 | 4 | 5 | 4.3 |
| CO2 | 5 | 5 | 5 | 4 | 4 | 4 | 5 | 5 | 4 | 4 | 4.5 |
| CO3 | 3 | 4 | 5 | 5 | 4 | 4 | 5 | 4 | 5 | 4 | 4.3 |
| CO4 | 5 | 4 | 4 | 4 | 5 | 5 | 4 | 4 | 5 | 5 | 4.5 |
| CO5 | 3 | 4 | 5 | 4 | 5 | 5 | 4 | 5 | 5 | 5 | 4.5 |
| Mean Overall score | | | | | | | | | | | 4.42 |

**METHOD OF EVALUATION**

| Continuous Internal Assessment | End Semester | Examination Total | Grade |
|---|---|---|---|
| **25** | **75** | **100** | |

**SEMESTER –II**

| | |
|---|---|
| Programm : M.Sc., Geography | SEC |
| Semester : II | Hours: 5/W |
| Sub Code : **P23DG07** | Credits: 3 |

**TITLE: REMOTE SENSING AND GNSS**

| | | | | | | |
|---|---|---|---|---|---|---|
| Relevant to Global need | ✔ | Employability Oriented | ✔ | Addresses Professional Ethics | | |
| Relevant to National need | ✔ | Entrepreneurship Oriented | ✔ | Addresses Gender Sensitization | | |
| Relevant to Regional need | ✔ | Skill Development Oriented | ✔ | Addresses Environment and Sustainability | | |
| Relevant to Local need | | | | Addresses Human Values | ✔ | |

**Course Objectives:**

1.Understand the purpose and importance of RS, GIS & GNSS

2.To provide background knowledge and understanding of principles of RS and GNSS Systems

3. To enhance student's capacity to interpret images and extract information on the earth surface from multi-resolution imagery at multi-scale level.

**UNIT-1 INTRODUCTION TO REMOTE SENSING**

Remote Sensing Process - Analog to Digital data – Digital image data formats - Image processing system characteristics - Image Pre-processing: calculating radiance from DNs - atmospheric, radiometric and geometric correction.

**UNIT-2 AERIAL AND SATELLITE REMOTE SENSING**

Aerial Remote Sensing: Aerial photographs: Classifications based on Camera, Film and Orientation –Photo scale - Parallax – Stereo model - Flight planning – Marginal information – Interpretation keys - LIDAR – Drone Satellite Remote Sensing: Satellite – Types, Orbits and Sensors – Resolution: types - aspects of LANDSAT, SPOT, IRS, IKONOS, QUIKBIRD and recent satellites – Marginal information and Interpretation.

**UNIT-3 IMAGE ENHANCEMENT TECHNIQUES**

Contrast enhancement: linear, non-linear and level slicing – Spatial feature enhancement: spatial filtering, edge enhancement and Fourier and wavelet transform – multi-image enhancement – band rationing, principal component analysis texture transformations

**UNIT-4 IMAGE CLASSIFICATION**

Supervised classification: classification algorithm and training site selection - Unsupervised classification –Classification of mixed pixels: spectral mixture analysis and fuzzy classification – Post classification smoothing.

**UNIT-5 BASICS OF GNSS**

Introducing Global Navigation Satellite System: GNSS Components, Satellite Orbit, and Satellite Position on Orbital Plane, Signals, Reference System and Observation Techniques.

| **Expected Course Outcomes:** | | |
|---|---|---|
| 1 | Understand the basics of spatial structure of transportation network | **K2, K6** |
| 2 | Gain insights on processing methods and techniques for handling radiometric and geometric properties of remotely sensed | **K4, K5** |
| 3 | Developing data processing automation skills necessary to analyze high level remote sensing and GIS Products. | **K3, K6** |
| 4 | Familiarize with principles and methods of multi-resolutions and multi-spectral data fusion, multi- temporal processing and accuracy assessment. | **K1, K6** |
| **K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create** | | |

| **References** | |
|---|---|
| 1 | Peter A. Burrough and Rachael A. McDonnell, 2011, Principles of Geographic Information Systems, Oxford University Press. |
| 2 | Ian Heywood, Sarah Cornelius and Steve Carver, An Introduction to Geographic Information System, 2010, third edition, Pearson Education Ltd. |
| 3 | David O' Sullivan and David J. Unwin, 2010, Geographic Information analysis, second edition, John Wiley & Sons. |
| 4 | Kang – Tsung Chang, 2018, Introduction to Geographical Information System, New York: McGraw-Hill Education, ISBN 9781259929649 |
| 5 | Stephen R. Galati, 2006, Geographic Information Systems Demystified, ARTECH HOUSE, INC., ISBN-13: 978-1-58053-533-5. |
| 6 | Michael N. DeMers, 2009, GIS For Dummies, Wiley Publishing, Inc., ISBN: 978-0-470- 23682-6 |
| 7 | Bhatta, Basudeb. Remote Sensing and GIS. India, OUP India, 2011. |
| 8 | Campbell, James B. Introduction to Remote Sensing. United Kingdom, Taylor & Francis, 2002. Joseph, George. Fundamentals of Remote Sensing. India, Universities Press, 2005. |

| | |
|---|---|
| 9 | Digital Image Processing. India, Tata McGraw Hill Education, 2009. |
| 10 | Jain, Anil K. Fundamentals of digital image processing. India, Prentice Hall, 1989. |


| **Mapping with Programme Outcomes (MPO)*** | | | | | |
|---|---|---|---|---|---|
| **MPO** | **PSO 1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** |
| **CO1** | 1 | 1 | 2 | 1 | 2 |
| **CO2** | 1 | 1 | 3 | 1 | 1 |
| **CO3** | 1 | 2 | 1 | 1 | 1 |
| **CO4** | 1 | 1 | 1 | 1 | 1 |
| **CO5** | 1 | 1 | 1 | 2 | 2 |
| Map **Course Outcomes (CO)** for each Course with **Programme Specific Outcomes (PSO)** in the 3 Point scale of **1,2, 3 (Strong, Medium and Low)** | | | | | |

**METHOD OF EVALUATION**

| Continuous Internal Assessment | End Semester | Examination Total | Grade |
|---|---|---|---|
| **25** | **75** | **100** | |

**SEMESTER –II**

| | |
|---|---|
| Programm : M.Sc., Geography | Part I Core |
| Semester : II | Hours: 5/W |
| Sub Code : **P23DG08** | Credits: 3 |

**TITLE: PRINCIPLE OF GIS**

| | | | | | | |
|---|---|---|---|---|---|---|
| Relevant to Global need | ✔ | Employability Oriented | ✔ | Addresses Professional Ethics | | |
| Relevant to National need | ✔ | Entrepreneurship Oriented | ✔ | Addresses Gender Sensitization | | |
| Relevant to Regional need | ✔ | Skill Development Oriented | ✔ | Addresses Environment and Sustainability | | |
| Relevant to Local need | | | | Addresses Human Values | | |

**Course Objectives:**

1. 1Understanding the basic spatial concepts, approaches, history and development of GIS
2. Obtain an understanding of spatial and non-spatial data models
3. Understanding of data capturing methods and data accuracy and accessing publicly available data sets
4. Teaching basic spatial operations skills necessary to work with GIS project
5. Develop a project requiring GIS as a management, analytical, and/or visualization tool using spatial analysis methods

**UNIT-1 BASIC CONCEPTS OF SPATIAL SCIENCE AND GIS**

Basic concepts of spatial science and GIS: geographic spaces, spatial data and information, reference systems and datum, GIS definition, approaches and components; history and development of GIS.

