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ताळगांव पठार
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(Accredited by NAAC)

GU/Acad –PG/BoS -NEP/2023/56/2 Date:18.05.2023

Ref: GU/Acad –PG/BoS -NEP/2022/339/26 dated 20.08.2022

**CIRCULAR**

In supersession to the above referred Circular, the updated approved Syllabus with revised Course Codes of the **Master of Arts in Geography** Programme is enclosed.

The Dean/ Vice-Deans of the D.D. Kosambi School of Social Sciences and Behavioural Studies / Principals of Affiliated Colleges offering the **Master of Arts in Geography** Programme are requested to take note of the above and bring the contents of the Circular to the notice of all concerned.

(Ashwin Lawande)
Assistant Registrar – Academic-PG

To,

1. The Dean, D.D. Kosambi School of Social Sciences and Behavioural Studies , Goa University.
2. The Vice-Deans, D.D. Kosambi School of Social Sciences and Behavioural Studies , Goa University.
3. The Principal of Affiliated Colleges offering the Master in Arts in Geography Programme.

Copy to:

1. The Chairperson, Board of Studies in Geography.
2. The Controller of Examinations, Goa University.
3. The Assistant Registrar, PG Examinations, Goa University.
4. Directorate of Internal Quality Assurance, Goa University for uploading the Syllabus on the University website.

**GOA UNIVERSITY**

**DEPARTMENT OF GEOGRAPHY**

**MA Syllabus based on Choice Based Credit System as per the NEP 2020**

**Total Credits 80**

**The course and credit distribution**

| Courses | Course Code | SEM I | SEM II | SEM III | SEM IV | Total Credits |
|---|---|---|---|---|---|---|
| Discipline Specific Core Courses | DSCC | 16 | 16 | | | 32 |
| Discipline Specific Optional Courses | DSOC | 4 | 4 | | | 8 |
| Research Specific Optional Courses | RSOC | | | 8 | 4 | 12 |
| Optional Generic Course | OGC | | | 12 | | 12 |
| Discipline Specific Dissertation | DSD | | | | 16 | 16 |
| Total Credits | 20 | 20 | 20 | 20 | 20 | 80 |

**One credit is 15 contact hours**

**Discipline Specific Core Courses**

| Course Number and Name | Lecture hours per week | Credits |
|---|---|---|
| **Semester I** | | |
| GOG-500: **Theory:** Advanced Geomorphology | 3 | 3 |
| GOG-500: **Practical:** Practicals in Geomorphology | 2 | 1 |
| GOG-501: **Theory:** Advanced Climatology | 3 | 3 |
| GOG-501: **Practical:** Practicals in Climatology | 2 | 1 |
| GOG-502: **Theory:** Fundamentals of Remote Sensing | 3 | 3 |
| GOG-502: **Practical:** Practicals in Remote Sensing | 2 | 1 |
| GOG-503: **Theory:** Environmental Geography | 4 | 4 |
| **Semester II** | | |
| GOG-504: **Theory:** Population Geography | 3 | 3 |
| GOG-504: **Practical:** Practicals in Population Geography | 2 | 1 |
| GOG-505: **Theory:** Economic Geography | 3 | 3 |
| GOG-505: **Practical:** Practicals in Economic Geography | 2 | 1 |
| GOG-506: **Theory:** Fundamentals of Geographic Information System | 3 | 3 |
| GOG-506: **Practical:** Practicals in Geographic Information System | 2 | 1 |

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| GOG-507: **Theory:** Geographical Thought and Development of Geography | 4 | 4 |
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**Discipline Specific Optional Courses**

| **Course Number and Name** | **Lecture hours per week** | **Credits** |
|---|---|---|
| **Semester I** | | |
| GOG-521 : Disaster Mitigation and Management | 4 | 4 |
| GOG-522: Advance Oceanography and Soil Geography | 4 | 4 |
| GOG-523: Socio-Cultural and Urban Geography | 4 | 4 |
| **Semester II** | | |
| GOG-524: Political Geography | 4 | 4 |
| GOG-525: Geography of Trade and Transport | 4 | 4 |

**SYLLABUS OF THE M. A. GEOGRAPHY PROGRAMME**

**SEMESTER I DISCIPLINE SPECIFIC CORE COURSES**

Programme: M. A. (Geography)

Course Code: **GOG-500** **Title of the Course**: Advanced Geomorphology

Number of Credits: 3

Effective from AY: 2022-2023

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|---|---|---|
| Prerequisites for the course: | Knowledge of Bachelor's Programme in Geography | |
| Objectives: | The main focus of this course is to<br>1. Understand the processes that shape the landforms around us<br>2. To apply geomorphological concepts to problems of slope instability and identify the factors responsible for hazards occurrences in various environments | |
| Content: | **Introduction to Geomorphology:** Nature and scope of Geomorphology, Fundamental concepts—Geological structures and landforms, uniformitarianism, multi-cyclic and polygenetic evolution of landscapes, concept of threshold<br>Earth movements - epeirogenic, orogenic and cymatogenic earth movements. Forces of crustal instability, isostasy, plate tectonics, seismicity, vulcanicity, orogenic structures with reference to the evolution of the Himalaya. | 15 Hours |
| | **Process Geomorphology:** General degradational processes: processes of rock weathering and their effects on landforms,<br>Slope development and slope facets; Concept of slope form, slope processes, and evolution; Models of slope evolution; Geomorphological processes upon slopes.<br><br>Evolution of landforms by the process – Fluvial, Glacial & Periglacial, Aeolian Karst and Coastal | 15 Hours |
| | **Applied Geomorphology**: Application of geomorphic mapping terrain evaluation. Digital Elevation Model (DEM) and Triangulated Irregular Network (TIN) unit, land capability and land suitability classification, hydro-Geomorphology, Urban Geomorphology, Environmental Geomorphology, geomorphic hazards. | 15 Hours |
| Pedagogy: | Lectures, Group, discussions, tutorials, student Seminars, Presentations, Case Studies,<br>Assignments, Problem Solving Sessions, Blended | |

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| | Learning, Flipped Classroom, Experiential learning (Local Field visits) | |
| References/Readings: | 1) Bloom A.L. 1978: Geomorphology: A Systematic Analysis of Late Cenozoic Landforms Prentice – Hall of India, New Delhi.<br>2) Brunsden D. 1985: Geomorphology in the Service of Man: The Future of Geography, Methnen, U.K.<br>3) Chorley, R. J. 1969: Introduction to Fluvial Processes, Methuen, London.<br>4) Chorley, R. J., Schumm, S. A. and Sugden, D. E. 1984: Geomorphology, Methuen, London.<br>5) Cooke, R.U. and Warren, 1973: Geomorphology in Deserts, Batsford, London<br>6) Dayal, P. 1996: Textbook of Geomorphology, Shukla Book Depot, Patna.<br>7) Goudie Anrew et.al. 1981: Geomorphological Techniques, George Allen &Unwin, London.<br>8) Hallam, A. 1973: A Revolution in Earth Science: From Continental Drift to Plate Tectonics, Oxford University Press, London.<br>9) Homes A. 1965: Principles of Physical Geology, 3rd Edition, ELBSS Edn.<br>10) Kale, V. and Gupta, A. 2001: Introduction to Geomorphology, Orient Longman, Kolkata.<br>11) McCullagh, P. 1978: Modern Concepts in Geomorphology, Oxford University Press, Oxford. UK.<br>12) Morisowa, M. 1968: Streams, their Dynamics and Morphology, McGraw Hill, New York.<br>13) Strahler A.N. 1968: The Earth Sciences, Harper & Row Intl. Edn, New York<br>14) Thornberry W. D. 1969: Principles of Geomorphology 2nd Edition, Wiley Intl. Edn. & Wiley, 1984.<br>15) Verstappen H. 1983: Applied Geomorphology, Geomorphological Surveys for Environmental Development, Elsevier, Amsterdam | |
| Learning outcomes: | On completion of the course, students will be able to:<br>**1.** Identify the process of landform formation.<br>**2.** Understand general de-gradational processes**.**<br>**3.** Apply geomorphic knowledge for sustainable environment | |

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| | **4.** Analyze geomorphological knowledge to solve problems | |

Programme: M. A. (Geography)
Course Code: GOG-500 Title of the Course: Practical in Geomorphology

Number of Credits: 1
Effective from AY: 2022-2023

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| Prerequisites for the course: | Knowledge of Bachelor's Programme in Geography | |
| Objectives: | The main focus of this course is to understand geomorphic mapping in the field-process and material mappings with the help of topo-sheets. | |
| Content: | Preparation of contour and drainage map from topo-sheet, Morphometric analysis.<br><br>Slope (isotan and isosin) and aspect maps & Hypsometric curve and integral.<br><br>Geomorphic mapping in the field-process and materials mapping. Size analysis of the sediment samples collected in the field (by sieving). | 15 Hours |
| | Plotting of the weights in different sieves on probability graph. Calculation of mean, median sorting index, skewness & kurtosis. Determination of silt and clay based on settling velocity.<br><br>Measurement of channel cross-sections in the field, Geomorphic map of channel bed, Study of erosional and depositional features on the field | 15 Hours |
| Pedagogy: | Demonstrations and Problem Solving Sessions. | |
| References/Readings: | 1. Doorenbos, J. (1977) and Pruitt W. O. Crop water requirement, FAO Irrigation and Drainage.<br>2. Frere and Popov (1979)- Agro-Meteorological Crop monitoring and forecasting, FAO plant production Paper No. 17.<br>3. Lawrence, G. R. P.: Cartographic Methods, Methuen & Co. London.<br>4. Monkhouse, F. J. R and: Maps and Diagrams, Wilkinson, H. R. Methuen and Co., London.<br>5. Singh, R. L. & Singh, Rana P. B. (1999): Element of Practical Geography, Kalyani Pub. New Delhi. | |
| Learning outcomes: | At the end of this course, students will learn to:<br>1. Prepare maps using toposheets<br>2. Carry out soil analysis of drainage and morphometry. | |

Programme: M. A. (Geography)
Course Code: **GOG-501** **Title of the Course**: Advanced Climatology

Number of Credits: 3
Effective from AY: 2022-2023

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| Prerequisites for the course: | Knowledge of Bachelor's Programme in Geography | |
| Objectives: | The main focus of this course is to study the unique characteristics of atmosphere in controlling the global climate, origin, types of climates, causes and processes influencing the climatic variations, and the impact of climate on humans or vice-versa. | |
| Content: | Nature and scope of climatology and its relationship with meteorology. Composition, mass and structure of the atmosphere.<br><br>**Temperature:** Insolation, difference between Heat and Temperature, Horizontal and Vertical distributions of insolation, heat balance of the earth, green-house effect, and Inversion of temperature<br><br>**Pressure:** Factors affecting air pressure, Pressure changes with altitude, distribution of surface pressure, Pressure measurement and Units | 15 Hours |
| | Stable and Unstable Atmosphere, Factors affecting atmospheric stability, Normal, environmental, dry and wet adiabatic lapse rate, Absolute stability, Absolute instability, Conditional instability, Weather associated with stability and instability<br><br>**Atmospheric moisture:** Humidity, Humidity measurement, Changes of state of water, evaporation, Factors affecting Evaporation , condensation, Factors affecting Condensation, Precipitation: formation, types, acid rain, world pattern of precipitation, | 15 Hours |
| | Wind movement, Global Circulation Model, Tri-cellular theory, and Eddy theory. Classical and Modern Theory of Monsoon<br><br>Air masses and their modifications,<br>Global, Seasonal & Local winds,<br>Jet stream | 15 Hours |
| Pedagogy: | Lectures, Group, discussions, tutorials, student | |

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| | Seminars, Presentations, Case Studies, Assignments, Problem Solving Sessions, Blended Learning, Flipped Classroom, Experiential learning (Local Field visits) | |
| References/Readings: | 1. Critchfield, H. J. (Rep.2010): General Climatology. Prentice Hall, New Delhi.<br>2. Lal, D. S. (Edition 2003): Climatology. Sharda Pustak Bhawan, 11, University Road, Allahabad, 211002, U. P.<br>3. Lutgen, Frederick K., Buck, Edward Tar: "The Atmosphere: An Introduction to Meteorology", Prentice Hall, Englewood Cliffs, New Jersey, 0762,1998.<br>4. Singh, Savindra (Rep.2011): Climatology, Prayag Pub. Allahabad, U. P. India.<br>5. Trewartha, G. T.: Introduction to Weather and Climate, Mc-Graw- Hill Book Co., New York. | |
| Learning outcomes: | On completion of the course, students will be able to:<br>1. Develop in depth basic knowledge of Climatology<br>2. Understand various concepts, theories and models.<br>3. Apply the knowledge of Climatology in understanding real life situations.<br>4. Analyze the various theories of Monsoon and understand characteristics of Monsoon | |

Programme: M. A. (Geography)
Course Code: **GOG-501** **Title of the Course**: Practicals in Climatology

Number of Credits: 1
Effective from AY: 2022-2023

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| Prerequisites for the course: | Knowledge of Bachelor's Programme in Geography | |
| Objectives: | The main focus of this course is to study the climatic data and analyse upper air data, water and rainfall. | |
| Content: | **Temperature Analysis:** Processing of observed data to derive maximum, minimum and daily range of temperature. Analysis of upper air data – Tephigram (Temperature-Height diagram) Calculation of relative humidity, dew point and vapor pressure from dry and wet bulb temperature data. | 15 Hours |
| | **Rainfall Analysis:** Classification of Koppen and Thornthwaite's Climate, Calculation of seasonal rainfall and annual variability of rainfall, Construction of crop-coefficient curve for any one crop.<br><br>Calculation of water surplus and water deficit amounts during crop growing season. Computation of Water Requirement Satisfaction index. Discomfort index by Thom's (1959) method. Identification and categorization of heat and cold waves | 15 Hours |
| Pedagogy: | Demonstrations and Problem Solving Sessions | |
| References/Readings: | 1. Doorenbos, J. (1977) and Pruitt W. O. - Crop water requirement, FAO Irrigation and Drainage.<br>2. Frere and Popov (1979)- Agro-Meteorological Crop Monitoring and Forecasting, FAO Plant Production Paper, No. 17.<br>3. John F. Mather (1974) - Climatology Fundamentals and Application, Oxford University Press, London.<br>4. Mather J. R. (1974)- Climatology, Fundamentals and Applications, Mc Graw Hill Book Co, New York.<br>5. Singh, R. L. & Rana P. B. (1999): Element of Practical Geography, Kalyani Pub. New Delhi.<br>6. Trewartha, G. T. (1980): An Introduction to Climatology, Mc-Graw-Hill Book Co. New York. | |

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| Learning outcomes: | Students will be able to<br>**Analyse** Temperature and Rainfall Data.<br>**Calculate** water surplus and water deficit during crop growing season | |

Programme: M. A. (Geography)
Course Code: **GOG-502** **Title of the Course**: Fundamentals of Remote Sensing

Number of Credits: 3
Effective from AY: 2022-2023

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| Prerequisites for the course: | No prerequisites are identified for this course | |
| Objectives: | The course is designed to fulfil following objectives:<br>1. To provide exposure to students in gaining knowledge on concepts and principles of Remote Sensing and Aerial Photography<br>2. Interpretation of Satellite Images | |
| Content: | Introduction, History, development of Remote Sensing, Electro-magnetic Radiation (EMR) Concept, Electro-magnetic spectrum and its components, EMR Interactions with Earth's Atmosphere and Surface features, Spectral Reflectance Curve, Advantages & Disadvantages of Remote Sensing.<br><br>Remote Sensing Platforms, Satellite orbit: Geostationary satellite and polar orbiting satellite, Types of Sensors,<br><br>Operating Principles of across & along track scanners | 15 Hours |
| | Concept of Resolution, Swath and Image Pixel, Types of Resolution, Spectral information in satellite image, Spectral Signature Curve<br><br>Concept of False Color Composite (FCC) and True Color Composite, Satellite Data Products of Indian Remote Sensing, National Aeronautics and Space Administration and European Space Agency, Digital Height Products,<br><br>Elements of Image Interpretation: Tone, Color, Texture, Pattern, Shape, Size and associated features | 15 Hours |
| | Introduction to Aerial Photography, Geometry of the vertical aerial photograph, Classification of aerial photography, Scale of Aerial Photograph, Aerial survey planning.<br><br>Introduction to Photogrammetry, Photo Scale; Planimetric measurements on aerial | |