**UNIT-2 DATA MODELS AND MANAGEMENT**

Data models and management: spatial data models – vector and raster data models; data models – object based – oriented data models – coding and encoding

**UNIT-3 DATA CAPTURE AND GEOPROCESSING**

Data Capture and geo processing: sources of geographic data, capturing methods, topology, geometric transformation, re projection, scales in GIS, precision and accuracy of geographical data

**UNIT-4 GIS:SPATIAL OPERATION**

| |
|---|
| Spatial operations: basic operations and set theory basics - buffer, overlay, network, view shed and watershed analysis, interpolation, 3D visualization<br>**UNIT-5 SPATIAL MODELLING AND ITS APPLICATION**<br>GIS modelling - multi-criteria analysis - network applications - LBS – Geo coding - suitability modelling - location allocation modelling - applications and case studies. |

| **Expected Course Outcomes:** | | |
|---|---|---|
| 1 | Developing an understanding of spatial concepts and spatial and non- spatial data models | **K1, K2** |
| 2 | Learning skills in creating spatial data models using GIS software | **K2, K6** |
| 3 | Gaining ability to access data in the GIS, compile, analyse, and present geospatial data | **K3, K4** |
| 4 | Performing GIS functions and demonstrate the skills in modelling | **K4, K5** |
| **K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create** | | |
| | | |

| **References** | |
|---|---|
| 1 | Peter A. Burrough and Rachael A. McDonnell, 2011, Principles of Geographic Information Systems, Oxford University Press. |
| 2 | Ian Heywood, Sarah Cornelius and Steve Carver, An Introduction to Geographic Information System, 2010, third edition, Pearson Education Ltd. |
| 3 | David O' Sullivan and David J. Unwin, 2010, Geographic Information analysis, second edition, John Wiley & Sons. |
| 4 | Kang – Tsung Chang, 2018, Introduction to Geographical Information System, New York: McGraw-Hill Education, ISBN 9781259929649 |
| 5 | Stephen R. Galati, 2006, Geographic Information Systems Demystified, ARTECH HOUSE, INC., ISBN-13: 978-1-58053-533-5. |
| 6 | Michael N. DeMers, 2009, GIS For Dummies, Wiley Publishing, Inc., ISBN: 978-0-470- 23682-6 |
| 7 | Bhatta, Basudeb. Remote Sensing and GIS. India, OUP India, 2011. |

| **Mapping with Programme Outcomes (MPO)*** | | | | | |
|---|---|---|---|---|---|
| **MPO** | **PSO 1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** |
| **CO1** | 1 | 1 | 2 | 1 | 2 |
| **CO2** | 1 | 1 | 3 | 1 | 1 |
| **CO3** | 1 | 2 | 1 | 1 | 1 |
| **CO4** | 1 | 1 | 1 | 1 | 1 |

| | | | | | |
|---|---|---|---|---|---|
| **CO5** | 1 | 1 | 1 | 2 | 2 |

Map **Course Outcomes (CO)** for each Course with **Programme Specific Outcomes (PSO)** in the 3 Point scale of **1,2, 3 (Strong, Medium and Low)**

**METHOD OF EVALUATION**

| Continuous Internal Assessment | End Semester | Examination Total | Grade |
|---|---|---|---|
| **25** | **75** | **100** | |

**SEMESTER –II**

| | |
|---|---|
| Programm : M.Sc., Geography | ELECTIVE |
| Semester : II | Hours: 2/W |
| Sub Code : **P23DSEG1** | Credits: 2 |

**TITLE: GEOSPATIAL STATISTICS**

| | | | | | | |
|---|---|---|---|---|---|---|
| ~~Relevant to~~ Global need | **Prior** | ✔ | ~~Employability~~ Oriented | ✔ | ~~Addresses Professional~~ Ethics | |
| Relevant to National need | | | Entrepreneurship Oriented | ✔ | Addresses Gender Sensitization | |
| Relevant to Regional need | | | Skill Development Oriented | ✔ | Addresses Environment and Sustainability | |
| Relevant to Local need | | | | | Addresses Human Values | |

**Pre-requisite** **Knowledge in Statistics.**

**Course Objectives:**

1. To introduce basic statistical procedures to the students
2. To indicate the assumptions, limitations and interpretation of these procedures and results
3. To train the students to handle these statistics towards analysing the geographical problems.
4. To understand the Statistical Techniques, Numerical data in Geography
5. To familiarize about Probabilistic Treatment, Parametric Statistics and Regression Analysis

**UNIT-1 GEOGRAPHY AND STATISTICS**

Significance of Statistics in geographical studies; Types of Data; levels of data measurement.

**UNIT-2 SAMPLING**

Sampling: basic concepts, sample UNITs and design, sampling frame and procedures, standard error and sample size, testing the adequacy of samples, Lorenz Curve and Gini's Coefficient; location Quotient.

**UNIT-3 MEASURES OF CENTRAL TENDENCY AND THEIR SIGNIFICANCE**

Centro graphic techniques: mean centre, median centre and standard distance. Measures of dispersion and concentration: Range, quartile deviation, mean deviation, standard deviation; coefficient of variation

**UNIT-4 BIVARIATE ANALYSIS**

Spearman's Rank Correlation and Karl Pearson's Product Moment Correlation

**UNIT-5 REGRESSION ANALYSIS**

Regression equations, construction of regression line interpolation, prediction, explanation; residual-statistical tests of significance of the estimates; computation of residuals and mapping.

| **Expected Course Outcomes:** | | |
|---|---|---|
| 1 | Explain the role of quantitative information in geographic research and applications. | **K2, K1** |
| 2 | Demonstrate an understanding of basic descriptive statistics and regression methods as they apply to problem solving in Geography. | **K2, K4** |
| 3 | Evaluate the roles of probability theory and sampling distributions in drawing inferences about populations based on samples | **K3, K5** |
| 4 | Perform basic data manipulation, statistical calculations and graphical presentation by hand, and using computer spreadsheets or statistical software (e.g., Excel, SPSS). | **K4, K6** |
| 5 | Acquired skills to assemble, collect and manage big data resources so that they facilitate both statistical as well as geographical studies. | **K3, K6** |
| **K1 - Remember; K2 - Understand; K3 - Apply; K4 - Analyze; K5 - Evaluate; K6 – Create** | | |

| **References** | |
|---|---|
| 1 | David M. Smith (1975), Patterns in Human Geography, Penguin, Harmons worth. |
| 2 | David U (1981), Introductory Spatial Analysis, Methuen, London. |
| 3 | Ebdon, D. (1983), Statistics in Geography: A Practical Approach, Blackwell, London. |
| 4 | Gupta, S.P. (2010), Statistical Methods, Sultan Chand and Sons, Latest Edition. |
| 5 | Hammond, R. and McCullagh, P.S. (1974), Quantitative Techniques in Geography: An Introduction, Clarendan Press, Oxford. |
| 6 | Peter a. Rogerson (2015), statistical methods for geography: a student's guide, sage publications ltd, London, United Kingdom. |
| 7 | Mathews, J.A. (1987), Quantitative and Statistical Approaches to Geography |
| 8 | Haggett, P., Andrew D. C., & Allan F. (1977), Location Methods, Vols. I and II, Edward Arnold, London |

| | |
|---|---|
| 9 | Ashis sarkar, (2013), quantitative geography: tech. & presentations orient blackswan private |
| **Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.]** | |
| 1 | https://swayam.gov.in/course/266-quantitative-methods |
| 2 | http://www.sethspielman.org/courses/geog5023/ |
| 3 | https://www.colorado.edu/geography/class_homepages/geog_4023_s08/ |
| 4 | http://www.oxfordbibliographies.com/view/document/obo 9780199874002/obo-9780199874002-0053.xml |
| 5 | https://searchworks.stanford.edu/view/923805 |

| **Mapping with Programme Outcomes (MPO)*** | | | | | |
|---|---|---|---|---|---|
| **MPO** | **PSO 1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** |
| **CO1** | 1 | 1 | 2 | 1 | 2 |
| **CO2** | 1 | 1 | 3 | 1 | 1 |
| **CO3** | 1 | 2 | 1 | 1 | 1 |
| **CO4** | 1 | 1 | 1 | 1 | 1 |
| **CO5** | 1 | 1 | 1 | 2 | 2 |
| Map **Course Outcomes (CO)** for each Course with **Programme Specific Outcomes (PSO)** in the 3-Point scale of **1,2, 3 (Strong, Medium and Low)** | | | | | |

**METHOD OF EVALUATION**

| Continuous Internal Assessment | End Semester | Examination Total | Grade |
|---|---|---|---|
| **25** | **75** | **100** | |

## SEMESTER- III

| | | | | | |
|---|---|---|---|---|---|
| PROGRAMME: M.Sc. GEOGRAPHY | | | | | |
| SEMESTER: III | **Part: III Core Course 7** | COURSE CODE : P23CG7 | | | |
| TITLE OF THE COURSE: **GEOGRAPHICAL THOUGHT** | | | | | |
| HOURS OF INSTRUCTION PER WEEK: 6 | CREDITS: 5 | CIA: 25 | EXTERNAL MARKS: 75 | TOTAL: 100 | |

**NATURE OF THE COURSE**

| | | | | | |
|---|---|---|---|---|---|
| Relevant to Global need | ✔ | Employability Oriented | ✔ | Addresses Professional Ethics | |
| Relevant to National need | ✔ | Entrepreneurship Oriented | ✔ | Addresses Gender Sensitization | |
| Relevant to Regional need | | Skill Development Oriented | | Environment and Sustainability | |
| Relevant to Local need | | | | Addresses Human Values | |