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| | photographs: Area, Distance, Relative height; Radial displacement due to relief and its controlling factors, Concept of 3D vision, Digital and traditional Photogrammetry, Concept of Anaglyph & Stereo imaging;<br>Photogrammetric instruments: Pocket Stereoscope, Mirror Stereoscope, Parallax Bar, Stereo Plotter | 15 Hours |
| Pedagogy: | Lectures, Group, discussions, tutorials, student Seminars, Assignments, Presentations, Field visits, Case Studies, Problem Solving Sessions, Instruments handling, Blended Learning, Flipped Classroom, | |
| References/Readings: | 1. Barrett, E. C. and Curtis, L. .F.: Fundamentals of Remote Sensing and Air Photo Interpretation, Mcmillan, New York, 1992.<br>2. Compbell, J.: Introduction to Remote Sensing, Guilford, New York, 1989.<br>3. Curran, Paul J : Principles of Remote Sensing, Longman, London, 1985.<br>4. Luder, D: Aerial Photography Interpretation : Principles and Application, McGraw Hill, New York, 1959.<br>5. Pratt, W. K. Digital Image Processing. Wiley, New York,1978.<br>6. Thomas, M. Lillesand and Ralph, W. Kefer, Remote Sensing and Image Interpretation, John Wiley & Sons, New York, 1994. | |
| Learning outcomes: | On completion of the course, students will be able to:<br>1 **Acquire** in depth knowledge of the basic concepts of Remote Sensing<br>2 **Understand** the importance of Remote Sensing and its applications.<br>3 **Distinguish** between Remote Sensing and Photogrammetry.<br>4 **Apply** the knowledge of Remote Sensing and in day-to-day life. | |

Programme: M. A. (Geography)
Course Code: **GOG-502** **Title of the Course**: Practicals in Remote Sensing

Number of Credits: 1
Effective from AY: 2022-2023

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| Prerequisites for the course: | Basic Computer Skills | |
| Objectives: | The course is designed to fulfil the following objectives<br>1. To acquire skills in storing, managing digital data for planning and development.<br>2. Preparing Land Use maps and detecting change<br>3. Interpretation of satellite images | |
| Content: | **Data Representation:** Understanding & Visualizing Satellite Data, Layer Stacking, Layer Mosaic, Band combinations & Color Composites, Identification of features using Color Composite.<br><br>**Spectral Signatures:** Representation of pixel data in the form of spectral signature curve, Identification of features using spectral differences<br><br>**Data Sources:** Downloading free satellite data: Landsat, ASTER, SRTM, Sentinal | 15 Hours |
| | **Image Interpretation:** Interpretation of satellite image: Landsat TM, Resourcesat, Sentinal, Landsat Thermal Band.<br><br>**Image Classification & Change Detection:** Generating land use map using satellite image classification techniques, Accuracy Assessment, Area calculations, Change Detection in land use pattern.<br><br>**Aerial Stereoscopy:** Arrangement of stereo pairs, identification and interpretation of features. | 15 Hours |
| Pedagogy: | Demonstrations, Problem Solving, Interactive Sessions, Computer based exercises | |
| References/Readings: | 1. American Society of Photogrammetry: Manual of Remote Sensing. ASP Falls Church, V.A. 1983.<br>2. Barrett, E. C. and L. F. Curtis: Fundamentals of Remote Sensing and Air Photo Interpretation, Mc. Millan, New York, 1992.<br>3. Compbell, J.: Introduction to Remote | |

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| | Sensing, Guilford, New York, 1989.<br>4. Curran, Paul J : Principles of Remote Sensing, Longman, London, 1985.<br>5. Hord, R. M.: Digital Image Processing of Remotely Sensed Data, Academic, New York, 1989.<br>6. Luder, D.: Aerial Photography Interpretation: Principles and Application, McGraw Hill, New York, 1959.<br>7. Pratt, W. K. Digital Image Processing. Wiley, New York, 1978.<br>8. Thomas, M. Lillesand and Ralph W. Kefer, Remote Sensing and Image Interpretation, John Wiley & Sons, New York, 1994. | |
| Learning outcomes: | Acquire skills in handling instruments, tools, techniques and modelling while using Remote Sensing Technology. | |

Programme: M. A. (Geography)
Course Code: **GOG-503** **Title of the Course**: Environmental Geography

Number of Credits: 4
Effective from AY: 2022-2023

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| Prerequisites for the course: | Knowledge of Bachelor's Programme in Geography or related Sciences | |
| Objectives: | The main focus of the course is to possesses core knowledge of Environmental Geography and analyse the impact of Global Warming and Climate Change. | |
| Content: | **Introduction to Environmental Geography :** Concept of Environment, major elements of the environment, functioning of environmental systems, the role of biotic and abiotic elements, approaches and methods in Environmental Geography. | 15 Hours |
| | **Ecosystem and Biodiversity:** Terrestrial ecosystems: Forest, Grassland, Desert and Agriculture. Biodiversity: Genetic, species, community and ecosystem diversity; biodiversity uses, threats to biodiversity, biodiversity conservation. | 15 Hours |
| | **Environmental Degradation:** Nature and types of degradation-Natural and Anthropogenic degradation, causes and effects of environmental degradation/problems with special reference to the Indian scenario.<br><br>**Global Warming and Its Impacts:** Climate Change and Global Warming - Ozone layer depletion, Green House Gases, Impacts of Climate Change and Global warming and measures. | 15 Hours |
| | **Environmental Management:** Environmental planning and policies, Environmental Impact Assessment (EIA). Sustainable development, management of environmental quality. | 15 Hours |
| Pedagogy: | Lectures, Group, discussions, tutorials, student Seminars, Presentations, Assignments, Case Studies, Problem Solving Sessions, Blended Learning, Flipped Classroom, Experiential learning (Local Field visits) | |
| References/Readings: | 1. Bertalanffy, L. General Systems Theory, George Bragiller, New York, 1958.<br>2. Bodkin, E.: Environmental Studies, Charles E. Merril Pub. Co., Columbus, Ohio, 1982.<br>3. Manners, I. R. and Mikesell, M. W.(eds.), | |

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|---|---|---|
| | Perspectives on Environment, Commission on College Geography, Publ. No. 13, Washington, D.C., 1974.<br>4. Noel, Castree, David, Demeritt, Liverman, Diana & Rhodes, Bruce. A Companion to Environmental Geography- A John Wiley & Sons, Ltd., Publication, 2009.<br>5. Odum, E. P. : Fundamentals of Ecology, W. B. Saunders, Philadelphia, 1971.<br>6. Singh, S.: Environmental Geography, Prayag Publications, Allahabad, 1991.<br>7. Smith, R. L.: Man and His Environment: An Ecosystem Approach, Harper & Row, London, 1992.<br>8. Strahler, A. N., Geography of Man's Environment, John Wiley & Sons Inc. New York, 1984. | |
| Learning outcomes: | On completion of the course, students will be able to:<br>1 **Understand** the functioning of environmental systems.<br>2 **Evaluate** the cause-and-effects of environmental degradation.<br>3 **Apply** knowledge to understand Global Warming and Climate Change.<br>4 **Undertake** research on man-nature interaction. | |

**Semester II Core Papers**

Programme: M. A. (Geography)
Course Code: **GOG-504** **Title of the Course**: Population Geography

Number of Credits: 3
Effective from AY: 2022-2023

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|---|---|---|
| Prerequisites for the course: | Knowledge of Bachelor's Programme in Geography or in any other Social Sciences | |
| Objectives: | The main focus of this course is to introduce students to the theories in Population Geography and Demography. The course will enable students to examine the patterns and trends associated with migration. Students will also associate the relation between population and resources with contemporary examples. | |
| Content: | **Population as a Geographic Subject:** Scope, development and recent trends of population geography and its interdisciplinary nature, Population geography and demography.<br><br>**Human Population over Time and Space, Determinants of population growth:** World population growth and distribution, overview of population growth. Determinants of Fertility and Mortality, Demographic Transition theory and its relevance. Case Study of India and one of its States. | 15 hours |
| | **Dynamics of Migration: trends and patterns:** Importance of Migration, types of migration, cause – effect of migration, Indian migration abroad, recent trends and consequences. Migration theories – Lee, Ravenstein and Zelinsky. | 15 hours |
| | **Population and Resources:** Population versus resources - Under population, overpopulation and optimum population, Malthusian theory of population and analysis of Global Crises. Population-Development and environment.<br>**Population Issues - Global and India**<br>China: Population control Policy and consequences, racism, population dynamics of western world, India Billion Plus and Consequences, India's Population policy, declining gender ratio, women equity and empowerment in India. Changing age structure and Ageing Population, Human development Index. | 15 hours |

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| Pedagogy: | Lectures, Group, discussions, tutorials, student Seminars, Presentations, Assignments,Case Studies, Problem Solving Sessions, Blended Learning, Flipped Classroom | |
| References/Readings: | 1. Bose, Ashish et al.: Population in India's Development (1947-2000): Vikas Publishing House, New Delhi, 1974.<br>2. Bose, Ashish: India's Billion Plus People-2001 Census Highlights, Methodology and Media Coverage, B. R. Publishing Corporation, New Delhi. 2001.<br>3. Census of India, India: A State Profile, 2001 and 2011.<br>4. Chandna, R. C. Geography of Population: Concept, Determinants and Patterns, Kalyani Publishers, New York, 2000 (Reprint 2012).<br>5. Clarke, John I.: Population Geography, Pergamon Press, Oxford, 1973.<br>6. Daugherty, Helen Gin, Kenneth C. W., Kammeryir, An Introduction to Population Geography (Second Edition), The Guilford Press, New York, London, 1998.<br>7. Garnier, B. J. Geography of Population, Longman, London, 1970 (Reprint 2018).<br>8. Mitra, Asok: India's Population Aspects of Quality and Control, Vol. I & II. Abhinav Publication, New Delhi, 1978.<br>9. Mamoria, C. B.: India's Population Problem: Kitab Mahal, New Delhi, 1981.<br>10. Premi, M. K. India's Population: Heading Towards a Billion, B. R. Publishing Corporation, New Delhi, 1991.<br>11. Srinivasan, K.: Basic Demographic Techniques and Applications, Sage Pub., New Delhi, 1998. | |
| Learning outcomes: | At the end of this course, students will:<br>1. Acquire knowledge on the concepts associated with Population Geography.<br>2. Understand the phenomenon of migration and its effect on resources of a region.<br>3. Correlate population and resource issues. | |

Programme: M. A. (Geography)
Course Code: **GOG-504** **Title of the Course**: Practicals in Population Geography

Number of Credits: 1
Effective from AY: 2022-2023

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| Prerequisites for the course: | Theoretic knowledge of demographic parameters and basics of computation. | |
| Objectives: | The main focus of this course is to calculate population data and represent in graphical form. | |
| Content: | **Methods of Population data collection**<br>Basic sources of population data, collection and processing of demographic data: Census, sample survey and registration. Processes involved.<br><br>**Methods of Calculation of population data**<br>Fertility, Mortality, Population growth and projections (semi average method, least square method, Exponential population growth), construction of life Tables, population density and concentration index. Dependency ratio, calculation of human development Index. | 15 hours |
| | **Methods of representation of population data**<br>Pie chart, Age and sex pyramid and types, Trilinear chart, Flow diagram, Choropleth, Proportional circles, divided proportional circles, level of urbanization.<br><br>**Model testing:** Demographic Transition model, rank size rule, nearest neighbourhood index. Settlement Geography – Rural-urban composition and ratio, Gini's concentration, Primacy Index and rank size rule. | 15 hours |
| Pedagogy: | Demonstrations, problem-solving sessions | |
| References/Readings: | **1.** Bose, Ashish et al.: Population in India's Development (1947-2000): Vikas Publishing House, New Delhi, 1974.<br>**2.** Census of India, India: A State Profile, 2001 and 2011.<br>**3.** Chandna, R. C. Geography of Population: Concept, Determinants and Patterns, Kalyani Publishers, New York, 2000 (Reprint 2012).<br>**4.** Clarke, John I.: Population Geography, Pergamon Press, Oxford, 1973.<br>**5.** Garnier, B. J. Geography of Population, Longman, London, 1970 (Reprint 2018).<br>**6.** Mitra, Asok: India's Population Aspects of | |

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| | Quality and Control, Vol. I & II. Abhinav Publication, New Delhi, 1978.<br>**7.** Premi, M. K. India's Population: Heading Towards a Billion, B. R. Publishing Corporation, New Delhi, 1991.<br>8. Srinivasan, K.: Basic Demographic Techniques and Applications, Sage Publications, New Delhi, 1998. | |
| Learning outcomes: | **1.** At the end of this course, students will be able to:<br>**2.** Process raw data into demographic data.<br>**3.** Master the skills of graphic representation of data. | |

Programme: M. A. (Geography)
Course Code: **GOG-505** **Title of the Course**: Economic Geography
Number of Credits: 3
Effective from AY: 2022-2023

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| Prerequisites for the course: | Knowledge of Bachelor's Programme in Geography or in Economics | |
| Objectives: | The main focus is to understand the ways in which economic activities are organized spatially and to evaluate the theories of industrial locations. Students will also gain knowledge of Economic Geography through an understanding of accessibility and connectivity, and analyse the regional disparity using local examples. | |
| Content: | **Introduction to Economic Activities**<br>Scope, content and recent trends in Economic Geography, relation of Economic Geography with other social sciences, Approaches in Economic Geography, Factors of location of economic activities (Physical, social, economic and cultural) Classification of economies; sectors of economy (primary, secondary and tertiary).<br><br>**Agricultural regions**<br>Concept and techniques of delimitation of agricultural regions, crop combination and diversification-Von Thunen's model and its modifications. | 15 hours |
| | **Industries:** Classification of industries: Resource based and footloose industries, Theories of industrial location-Weber, Losch and Isard; Case studies of selected industries: Iron and Steel, Aluminum, Chemical, Oil refining and Petrochemical, Engineering, Textile. | 15 hours |
| | **Transportation**: Modes of transportation and transport cost; accessibility and connectivity: international, inter and intraregional; comparative cost advantages. Typology of markets, market network in rural societies, market system in urban economy, role of market in the development of trade and commerce.<br><br>**Economic development of India:** Regional disparities, Impact of green revolution on Indian economy, Globalization and Indian | 15 hours |

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| | economy and its impact on environment. | |
| Pedagogy: | Lectures, Group, discussions, tutorials, student Seminars, Presentations, Assignments, Case Studies, Problem Solving Sessions, Blended Learning, Flipped Classroom | |
| References/Readings: | 1. Berry, J. L. (1967): Geography of Market Centres and Retail Distribution. Prentice Hall. New York.<br>2. Chatterjee, S. P. (1984): Economic Geography of Asia. Allied Book Agency, Calcutta.<br>3. Chorley, R. J. and Haggett, P. (1969): Network Analysis in Geography: Arnold, London.<br>4. Dreze, J. and Sen, A. (1996). India-Economic Development and Social Opportunity. Oxford University Press, New Delhi.<br>5. Eckarsley, R. (1995). Markets, the State and the Environment. McMillan. London.<br>6. Garnier, B. J. and Deblize (1979). A Geography of Marketing. Longman. London. | |
| Learning outcomes: | At the end of this course, students will be able to:<br>1. Understand concepts and techniques associated with Economic Geography.<br>2. Acquire knowledge pertaining to industries, their locations, and association to markets. | |

Programme: M. A. (Geography)
Course Code: **GOG-505** **Title of the Course**: Practicals in Economic Geography

Number of Credits: 1
Effective from AY: 2022-2023

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| Prerequisites for the course: | Theoretic knowledge of Economic Geography and basics of computation. | |
| Objectives: | The main focus of this course is to analyse and interpret data associated with agriculture, transportation and trade. | |
| Content: | **Crop Concentration:** Bhatia's method, Jasbir<br><br>**Crop Diversification:** Singh's modified method, Gibbs Martins Index<br><br>**Crop Combination:** Bhatia's method, Maximum Positive Deviation method of Rafiullah (1956), Athawale's method of crop combination (1966)<br><br>**Agricultural efficiency:** Aiyar's method, Sapre and Deshpande, Calories per head, Standard Nutritional Units per hectare | 15 hours |
| | **Lorenz Curve:** Gini coefficient<br><br>**Transport Network:** Theoretical measures of transport network and Graphical Representation: Non-ratio measures cyclomatic number diameter, Ratio measures: Eta, Theta, Iota, Pi, Measurement of route, Measures of Individual elements of transport: Associated number, Degree of connectivity network, Dispersion or Accessibility Index<br><br>**Models of Spatial Interaction**: Gravity model, Potential Population Surfaces, Breaking Point Theory –Trade area delimitation. Law of retail trade gravitation. | 15 hours |
| Pedagogy: | Demonstrations, problem-solving sessions. | |
| References/Readings: | 1. Chorley, R. J. and Hagget, P. (1971). Models in Geography. Methuen and Co. London.<br>2. Hussain, M. (1996). Systematic Agricultural Geography. Rawat Publication. Jaipur.<br>3. Lloyd and Dickens (1972). Location in Space Theoretical Approach to Economic | |

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| | Geography. Harper and Raw Publication. London.<br>4. Singh, Jasbir (1987). Agricultural Geography. Tata McGraw Publication. New Delhi.<br>5. Yeats, M. H. (1978). An Introduction to Quantitative Analysis in Human Geography, New York. | |
| Learning outcomes: | At the end of this course, students will be able to:<br>1. Learn various methods of crop combinations.<br>2. Master the skills of processing trade and transport data.<br>3. Compute indices and models of spatial interaction. | |

Programme: M. A. (Geography)
Course Code: **GOG-506** **Title of the Course**: Fundamentals of Geographic Information System

Number of Credits: 3
Effective from AY: 2022-2023

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| Prerequisites for the course: | Basic knowledge of remote sensing | |
| Objectives: | Students will acquire knowledge different components & functions of GIS. Students will be able to examine and identify online open-source software. They will also study GIS data models and ese GIS software to create various types of maps | |
| Content: | **Introduction to GIS:** Definition, Components & Functions of GIS, Advantage over traditional map making, Interdisciplinary approach of GIS<br><br>**Geospatial Data:** Geographical Data Models and Structures, Advantages and disadvantages of using raster and vector formats, Sources of Geographical data | 15 hours |
| | **Types of GIS & GIS software:** GIS Types: Desktop GIS, Web GIS, Mobile GIS<br>Software: Proprietary GIS (ESRI ArcGIS, Map Info, and Global Mapper) and Open-source GIS (Quantum GIS, Grass and Saga GIS)<br><br>**Data visualization & Integration:** Representation of Geospatial data, Layout formats, Colour Combination & Standardizations, Visualizing data on: GIS portal and Google Earth, Integrating GIS and Google Earth. | 15 hours |
| | **Applications of GIS:** Case studies on the use of GIS in following fields: Watershed management, Land cover dynamics, socio-cultural settings, Transportation, mining, Land Surface Temperature, Environmental Impact Assessment, Land capability & suitability study<br><br>**Global Positioning System (GPS):** Introduction to GPS: GPS Segments, Satellite Constellations, Working Principles, GPS Errors, GPS receivers: Handheld GPS, DGPS. GPS Accuracy and applications | 15 hours |
| Pedagogy: | Lectures, Group, discussions, tutorials, student Seminars, Presentations, Assignments, Case | |

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| | Studies, Problem Solving Sessions, Blended Learning, Flipped Classroom | |
| References/Readings: | 1. Burrough, P.A. Principles of Geographic Information Systems for Land Resource Assessment Oxford University Press, New York, 1986.<br>2. Fraser Taylor, D.R. Geographic information Systems Pergamon Press, Oxford, 1991.<br>3. Maquire, D.J.M.F. Goodchild and D.W. Rhind (eds.) Geographic Information Systems: Principles and Application. Taylor & Francis, Washington. 1991.<br>4. Mark, S. Monmonier. Computer-assisted Cartography. Prentice-Hall, Englewood Cliff, New Jersey, 1982.<br>5. Peuquet, D. J. and D. F. Marble, Introductory Reading in Geographic Information Systems. Taylor & Francis, Washington, 1990.<br>6. Star, J and J. Estes, Geographic Information Systems: An Introduction, Prentice Hall, Englewood Cliff, New Jersey, 1994. | |
| Learning outcomes: | At the end of this course, students will be able to:<br>Comprehend the advantages of GIS over traditional Cartography<br><br>Gain knowledge on the open source software available in Geo-informatics<br><br>Acquire skills for representation of geospatial data<br><br>Apply GIS technique in different fields | |

Programme: M. A. (Geography)
Course Code: **GOG-506** **Title of the Course**: Practicals in Geographic Information System

Number of Credits: 1
Effective from AY: 2022-2023

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| Prerequisites for the course: | Basic knowledge of remote sensing and computer skills. | |
| Objectives: | Students will acquire knowledge of different components & functions of GIS. Students will be able to examine and identify online open-source software. They will also study GIS data models and use GIS software to create various types of maps. | |
| Content: | **Geospatial Data Access:** Accessing existing data into GIS, Creating multiple copies, re-projecting vector and raster files, Map Projections and Datum, Symbology, Geo-referencing, Digitization.<br>**Digitization:** Creating vector layers in GIS, Basic and Advanced editing, Topology building<br>**Attribution:** Creating and modifying attribute tables, attaching attribute information to vector layers, using field calculators | 15 hours |
| | **Data Retrieval**: Querying, Attribute Queries and Spatial Queries, Saving query outputs<br><br>**Vector operations**: Merge, Dissolve, Intersect, union, Clip, Erase and spatial join<br><br>**GPS Survey**: Handling GPS receiver, taking waypoints, Importing GPS points in GIS software | 15 hours |
| Pedagogy: | Demonstrations, equipment handling, interactive sessions, hands-on computer-based exercises. | |
| References/Readings: | 1. Burrough, P.A. Principles of Geographic Information Systems for Land Resource Assessment Oxford University Press, New York, 1986.<br>2. Fraser Taylor, D.R. Geographic information Systems Pergamon Press, Oxford, 1991.<br>3. Maquire, D.J.M.F. Goodchild and D.W. Rhind (eds.) Geographic Information Systems: Principles and Application. Taylor & Francis, Washington. 1991.<br>4. Mark, S. Monmonier. Computer-assisted Cartography. Prentice-Hall, Englewood Cliff, | |

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| | New Jersey, 1982.<br>5. Peuquet, D. J. and D. F. Marble, Introductory Reading in Geographic Information Systems. Taylor & Francis, Washington, 1990.<br>6. Star, J and J. Estes, Geographic Information Systems: An Introduction, Prentice Hall, Englewood Cliff, New Jersey, 1994. | |
| Learning outcomes: | At the end of this course, students will be able to:<br>1. Use technology to integrate geographical concepts with practical examples for problem-solving of critical global and local issues.<br>2. Acquire hands-on training in various GIS softwares and GPS survey methods. | |

Programme: M. A. (Geography)
Course Code: **GOG-507** **Title of the Course**: Geographical Thought and Development of Geography

Number of Credits: 4
Effective from AY: 2022-2023

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| Prerequisites for the course: | No prerequisites are identified for this course | |
| Objectives: | Students will acquire knowledge on the contributions made by geographers during different periods and understand various approaches to studying geography. Students will also be able to assess the dualism and dichotomies in Geography. Students will also analyse the initiatives taken by the Research Organizations in India. | |
| Content: | **Development of Geography: Ancient Period** Geography as a science of synthesis, Greek, Roman and Indian Schools of Thoughts, Contribution of Herodotus, Eratosthenes, Strabo, Ptolemy.<br><br>**Development of Geography: Medieval Period** Scientific explanations: routes to scientific explanations Arab School of thought, Dark age, Age of Discovery, Contribution of Marco Polo, Columbus, Vasco-Da-Gama and Captain Cook. | 15 hours |
| | **Development of Geography: Modern Period** Foundations of modern geography, German, French, British and American schools of thought, Contributions of Kant, Humboldt, Ritter, W. M. Davis, Charles Darwin.<br><br>**Dualism in Geography:** Descriptive & Analytical, Systematic & Regional Geography; Physical & Human Geography, the myth and reality about Dualisms, Environmental Determinism, Possibilism, Neo-determinism, Positivism, Behavioralism, Postmodernism. | 15 hours |
| | **Development of Geography in 21st Century** Conceptual and methodological developments and changing paradigms, Scientific methods, Quantitative revolution.<br><br>**Applied Geography:** Quantification and application of statistical techniques in Geography, Computer applications in Land use, | 15 hours |

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| | regional, rural & urban planning, Management of resources and Assessment. GPS Accuracy and applications | |
| | **Development of Geography in India:** Early Development of Geography in India, Developmental Initiatives during Colonial Period and Post-Independence, Contributions of Indian Geographers, Current Initiatives in Geography.<br><br>**Geographic Institutions of Eminence in India:** Academic and Research Institutions, Professional Bodies of Geographers and their Initiatives. | 15 hours |
| Pedagogy: | Lectures, Group, discussions, tutorials, student Seminars, Presentations, Assignments, Blended Learning, Flipped Classroom | |
| References/Readings: | 1.Coffey, W. J. (1981): Geography: Towards a General Spatial Systems Approach, Methuen, London.<br>2.Cooke, R. U. and Doornkamp, J. C. (1974): Geomorphology in Environmental Management, Clarendon Press, Oxford.<br>3.Dikshit, R. D. (1997): Geographical Thought: A Contextual History of Ideas, Pub. By A. K. Ghosh, Prentice Hall of India Pvt. M 97, New Delhi.<br>4.Frazire, J. W. (1982): Applied Geography, Prentice Hall, Englewood Cliffs.<br>5.Hartshorne, R. (1959): Perspectives of Nature of Geography, Rand MacNally and Co., London.<br>6.Hussain, M. (1995): Evolution of Geographical Thought, Rawat Pub., Jaipur, India.<br>7. Robert Sack (1973) David Harvey, *Explanation in Geography*, Historical Methods Newsletter, 6:2, 68-72, DOI: 10.1080/00182494.1973.10593999<br>9.Singh, I. (2006): Diverse Aspect of Geographical Thought, ALFA Publications, New Delhi. | |
| Learning outcomes: | At the end of this course, students will be able to:<br>1. Appreciate the development of geography as an amalgamation of multiple sub-disciplines of science and humanities.<br>2. Understand the future course of the subject through initiatives of academic and research institutions. | |

**DISCIPLINE SPECIFIC OPTIONAL COURSES**

**Semester I**

Programme: M. A. (Geography)
Course Code: **GOG-521** **Title of the Course**: Disaster Mitigation & Management

Number of Credits: 4
Effective from AY: 2022-2023

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| Prerequisites for the course: | No prerequisites are identified for this course | |
| Objectives: | The main focus of the course is to understand different hazards and understand and apply risk reduction strategies. | |
| Content: | **Introduction to hazards & disasters:** Definition, Types of hazards & disasters, Definition, Hazard, Risk & Vulnerability assessment.<br><br>**Disaster Zonation of the world:** Disaster Zonation of the world in terms of Natural Disasters like Earthquakes, Tropical Cyclones, Tsunamis, Avalanches, Mass movements and Landslides, Floods by severity scales, Disasters in India. | 15 Hours |
| | **Climatic, Geological & Geomorphic Disasters:** Earthquakes and Tsunamis- Cause and effects and areas affected by earthquakes and tsunamis.<br>Land instability - Causes and effects and areas affected by landslides, subsidence, erosion, deposition. | 15 Hours |
| | **Human-induced, Physical Hazards, Biological and Chemical:** Hazards Types of human-induced hazards: physical, chemical, biological and pollution. Factors of man-made hazards.<br><br>Physical Hazards - Cause and effects of Landslides, Soil erosion, forest fires, desertification etc. Impact of large river projects such as the Sardar Sarovar, the Tehri Dam, the impacts of excessive irrigation, and effects of thermal and hydel power stations.<br><br>Chemical Hazards - Nuclear Hazards, release of toxic elements in the air, soil and water; oil spills.<br>Biological Hazards- Effects of Population growth – its impact on biodiversity, effects of over | 15 Hours |

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| | exploitation of resources, ecological disturbances – such as soil development, hydrological cycle, pollution. | |
| | **Disaster Management and Measures:**<br>Structural and Nonstructural Measures, Disaster prevention, mitigation, preparedness, response, recovery and rehabilitation.<br><br>**Strategies of risk reduction:**<br>Strategies of risk reduction, disaster preparedness, support system, organizations, awareness programs.<br><br>Disaster Policy and Planning in India, Disaster vulnerabilities in the Himalayas: Earthquakes, Flooding and Landslides (to be based on Sikkim examples and Data) | 15 Hours |
| Pedagogy: | Lectures, Group, discussions, tutorials, student Seminars, Presentations, , Assignments, Case Studies, Problem Solving Sessions, Blended Learning, Flipped Classroom, Experiential Learning (Field visits) | |
| References/Readings: | 1. Blaikie, P., Cannon, T., Davis, I., et al. 1994: At Risk: Natural Hazards, People's Vulnerability and Disasters, Routledge, London.<br>2. Hart, M. G. (1986): Geomorphology, Pure and Applied, George Allen and Unwin, London.<br>3. Morrisawa, M. (Ed.) (1994): Geomorphology and Natural Hazards, Elsevier, Amsterdam.<br>4. National Center for Disaster Management (NIDM), Disaster Atlas, South-East Asia, New Delhi.<br>5. Paraswamam, S. and Unikrishnan, P. V. (2000): India Disaster Report, Oxford University Press, New Delhi.<br>6. Quarantelli, E. L. (ed.): What is a Disaster? Perspective on the Question, Routledge, London.<br>7. Singh, Savindra (2000): Environmental Geography, Parag Pustak Bhavan, Allahabad.<br>8. Turk, J. (1985): Introduction to Environmental Studies, Saunders, College Publication, Japan.<br>9. Valdiya K. S. (1987): Environmental | |

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| | Geology, Tata McGraw Hill, New Delhi. | |
| Learning outcomes: | On completion of the course, students will be able to:<br>1 **Know** the importance of disasters and mitigation measures.<br>2 **Understand** the cause and effect relationship of the disasters.<br>3 **Apply** the knowledge in real life situations.<br>4 **Undertake** research in the field of disaster assessment and mitigation | |

Programme: M. A. (Geography)
Course Code: **GOG-522** **Title of the Course**: Advanced Oceanography and Soil Geography