**LEARNING OBJECTIVES:** To enable the students to:

1. Understand ancient scholar's contribution to geography

2. Known exploration and discoveries, history of world civilization and contribution of modern geographer to geography.

| UNIT | CONTENT | HRS |
|---|---|---|
| I | **ANCIENT SCHOLAR OF GEOGRAPHIC THOUGHTS**<br><br>Nature of geography – Greek contribution to physical geography, Human geography , cartography ,Mathematical geography – Contribution of Romans – Arab contribution to geography – Ancient Indian geography thoughts. | 15 |
| II | **EXPLORATION AND DISCOVERIES**<br><br>Major exploration and discoveries: Contribution of Magellan, Vascodagama, James cook, Christopher Columbus. | 15 |
| III | **DUALISM IN GEOGRAPHY**<br><br>Dualism in geography: Systematic and regional geography: Physical and human geography – Scientific explanation – cause and effect – temporal, functional and ecological systems. | 15 |
| IV | **MODELS AND QUANTITATIVE REVOLUTION IN GEOGRAPHY**<br><br>Theories and models in geography – quantitative revolution and paradigm – Themes in geography - positivism – pragmatism – behaviorism – functionalism – idealism – realism and Marxism. | 15 |
| V | **STATUS OF MODERN GEOGRAPHY**<br><br>Modern political ideas in geography- conceptual and methodological developments and changing paradigms, status of Indian geography, future of geography. | 15 |

| **COURSE OUTCOMES:** | |
|---|---|
| **CO1** | Recall ancient scholar's contribution to geography k1 ,k2 |
| **CO2** | Evaluate contribution of modern geographer to geography and ability to analysis determinism and possibilism in geography |

| | |
|---|---|
| | k2 ,k5 |
| **CO3** | Assessment of dualism concept in geography k4 ,k5 |
| **CO4** | Apply quantitative revolution in geography k3 ,k5 |
| **CO5** | Discuss various theories , themes , models in geography and evaluate modern political ideas based on location<br>k3 ,k6 |

**TEXTBOOK**: Rana, lalita.Geographical thought concept publishing company, 2008.

**REFERENCES**:

**1**. Johnston, R. (2008). A Student's introduction to geographical thought: Theories, philosophies, methods

**2**. May, J.A. (2019). Kant's concept of geography and its relation to recent geography, random house, new york

**3**. Amedee, D., Golledge, R.G., 1975. An introduction to the scientific reasoning in geography ,random House, new york

4. Anoop Nayak, Alex Jeffrey, 2013. Geographical thought: An introduction to ideas in human geography, Routledge publication ,ISBN: 1317904125 , 9781317904120

**E-LEARNING RESOURCES**:

https://www.tandfonline.com/doi/full/10.1080/2325548x.2014.901849

**MAPPING WITH PROGRAMME OUTCOMES**

| CO / PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | S | S | S | M | S | M | S | S | S | M |
| CO2 | S | S | S | M | S | S | S | S | S | M |
| CO3 | S | S | S | M | S | S | S | S | S | M |
| CO4 | S | S | S | M | S | M | S | S | S | M |
| CO5 | S | S | S | M | S | M | S | S | S | M |

**MAPPING WITH PROGRAMME SPECIFIC OUTCOMES**

| CO/PSO | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|
| CO1 | 1 | 1 | 2 | 1 | 2 |
| CO2 | 1 | 1 | 3 | 1 | 1 |
| CO3 | 1 | 2 | 1 | 1 | 1 |

| | | | | | |
|---|---|---|---|---|---|
| CO4 | 1 | 1 | 1 | 1 | 1 |

PROGRAMME: M.Sc GEOGRAPHY

| SEMESTER:3 | **Part: III Core Course 8** | COURSE CODE : P23CG8 |
|---|---|---|

TITLE OF THE COURSE: **THEORITICAL ECONOMIC GEOGRAPHY**

| HOURS OF INSTRUCTION PER WEEK: 6 | CREDITS: 5 | CIA: 25 | EXTERNAL MARKS: 75 | TOTAL: 100 |
|---|---|---|---|---|

**NATURE OF THE COURSE**

| | | | | | |
|---|---|---|---|---|---|
| Relevant to Global need | ✔ | Employability Oriented | | Addresses Professional Ethics | ✔ |
| Relevant to National need | ✔ | Entrepreneurship Oriented | | Addresses Gender Sensitization | |
| Relevant to Regional need | | Skill Development Oriented | | Environment and Sustainability | ✔ |
| Relevant to Local need | | | | Addresses Human Values | |

**LEARNING OBJECTIVES:** To enable the students to:

1. Provide students with the contextual information of the spatial distribution and spatial interaction of economic activities.

2. Apply geospatial technology in economic geography and regional planning for solving the spatial problems.

| UNIT | CONTENT | HRS |
|---|---|---|
| I | **ECONOMIC ACTIVITIES IN SPACE**<br><br>Economic activity in space: basics – principles of location, distance and resource utilisation economic principles of demand, supply price and transactions and markets. | 15 |
| II | **BASIC CONCEPETS IN SPATIAL ANALYSIS AND SPATIAL ORGANISATION**<br><br>Basic concepts: spatial analysis and spatial organisation , economic activity , interaction and economic landscape – primary activities and land rent – theory of isolated state | 15 |
| III | **PRINCIPLES OF DEMAND – SUPLLY AND SCALES OF ECONOMICS**<br><br>Principles of demand , supply, market , economies of scale , scale agglomeration , cost and price , the principles of heterogeneous landscape and resource variation – utility curve | 15 |

| | | |
|---|---|---|
| **IV** | **ECONOMIC ACTIVITIES**<br><br>Economic activities : primary - location and interaction mechanism – Von- Tunen location theory – application in time – space environment , manufacturing activity – Smith , Weber and Isard , tertiary activity – Christaller , Losch | **15** |
| **V** | **ECONOMIC GEOGRAPHY AND ITS APPLICATIONS**<br><br>Applications of geospatial technology in economic geography , regional planning – concepts of growth centres , area and sectoral plans – recent trends and scope of economic geography – new approaches to spatial policy issues –public policy | **15** |

| **COURSE OUTCOMES:** | |
|---|---|
| **CO1** | Develop an understanding of concepts and issues related to the spatial interaction of the economy k1, k2 |
| **CO2** | Understanding the theoretical developments and ability for problem solving k2, k3 |
| **CO3** | Develop the ability to analyse – critically – current issues related to economic geography with spatial references to planning and development k3, k4 |
| **CO4** | Developing the ability to analyse spatial public policy and solve t spatial problems using geospatial technology<br>k4 , k6 |
| **CO5** | Develop an understanding of concepts and issues related to the spatial interactions of the economy<br>k4 , k5 |

**TEXTBOOK**:

Boyce, R.R. (1974). “The Basic of economic geography”, Holf Rinehart and Winston Inc. new York

**REFERENCES:**

1. Abler, Adam and P.Gould(1972) . Spatial organisation: A Geographer's view of the World. Englewood cliff. New Jersey

2. Baldwin, R.,R.Forslid, P.Martin, G. Ottaviano and F. Robert-Nicoud, (2003). Economic geography and public policy , Princeton

3. Fujita, M., P.R. Krugman and A.J. Venables , (1999) . The spatial Economy , MIT press

4. Smith, D.E. (1971) Industrial Location: An Economic Geographical Analysis , John Wiley and sons., New York

**E-LEARNING RESOURCES**:

https:// www.tandfonline.com/toc/recg20/current

**MAPPING WITH PROGRAMME OUTCOMES**

| CO / PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | S | S | S | M | S | M | S | S | S | M |
| CO2 | S | S | S | M | S | S | S | S | S | M |
| CO3 | S | S | S | M | S | S | S | S | S | M |
| CO4 | S | S | S | M | S | M | S | S | S | M |
| CO5 | S | S | S | M | S | M | S | S | S | M |

**MAPPING WITH PROGRAMME SPECIFIC OUTCOMES**

| CO/PSO | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|
| CO1 | 1 | 1 | 2 | 1 | 2 |
| CO2 | 1 | 1 | 3 | 1 | 1 |
| CO3 | 1 | 2 | 1 | 1 | 1 |
| CO4 | 1 | 1 | 1 | 1 | 1 |

PROGRAMME: M.Sc GEOGRAPHY

| SEMESTER:3 | **Part: III Core Course 9** | COURSE CODE : P23CG9P |
|---|---|---|

| TITLE OF THE COURSE: PRACTICAL-III GEO-SPATIAL LAB | | | | |
|---|---|---|---|---|
| HOURS OF INSTRUCTION PER WEEK: 6 | CREDITS: 4 | CIA: 25 | EXTERNAL MARKS: 75 | TOTAL: 100 |

**NATURE OF THE COURSE**

| | | | | | |
|---|---|---|---|---|---|
| Relevant to Global need | ✔ | Employability Oriented | | Addresses Professional Ethics | |
| Relevant to National need | ✔ | Entrepreneurship Oriented | | Addresses Gender Sensitization | |
| Relevant to Regional need | ✔ | Skill Development Oriented | | Environment and Sustainability | |
| Relevant to Local need | | | | Addresses Human Values | |