Number of Credits: 4
Effective from AY: 2022-2023

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| Prerequisites for the course: | Knowledge of Bachelor's Programme in Geography | |
| Objectives: | The main focus of the course is to understand Ocean System, its functioning and influence on the earth. The course also introduces different aspects of Soil Science. | |
| Content: | **Introduction:** Foundation of Modern Oceanography, Contribution of Oceanographers in the subject, Post-war Oceanography, Modern Trends<br><br>**Origin of the Ocean Basins and Ocean Floor:** Continental Drift, Seafloor Spreading, Plate Tectonics, World Oceans and their formations, Continental Margin, Oceanic Ridges and Rises, Abyssal Plains, Oceanic Trenches, Marine Sediments, Coral Reefs and Atolls. | 15 Hours |
| | **Properties of Sea Water:** Factors affecting the temperature of sea water and distribution, Factors affecting density, Origin and composition of sea salt and residence time. Sea Water Analysis in Laboratory.<br><br>**Tides and Tidal Currents:** Tides and their types, tide generating forces, Tidal effects in coastal areas, Tidal Bores, Tidal Currents and their Channels, Equilibrium Theory of Tides, Dynamic Theory of Tides.<br><br>**Ocean Currents:** Ocean Currents and their types, Factors responsible for ocean currents, Ocean currents in Pacific, Atlantic and the Indian Ocean. | 15 Hours |
| | **Introduction to Soil Formation:** Importance of soil, Relationship between Hydrology and Soils, Agriculture and Soils, Types of soils, World soil distribution.<br><br>Factors of soil formation (climate, topography, vegetation), Parent material and soil, Soil Horizons, Mineral Component of Soils, Soil | 15 Hours |

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| | Organic Matter. | |
| | **Soil Properties & Quality:** Soil Texture, Soil Structure, Soil Color, Bulk Density, Porosity, Permeability, Soil Moisture and Temperature, Processes in Profile Development, Acidity and Alkalinity, Soil pH, Nutrient Cycling. Soil Analysis in Laboratory, Salinization, Acidification, Soil fertility decline, Soil contamination, Deforestation, Overgrazing, Incorrect methods of farming, methods of soil conservation and reclamation<br>Maintenance of Soil Productivity, Fertilizers and Pesticides, Problem Soils, Soil Quality and Sustainable Land Management. | 15 Hours |
| Pedagogy: | Lectures, Group, discussions, tutorials, student Seminars, Presentations, Case Studies, Assignments, Problem Solving Sessions, Blended Learning, Flipped Classroom, Experiential Learning (Field visits) | |
| References/Readings: | 1. Basu, S. K. (2003) (ed): Handbook of Oceanography, Global Vision, Delhi.<br>2. Birkeland, P. W. (1999): Soil and Geomorphology, Oxford University Press Inc., New York.<br>3. Brady, N. C. (1984): The Nature and Properties of Soils. Macmillan Publishing Company, New York and Collier Macmillan Publishers, London.<br>4. Bunting, B. T. (1969): Geography of Soil, Hutchinson University Library, London.<br>5. Cruickshank, J. G. (1972): Soil Geography, David and Charles (publishers) Limited, Newton Abbot.<br>6. Davis, Richard A. (1972): Oceanography, Addition Wesley Publishing Co.<br>7. Fenwick, I. M. and Knapp B. J. (1982): Soils - Process and Response, Unwin Brothers Ltd., The Greshman Press, Surrey.<br>8. Garrison. Tom (1999): Oceanography, Brooks/Cole Wadsworth, New York.<br>9. Garrison, Tom (2004): Essentials of Oceanography. Thompson, Australia.<br>10. Grant, Gross M. (1982): Oceanography, Prentice Hall, Inc., New Jersey. | |

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| | 11. King Cuchlain A. M. (1962): Oceanography for Geographers (ED) Edward Arnold,<br>12. Pitty, A. F. (1978): Geography and Soil Properties, Methuen and Company Ltd., London.<br>13. Sharma & Vatal (1962): Oceanography for Geographers. Chaitanya Publishing House, Allahabad.<br>14. Thomas, J. B. and Brunsden, D. (1977): Geomorphology and Time, Methuen and Company Ltd.<br>15. Thurman, Harold V. (1985): Introductory Oceanography. Bell & Howell Co. London<br>16. Weisberg, J. and Howard P. (1974): Introductory Oceanography. McGraw Hill, Kogakusha, Tokyo.<br>17. White, R. E. (1987): Introduction to the Principles and Practice of Soil Science, Blackwell Scientific Publications, London. | |
| Learning outcomes: | At the end of this course, the students will be able to:<br>1 **Understand** the significance of Oceans and their impacts on.<br>2 **Understand** the various concepts in the field.<br>3 **Acquire** the skills to apply the knowledge to real life situations.<br>4 **Analyze** the properties of Ocean Water and Soil. | |

Programme: M. A. (Geography)
Course Code: **GOG-523** **Title of the Course**: Socio-Cultural and Urban Geography

Number of Credits: 4
Effective from AY: 2022-2023

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| Prerequisites for the course: | Knowledge of Bachelor's Programme in Geography or Sociology | |
| Objectives: | The main focus of the course is to introduce different philosophical approaches and concepts in Socio-Cultural Geography and Urban Geography. | |
| Content: | **Introduction to Philosophical Bases and Concepts:**<br>Definitions, Conceptual and Methodological approaches, Trends and Development. Positivism, Humanism, Idealism, Phenomenalism, Existentialism, Structuralism and Radicalism,<br><br>**Space and Society:** Origin and diffusion of Culture, Individual's space, Intimate, Personal, Social and Public Space, Interaction and social relations. | 15 Hours |
| | **Social Groups:** Primary and Secondary Groups, Social Structure, Models of Assimilation and Segregation, Industrialization, Migration, Urbanization, Modernization, Globalization and Sanskritization.<br><br>**Social – Cultural Regions:** Cultural Diversities, Role of Race, Religion, Caste, Ethnicity, Tribe and Language and Dialect, Level of Education, Economic Activity, Class, Power, Transformation and Change, Cultural regions of the World and India | 15 Hours |
| | **Urbanization:** Meaning of Urban settlement and their types, and urbanization. Criteria used to distinguish urban settlements; Behavioral, structural and demographic concepts of urbanization. Brief review of spatial-temporal variations in urbanization in the world, Urbanization curve, Contemporary factors of urbanization.<br><br>**Urban Morphology & Urban Classification:** Park and Burgess Model, Homer Hoyt Model, Harris | 15 Hours |

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| | and Ullman Model, and demarcation of CBD and their applications in Indian context.<br>Various approaches to classification, Urban function, and functional classification of towns and cities by C.D. Harris and H. J. Nelson. | |
| | **Rural-Urban Fringe & City and its Region:**<br>Concepts of the city region and various synonymous terms used. Criteria used to demarcate the city region,<br>Rurban, Nature of urban influence.<br><br>**Contemporary Urban issues & Urban policy and planning:** Value of Land and growth of cities - vertical and horizontal, Urban sprawl, Scarcity of housing and growth of Slums, Problems of civic amenities, Urban transport problems,<br><br>Policies of Urban development, Need for city planning, Elements of the city plan, Master plan of towns, new towns, Environmental pollution, Sustainable Development Goals. | 15 Hours |
| Pedagogy: | Lectures, Group, discussions, tutorials, student Seminars, Presentations, Assignments, Case Studies, Problem Solving Sessions, Blended Learning, Flipped Classroom | |
| References/Readings: | 1. Aijazuddin, Ahmad (1999). Social Geography, Rawat Publications, New Delhi.<br>2. Brian, R. K. (1996). Landscape of Settlement: Prehistory to the Present. Routledge. London.<br>3. Bulsara, J. F. (1970). Patterns of Social Life in Metropolitan Areas, Popular Prakashan, Bombay.<br>4. Carter, H. J. (1972). The Study of Urban Geography. Edward Arnold. London.<br>5. Census of India (1974). Economic and Socio-Cultural Dimensions of Rationalization, Census Centenary, Monograph No. 7, Govt. of India, New Delhi.<br>6. Coates, B. E. et al. (1977). Geography and Inequality, Oxford University Press, London.<br>7. Dubey, S. C. (1991). Indian Society, National Book Trust, New Delhi.<br>8. Hall, P. (1992). Urban and Regional | |

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| | Planning. Routledge. London.<br>9. Jordon, X. and Lester, G. (1995). The Human Mosaic, Harper and Row, New York.<br>10. Kundu, A. (1992). Urban Development and Urban Research in India: Khanna Publication.<br>11. Orang, Mike (1998). Cultural Geography. Routledge Publication, London.<br>12. Singh. K. and Steinberg. F. (1998). Urban India in Crisis: New Age Interns. New Delhi. | |
| Learning outcomes: | At the end of this course, the students will be able to:<br>1 **Understand** the philosophical base of Socio-Cultural and Urban Geography.<br>2 **Assess** the significance of Social and Cultural Regions of the World and India.<br>3 **Acquire** the knowledge of spatio-temporal variations in urbanization in the world.<br>4 **Evaluate** Urban theories and processes in Indian context. | |

**DISCIPLINE SPECIFIC OPTIONAL COURSES**

**Semester II**

Programme: M. A. (Geography)
Course Code: **GOG-524** **Title of the Course**: Political Geography

Number of Credits: 4
Effective from AY: 2022-2023

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| Prerequisites for the course: | Knowledge of Bachelor's Programme in Geography or Political Science | |
| Objectives: | The main objective of this course is to make students to understand the geo-political significance of India in the Indian Ocean and in the changing world order. The course will analyse the internal disputes of Indian states and apply knowledge of political geography in understanding the space, state and nation. Lastly, the students will evaluate geostrategic views on current global issues. | |
| Content: | **Introduction to political Geography:** Definition, Geography & Politics, History & Development of Political Geography.<br><br>**Approaches of Political Geography:** Whittlesey's landscape approach, Functional approach, Centrifugal & centripetal forces, analysis of external functions, Unified Field Theory. | 15 hours |
| | **Concept Nation & State Frontiers & Boundaries:** Territoriality, State & Nation, State formation. Nation building / Nationalism, Definition of frontiers & boundaries, Distinction between frontiers & boundaries, Genetic, functional & morphological classification of boundaries, Global geostrategic view. | 15 hours |
| | **Resource Development & Power Geopolitics:** Resources & National strategy, Resource management & power of Nation. Significance of Indian ocean, SAARC, G-4, G-7, G-20, BRICS, Geopolitical and strategic significance of India. | 15 hours |
| | **Political Geography of India:** Changing internal political map of India and emergence of new states, Unity in diversity, politics of interstate: water, language, and border disputes, Problems of border states of India. | 15 hours |

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| Pedagogy: | Lectures, group discussions, case studies, paper reviews, Assignments, Presentations, Blended Learning, Flipped Classroom | |
| References/Readings: | 1. Alexander, L. M. (1963): World Political Patterns, Ram McNally, Chicago.<br>2. Adhikari, Sudeepta (2012): Political Geography, Rawat Publication, Jaipur, India.<br>3. Dikshit, R. D. (1996): Political Geography: A Contemporary Perspective, Tata McGraw Hill, New Delhi.<br>4. Dikshit, R. D. (1999): Political Geography: A Century of Progress, Sage, New Delhi.<br>5. De Blij, H. J. and Glasson, M. (1968): Systematic Political Geography, John Wiley, New York.<br>6. Pounds, N. J. G. (1972): Political Geography, McGraw Hills, New York.<br>7. Taylor, R. J. (1989) Political Geography, Longman, UK. | |
| Learning outcomes: | At the end of this course, students will be able to:<br>1. Appreciate the geo-political implications of India with other nations, as well as the internal situation. | |

Programme: M. A. (Geography)
Course Code: **GOG-525**

**Title of the Course**: Geography of Trade and Transport

Number of Credits: 4
Effective from AY: 2022-2023

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| Prerequisites for the course: | Knowledge of Bachelor's Programme in Geography or Economics or Commerce | |
| Objectives: | This course will help students to understand relationship between geography, trade and transport and examine the models and theories of trade and transport. Students will also assess alternative transport system in mega cities of India, and finally analyse recent trends in India's Foreign Trade. | |
| Content: | **Transportation and Geography:** Transportation and geography, Transportation and space, Transportation and Geography of Trade and Transport, Geography of transportation networks.<br><br>**Significance of different modes:** Significance of transportation in world and regional economies, Transportation modes, Factors associated with their growth, Characteristics and relative significance of different modes of transport. | 15 hours |
| | **Transport network and methods:** Methods in transport geography, Models of network changes, Graph theoretic measures, Traffic flow, Gravity models. Transport network and economic development.<br><br>**Urban transport:** Transportation and the urban form, Transport energy and environment. Alternative transport system in mega cities of India, Transport planning and policy. | 15 hours |
| | **History and development of international trade:** History and development of international trade. Trade areas and economic blocks, Various treaties of trade at international level, Geographical factors influencing, international trade. Problems and prospects of international trade in globalization.<br>**Trade Theories:** Theory of comparative advantage-Neo-classical theory, Modern theory. | 15 hours |
| | **International Trade:** World Trade Patterns, | |

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| | Major Trade Block: OPEC, ASEAN Economic Community (AEC), European Union (EU), WTO, Asia Pacific Economic Cooperation (APEC), Indian Ocean Rim Association (IORA).<br><br>India's Foreign Trade: Trends, Composition, Direction and Changing Pattern. Challenges and prospects of foreign trade of India, Impact of trade liberalization on the geographical distribution of industries. | 15 hours |
| Pedagogy: | Lectures, group discussions, case studies, paper reviews, Assignments,Presentations, Blended Learning, Flipped Classroom | |
| References/Readings: | 1. Bhandari, S. (1992): Transport and Regional Development, Concept Publication, New Delhi.<br>2. Chorley, R. J. and Haggett, P. (1968): Network Analysis, Edward Arnold, London.<br>3. Pande, N. P. (1991): Transport Geography, Concept Publication, New Delhi.<br>4. Sealy, K. R. (1968): Geography of Air Transportation. Hutchinson University Press, London.<br>5. Singh, K. N. (1990): Transport Network in Rural Development, Institute of Rural Economic Development, Varanasi.<br>6. Taffe, E. J. and Gauthier H. L. (1973): Geography of Transportation, Prentice-Hall<br>7. Tolley, R. S. and Turton B. J. 91989): Transport system, Policy and Planning Longman Group, Singapore<br>8. Vaidya, B. C. (eds.) (1998): Reading in Transport Geography: A Regional Perspective, Devika Publications, New Delhi.<br>9. White, H. P. and Senior, M. L. (1989): Transport Geography, Longman Group, Hong Kong. | |
| Learning outcomes: | At the end of this course, students will be able to:<br>1. Correlate trade and transport in spatial context.<br>2. Apply trade theories to international trade scene. | |

**COURSES FOR SEMESTER III**

| Course Code and Name | **Credits** |
|---|---|
| **Semester III Research Specific Elective Courses** | |
| GOG-600: Theory: Principles and Research in Fluvial Geomorphology | **4** |
| GOG-601: Theory: Digital Image Processing in Geographical Research | **4** |
| GOG-602: Theory: Research Tools in Field Study and Survey | **4** |
| GOG-603: Theory: Principles and Research in Regional Planning in India | **4** |
| GOG-604: Theory: Principles and Research in Watershed Management | **4** |
| GOG-605: Theory: Research Methodology in Geography | **4** |
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| **Semester III Generic Elective Course** | |
| GOG-621: Theory: Teaching Methodology and Competencies in Geography | **4** |
| GOG-622: Theory: Bio-geography | **4** |
| GOG-623: Theory: Geography of Health and Wellbeing | **4** |
| GOG-624: Theory: Spatial Analysis and Modeling in Geography | **4** |
| GOG-625: Theory: Geographical Data-Base Management System and Programming | **4** |
| GOG-626: Theory: Economic Geography of Globalization | **4** |
| GOG-627: Theory: Geography of International Relations | **4** |
| GOG-628: Theory: Geopolitics of South Asia | **4** |
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| COURSES FOR SEMESTER IV | |
| **Semester IV: Research Specific Elective Courses** | |
| GOG-606: Theory: Principles and Practices of Cartographic Techniques and Computer Applications in Geographical Research | **4** |
| GOG-607: Theory: Quantitative and Statistical Techniques in Geographical Research | **4** |
| GOG-608: Theory: Principles and Practices of Settlement Geography | **4** |
| GOG-609: Theory: Research Techniques in Tropical Geomorphology | **4** |
| GOG-610: Theory: Principles and Research in Coastal Geomorphology | **4** |
| GOG-611: Theory: Themes and Research in Industrial and Agricultural Geography | **4** |
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| GOG-651: Discipline Specific Dissertation | **16** |