**LEARNING OBJECTIVES:** To enable the students to:

To introduce the concept of geographic information systems practically and to understand the various aspects of map reading , design , and evolution of digital maps.

| UNIT | CONTENT | HRS |
|---|---|---|
| I | OPEN SOURCE TOOLS : OPEN SOURCE GIS SOFTWARE | 15 |
| II | QGIS: OVERVIEW OF INTERFACE – TOOLBARS – ADDING SPATIAL AND NON- SPATIAL DATA – COORDINATE SYSTEMS. | 15 |
| III | SCANNING AND GEOREFRENCING | 15 |
| IV | DIGITIZATION (POINT , LINE AND POLYGON) | 15 |

| | | |
|---|---|---|
| V | DATABASE CREATION : ADDING ATTRIBUTE DATA AND ADDING ATTRIBUTE DATA THROUGH LINKING TABLE | 15 |

| **COURSE OUTCOMES:** | |
|---|---|
| **CO1** | A clear understanding in key concepts of cartography ,GIS and the aspects in reading , designing , and evaluating digital cartographic maps. K1 ,K2 |
| **CO2** | Understand the relationship between map projections, coordinate systems and geospatial layers including map algebra and spatial statistics. K2 ,K3 |
| **CO3** | Learn the skills in data collection , storage , analysis and interpretation of spatial data in GIS interface K3 , K6 |
| **CO4** | Ability to analyse and evaluate the maps and perform spatial operations like overlay analysis, landscape analysis , terrain analysis , suitability analysis and spatial modelling K4 ,K5 |
| **CO5** | Create tools and models for developing and solving complex geospatial problems in GIS K4 , K6 |

**TEXTBOOK**:

Aronoff , S. (1991). Geographic information systems: a management perspective, WDL publications, Ottawa, Canada.

**REFRENCES:**

1. Ballas , D., Clarke, Frankline, R.S.,&Newing, A. (2017). GIS and the social sciences: theory and applications. Routledge

2. Zhu, X.(2016). GIS for environmental applications: a practical approach. Routledge.

3. Whyatt , D., Clark, G., & Davis, G. (2011). Teaching geographical information systenms in geography degrees: A critical reassessment of vocationalism . journal of geography in higher education , 35(2), 233-244

**E-LEARNING RESOURCES:**

http:// www.esri.com/

**MAPPING WITH PROGRAMME OUTCOMES**

| CO / PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | S | S | S | M | S | M | S | S | S | M |
| CO2 | S | S | S | M | S | S | S | S | S | M |
| CO3 | S | S | S | M | S | S | S | S | S | M |
| CO4 | S | S | S | M | S | M | S | S | S | M |
| CO5 | S | S | S | M | S | M | S | S | S | M |

**MAPPING WITH PROGRAMME SPECIFIC OUTCOMES**

| CO/PSO | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|
| CO1 | 2 | 1 | 1 | 2 | 1 |
| CO2 | 1 | 2 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 1 | 1 | 2 |
| CO4 | 2 | 1 | 1 | 1 | 1 |

| | | | | | |
|---|---|---|---|---|---|
| PROGRAMME: M.Sc GEOGRAPHY | | | | | |
| SEMESTER: 3 | **Part: III Core Course 10** | COURSE CODE : P23CG10 | | | |
| TITLE OF THE COURSE: INDUSTRIAL GEOGRAPHY | | | | | |
| HOURS OF INSTRUCTION PER WEEK: 5 | | CREDITS: 3 | CIA: 25 | EXTERNAL MARKS: 75 | TOTAL: 100 |

**NATURE OF THE COURSE**

| | | | | | |
|---|---|---|---|---|---|
| Relevant to Global need | ✔ | Employability Oriented | | Addresses Professional Ethics | |
| Relevant to National need | | Entrepreneurship Oriented | | Addresses Gender Sensitization | |
| Relevant to Regional need | | Skill Development Oriented | | Environment and Sustainability | ✔ |
| Relevant to Local need | ✔ | | | Addresses Human Values | |

**LEARNING OBJECTIVES:**

1. Provide students with the contextual information of the distribution of industrial estate role of industries in regional development.

2. To know the impact of globalization on industries and environmental impact of industrialization

| UNIT | CONTENT | HRS |
|---|---|---|
| I | Basic concepts: meaning and scope of industrial geography , recent trends in industrial geography, classification of industries, concepts of industrialization , industrial complex and industrial estate, role of industries in regional development. | 15 |
| II | Location factors and theories: factors of industrial location, linkage in industries, theories of industrial location: weber, hoover, losch and smith. | 15 |
| III | Spatial arrangement of industries: localization and distribution of iron & steel , cotton textile and sugar industries, bases of identification of industrial regions, industrial regions of USA and west Europe. | 15 |
| IV | Impact of globalization on industries problems of industrialization, environmental impact of industrialization. | 15 |
| V | Industrialization in India: industrial development and policies , industrial regions and complexes, impact of globalization on industries, problems of industrialization, environmental impact of industrialization | 15 |

**TEXTBOOK :**

Alexanderson, c. (1967): Geography of manufacturing. Prentice-hall of india , New Delhi. 2. Hoover, e. M. (1948): location and space economy. McGraw hill , Newyork

**REFRENCES:**

1. Barnes, T.J. 2009. “Economic Geography.” In Interna-tional Encyclopedia of Human Geography,editedbyR.Kitchin and N. Thrift, 315–327. Oxford: Elsevier.
Bathelt, Harald. 2005.

2. “Geographies of Produc-tion: Growth Regimes in Spatial Perspective(II) – Knowledge Creation and Growth in Clus-ters.” Progress In Human Geography, 29(2): 204–216.DOI:10.1191/ph539pr

3. Yeung, Henry Wai-chung. 2000. “Organizing ‘theFirm’ in Industrial Geography I: Networks, Insti-tutions and Regional Development.” Progress InHuman Geography, 24(2): 301–315. DOI:10.1191/030913200671984115.

**MAPPING WITH PROGRAMME OUTCOMES**

| CO / PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | S | S | S | M | S | M | S | S | S | M |
| CO2 | S | S | S | M | S | S | S | S | S | M |
| CO3 | S | S | S | M | S | S | S | S | S | M |
| CO4 | S | S | S | M | S | M | S | S | S | M |
| CO5 | S | S | S | M | S | M | S | S | S | M |

**MAPPING WITH PROGRAMME SPECIFIC OUTCOMES**

| CO/PSO | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|
| CO1 | 2 | 1 | 1 | 2 | 1 |
| CO2 | 1 | 2 | 1 | 1 | 1 |
| CO3 | 1 | 1 | 1 | 1 | 2 |
| CO4 | 2 | 1 | 1 | 1 | 1 |

| | | | | | |
|---|---|---|---|---|---|
| PROGRAMME: M.Sc GEOGRAPHY | | | | | |
| SEMESTER:3 | **Part: PART III CORE COURSE DSEC5 CHOICE 1** | COURSE CODE : P23DG09 | | | |
| TITLE OF THE COURSE: POLITICAL GEOGRAPHY | | | | | |
| HOURS OF INSTRUCTION PER WEEK: 5 | CREDITS: 3 | CIA: 25 | EXTERNAL MARKS: 75 | TOTAL: 100 | |
| **NATURE OF THE COURSE** | | | | | |
| Relevant to Global need | ✔ | Employability Oriented | | Addresses Professional Ethics | |
| Relevant to National need | ✔ | Entrepreneurship Oriented | | Addresses Gender Sensitization | |
| Relevant to Regional need | | Skill Developme | ✔ | Environment and | |

| | | | | | |
|---|---|---|---|---|---|
| | | nt Oriented | | Sustainability | |
| Relevant to Local need | | | | Addresses Human Values | |

| UNIT | CONTENT | HRS |
|---|---|---|
| I | POLITICAL GEOGRAPHY : NATURE , SCOPE , APPROACHES<br><br>Nature, scope and subject matter of political geography, political geography and geopolitics – approaches to the study of political geography, recent development in political geography. | 15 |
| II | GEOGRAPHIC ELEMENTS AND THE STATE:<br><br>Geographic elements and the state, physical elements, human elements, economic elements, political geography and environment interface. | 15 |
| III | POLITICAL GEOGRAPHY : THEMES<br><br>Themes in political geography, state , nation , nation – state and nation-building, frontiers and boundaries , difference forms of governance – the changing patterns of world powers – perspectives on core- periphery concept. | 15 |
| IV | GEOPOLITICAL SIGNIFICANCE OF INDIAN OCEAN | 15 |
| V | POLITICAL GEOGRAPHY – CONTEMPORARY INDIA<br><br>Political geography of contemporary India with special reference to: The changing political map of India, unity – diversity: centripetal & centrifugal forces, stability & instability, | 15 |

| | | |
|---|---|---|
| | interstate issues. | |

**COURSE OUTCOMES:**

| | |
|---|---|
| **CO1** | Developing an understanding of political geography and its influence in politics K1,K2 |
| **CO2** | Able to apply spatial analysis methods to assess physical and human environment to shape and reshape political geographic outcomes K3,K4 |
| **CO3** | Understand the themes of political geography in relation to nation, state, nation-building, frontiers and boundaries. K2 , K3 |
| **CO4** | Ability to analyse critically the conflicts in India and geospatial significance of Indian ocean and its importance K4,K5 |
| **CO5** | Ability to describe the contemporary issues, conflicts and challenges surrounding the Indian regions – SAARC, South – east Asia , West and East Asia. K4, K6 |