## SYLLABUS IN DETAIL SEMESTER III

## Research Specific Elective Courses

Programme: M. A. (Geography)
Course Code: **GOG-600**

**Title of the Course**: **Theory:** Principles and Research in Fluvial Geomorphology

Number of Credits: 4
Effective from AY: 2023-2024

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| Prerequisites for the course: | Knowledge of Geomorphology | |
| Objectives: | The main focus of this course is to develop an understanding of the processes of river management | |
| Content: | 1. Fluvial Geomorphology and Geography; hydrological cycle and sub cycle; drainage pattern evolution; limits of drainage development; channel changes with time. Types of flow and flow discrimination; forces acting in channels; Flow regimes; sediment load of streams. Sediment transport; competent velocity; lift force; critical tractive force. | 15 Hours |
| | 2. Hydraulic geometry of streams at a station and down-stream; channel thalweg; causes of concavity; channel patterns; equilibrium profile - straight, meandering and braided. | 15 Hours |
| | 3. Drainage basin - form and process, drainage basin morphometry, Morphometric interrelations. Denudation; Concept of grade; graded profile; dynamic equilibrium Landforms of fluvial erosion - erosional processes, Landforms of fluvial deposition - depositional processes, Bedrock and alluvial, Channel cross section, patterns, gradient. | 15 Hours |
| | 4. Human adjustment to flood plain, alluvial fans and deltaic environments (case studies). Effects of reservoirs on fluvial systems. Current research direction/inclination in Fluvial Geomorphology, Contemporary research questions in Fluvial Geomorphology, Remote sensing and GIS application to fluvial environments | 15 Hours |
| Pedagogy: | Lectures, Group Discussions, Student Seminars, Presentations, Case Studies, Tutorials, Assignments, Blended learning, Gamification, Problem-solving approach through logic, Experiential learning, Multi-literacies and discussion-based teaching, Brainstorming, | |

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| | Guided Questioning, Interpretive Trails, Stimulus activities, Critical incidents, Fieldwork and outdoor learning, Flipped classroom pedagogy, Art Integrated Learning, Cutting Edge, Cooperative Learning Strategies. Flipped classroom, Art Integrated Learning, Project-based Learning, Cutting Edge Pedagogy, and Cooperative Learning Strategies. | |
| References/ Readings: | 1. Carling, P.A., and Petts, G.E. (1998). Fluvial systems and environmental change. London: Arnold.<br>2. Chorley R. J. (ed) (1973) Introduction of Fluvial Processes Methuen & Co., London.<br>3. Coates D. R. and Vitek J.I. (1980) Thresholds in Geomorphology. George Allen Unwin, London.<br>4. Gleick, P. H. (ed.). (1993) Water in Crisis Oxford University Press, New York.<br>5. Gregory K.J. (1977) 'River Channel Changes' John Wiley & Sons, New York.<br>6. Kingston D. (1984) Fluvial Forms and Processes Edward Arnold, London.<br>7. Leopold C. B. et.al. (1964) Fluvial Processes in Geomorphology; Freeman, London.<br>8. Morisawa M.(ed.) (1981) Fluvial Geomorphology. George Allen & Unwin.<br>9. Morisawa M: 'Streams (1968) Their Dynamics and Morphology' McGraw Hill, New York.<br>10. Ritter, D.F., Kochel, R.C., and Miller, J.R. (2002). Process geomorphology. New York: Waveland Press.<br>11. Simon, A. (2010). Fluvial geomorphology. In J.F. Shroder (Ed.), Treatise on geomorphology: vol. 9, geomorphology from space (pp. 123-141). San Diego: Academic Press. | |
| Learning outcomes: | On completion of the course, students will be able to:<br>**1. Understand** the fundamentals of river mechanics<br>**2. Appreciate** the hydraulic geometry.<br>**3. Apply** geomorphic knowledge to appreciate Channel Morphology<br>**4. Analyze** Human adjustment to Fluvial Geomorphology | |

Programme: M. A. (Geography)
Course Code: **GOG-601**

**Title of the Course**: **Theory:** Digital Image Processing in Geographical Research

Number of Credits: 4
Effective from AY: 2023-2024

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| Prerequisites for the course: | Knowledge of Fundamentals of Remote Sensing | |
| Objectives: | • To introduce the concepts of image processing and basic analytical methods to be used in image processing.<br>• To familiarize students with image enhancement and restoration techniques,<br>• To explain different image compression techniques. | |
| Content: | 1. Digital Image Processing-Principles, color concept and color combination, Analog and Digital Image Processing, Digital Data Formats, Image sampling and Quantization, Basic relationship between pixels. Development, scope and fundamental steps involved in Digital Image Processing, components of Image Processing | 15 Hours |
| | 2. Significance of the histogram in digital image Processing, Univariate descriptive image statistics: measures of central tendency, measure of dispersion, skewness; Multivariate image statistics: covariance in multiple bands, correlation between multiple bands, Feature space plots | 15 Hours |
| | 3. Source of image degradation, Correction Processing: Radiometric and Atmospheric Correction, Geometric Correction, Ortho-rectification. Contrast Enhancement: Linear contrast enhancement, Maximum-Minimum contrast stretch, Standard Deviation contrast Stretch, Non-Linear contrast stretch, Band ratioing, Spatial Filtering, Fourier Transform. | 15 Hours |
| | 4. Introduction to Parametric and non-parametric method, Supervised classification: LULC classification levels, Classification stage: Minimum-Distance-to-Means Classifier, Parallel piped Classifier, Maximum Likelihood Classifier, Nearest Neighbour; Unsupervised | 15 Hours |

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| | classification; Classification accuracy assessment, error matrix. | |
| Pedagogy: | Lectures, Group Discussions, Student Seminars, Presentations, Case Studies, Tutorials, Assignments, Blended learning, Gamification, Problem-solving approach through logic, Experiential learning, Multi-literacies and discussion-based teaching, Brainstorming, Guided Questioning, Interpretive Trails, Stimulus activities, Critical incidents, Fieldwork and outdoor learning, Flipped classroom pedagogy, Art Integrated Learning, Cutting Edge, Cooperative Learning Strategies. Flipped classroom, Art Integrated Learning, Project-based Learning, Cutting Edge Pedagogy, and Cooperative Learning Strategies. | |
| References/ Readings: | 1. Chen, J., and Qiu, F. (2016). Advances in remote sensing image processing: a review. Remote Sensing, 8(7), 606.<br>2. Cha, B., Dattaa, D., Majumdar (2001): Digital Image Processing Analysis, Prentice-Hall of India, New Delhi<br>3. Congalton, R.G., and Green, K. (1999). Assessing the accuracy of remotely sensed data: Principles and practices. Boca Raton, FL: CRC Press.<br>4. Jensen, J. R. (2005): Introductory Digital Image Processing, Prentice Hall,NewJersey<br>5. Lillesand, T. M., Kiefer, R. W.Chipman, J. W.(2008): Remote Sensing and Image Interpretation, John Wiley & Sons, New Delhi<br>6. Lu, D., Mausel, P., Brondizio, E., and Moran, E. (2004). Change detection techniques. International Journal of Remote Sensing, 25(12), 2365-2407.<br>7. Nag, P. Kudrat, M. (1998): Digital Remote Sensing, Concept Publishing Company, New Delhi<br>8. Richards, J.A., and Jia, X. (2014). Remote sensing digital image analysis: An introduction. New York: Springer.<br>9. Sabins, F. F. (1996): Remote Sensing: Principles an Interpretation, W. H. Freeman Company, NewYork | |

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| | 10. Singh, A. (1989). Digital change detection techniques using remotely-sensed data. International Journal of Remote Sensing, 10(6), 989-1003. | |
| Learning outcomes: | On completion of the course, students will be able to:<br>1. **Understand** the fundamentals of digital image and its processing<br>2. **Elucidate** the Image Quality Assessment and Statistical Evaluation<br>3. **Appreciate** Image Classification<br>4. **Describe** Image Rectification & Image enhancement | |

Programme: M. A. (Geography)
Course Code: **GOG-602** **Title of the Course:** Research Tools in Field Study and Survey

Number of Credits: 4
Effective from AY: 2023-2024

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| Prerequisites for the course: | No prerequisites are identified for this course | |
| Objectives: | The main focus of this course is to understand research tools used in geographic field study and field survey. | |
| Content: | 1. Importance of field instrument survey - scope and purpose, principles and application of selected survey instruments. Chain survey: use of tapes-open traverse; triangulation survey; Plane table; plan preparation, resection -one point and two-point problem, three-point problem; tracing paper method. | 15 Hours |
| | 2. Prismatic compass: Open and closed traverse, elimination error, Bowditch method. Dumpy level: traverse survey, contour plan preparation. Theodolite - horizontal, and vertical (height) measures, accessible and inaccessible method. | 15 Hours |
| | 3. Components of Total Station, Advantages and disadvantages of Total Station, on field survey using Total Station. Fundamentals of Village survey, prerequisites of village survey, preparation of questionnaires, data entry, basic analysis in Microsoft excel | 15 Hours |
| | 4. Mobile Maps, GPS, DGPS and Drone Technology. Basics of Microsoft Excel, AutoCAD and Google earth. Pilot Project using advanced techniques and Software, Observations and Report of campus field visit. | 15 Hours |
| Pedagogy: | Lectures, Group Discussions, Student Seminars, Presentations, Case Studies, Tutorials, Assignments, Blended learning, Gamification, Problem-solving approach through logic, Experiential learning, Multi-literacies and discussion-based teaching, Brainstorming, Guided Questioning, Interpretive Trails, Stimulus activities, Critical incidents, Fieldwork and outdoor learning, Flipped classroom pedagogy, Art Integrated Learning, Cutting Edge, Cooperative Learning Strategies. Flipped classroom, Art Integrated Learning, Project-based Learning, Cutting Edge Pedagogy, and Cooperative Learning Strategies. | |
| References/ | 1. Clendinning, J.: Principles and use of | |

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| Readings: | Surveying Instruments. 2nd edition, Blockie. A, 1958.<br>2. Clendinning, J.: Principles of Surveying, 2nd edition, 1960.<br>3. Creswell, J.W. (2014). Research design: Qualitative, quantitative, and mixed methods approaches. Thousand Oaks, CA: SAGE Publications.<br>4. Flick, U. (2018). The SAGE handbook of qualitative data collection. London: SAGE Publications.<br>5.<br>6. Hotine, Major M. The Re-triangulation of Great Britain. Empire Survey Review, 1935.<br>7. Mishra, R. P. and Ramesh, A.: Fundamentals of Cartography, Revised Edition, Concept Publication, New Delhi.<br>8. Monkhouse, F. J.: Maps and Diagrams, Methuen, London, 1971.<br>9. Negi, Balbir Singh. Practical Geography, Third Revised Ed. Kedar Nath and Ram Nath, Meerut & Delhi, 1994-95.<br>10. Patton, M.Q. (2014). Qualitative research & evaluation methods: Integrating theory and practice. Thousand Oaks, CA: SAGE Publications.<br>11. Sandover, J. A. Plane Surveying. Arnold, 1961.<br>12. Singh & Karaunjia: Map Work and Practical Geography, Central Book Depot, Allahabad 1972.<br>13. Singh, R. L. and Dutt, P. K.: Elements of Practical Geography, Students Friends, Allahabad.1968.<br>14. Yin, R.K. (2018). Case study research and applications: Design and methods. Thousand Oaks, CA: SAGE Publications. | |
| Learning outcomes: | On completion of the course, students will be able to:<br>**1. Develop** a sound knowledge of fundamental principles of Surveying.<br>2. **Understand** the application of survey instruments.<br>3. **Comprehend** the fundamentals of village survey and preparation of questionnaires<br>4. **Undertake** a Pilot Project using advanced tools and software | |

Programme: M. A. (Geography)
Course Code: **GOG-603**

**Title of the Course: Theory:** Principles and Research in Regional Planning in India

Number of Credits: 4
Effective from AY: 2023-2024

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| Prerequisites for the course: | No prerequisites are identified for this course | |
| Objectives: | The main focus of this course is to understand concept of region and planning process. | |
| Content: | 1. Concept and theoretical framework of Region in Geography. Concept of space, area, locational attributes, Changing concept of the region from an inter-disciplinary view-point. Types of regions: Formal, functional and Vernacular, uniform and nodal. Regional hierarchy: special purpose region in the context of planning (river valleys, metropolitan regions). Regional Planning and Development: Merits and limitations | 15 Hours |
| | 2. Physical and resource regions; regional divisions according to variations in levels of socio-economic development. Approaches to delineation of different types of regions and their utility in planning. Planning process – sectoral, temporal and spatial dimensions; short-term and long term perspectives of planning. | 15 Hours |
| | 3. Concept of Multi-level planning; decentralized planning; peoples participation in the planning process; Panchayati Raj system: Concept, role and relationship of Panchayati Raj Institutions (Village Panchayat, Panchayat Samiti and Zilla Parishad) and administrative structure (Village, Block and District). | 15 Hours |
| | 4. Indicators of regional development and disparities in India, Regional development in India: problems and prospects. Regional Policies; Regional Development and Planning Strategies: Concentration versus dispersal (growth versus development), | 15 Hours |
| Pedagogy: | Lectures, Group Discussions, Student Seminars, Presentations, Case Studies, Tutorials, Assignments, Blended learning, Gamification, Problem-solving approach through logic, Experiential learning, Multi-literacies and discussion-based teaching, Brainstorming, Guided Questioning, Interpretive Trails, Stimulus activities, Critical incidents, Fieldwork and outdoor | |

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| | learning, Flipped classroom pedagogy, Art Integrated Learning, Cutting Edge, Cooperative Learning Strategies. Flipped classroom, Art Integrated Learning, Project-based Learning, Cutting Edge Pedagogy, and Cooperative Learning Strategies. | |
| References/ Readings: | 1. Agarwal, A., and Tewari, R. (2017). Planning and development in India: Retrospect and prospect. New Delhi: SAGE Publications.<br>2. Bhat, L. S. (1973). Regional Planning in India. Statistical Publishing Society. Calcutta.<br>3. Bhat, L. S. et al (1976). Micro-Level Planning: A Case Study of Karnal Area, Haryana. K. B. Publications. New Delhi.<br>4. Christaller, W. (1966). Central Places in Southern Germany, Translated by C. W. Baskin. Prentice Hall. New Jersey.<br>5. Friedmann, J. and Alonso, W. (1966). Regional Development Policy–A case Study of Venezuela, M.I.T. Press, USA.<br>6. Ghosh, M. (2016). Regional planning in India: Theory and practices. New Delhi: Springer.<br>7. Glikson, Arthur (1955). Regional Planning and Development, Netherlands Universities Foundation for International Co-operation. London:<br>8. Gosal, G. S. and Krishan, G. (1984). Regional Disparities in Levels of Socio-Economic Development in Punjab. Vishal Publications. Kurukshetra.<br>9. Gupta, A.K., and Ramachandraiah, C. (2012). Regional planning in India. New Delhi: Concept Publishing Company.<br>10. Johnson, E. A. J. (1970). The Organisation of Space in Developing Countries. Harvard University Press. Cambridge.<br>11. Joshi, P.C. (2017). Regional planning and development in India. New Delhi: Atlantic Publishers and Distributors.<br>12. Misra, R. P. (1969). Regional Planning: Concepts, Techniques and Policies. University of Mysore. Mysore.<br>13. Nair, P.S. (2016). Regional planning in India. New Delhi: Concept Publishing Company.<br>14. Rao, M.V. (2014). Urban and regional planning in India: A handbook for professional practice. | |

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| | New Delhi: SAGE Publications. | |
| Learning outcomes: | On completion of the course, students will be able to:<br>1. **Gain knowledge** on the concepts of region, regionalization and regional planning<br>2. **Delineate** of different types of regions and identify their utility in planning<br>3. **Understand** how multi-level planning different from single level planning<br>4. **Analyze** the interstate imbalance in India with respect to various indicators of development | |

Programme: M. A. (Geography)
Course Code: **GOG-604**

**Title of the Course: Theory:** Principles and Research in Watershed Management

Number of Credits: 4
Effective from AY: 2023-2024

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| Prerequisites for the course: | Knowledge of Bachelor's Programme in Geography | |
| Objectives: | The course is designed to provide exposure to students in gaining knowledge on concepts and principles Watershed and Participatory Watershed Management | |
| Content: | 1. Watershed – Definition, concept, Objectives; Land capability classification - priority watersheds; Integrated Watershed Management, Hydrology and water balance. | 15 Hours |
| | 2. Planning Principles: collection of data, study of present land use; Preparation of watershed development plan; Estimation of costs and benefits; Financial plan; selection of implementation agency; Monitoring and evaluation system. | 15 Hours |
| | 3. Participatory Watershed Management; Run off management, Factors affecting runoff; Temporary & Permanent gully control measures; Water conservation practices in irrigated lands: Soil and moisture conservation practices in dry lands. | 15 Hours |
| | 4. In-situ & Ex-situ moisture conservation principles and practices; Afforestation principles; Micro catchment water harvesting; Ground water recharge; percolation ponds; Water harvesting: Farm pond: Supplemental irrigation: Evaporation suppression: Seepage reduction. Application of Remote Sensing and GIS in Watershed Management | 15 Hours |
| Pedagogy: | Lectures, Group Discussions, Student Seminars, Presentations, Case Studies, Tutorials, Assignments, Blended learning, Gamification, Problem-solving approach through logic, Experiential learning, Multi-literacies and discussion-based teaching, Brainstorming, Guided Questioning, Interpretive Trails, Stimulus activities, Critical incidents, Fieldwork and outdoor learning, Flipped classroom pedagogy, Art Integrated Learning, Cutting Edge, Cooperative Learning Strategies. Flipped classroom, Art Integrated Learning, Project-based Learning, Cutting Edge Pedagogy, and Cooperative Learning Strategies. | |
| References/ | 1. Bosch, D.D., and Sheridan, J.M. (2010). | |

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| Readings: | Hydrology and management of watersheds. Ames, IA: Wiley-Blackwell.<br>2. Dhruva Narayana, V., Sastry, V. G. & Patnaik, U. S. (1997) Watershed Management. ICAR, New Delhi<br>3. Ghanashyam Das, "Hydrology and Soil Conservation Engineering", Prentice Hall of India Private Limited, New Delhi, 2000.<br>4. Gurmel Singh et al. 2004. Manual of soil and water conservation practices. Oxford & IBH publishing Co. New Delhi.<br>5. Murthy, V.V.N. 2005, Land and water management, Kalyani publishing, New Delhi. Raghunath, H. N. (2004), Hydrology. New Age International Publishers, reprint.<br>6. Regan, K.L., et al. (2002). Water resources management: Principles, regulations, and cases. Boca Raton, FL: CRC Press.<br>7. Singh, P. K. (2000), Watershed Management: Design and Practice. E-media Publications, Udaipur.<br>8. Singh, Rajvir (2000), Watershed Planning and Management. Yash Publishing House, Bikaner.<br>9. Suresh, R. 2008. Land and water management principles, Standard Publishers & Distributors, New Delhi.<br>10. Tideman, E.M., (1996), Watershed Management: Guidelines for Indian Conditions. Omega Scientific Publishers, New Delhi.<br>11. Tripathi R.P. and H.P.Singh 2002, Soil erosion and conservation, Willey Eastern Ltd., New Delhi<br>12. Venkateswarlu, B. Mohammed Osman, M. V. Padmanabhan, K. Kareemulla, P.K. Mishra, G.R. Korwar & K. V. Rao, (2013), Field Manual on Watershed Management. CRIDA, Hyderabad. | |
| Learning outcomes: | After completion of the course, the students will be able to have:<br>**1. Comprehensive knowledge** on Watershed planning and development<br>**2.** Using planning principles, **prepare** Watershed Development Plans<br>**3. Appreciate** the significance of Participatory Watershed Management strategies<br>**4. Evaluate** In-situ & Ex-situ moisture conservation principles and practices | |

Programme: M. A. (Geography)
Course Code: **GOG-605** **Title of the Course: Theory:** Research Methodology in Geography

Number of Credits: 4
Effective from AY: 2023-2024

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| Prerequisites for the course: | No prerequisites are identified for this course | |
| Objectives: | This course provides a conceptual and practical overview of the diverse research methods used in geography. | |
| Content: | 1. Introduction to Research: Meaning, concept, nature, steps, types and their characteristics, Approaches and theories of paradigm and their implications in research, Philosophical and sociological foundations of research, Interdisciplinary approach and its implications in various research area in Geography Methods of Research: Qualitative and quantitative methods: Historical, case study, ethnography, documentary and content analysis, survey (Normative, descriptive, evaluative etc.), field and laboratory experimental studies. Characteristics of methods and their implications in research area in Geography. | 15 Hours |
| | 2. Development of Research Proposal: Research proposal and its elements, Formulation of research problem-criteria of sources and definition, Development of objectives, Derivation and operationalization of variables, Developing assumptions and applications. | 15 Hours |
| | 3. Methods of Data Collection: Secondary and Primary: Concept of sampling and Merits and Demerits of sampling in research, Probability and non-probability samples, their characteristics and implications, Tools of data collections, their types, attributes and uses, Research tools: questionnaire, observation, interviews, scales and tests. Methods of Data Analysis: Analysis of qualitative data, Analysis of quantitative data and it presentation with tables, graphs, Cartograms, Statistical tools of data analysis and Statistical Analysis soft wares– measures of central tendency, dispersion, relative Position, Decision making with hypothesis testing through parametric and non-parametric tests, Validity and delimitations of research findings. | 15 Hours |

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| | 4. Report Writing and Presentation: Principles of report writing and guide lines according to style manuals. Writing and presentation of preliminary, main body and reference section of report. Presentation of research report to Authorities and project implementing agencies (PIA). Follow up of Research Recommendations, Monitoring and Evaluation. | 15 Hours |
| Pedagogy: | Lectures, Group Discussions, Student Seminars, Presentations, Case Studies, Tutorials, Assignments, Blended learning, Gamification, Problem-solving approach through logic, Experiential learning, Multi-literacies and discussion-based teaching, Brainstorming, Guided Questioning, Interpretive Trails, Stimulus activities, Critical incidents, Fieldwork and outdoor learning, Flipped classroom pedagogy, Art Integrated Learning, Cutting Edge, Cooperative Learning Strategies. Flipped classroom, Art Integrated Learning, Project-based Learning, Cutting Edge Pedagogy, and Cooperative Learning Strategies. | |
| References/ Readings: | 1. A Survey Research in Geography- ICSSR, New Delhi (1972), Popular Prakasan, Bombay.<br>2. Ackoff Russell (1961). The Design of Social Research by, Chicago University Press.<br>3. Allen, T. Harrell (1978). New Methods in Social Science Research, Praeger Publishers , New York.<br>4. David Dooley (1995). Social Research Methods by Prentice Hall, London. Hira, D. S. System Simulation. S. Chand of Co., New Delhi.<br>5. DeLyser, D. (2011). The SAGE handbook of qualitative geography. Thousand Oaks, CA: SAGE Publications.<br>6. Francis Robin (2009). Basic Guide to Evaluation for Development, Oxfarm Publication.<br>7. Freedman, P (1960) The Principles of Scientific Research, Pergamon Press, New York.<br>8. Gosal G. S. (1999), Fourth Survey of Research in Geography, Manak publication.<br>9. Hanagi. I. L (1973), An Introduction to Scientific Geographical Research Brown co<br>10. Kitchin, R., and Tate, N. (2016). Conducting research in human geography: Theory, methodology and practice. New York: Routledge.<br>11. Kothari, C. K. (2004). Research Methodology-Methods and Techniques. New Age Int.. New Delhi. | |

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| | 12. Krishnaswamy, K. N., Sivakumar, Appa Iyer and Mathiranjan, M. (2006). Management Research Methodology; Integration of Principles, Methods and Techniques. Pearson Education. New Delhi.<br>13. Kultar Singh (2007). Quantitative Social Research Methods, Sage Publication.<br>14. Longhurst, R. (2015). Research methods in geography: A critical introduction. New York: Wiley-Blackwell.<br>15. Majid Hussain (1994). Methodology of Geography, Anmol Pubication, New Delhi.<br>16. Misra R. P. (1983). Contributions in Indian Geography, Hilky publishers, New Delhi.<br>17. Montgomery, Douglas C. (2007). Design and Analysis of Experiments: Wiley, India.<br>18. Moonis Raza (1979) A Survey Research in Geography -1969-1972, Edited Book, Allied publishers private limited, Bombay.<br>19. Narasimha Murthy K. L. (1999). Geographical Research, Concept Publishing company.<br>20. Paul Nicholas (2009). Social Survey Methods Oxfarm Publishers Delhi.<br>21. Vandana Desai and Robert B Potter (2006). Doing Development Research by Sage Publications, New Delhi.<br>22. Vidyarthi L. P and Helder A. K . (1985). Research Methodology in Social Science in India, today and tomorrow printers and publishers.<br>23. Ward, K. (2014). Researching the city: A guide for students. Thousand Oaks, CA: SAGE Publications. | |
| Learning outcomes: | Upon completion of the course, students should be able to:<br>**1. Critically evaluate** the principles underlying quantitative and qualitative research methods used in geography<br>2. Effectively **apply** select quantitative and qualitative methods related to geography, appropriate to the area encompassed by the student's thesis topic<br>**3. Prepare** Thematic maps and diagrams<br>**4. Develop** research writing skills | |

## SEMESTER III Generic Elective Courses

Programme: M. A. (Geography)
Course Code: **GOG-621**

**Title of the Course: Theory:** Teaching Methodology and Competencies in Geography

Number of Credits: 4
Effective from AY: 2023-2024

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| Prerequisites for the course: | No prerequisites are identified for this course | |
| Objectives: | This course is focused to<br>• Develop and understand and reveal importance of Geography.<br>• Acquire the knowledge and develop understanding about the various pedagogical principles involved in the teaching Geography. | |
| Content: | 1. Aims and Objectives of teaching Geography, Importance of teaching Geography, relation of geography with other disciplines. Methods: Lecture, Project, Discussion, Assignment, Problems solving, Demonstration, Inductive and Deductive, Regional, Case study methods, Field trip, observation, questioning techniques. Design of Lesson planning, Approaches to Lesson Planning, Writing the lesson plan. Geography room and Geography Museum. Instructional materials used in the teaching of geography- maps, globes, atlas, films, pictures, specimens, models, simple meteorological equipment. Field work and excursions. | 15 Hours |
| | 2. Projected Media: Overhead projector with transparencies, Films and slides; Non-projected: Pictures and charts, Chalk board. Printed: Text and reference books, Newspapers and magazine. Mass media: Television, Radio, Audio, Computer. | 15 Hours |
| | 3. Construction of tests in geography – designing of tests, blueprint of tests, framing the questions, assembling the questions and preparing the instructions, administration of tests, Diagnostic tests and remedial measures in geography. | 15 Hours |
| | 4. The skill of introduction, explanation, questioning, stimulus variation, reinforcement, illustration, blackboard writing, achieving closure, demonstration. Preparation of Lesson Plan, Teaching Aids, Classroom Teaching Activity | 15 Hours |
| Pedagogy: | Lectures, Group Discussions, Student Seminars, Presentations, Case Studies, Tutorials, Assignments, | |

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| | Blended learning, Gamification, Problem-solving approach through logic, Experiential learning, Multi-literacies and discussion-based teaching, Brainstorming, Guided Questioning, Interpretive Trails, Stimulus activities, Critical incidents, Fieldwork and outdoor learning, Flipped classroom pedagogy, Art Integrated Learning, Cutting Edge, Cooperative Learning Strategies. Flipped classroom, Art Integrated Learning, Project-based Learning, Cutting Edge Pedagogy, and Cooperative Learning Strategies. | |
| References/ Readings: | 1. Arora, K. L. (1983). BhugolShikshan: The Teaching of Geography. Parkash Brothers. Ludhiana.<br>2. Fien, John et al. (1985). The Geography Teachers' Guide to the Classroom.<br>3. Graves, Norman J. (1982), Source book for Geography Teaching: UNESCO Press. New York.<br>4. Rao, M. S. (2009). Teaching of Geography: Anmol Publication. New Delhi.<br>5. Rathod & Prakash (1995). Emerging Trends in the Teaching of Geography: Kanishka Publishers & Distributors.<br>6. Varma & Vedanayagam (1970). Geography Teaching. | |
| Learning outcomes: | On completion of the course, students will be able to:<br>**1. Use** different methods of teaching geography.<br>**2. Create** a set of methods of teaching for specific sections of students group.<br>**3. Appreciate** and apply theoretical geographical knowledge in application of geography.<br>**4. Develop** research on the basis of motivation, participation and retention. | |

Programme: M. A. (Geography)
Course Code: **GOG-622** **Title of the Course: Theory:** Biogeography

Number of Credits: 4
Effective from AY: 2023-2024

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| Prerequisites for the course: | No prerequisites are identified for this course | |
| Objectives: | This course is aimed at providing ecological foundations needed to understand the distribution and abundance of species and their changes over time as well as sustainable food systems and ecosystem services. | |
| Content: | 1. Biogeography: Nature, Scope, Significance and Historical development. Main fields of biogeography: 1) historical, 2) ecological, and 3) conservation biogeography, Nature of biosphere and basic ecological principles. | 15 Hours |
| | 2. Distribution of Plants and Animals: (i) Geographical distribution of plants and animals (ii) Factors influencing their distribution (biotic, abiotic, anthropogenic and historical) (iii) Phyto-geographic and zoo-geographic regions of the world | 15 Hours |
| | 3. Concept and Types of Ecosystem: (i) Concept of Ecosystem, Tropic Level, Food Chain, Food Web and Transfer of Energy (ii) Types of ecosystems: Terrestrial (grassland and desert ecosystem) and Aquatic (wetland and marine ecosystem) | 15 Hours |
| | 4. Biodiversity: (i) Concept of Biodiversity (ii) Biodiversity loss and its conservation (iii) Biodiversity 'hot spots' of the world (iv) Status of Biodiversity in Western Ghats and Himalayas. Conservation and Management of Ecological Regions: (i) Study of the following ecological regions of India in relation to plant and animal diversity, interrelations, problems, conservation and management: (i) Tropical Rain Forest (ii)Mangroves. | 15 Hours |
| Pedagogy: | Lectures, Group Discussions, Student Seminars, Presentations, Case Studies, Tutorials, Assignments, Blended learning, Gamification, Problem-solving approach through logic, Experiential learning, Multi-literacies and discussion-based teaching, Brainstorming, Guided Questioning, Interpretive Trails, Stimulus activities, Critical incidents, Fieldwork and outdoor learning, Flipped classroom pedagogy, Art Integrated Learning, Cutting Edge, Cooperative Learning Strategies. Flipped classroom, Art Integrated Learning, Project-based Learning, Cutting Edge Pedagogy, and | |