REFRENCES:


1. De Blij, H. j., Glassner, 1968. Martin systematic political geography, john Wiley, new york
2. Deshpande C.D., 1992. India-a regional interpretation northern book centre, new Delhi
3. Dikshit, R.D., 1996.political geography: a contemporary perspective, tat McGraw hill, new delhi


E-LEARNING RESOURCES:

https://www.opengeography.org/ch-10-political geography.html

| CO / PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | S | S | S | M | S | M | S | S | S | M |
| CO2 | S | S | S | M | S | S | S | S | S | M |
| CO3 | S | S | S | M | S | S | S | S | S | M |
| CO4 | S | S | S | M | S | M | S | S | S | M |
| CO5 | S | S | S | M | S | M | S | S | S | M |

| MAPPING WITH PROGRAMME SPECIFIC OUTCOMES | | | | | |
|---|---|---|---|---|---|
| **CO/PSO** | **PSO1** | **PSO2** | **PSO3** | **PSO4** | **PSO5** |
| CO1 | 1 | 1 | 2 | 1 | 2 |
| CO2 | 1 | 1 | 3 | 1 | 1 |
| CO3 | 1 | 2 | 1 | 1 | 1 |
| CO4 | 1 | 1 | 1 | 1 | 1 |

| PROGRAMME: M.Sc. GEOGRAPHY | | | | |
|---|---|---|---|---|
| SEMESTER:3 | **Part: III Core Course DSEC5 CHOICE 2** | COURSE CODE :P23DG10 | | |
| TITLE OF THE COURSE: SOCIAL GEOGRAPHY | | | | |
| HOURS OF INSTRUCTION PER WEEK: 5 | CREDITS: 3 | CIA: | EXTERNAL MARKS: 75 | TOTAL: 100 |

| | | | | | |
|---|---|---|---|---|---|
| | | 25 | | | |

**NATURE OF THE COURSE**

| | | | | | |
|---|---|---|---|---|---|
| Relevant to Global need | ✔ | Employability Oriented | | Addresses Professional Ethics | |
| Relevant to National need | | Entrepreneurship Oriented | ✔ | Addresses Gender Sensitization | |
| Relevant to Regional need | | Skill Development Oriented | ✔ | Environment and Sustainability | |
| Relevant to Local need | | | | Addresses Human Values | |

**LEARNING OBJECTIVES:** To enable the students to:

Explain the social wellbeing and understand the public policy and social planning in india.

| UNIT | CONTENT | HRS |
|---|---|---|
| I | Social geography: nature, scope and recent trends of social geography – social geography in the realm of social sciences. | 15 |
| II | Elements of social geography: ethnicity, tribe, dialect, language, religion and caste. | 15 |
| III | Space and society: concept of social space – social structure and social processes – geographical bases of social formation – social differentiation and region formation – patterns and bases of rural and urban society | 15 |
| IV | Social well- being: concepts of social well-being – physical quality of life-human development – measurement of human development : social , economic and environment indicators – social geographies of inclusion and exclusion | 15 |
| V | Public policy and social planning in India: five year plans and strategies | 15 |

**COURSE OUTCOMES:**

| | |
|---|---|
| **CO1** | Know the nature and development of social geography – realm of social sciences. |
| **CO2** | Elements of social geography: ethnicity, tribe, dialect, language, religion and caste. |
| **CO3** | Understand the space and society – structure and process – to social theory; power relations and space. |
| **CO4** | Explain the social well –beings and human development |
| **CO5** | Understand the public policy and social planning in India |

## REFRENCES:


1. Aijazuddin Ahmad (2012), social geography of India – concept of publishing company Pvt Ltd, New Delhi.
2. Aijazuddin Ahmad (2007) social geography Rawat publication Jaipur.
3. David Atkinson (2007) Cultural geography rawat publication jaipur.


**MAPPING WITH PROGRAMME OUTCOMES**

| CO / PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | S | S | S | M | S | M | S | S | S | M |
| CO2 | S | S | S | M | S | S | S | S | S | M |

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| CO3 | S | S | S | M | S | S | S | S | S | M |
| CO4 | S | S | S | M | S | M | S | S | S | M |
| CO5 | S | S | S | M | S | M | S | S | S | M |

**MAPPING WITH PROGRAMME SPECIFIC OUTCOMES**

| CO/PSO | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|
| CO1 | 1 | 1 | 2 | 1 | 2 |
| CO2 | 1 | 1 | 3 | 1 | 1 |
| CO3 | 1 | 2 | 1 | 1 | 1 |
| CO4 | 1 | 1 | 1 | 1 | 1 |

| PROGRAMME: M.Sc GEOGRAPHY | | | | | |
|---|---|---|---|---|---|
| SEMESTER:3 | **Part: III Core Course SEC2** | COURSE CODE : P23SEG2 | | | |
| TITLE OF THE COURSE: GEOGRAPHY OF HEALTH AND WELL BEING | | | | | |
| HOURS OF INSTRUCTION PER WEEK: 2 | CREDITS: 2 | CIA: 25 | EXTERNAL MARKS: 75 | TOTAL: 100 | |

**NATURE OF THE COURSE**

| | | | | | |
|---|---|---|---|---|---|
| Relevant to Global need | ✔ | Employability Oriented | ✔ | Addresses Professional Ethics | |
| Relevant to National need | | Entrepreneurship Oriented | | Addresses Gender Sensitization | |
| Relevant to Regional need | | Skill Development Oriented | ✔ | Environment and Sustainability | |
| Relevant to Local need | | | | Addresses Human Values | |

**LEARNING OBJECTIVES:** To enable the students to:

1. To understand about the gender and health diseases of the rich and poor and migration diseases.

2. the student will develop a working knowledge of several numerical methods and their analysis basics

| UNIT | CONTENT | HRS |
|---|---|---|
| I | Nature, scope and development of medical geography – traditional and contemporary approaches – concepts of health and diseases – reproductive health – climate and health- human diseases – classification- infectious , degenerative and chronic , inherited and genetic diseases | 15 |

| | | |
|---|---|---|
| **II** | Nutrition – deficiency related diseases – geographical perspectives of communicable and non- communicable diseases – epidemic , endemic and pandemic nature of diseases – major tropical diseases – malaria , filariasis and leprosy; social diseases – HIV /AIDS, STD | **15** |
| **III** | Disease ecology – determinants of diseases – interlay of environmental, cultural, socio-economic and ecological factors – gender and health –.diseases of the rich and poor – disease diffusion – concepts – dynamics of major diseases- migration and disease- travel medicine. | **15** |
| **IV** | Medical cartography – measurements techniques of diseases - diseases mapping techniques at macro , meso and micro levels – medical statistics – epidemiological methods in diseases measurement and analysis – measurement of morbidity and mortality | **15** |
| **V** | Health care delivery system – hierarchy of medical services – planning for man power, infrastructure and service facilities of health care – rural and urban disparities – health education – improved health care delivery syaastem. | **15** |

**COURSE OUTCOMES:**

| | |
|---|---|
| **CO1** | To provide a critical understanding of key concepts related to medical geography. |
| **CO2** | To examine the role of societal structures and human behavior in creating and sustain health inequalities and differences in access to health care. |
| **CO3** | To understand about the gender and health diseases of the rich and poor and migration diseases. |
| **CO4** | The student will develop a working knowledge of several numerical methods and their analytical basis. |
| **CO5** | To understand how national health care systems either reduce or enhance health inequalities and differences in access to health care. |

REFRENCES:

1. Cliff, A. and Haggett, P.: Atlas of disease distribution. Basil Blackwell, oxford, 1989.

2. Hazra, J. (ed.); Health care planning in developing countries. University of Calcutta, Calcutta, 1997.

3. Learmonth A.T.A.: Patterns of disease and hunger. A study in medical geography. David & Charles, victoria, 1978.

4. Narayan, K.V.: Health and development – inter-sectorial linkages in India.

**MAPPING WITH PROGRAMME OUTCOMES**

| CO / PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | S | S | S | M | S | M | S | S | S | M |
| CO2 | S | S | S | M | S | S | S | S | S | M |
| CO3 | S | S | S | M | S | S | S | S | S | M |
| CO4 | S | S | S | M | S | M | S | S | S | M |
| CO5 | S | S | S | M | S | M | S | S | S | M |

| CO/PSO | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|
| CO1 | 1 | 1 | 2 | 1 | 2 |
| CO2 | 1 | 1 | 3 | 1 | 1 |
| CO3 | 1 | 2 | 1 | 1 | 1 |
| CO4 | 1 | 1 | 1 | 2 | 1 |

| | | | | | |
|---|---|---|---|---|---|
| PROGRAMME: M.Sc. GEOGRAPHY | | | | | |
| SEMESTER:3 | **Part: III Core Course** | COURSE CODE : P23S1G1 | | | |
| TITLE OF THE COURSE: INTERNSHIP / INDUSTRIAL ACTIVITY | | | | | |
| HOURS OF INSTRUCTION PER WEEK: | CREDITS: 2 | CIA: | EXTERNAL MARKS: | TOTAL: | |

**NATURE OF THE COURSE**

| | | | | | |
|---|---|---|---|---|---|
| Relevant to Global need | ✔ | Employability Oriented | | Addresses Professional Ethics | |
| Relevant to National need | | Entrepreneurship Oriented | | Addresses Gender Sensitization | |
| Relevant to Regional need | | Skill Development Oriented | | Environment and Sustainability | |
| Relevant to Local need | | | | Addresses Human Values | |

**LEARNING OBJECTIVES:** To enable the students to:

1. Integrate theory and practice

2. develop communication inter personal and other critical skill in the job interview process

**COURSE OUTCOMES:**

| | |
|---|---|
| **CO1** | Develop skills to work effectively and further develop observation , recording and interpretation skills K2,K1 |
| **CO2** | Helps in skill building – improvise skills in specific field of interest K2,K4 |
| **CO3** | Communicate and collaborate effectively and appropriately with different professionals in the work environment through written and oral means K3,K5 |
| **CO4** | Use geospatial tools and techniques for hazard mitigation and resources planning K3,K6 |

| | |
|---|---|
| **CO5** | Pursue research and develop capabilities to handle multi-disciplinary field projects and work in teams and demonstrate leadership skills professional ethics. K5,K6 |

TEXTBOOK :

1. H.Frederick Sweitzer and Mary A . King (2019). Successful internship- 5th edition. Brooks/Cole publishing Co.

2. Lynne S .gross (1993). Internship experience – 2nd edition. Waveland press, Inc.

REFRENCES:

1. Marianne Ehrlich green (1997). Internship success-97 edition. National textbook Co.Gast, David L.Single subject research methodology in behavioural sciences:

Applications in special education and behavioural sciences. Routledge , 2009.

E-LEARNING RESOURCES:

https://careers.uiowa.edu/students/benefits-internship

**MAPPING WITH PROGRAMME SPECIFIC OUTCOMES**

| CO/PSO | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|
| CO1 | 1 | 1 | 2 | 1 | 2 |
| CO2 | 1 | 1 | 3 | 1 | 1 |
| CO3 | 1 | 2 | 1 | 1 | 1 |
| CO4 | 1 | 1 | 1 | 1 | |

## SEMESTER -IV

| | | | | | |
|---|---|---|---|---|---|
| PROGRAMME: M.Sc. GEOGRAPHY | | | | | |
| SEMESTER:4 | **Part: III Core Course C11** | COURSE CODE : P23CG11 | | | |
| TITLE OF THE COURSE: GEOGRAPHY OF INDIA AND PLANNING | | | | | |
| HOURS OF INSTRUCTION PER WEEK: 6 | CREDITS: 5 | CIA: 25 | EXTERNAL MARKS: 75 | TOTAL: 100 | |

**NATURE OF THE COURSE**

| | | | | | |
|---|---|---|---|---|---|
| Relevant to Global need | ✔ | Employability Oriented | | Addresses Professional Ethics | ✔ |
| Relevant to National need | ✔ | Entrepreneurship Oriented | | Addresses Gender Sensitization | |
| Relevant to Regional need | | Skill Development Oriented | | Environment and Sustainability | |
| Relevant to Local need | | | | Addresses Human Values | |

**LEARNING OBJECTIVES:** To enable the students to:

1. To learn the physical setting of Indian topography and climatic condition.

2. To study disaster zones of India

| UNIT | CONTENT | HRS |
|---|---|---|

| | | |
|---|---|---|
| **I** | PHYSICAL AND CLIMATE SETTINGS OF INDIA:<br><br>Major physiographic divisions and their characteristics, drainage system (Himalayan and peninsular) , climate factor: seasonal weather characteristics , climatic regions of Indian monsoon ( mechanism and characteristics), jet streams | **15** |
| **II** | NATURAL RESOURCES AND AGRICULTURE<br><br>Types and distribution of natural resources: soil, vegetation, mineral and marine resources. Agriculture: characteristics of Indian agriculture, agricultural problems. | **15** |
| **III** | POPULATION CHARACTERISTICS<br><br>Population characteristics (spatial patterns of distribution), growth and composition (rural-urban , age, sex,occupation, educational,ethnic and religious), determinants of population, population policies in india. | **15** |
| **IV** | TRANSPORT AND ECONOMY<br><br>Development and patterns of transport networks (railways, roadways, waterways, airways and pipelines), internal and external trade (trend, composition and directions), regional development planning in India, globalisation and its impact on Indian economy. Trade policy. Developments in communication and information technology and their impacts on economy and society; Indian space programme. | **15** |
| **V** | NATURAL DISASTER<br><br>Natural disasters in India (earthquake, drought, flood, cyclone, tsunami, Himalayan highland hazards and disasters. | **15** |

**COURSE OUTCOMES:**

| | |
|---|---|
| **CO1** | Understand the physical, cultural, economic, and demographic aspects with references to India and pursue it for further research. K1,K2 |
| **CO2** | To analysis soil types and variation of vegetation K2,K3 |

| | |
|---|---|
| **CO3** | Acquaint with the distinctiveness of geographic regions as the field of learning in geographical studies K3,K6 |
| **CO4** | To evaluate various transport network system of India K4,K5 |
| **CO5** | To apply sustainable concept to natural resource K4,K6 |

**TEXTBOOK**:

1. Deshpande, C.D. (1992). India –a regional interpretation. New Delhi, ICSSR and northern book Centre.

2. Nag, P., & Sengupta, S. (1992). Geography of India. Concept Publishing Company.

3. R.L. Singh (1989) India: A Regional Geography. Delhi: UBSPD,

4. Spate, O.H.K (1967) India and Pakistan, (3rd Edition) London: Methuen

**REFRENCES**:

1. Oldham, R.D.(1894). The evolution of Indian geography. The geographical journal, 3(3), 169-192.

**E-LEARNING RESOURCES**

https://www.india.gov.in/india-glance/profile

**MAPPING WITH PROGRAMME OUTCOMES**

| CO / PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | S | S | S | M | S | M | S | S | S | M |
| CO2 | S | S | S | M | S | S | S | S | S | M |
| CO3 | S | S | S | M | S | S | S | S | S | M |
| CO4 | S | S | S | M | S | M | S | S | S | M |
| CO5 | S | S | S | M | S | M | S | S | S | M |

**MAPPING WITH PROGRAMME SPECIFIC OUTCOMES**

| CO/PSO | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|
| CO1 | 1 | 1 | 2 | 1 | 2 |
| CO2 | 1 | 1 | 3 | 1 | 1 |
| CO3 | 1 | 2 | 1 | 1 | 1 |
| CO4 | 1 | 1 | 1 | 1 | 1 |

PROGRAMME: M.Sc. GEOGRAPHY

| SEMESTER:4 | **Part: III Core Course C12** | COURSE CODE : P23CG12 |
|---|---|---|

TITLE OF THE COURSE: REGIONAL PLANNING

| HOURS OF INSTRUCTION PER WEEK: 6 | CREDITS: 5 | CIA: 25 | EXTERNAL MARKS: 75 | TOTAL: 100 |
|---|---|---|---|---|

**NATURE OF THE COURSE**

| | | | | | |
|---|---|---|---|---|---|
| Relevant to Global need | ✔ | Employability Oriented | | Addresses Professional Ethics | ✔ |
| Relevant to National need | ✔ | Entrepreneurship Oriented | | Addresses Gender Sensitization | |
| Relevant to Regional need | | Skill Development Oriented | | Environment and Sustainability | |
| Relevant to Local need | | | | Addresses Human Values | |

**LEARNING OBJECTIVES:** To enable the students to:

1. To understand the concepts and theories in regional planning.

2. Discuss the global pattern of development and learn variation in inter regional development.

| UNIT | CONTENT | HRS |
|---|---|---|

| | | |
|---|---|---|
| **I** | REGIONAL PLANNING<br><br>Definition of region, evolution and types of regional planning: formal, functional, and planning regions and regional planning; need for regional planning; types of regional planning. | **15** |
| **II** | PLANNING REGIONS<br><br>Choices of a region for planning: characteristics of an ideal planning region; delineation of planning region; regionalization of India for planning (agro ecological zones) | **15** |
| **III** | THEORIES AND MODELS FOR REGIONAL PLANNING<br><br>Theories and models for regional planning: growth pole model of perroux; growth centre model in Indian context;Rostow | **15** |
| **IV** | CONCEPT OF DEVELOPMENT<br><br>Changing concept of development, concept of underdevelopment; efficiency-equity debate- measuring development: indicators (economic, social and environmental) | **15** |
| **V** | GLOBAL PATTERN OF DEVELOPMENT<br><br>Global pattern of development: inter-regional variations; human development: international, interstate comparison of India- geospatial technology and regional planning. | **15** |

**COURSE OUTCOMES:**

| | |
|---|---|
| **CO1** | Acquire a general understanding of the major concepts and theories in the fields of regional development and planning. K1,K2 |
| **CO2** | Identify, appreciate and use models and principles for policy formulation K4,K5 |
| **CO3** | Evaluate regional development planning policies K4,K5 |
| **CO4** | Acquire ability to prescribe appropriate strategies for regional development at appropriate level of governance K3,K6 |
| **CO5** | Comprehensive understanding on contemporary issues and challenges in relation to regional development K1,K6 |

## TEXTBOOK:

Abler, R., Hall, Englewood cliffs, N.J., (1971). Spatial organisation: the geographer's view of the world.

## REFRENCES:

1. misra, R.P.(1969). Regional planning: cocnepts, techniques and policies, university of mysore, mysore.

**E-LEARNING RESOURCES:**

http://www.dspmuranchi.ac.in/pdf/blog/regional planning techniques.pdf.

**MAPPING WITH PROGRAMME OUTCOMES**

| CO / PO | PO1 | PO2 | PO3 | PO4 | PO5 | PO6 | PO7 | PO8 | PO9 | PO10 |
|---|---|---|---|---|---|---|---|---|---|---|
| CO1 | S | S | S | M | S | M | S | S | S | M |
| CO2 | S | S | S | M | S | S | S | S | S | M |
| CO3 | S | S | S | M | S | S | S | S | S | M |
| CO4 | S | S | S | M | S | M | S | S | S | M |
| CO5 | S | S | S | M | S | M | S | S | S | M |

**MAPPING WITH PROGRAMME SPECIFIC OUTCOMES**

| CO/PSO | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|
| CO1 | 1 | 1 | 1 | 1 | 1 |
| CO2 | 1 | 3 | 3 | 2 | 1 |
| CO3 | 2 | 2 | 1 | 2 | 2 |
| CO4 | 1 | 2 | 1 | 2 | 1 |

PROGRAMME: M.Sc. GEOGRAPHY

| SEMESTER:4 | **Part: III Core Course CC13** | COURSE CODE : P23GPW |
|---|---|---|

TITLE OF THE COURSE: PROJECT WORK WITH VIVA VOICE

| HOURS OF INSTRUCTION PER WEEK: 10 | CREDITS: 7 | CIA: 60 | EXTERNAL MARKS: 40 | TOTAL: 100 |
|---|---|---|---|---|

**NATURE OF THE COURSE**

| | | | | | |
|---|---|---|---|---|---|
| Relevant to Global need | ✔ | Employability Oriented | | Addresses Professional Ethics | ✔ |
| Relevant to National need | ✔ | Entrepreneurship Oriented | | Addresses Gender Sensitization | |
| Relevant to Regional need | | Skill Development Oriented | | Environment and Sustainability | |
| Relevant to Local need | | | | Addresses Human Values | |

**LEARNING OBJECTIVES:** To enable the students to:

1. Think beyond the classroom, practical work and help them to comprehend the skills , knowledge and confidence in the specific subjects area.

2. Developing skills in scientific writing for publication in referred journals.

**COURSE OUTCOMES:**

| | |
|---|---|
| **CO1** | Gaining ability to capture, analyze and present geospatial data for visualization. K2,K4 |
| **CO2** | Demonstration of depth of technical understanding and application skills. K3,K5 |
| **CO3** | Demonstration of ability to critically analyze other work and come up with original ideas with creative contribution. K1,K4 |
| **CO4** | Ability to analyze the result and draw conclusions from the research work. K4,K5 |
| **CO5** | Ability to write academic / scientific report for a specific topic to solve the spatial problems. K5,K6 |

## TEXTBOOK:

Douglas Amedeo, Reginald G.Golledge (1975). An introduction to scientific reasoning in geography; John wiley & sons Inc. newyork.

**REFRENCES:**

1. Council of science editors. Scientific style and format: the CSE manual for authors, editors, and publishers. 7th ed. Reston, VA: council of science

2. humbert M. Blacock, J.R,Ann B.Blacock (1971). Methods and techniques'. New delhi: new age international publication.

**E-LEARNING RESOURCES:**

APA Citation Guide- university libraries – The Ohio state university

http://www.lib.ohio-state.edu/sites/guides/apagd.html

examples of citations using the publication manual of the American psychology association (APA)

Mapping With Programme Outcomes (MPO):

| CO/PSO | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|
| CO1 | 1 | 3 | 2 | 1 | 2 |
| CO2 | 1 | 1 | 1 | 1 | 1 |
| CO3 | 2 | 2 | 1 | 2 | |
| CO4 | 1 | 1 | 2 | 1 | 1 |

| | | | | |
|---|---|---|---|---|
| PROGRAMME: M.Sc. GEOGRAPHY | | | | |
| SEMESTER:4 | **Part: III Core Course GEC/DSEC6 CHOICE 1** | COURSE CODE : P23DG11 | | |
| TITLE OF THE COURSE: NATURAL HAZARDS AND DISASTER MANAGEMENT | | | | |
| HOURS OF INSTRUCTION PER WEEK: 5 | CREDITS: 3 | CIA: 25 | EXTERNAL MARKS: 75 | TOTAL: 100 |

**NATURE OF THE COURSE**

| | | | | | |
|---|---|---|---|---|---|
| Relevant to Global need | ✔ | Employability Oriented | | Addresses Professional Ethics | ✔ |
| Relevant to National need | ✔ | Entrepreneurship Oriented | | Addresses Gender Sensitization | |
| Relevant to Regional need | | Skill Development Oriented | | Environment and Sustainability | |
| Relevant to Local need | | | | Addresses Human Values | |

**LEARNING OBJECTIVES:** To enable the students to:

1. To orient students about various natural and manmade disasters

2. To teach students vulnerability reduction strategies.

| UNIT | CONTENT | HRS |
|---|---|---|
| I | INTRODUCTION<br><br>Hazard, Risks, vulnerability, disaster; disaster management, meaning, nature importance, dimension & scope of disaster management, disaster management cycle. National disaster management framework; financial arrangements for disaster management , international strategy for disaster reduction | 15 |
| II | NATURAL DISASTER<br><br>Natural disaster – meaning and nature of natural disasters, their types and effects, hydrology disaster – flood, flash flood, drought, cloudburst. Geological disaster – earthquakes, landslide, avalanches, volcanic eruptions, mudflow. Wind-related- cyclone, storm, storm surge, tidal waves. Heat and cold waves, climatic change, global warming, sea level rise, ozone depletion. | 15 |
| III | MAN-MADE DISASTER<br><br>CBRN-chemical disaster, biological disaster, radiological disasters, nuclear disasters. Fire – building fire, coal fire, forest fire, oil fire. Accidents- road accidents, rail accidents, air accidents, sea accidents. Pollution and deforestation- air pollution, water pollution, deforestation, industrial wastewater pollution, deforestation. | 15 |

| | | |
|---|---|---|
| **IV** | DISASTER DETERMINANTS<br><br>Factors affecting damage- types, scale population, social status, habitation pattern, physiology and climate. Factors affecting mitigation measures, prediction, preparation, communication, area and accessibility, population physiology and climate. | **15** |
| **V** | DISASTER MANAGEMENT INFORMATION SOURCES FORECASTING & WARNING:<br><br>Indian methodological department, tsunami warning centre, pacific disaster centre, central water commission; resources: UNISDR, USAID, Red Cross, Indian disaster resources network; other: national disaster management authority, national institute of disaster management, Bhuwan , national disaster response force , state and district disaster management centre. | **15** |