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| | Cooperative Learning Strategies. | |
| References/ Readings: | 1. Bansereau, M. (1957): Biogeography-An Ecological Perspective, Ronald Press, New York.<br>2. Bhattacharya, N.N. (2007): Biogeography, Eastern Book House, Guwahati.<br>3. Cox Barry, C. et al. (1977): Biogeography: An Ecological and Evolutionary Approach, Cox Blackwell, Oxford.<br>4. Hagget, R. J. (1995): Geography: An Evolutionary Approach, Routledge, London.<br>5. Hagget, R.J. (1995): Fundamentals of Biogeography, Routledge, London.<br>6. Joy, T. (1993): Biogeography: A Study of Plants in the Ecosphere, Longman, London. Mani, M.S. (ed.) (1972): Biogeography of India, Springer, The Hague.<br>7. Lomolino, M. V., Riddle, B. R., & Whittaker, R. J. (2017). Biogeography. 5th Edition. Sinauer Associates, Inc.<br>8. Mathur, H.S. (1998): Essentials of Biogeography, Amy Printers, Jaipur.<br>9. Martin, C. (1975): Plant Geography, Methuen, London.<br>10. Phillip, J. (1957): Zoogeography: The Geographical Distribution of Animals, John Wiley, New York.<br>11. Robinson, H. (1982): Biogeography, Mc Donald and Evans, London.<br>12. Seddon, B. (1971): Biogeography, Duckworth, London.<br>13. Spellberg, I.F. and Sawyer, J. W.D. (1999): An Introduction to Applied Biogeography, Cambridge University Press, Cambridge.<br>14. World Resource Institute, (2001): People and Ecosystems: World Resources Institute, Washington. | |
| Learning outcomes: | On completion of the course, students will be able to:<br>1. **Understand** scope and nature of Biogeography.<br>2. **Describe** how geological, environmental, and ecological processes drive the distribution of species on Earth.<br>3. **Explain** the significance of ecosystems and transfer of energy<br>4. **Evaluate** the status of biodiversity and its significance to humans. | |

Programme: M. A. (Geography)
Course Code: **GOG-623** **Title of the Course: Theory:** Geography of Health and Wellbeing

Number of Credits: 4
Effective from AY: 2023-2024

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| Prerequisites for the course: | No prerequisites are identified for this course | |
| Objectives: | The objective of the course is to conceptualize learner in the field of health and well-being, relationship between human activities, health and environment. The course also covers broad aspects of pollution, climate change and health issues in different parts of the world. | |
| Content: | 1. Perspectives on Health: Definition, linkages with environment, development and health; driving forces in health and environmental trends: population dynamics, urbanization, poverty and inequality. | 15 Hours |
| | 2. Pressure on Environmental Quality and Health: Human activities and environmental pressure, land use and agricultural development; industrialization; transport and energy. | 15 Hours |
| | 3. Exposure and Health Risks: Air pollution; household wastes; water; housing; workplace. Health and Disease Pattern in Environmental Context with special reference to India, Types of Diseases and their regional pattern (Communicable and Lifestyle related diseases) | 15 Hours |
| | 4. Climate Change and Human Health: Changes in climate system – heat and cold; Biological disease agents; food production and nutrition. | 15 Hours |
| Pedagogy: | Lectures, Group Discussions, Student Seminars, Presentations, Case Studies, Tutorials, Assignments, Blended learning, Gamification, Problem-solving approach through logic, Experiential learning, Multi-literacies and discussion-based teaching, Brainstorming, Guided Questioning, Interpretive Trails, Stimulus activities, Critical incidents, Fieldwork and outdoor learning, Flipped classroom pedagogy, Art Integrated Learning, Cutting Edge, Cooperative Learning Strategies. Flipped classroom, Art Integrated Learning, Project-based Learning, Cutting Edge Pedagogy, and Cooperative Learning Strategies. | |
| References/ | 1. Akhtar Rais (Ed.), 1990: Environment and Health | |

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| Readings: | Themes in Medical Geography, Ashish Publishing House, New Delhi.<br>2. Avon Joan L. and Jonathan A Patzed. 2001: Ecosystem Changes and Public Health,Baltimin, John Hopling Unit Press(ed).<br>3. Bradley,D.,1977: Water, Wastes and Health in Hot Climates, John Wiley Chichesten.<br>4. Christaler George and Hristopoles Dionissios, 1998: Spatio Temporal Environment Health Modelling, Boston Kluwer Academic Press.<br>5. Cliff, A.D. and Peter,H., 1988 : Atlas of Disease Distributions, Blackwell Publishers, Oxford.<br>6. Cummins, S. (2014). Understanding the Health Effects of Neighborhoods: A Multilevel Analysis of the Geographies of Health in Cities. Health and Place, 27, 61-63.<br>7. Diez Roux, A. V. (2011). Conceptual Approaches to the Study of Health Disparities. Annual Review of Public Health, 32, 93-113.<br>8. Gatrell, A.,and Loytonen, 1998 : GIS and Health, Taylor and Francis Ltd, London.<br>9. Hardham T. and Tannav M.,(eds): Urban Health in Developing Countries; Progress, Projects, Earthgoan, London.<br>10. Murray C. and A. Lopez, 1996 : The Global Burden of Disease, Harvard University Press.<br>11. Moeller Dade W ed., 1993: Environmental Health, Cambridge, Harward Univ. Press.<br>12. Phillips, D.and Verhasselt, Y., 1994: Health and Development, Routledge, London.<br>13. Shaw, M., & Dorling, D. (2010). The Atlas of Health: Mapping the Challenges and Causes of Disease. University of California Press.<br>14. Smedley, B. D., & Syme, S. L. (2001). Promoting Health: Intervention Strategies from Social and Behavioral Research. National Academies Press. | |
| Learning outcomes: | On completion of the course, students will be able to:<br>1. **Explain** the perspectives on Health<br>2. **Analyze** the pressure on Environmental Quality and Health<br>3. **Understand** the relationship between exposure and Health Risks<br>4. **Describe** the impact of Climate Change on Human Health | |

Programme: M. A. (Geography)
Course Code: **GOG-624** **Title of the Course: Theory:** Spatial Analysis and Modeling in Geography

Number of Credits: 4
Effective from AY: 2023-2024

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| Prerequisites for the course: | No prerequisites are identified for this course | |
| Objectives: | This course aims to provide students with the understanding different concepts and context of spatial analysis and modeling so that you are equipped to find and apply the best analytical tool for your problem and to correctly and appropriately interpret and present your results | |
| Content: | 1. Significance of spatial analysis, overview of tools for analysis, Significance of Modeling. Map algebra, grid based operations, local, focal, zonal and global functions, cost surface analysis, optimal path and proximity search. | 15 Hours |
| | 2. Buffer Analysis: Types and applications. Overlay operations: point in polygon, line polygon, polygon in polygon; Single layer operations: features identification, extraction, classification and manipulation; Multilayer operations: union, Intersection, difference; Pattern Analysis: Nearest neighborhood analysis, Method for evaluating point patterns: Clustered and random distribution. | 15 Hours |
| | 3. Concept of network analysis, Types of network analysis, Evaluation of network complexity using Alpha, Gama indices, Network data model, Surface analysis- Interpolation method, DEM, TIN, variance filter, slope and aspect, relief and hill shading. | 15 Hours |
| | 4. Basic elements of GIS Modeling, Role of GIS in modeling, Classification & types of GIS Models, modeling process. | 15 Hours |
| Pedagogy: | Lectures, Group Discussions, Student Seminars, Presentations, Case Studies, Tutorials, Assignments, Blended learning, Gamification, Problem-solving approach through logic, Experiential learning, Multi-literacies and discussion-based teaching, Brainstorming, Guided Questioning, Interpretive Trails, Stimulus activities, Critical incidents, Fieldwork and outdoor learning, Flipped classroom pedagogy, Art Integrated Learning, Cutting Edge, Cooperative Learning Strategies. Flipped classroom, Art Integrated Learning, Project-based Learning, Cutting Edge Pedagogy, and Cooperative Learning Strategies. | |

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| References/ Readings: | 1. Alias, A. Rahman and Morakot, Pilouk (2008): Spatial Data Modeling for 3D GIS, Springer New York.<br>2. Bailey, T. C., & Gatrell, A. C. (1995). Interactive Spatial Data Analysis. Longman Scientific & Technical.<br>3. Burrough, P. A. MacDonneli, R. A. Principles of GIS, Oxford University Press, 2000.<br>4. Demers, M. N. (2000): Fundamentals of Geographic Information Systems, 2nd Edition published by John Wiley & Sons, London.<br>5. Goodchild, M. F., & Janelle, D. G. (2010). Toward Critical Spatial Thinking in the Social Sciences and Humanities. GeoJournal, 75(1), 3-13.<br>6. Goodrich, M. (2000). Data Structures and Algorithms in Java, 2nd Edition Wiley, New York.<br>7. Haining, R. (2003). Spatial Data Analysis: Theory and Practice. Cambridge University Press.<br>8. Longley, P. A., Goodchild, M. F., Maguire, D. J., & Rhind, D. W. (2015). Geographic Information Science and Systems. John Wiley & Sons.<br>9. Longley, P. A., Goodchild, M. F., Maguire, D. J. and Rhind, D. W. (2005). Geographic Information Systems and Science. Chichester: Wiley. 2nd edition, New York.<br>10. Makrewski, Jacek (2002), GIS and Multi-criteria Analysis, USA.<br>11. Malczewski, J. (2004). GIS and Multi-criteria Decision Analysis. John Wiley and Sons, New York.<br>12. Roy, P. S. (2000): Geographical Information Science, Vol. I Published by IIRS, Dehradun<br>13. Thurston, J., Poiker, T. K. and J. Patrick Moore (2003). Integrated Geospatial Technologies: A Guide to GPS, GIS and Data Logging. Hoboken, Wiley. New Jersey.<br>14. Ott, T. and Swiaczny, F. (2001). Time-integrative GIS. Management and analysis of Spatio-Temporal Data. Springer, Berlin/Heidelberg/New York:.<br>15. O'Sullivan, D., & Unwin, D. J. (2003). | |

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| | Geographic Information Analysis. Wiley.<br>16. Wilson, J. P., & Fotheringham, A. S. (2008). Handbook of Geographic Information Science. Wiley-Blackwell. | |
| Learning outcomes: | On completion of the course, students will be able to:<br>1. **Understand** the significance of spatial analysis and modelling<br>2. **Explain** the Buffer Analysis techniques and their applications<br>**1. Acquire** acquaintance of the procedures of network analysis<br>**2. Appreciate** the role of GIS in modelling | |

Programme: M. A. (Geography)
Course Code: **GOG-625**

**Title of the Course: Theory:**
Geographical Data-Base Management System and Programming

Number of Credits: 4
Effective from AY: 2023-2024

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| Prerequisites for the course: | No prerequisites are identified for this course | |
| Objectives: | A primary aim this course is to introduce students to the basic concepts in geographical database management system and programming. | |
| Content: | 1. Introduction and purpose of database, computer data organization, level of database implementation; Database system architecture: Levels of architecture, client server architecture, centralized and distributed. Introduction to database model: schema, Types of data modeling: Conceptual, logical and physical, Relational Database model, Entity relationship model, Object oriented Database Model. | 15 Hours |
| | 2. Classification of spatial database systems, Characteristics of spatial database systems, ArcGIS databases, Spatial data processing; spatial data standards and standardization, OGC spatial data standards WMS, WFS, WCS. Introduction to Query language, DML, DDL, DCL. | 15 Hours |
| | **3.** Introduction to programming, Developing a Program, Exceptions and errors. Basic features programming Language like Identifier, Keywords, Variable, data types, Operators and Expression. Key features of an Algorithm, Different ways of stating Algorithms. | 15 Hours |
| | **4.** Introduction to flowcharts, Standards for flowcharts Symbols used for flowcharts, Guidelines for drawing flowcharts. Advantages and Limitations of using flowcharts. Basic Concept of OOPS, Applications of OOPS, Introduction to C++. | 15 Hours |
| Pedagogy: | Lectures, Group Discussions, Student Seminars, Presentations, Case Studies, Tutorials, Assignments, Blended learning, Gamification, Problem-solving approach through logic, Experiential learning, Multi-literacies and discussion-based teaching, Brainstorming, Guided Questioning, Interpretive Trails, Stimulus activities, Critical incidents, Fieldwork and outdoor learning, Flipped classroom pedagogy, Art Integrated Learning, Cutting Edge, Cooperative Learning | |

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| | Strategies. Flipped classroom, Art Integrated Learning, Project-based Learning, Cutting Edge Pedagogy, and Cooperative Learning Strategies. | |
| References/ Readings: | 1. Benjamin, C. Pierce (2002). Types and Programming Languages, The MIT Press.<br>2. Booth, B., Shaner, J., MacDonald, A., Sanchez, P. Pfaff, R. (2004): ArcGIS, Geodatabase Workbook, Redlands<br>3. Bruce, J. MacLennan (1999). Principles of Programming Languages: Design, Evaluation, and Implementation, Oxford University Press.<br>4. Daniel, P. Friedman and Mitchell, Wand (2001). Christopher Thomas Haynes: Essentials of Programming Languages, MIT Press.<br>5. David Gelernter and Suresh Jagannathan (2008). Programming Linguistics, The MIT Press.<br>6. Deshpande, P. S. (2008): SQL & PL/SQL for Oracle 10g, Blackbook, Dreamtech Press, New Delhi.<br>7. Goldschlager, L. (2006). A Lister Computer Science - a modern Introduction Prentice Hall, 1988.<br>8. Zeiler, M. (1999): The ESRI guide to Geodatabase design, Redlands. | |
| Learning outcomes: | On completion of the course, students will be able to:<br>**5. Understand** the fundamental purpose of database<br>**6. Classify** spatial database systems<br>**7. Develop** a Program using a programming language<br>**8. Apprehend** the advantages and limitations of using flowcharts | |

Programme: M. A. (Geography)
Course Code: **GOG-626** **Title of the Course: Theory:** Economic Geography of Globalization

Number of Credits: 4
Effective from AY: 2023-2024

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| Prerequisites for the course: | No prerequisites are identified for this course | |
| Objectives: | The course explores the processes of globalization and seeks to provide understanding of today's increasingly interdependent world. Further, students will be familiarized with the rise of Asia and performance of India during post-reform period. | |
| Content: | 1. The uneven geographies of globalization, Perspectives of globalization, Globalization and the development of the world economy, Contemporary processes of economic globalization, Patterns of global inequality. | 15 Hours |
| | 2. Changing geography of FDI, Understanding the emergence of MNC, The embedded geographies of MNCs: the continuous influence of home countries on MNCs strategies, The impact of MNCs on Host region. | 15 Hours |
| | 3. The nature and scope of service sector, Growth of services, Global patterns of trade and investment services, Business and financial services and world cities, Digitization and the internet economy, Globalization and the geographical dispersal of services. The rise of Asia: China, and India, Regional Developments and Economic- political implications. Impact of Globalization on Developing Countries. | 15 Hours |
| | 4. The Impact of Trade Liberalization on Employment: Performance of India's Manufacturing Sector in the Post-reform Period. Pattern of Industry Location under Liberalization. Banking Sector Reform, Flow of Foreign Direct Investment to India, Export Composition in the Liberalized Era, International Integration and Financial Crisis | 15 Hours |
| Pedagogy: | Lectures, Group Discussions, Student Seminars, Presentations, Case Studies, Tutorials, Assignments, Blended learning, Gamification, Problem-solving approach through logic, Experiential learning, Multi-literacies and discussion-based teaching, Brainstorming, Guided Questioning, Interpretive Trails, Stimulus activities, Critical incidents, Fieldwork and outdoor learning, Flipped classroom pedagogy, Art Integrated Learning, Cutting Edge, Cooperative Learning | |