**COURSE OUTCOMES:**

| | |
|---|---|
| **CO1** | Students will learn different disasters and measures to reduce the risk due to these disasters. K1,K2 |
| **CO2** | Students will learn institutional frame work for disaster management national as well as global level K2,K3 |
| **CO3** | The students will get familiarized with eco system and issues related to the environment system. K3,K6 |
| **CO4** | Students can act as First Respondent and can handle Onsite situations. K4,K5 |
| **CO5** | Will help students in building a safe environment through sustainability development.at the end of this course, students are expected to carry out pre and post-disaster damage assessment, understand disaster recovery and the role of different agencies in the rehabilitation. K4,K6 |

**TEXTBOOK:**

1. Disaster administration and management, text & case studies- SL Goel-Deep and Deep publications.

2. Disaster management- G.K.Ghsoh –A.P.H. publishing corporation.

**E-LEARNING RESOURCES:** www.ncgia.ucsb.edu/education/curricula/giscc

**MAPPING WITH PROGRAMME SPECIFIC OUTCOMES**

| CO/PSO | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|
| CO1 | 1 | 1 | 2 | 1 | 2 |
| CO2 | 1 | 1 | 3 | 1 | 1 |
| CO3 | 1 | 2 | 1 | 1 | 1 |
| CO4 | 1 | 1 | 1 | 1 | 1 |

| PROGRAMME: M.Sc. GEOGRAPHY | | |
|---|---|---|
| SEMESTER:4 | **Part: III Core Course GEC/DSE6 CHOICE 2** | COURSE CODE : P23DG12 |
| TITLE OF THE COURSE: ENVIRONMENTAL STUDIES | | |

| HOURS OF INSTRUCTION PER WEEK: 5 | CREDITS: 3 | CIA: 25 | EXTERNAL MARKS: 75 | TOTAL: 100 |
|---|---|---|---|---|

**NATURE OF THE COURSE**

| | | | | | |
|---|---|---|---|---|---|
| Relevant to Global need | ✔ | Employability Oriented | | Addresses Professional Ethics | ✔ |
| Relevant to National need | ✔ | Entrepreneurship Oriented | | Addresses Gender Sensitization | |
| Relevant to Regional need | | Skill Development Oriented | | Environment and Sustainability | |
| Relevant to Local need | | | | Addresses Human Values | |

**LEARNING OBJECTIVES:** To enable the students to:

1. To introduce the concept of interaction between living and non-living organisms with physical environment, conversation of resources and human adaptation and adjustment to diverse environment.

| UNIT | CONTENT | HRS |
|---|---|---|
| I | Nature and scope of environmental studies- role of geography- man and environment relationship –changing nature of the concepts- determinism-possibly –neo determination- Marxian view on environment. | 15 |
| II | Concept of ecosystem- structure-functioning of the ecosystem- food chain, food web and food pyramid- nutrient cycles- natural disruptions of the eco system- floods – drought. | 15 |
| III | human interference of the ecosystem – population growth and its impact- man's impact on the biosphere- agriculture- green revolution-HYV and pesticides- man's impact on land- mining – soil- coastal areas. | 15 |
| IV | Human settlements and environment- industrial environment- emerging environmental problems- urban environment- pollution- environmental and health- environmental degradation. | 15 |
| V | Eco crisis- environmental quality-environmental management and planning- environmental impact Assessment- environmental law and protection- conversation movements- need for interdisciplinary. | 15 |

REFRENCES:

1. Environmental geography – Savindra Singh, prayag pustak bhavan, Allahabad-1997.

2. Essentials of bio geography- H.S.Mathur; pointer publisher , Jaipur-302003-2003.

**MAPPING WITH PROGRAMME OUTCOMES**

| CO / PO | PO1 | PO2 | PO3 | PO4 | PO5 |
|---|---|---|---|---|---|
| CO1 | 4 | 4 | 5 | 5 | 5 |
| CO2 | 5 | 5 | 4 | 4 | 4 |
| CO3 | 3 | 4 | 5 | 5 | 4 |
| CO4 | 5 | 4 | 4 | 4 | 5 |
| CO5 | 3 | 4 | 5 | 4 | 5 |

**MAPPING WITH PROGRAMME SPECIFIC OUTCOMES**

| CO/PSO | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|
| CO1 | 3 | 4 | 4 | 4 | 5 |
| CO2 | 4 | 5 | 5 | 4 | 5 |
| CO3 | 4 | 5 | 4 | 5 | 4 |
| CO4 | 5 | 4 | 4 | 5 | 5 |
| CO5 | 5 | 4 | 5 | 5 | 5 |

| | | | | | |
|---|---|---|---|---|---|
| PROGRAMME: M.Sc. GEOGRAPHY | | | | | |
| SEMESTER:4 | **Part: III Core Course SEC3** | COURSE CODE : P23SEG3 | | | |
| TITLE OF THE COURSE: PROFESSIONAL COMPTETENCY SKILL- GEO SPATIAL PROJECT PLNNING AND MANAGEMENT | | | | | |
| HOURS OF INSTRUCTION PER WEEK: 3 | CREDITS: 2 | CIA: 25 | EXTERNAL MARKS: 75 | TOTAL: 100 | |
| **NATURE OF THE COURSE** | | | | | |
| Relevant to Global need | ✔ | Employability Oriented | | Addresses Professional Ethics | ✔ |
| Relevant to National need | ✔ | Entrepreneurship Oriented | | Addresses Gender Sensitization | |
| Relevant to Regional need | | Skill Development Oriented | | Environment and Sustainability | |
| Relevant to Local need | | | | Addresses Human Values | |
| **LEARNING OBJECTIVES:** To enable the students to: | | | | | |

1. known to identify research problem and planning for research design

2. Develop skill for hypothesis testing in research methodology and able to use various statistical software for hypothesis testing.

| UNIT | CONTENT | HRS |
|---|---|---|
| I | RESEARCH / PROJECT MANAGEMENT<br><br>Research meaning, research objectives, types of research and motivations in research, research methods vs. methodology, revelence of research, importance of research methodology, research process, project management definition- nature, scope and functions- evolution of project management- management- management through in modern trend- patterns of the project management analysis. | 15 |
| II | RESEARCH DESIGN/ PROJECT PLANNING<br><br>Research/project planning- identification of problem- problem statement-research design and breakdown of the steps, associated software and tools- (primavera, MS project, Open project) | 15 |
| III | PROJECT PLANNING AND MANAGEMENT<br><br>Project planning and management – initiation- design and development- implementation- monitor and testing- project closing- tools and techniques in PM- global PM scenarios (BMI- PMBOK- Prince2 – M2M- IPMA etc.,) | 15 |
| IV | TESTING<br><br>EDA and design: data collection and collection of data- univariate methods and graphs- bivariate and trivariate graphs- multivariate methods and graphs – EMA (Exploratory Map Inferences from analysis –hypothesis testing parametric and non-parametric tests- Z, t, F tests,X2 and KS Tests and applications. | 15 |
| V | REPORT WRITING AND PUBLISHING<br><br>Report writing and publishing's: reports, seminar papers (short and long) and desertions- open source tools in research and reporting ( example: Mind Map, PAST, Gretl, Geoda, Zotora, Nevernote and Lyx/script) – basics of manuscripts editing for the press- language and ethics in reporting. | 15 |

**COURSE OUTCOMES:**

| | |
|---|---|
| **CO1** | Recall identification of research problem and develop research design **k1, k2** |
| **CO2** | Apply bibliographic tools in research and use various writing style manual **k2, k3** |
| **CO3** | Plan for data collection and construct class intervals methods to classify the data **k3, k4** |
| **CO4** | Develop skill for use various statistical software for hypothesis testing **k4, k5** |
| **CO5** | Prepared for writing and publishing a research report and manuscript editing, apply new techniques and use different research tools. **K4, k6** |

## TEXTBOOK:

1. Smith, P.G., &Merritt, G.M. (2020). Proactive risk management: Controlling uncertainty in product development. Productivity press.

## REFRENCES:

Verma, S.P. Practical approaches to research methodology. Akansha publishing House, 2005

**E-LEARNING RESOURCES:**

https:// methods.sagepub.com/refrence/sage-encyc-qualitative-researc-methods/n343.xml

**MAPPING WITH PROGRAMME OUTCOMES**

| CO/PSO | PSO1 | PSO2 | PSO3 | PSO4 | PSO5 |
|---|---|---|---|---|---|
| CO1 | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| | 1 | 1 | 2 | 1 | 2 |
| CO2 | 1 | 1 | 3 | 1 | 1 |
| CO3 | 1 | 2 | 1 | 1 | 1 |
| CO4 | 1 | 1 | 1 | 1 | 1 |
| CO5 | 1 | 1 | 1 | 2 | 2 |