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| | Strategies. Flipped classroom, Art Integrated Learning, Project-based Learning, Cutting Edge Pedagogy, and Cooperative Learning Strategies. | |
| References/ Readings: | 1. Giovanna, Vertova (ed) (2006): The Changing Economic Geography of Globalization, Routledge.<br>2. MacKinnon, Danny & Andrew Cumbers (2007): An Introduction to Economic Geography Globalization, Uneven Development and Space. Persons Education Ltd. England.<br>3. Masahisa Fujita, & Paul Krugman (2004) The new economic geography: Past, present and the future. Regional Science (RSAI 2004) Papers Reg. Sci. 83, 139–164 (2004)<br>4. Saikia, Dilip, Shukla, Vachaspati, Kakarlapudi, Kiran Kumar (Edited) (2013): India's Economy in the Globalized Era. Bookwell, New Delhi. | |
| Learning outcomes: | On completion of the course, students will be able to:<br>**1. Understand** the process of Globalization with reference to development of the world economy and patterns of global inequality**.**<br>**2. Explicate** the Globalization and emergence of MNCs and their impact of on the host region.<br>**3. Describe** the Global patterns of trade and investment services.<br>**4. Analyze** the impact of trade liberalization on the Indian economy | |

Programme: M. A. (Geography)
Course Code: **GOG-627** **Title of the Course: Theory:** Geography of International Relations

Number of Credits: 4
Effective from AY: 2023-2024

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| Prerequisites for the course: | No prerequisites are identified for this course | |
| Objectives: | This course is aimed to understand key concepts and concerns in international relations, including notably the way power is acquired and used globally and how states and non-state actors interact. | |
| Content: | 1. Concepts of International Relation: Geo-economics, Space geo-strategy, Intermediate Region, Geo-jurisprudence, Geopolitical ontology and Geo-strategy, factors of relationship, System and Application of International Relationship , Current generation dominant power and their Zone of Influence.<br>Types of Relationships, Status Report of Bilateral, and Multilateral Relationships from Earlier generation till date, International organizations, International rules, Spatio-Temporal Changes. | 15 Hours |
| | 2. Ethnic Relationship, Geopolitics, International Agreements, Low Intensity Conflicts, Security Concerns and World Politics.<br>Geographical spread of Decisive International groups, Correlation and Trends of the relationship, Estimation of Future relationship using Time Series Analysis. | 15 Hours |
| | 3. Group formation for promoting Regional Cooperation, The member Countries, focus of relationship, present status, future plans and limitations.<br>International Aid and Assistance Programs,<br>Humanitarian Relationship, Cultural Relationship, Strategic partnership. | 15 Hours |
| | 4. Causes and Consequences of International Dominance, Exploring the decline of American influence in the Middle East. Assessment of the resurgence of Russia and its intervention in Ukraine. Europe's geo-political relations with Russia. Tracing the growing tensions in the East and South China Seas. India's regional influence, India-Pakistan dispute, Examining the Sub-Saharan African Shatter belt as a focus for Chinese investment and economic development, challenging U.S. and European influence in the region. | 15 Hours |
| Pedagogy: | Lectures, Group Discussions, Student Seminars, Presentations, Case Studies, Tutorials, Assignments, Blended learning, Gamification, Problem-solving approach through logic, Experiential learning, Multi-literacies and discussion- | |

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| | based teaching, Brainstorming, Guided Questioning, Interpretive Trails, Stimulus activities, Critical incidents, Fieldwork and outdoor learning, Flipped classroom pedagogy, Art Integrated Learning, Cutting Edge, Cooperative Learning Strategies. Flipped classroom, Art Integrated Learning, Project-based Learning, Cutting Edge Pedagogy, and Cooperative Learning Strategies. | |
| References/ Readings: | 1. Agnew, John (2017): Globalization and Sovereignty: Beyond Territorial Trap, 2nd Ed., December, Rowman and Little Field Pub., October, New York-London.<br>2. Agnew, John (2022): Hidden Geopolitics: Governance in a Globalized World, Rowman and Little Field Pub., August, New York-London.<br>3. Agnew, John and Muskara, Luca (2012): Making Political Geography, 2nd Ed., February, Rowman and Little Field Pub., October, New York-London.<br>4. Agnew, John and Shin, Michael (2019): Mapping Populism: Taking Politics to the People, Rowman and Little Field Pub., June, New York-London.<br>5. Cohen, Saul Bernard (2014), Geopolitics: The Geography of International Relation, 3rd Ed., November, Rowman and Little Field Pub., October, New York-London.<br>6. Dittmer, Jason and Daniel Bos (2019), Popular Culture, Geopolitics and Identity, 2nd Edn., Rowman and Little Field Pub., March, New York-London.<br>7. Randell, James (2020): An Introduction to Island Studies, Rowman and Little Field Pub., October, New York-London.<br>8. Short, John Rennei (2021): Geopolitics-Making Sense of a Challenging World, Rowman and Little Field Pub., August, New York-London.<br>9. Staudt, Cathleen (2019): Border Politics in a Global Era: Comparative Perspectives, June, Rowman and Little Field Pub., October, New York-London.<br>10. The New Castle Social Geographies Collective (2020), Social Geographies: An Introduction, Rowman and Little Field Pub., October, New York-London. | |
| Learning outcomes: | On completion of the course, students will be able to:<br>1. **Describe** the dominant theoretical approaches to international relations.<br>2. **Integrate** multiple disciplinary approaches to the study of international relations.<br>3. **Assess** the resurgence of Russia and its intrusion in Ukraine in the light of Europe's geo-political relations with Russia<br>4. **Analyse** India's regional influence in Asia. | |

Programme: M. A. (Geography)
Course Code: **GOG-628** **Title of the Course: Theory:** Geopolitics of South Asia

Number of Credits: 4
Effective from AY: 2023-2024

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| Prerequisites for the course: | No prerequisites are identified for this course | |
| Objectives: | This course is aimed to<br>• Study the origins and evolution of the geo-political concept of South Asia, in order to understand the contemporary security challenges that confront the region.<br>• Provide a comprehensive framework to understand the foreign and security policies of South Asian countries.<br>• The students will study about the emerging dynamics in the South Asian region. | |
| Content: | 1. Geopolitics of South Asia: Geography and Historical Evolution of the South Asian Region, Geopolitical Frames – South Asia, Indian Subcontinent and Southern Asia, Strategic Significance of South Asia. | 15 Hours |
| | 2. South Asia during the Cold War, History of Nationalism and Colonialism, Migration in South Asia<br>Impact of Cold War politics on South-Asia | 15 Hours |
| | 3. South Asia in Post-Cold War World<br>Disintegration of USSR and Indian Liberalization<br>Prospects and Challenges of Regional Cooperation<br>India and South Asia | 15 Hours |
| | 4. External influences in South Asia: United States, Russia, China | 15 Hours |
| Pedagogy: | Lectures, Group Discussions, Student Seminars, Presentations, Case Studies, Tutorials, Assignments, Blended learning, Gamification, Problem-solving approach through logic, Experiential learning, Multi-literacies and discussion-based teaching, Brainstorming, Guided Questioning, Interpretive Trails, Stimulus activities, Critical incidents, Fieldwork and outdoor learning, Flipped | |

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| | classroom pedagogy, Art Integrated Learning, Cutting Edge, Cooperative Learning Strategies. Flipped classroom, Art Integrated Learning, Project-based Learning, Cutting Edge Pedagogy, and Cooperative Learning Strategies. | |
| References/ Readings: | 1. Aminah Mohammed Arif, Introduction. Imaginations and Constructions of South Asia: An Enchanting Abstraction? South Asia Multidisciplinary Academic Journal, Vol 10, 2014.<br>2. Bahadur, Kalim (ed.), (1986): South Asia in Transition: Conflicts and Tensions, Patriots, New Delhi.<br>3. Banerjee, A. K. (ed.), (1998): Security Issues in South Asia: Domestic and External Sources of Threats to Security, Minerva, Calcutta.<br>4. Bose, Sugata (ed.), (1990): South Asia and World Capitalism Delhi: OUP.<br>5. Burke, S.M., (1973): Pakistan's Foreign Policy, Fairlawn N.J: Oxford University Press,.<br>6. Chauhan, R.S., (1989): Society and State building in Nepal: From Ancient Times to Mid Twentieth Century, New Delhi: Sterling,.<br>7. D.G.A. Khan, (2005): Political System in Pakistan (in Hindi), Shekhar Publication, Allahabad,<br>8. Dubey, Muchkund et al. (eds.), (1999) South Asian Growth Quadrangle: Framework for Multifaceted Cooperation, Delhi: Macmillan,.<br>9. Ganguly, S., & Thompson, W. R. (Eds.). (2009). Asian Rivalries: Conflict, Escalation, and Limitations on Two-Level Games. Stanford University Press.<br>10. Ghosh, Partha S., (1989) Cooperation and Conflict in South Asia, New Delhi: Manohar,<br>11. Gould, H.A. and Sumit Ganguly (eds.), (1993) The Hope and the Reality: U.S.-IndianRelations from Roosevelt to Reagan, Oxford & IBH, New Delhi.<br>12. Jones, Rodney W. and Sumit Ganguly, (2000) "Debating New Delhi's Nuclear Decision," International Security, Vol 24, (4), Spring<br>13. Mohammed Ayoob, (1995) The Third World Security Predicament: State Making, Regional Conflict, and the International System (Emerging Global Issues), Lynne Reiner Publications. | |

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| | 14. Stephen Philip Cohen (ed.), (1987): The Security of South Asia: American and Asian perspectives, New Delhi: Vistaor Publications<br>15. Wirsing, R. G., & Wong, J. Y. (2010). The Geopolitics of East Asia: The Search for Equilibrium. Lynne Rienner Publishers. | |
| Learning outcomes: | On completion of the course, students will be able to:<br>**1. Understand** the geopolitics of South Asia<br>**2. Evaluate** the status of South Asia during the Cold War<br>**3. Explain** the challenges of South Asia in Post-Cold War World<br>**4. Analyze** the external influences in South Asia | |

## SEMESTER IV: Research Specific Elective Courses

Programme: M. A. (Geography)
Course Code: **GOG-606**

**Title of the Course: Theory:** Principles and Practices of Cartographic Techniques and Computer Applications in Geographical Research

Number of Credits: 4
Effective from AY: 2023-2024

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| Prerequisites for the course: | Basic IT Skills | |
| Objectives: | The main focus of this course is to learn the fundamental concepts of Cartography and its advancements as Digital Cartography. | |
| Content: | 1. Introduction, concepts, evolution and development of Cartography since ancient times, Characteristics of Map. Categories of maps. Methods of mapping, Introduction to Digital Cartography, Geodesy and spheroid, Co-ordinate system, Principles of map projection, importance of map projection in map making and projection used in Survey of India for topographic sheets. Plane co-ordinates in UTM system, Map and map scales | 15 Hours |
| | 2. Sources of Data: Ground Survey and positioning, Remote sensing, Census and sampling; Data processing; image processing, digital database, Geographic and cartographic database, basic Statistical processing, Design of color and pattern, typography and lettering the map. Processing and generalizing geographic data, Simplification and Classification, computer assisted cartographic processes, symbolization, mapping with point, line and area symbols-Portraying the land surface form. Map Compilation-Analog and Digital Compilation. | 15 Hours |
| | 3. Representation of Geographic Data in chart or graph form: Histogram, Bar and line graphs, Pie charts, Scatter Plots, scatter grams and Trend lines. Representation of Geographic Data in map form: Using windows paint brush to make 2D maps using tabular data. | 15 Hours |
| | 4. Using Microsoft PowerPoint to present geographic analysis: adding graphs, maps, animation & videos to presentation, managing presentation time, Finding Geographic data on internet: Tabular data, graphs & charts, Maps and | 15 Hours |

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| | Toposheets, Working with Google earth maps and annotations. | |
| Pedagogy: | Lectures, Group Discussions, Student Seminars, Presentations, Case Studies, Tutorials, Assignments, Blended learning, Gamification, Problem-solving approach through logic, Experiential learning, Multi-literacies and discussion-based teaching, Brainstorming, Guided Questioning, Interpretive Trails, Stimulus activities, Critical incidents, Fieldwork and outdoor learning, Flipped classroom pedagogy, Art Integrated Learning, Cutting Edge, Cooperative Learning Strategies. Flipped classroom, Art Integrated Learning, Project-based Learning, Cutting Edge Pedagogy, and Cooperative Learning Strategies. | |
| References/ Readings: | 1. Cole, J. P. & King, Cuchlaine A. M. (1968): Quantitative Geography. John Wiley. London.<br>2. Crampton, J. W. (2010). Mapping: A Critical Introduction to Cartography and GIS. Wiley-Blackwell Cromley .R. G, (1992). "Digital Cartography", Prentice-Hall of India, New Delhi.<br>3. David J. Maguire (1989): Computers in Geography, Longman Scientific & Technical, London.<br>4. Dent .B. D, (1999). "Cartography – Thematic Map Design", 5th Edition, W C B McGraw-Hill, Boston,<br>5. Imus, D. and Dunlavey, P. 2002. Back to the Drawing Board: Cartography vs the Digital Workflow. MT. Hood, Oregon.<br>6. Kraak, Menno-Jan and Allan Brown (2001). Web Cartography – Developments and prospects, Taylor & Francis, New York, ISBN 0-7484-0869-X.<br>7. Mather, Paul M. (1993): Computer Application in Geography, John Wiley & Sons, New York.<br>8. Monmonier, M. S. (1982): Computer Assisted cartography, Prentice Hall, London.<br>9. Slocum, T. A., McMaster, R. B., Kessler, F. C., & Howard, H. H. (2009). Thematic Cartography and Geovisualization (3rd ed.). Prentice Hall.<br>10. Tyner, J. A. (2010). Principles of Map Design. Guilford Press.<br>11. Unnwin, D. J. & Dawson, J. A. (1987): Computer Programming for Geographers, Longman, London. | |

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| | 12. Warntz, W. (2012). Computer-assisted Cartography: Principles and Prospects. Prentice Hall.<br>13. Zipf, A., & Collier, J. (2016). Statistical Analysis of Geographic Information with ArcView GIS and ArcGIS. Wiley. | |
| Learning outcomes: | Upon completion of the course, students should be able to:<br><br>1. **Appreciate** the significance and methods of Cartography<br>2. **Evaluate** the significance of map projection in map making<br>3. **Learning** the different aspects of design in cartography.<br>4. **Assess** different techniques of Map production and Reproduction | |

Programme: M. A. (Geography)
Course Code: **GOG-607**

**Title of the Course: Theory:**
Quantitative and Statistical Techniques in Geographic Research

Number of Credits: 4
Effective from AY: 2023-2024

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| Prerequisites for the course: | Basic knowledge of Statistics | |
| Objectives: | The key focus of this course is to develop statistical literacy and provide practical experience in using real sets of data addressing meaningful research questions. | |
| Content: | 1. Importance and relevance of Statistics in Geography and Geographical Research, Data Sources: Census, SRS, NSS, Field data Collection, Remote Sensing, Sample Data, Sample: Significance in research and data collection, advantages of sampling, sampling methods, Sampling Techniques, random numbers. Sampling Plan, Frequency & cumulative frequency distribution, Graphical & Diagrammatic representation. Classification, Tabulation (format) and types of table | 15 Hours |
| | 2. Measures of central tendency and partition values: Arithmetic & Weighted Mean, Median, Mode, Quartiles, Deciles, and Percentiles for Grouped & Ungrouped data. Combined mean. | 15 Hours |
| | 3. Measures of Dispersion: Absolute measures of dispersion and skewness: Range, Quartile Deviation, Mean Absolute Deviation, Standard Deviation, Variance. Coefficient of variation (C.V.) | 15 Hours |
| | 4. Co-relation and Regression analysis: Scatter Diagram, Karl Person's Co-efficient correlation, Spearman's rank Correlation, Kendall's rank correlation, Regression analysis. Statistical calculations and graphical presentation by hand and spreadsheets or statistical software (e.g. Microsoft Excel etc.) | 15 Hours |
| Pedagogy: | Lectures, Group Discussions, Student Seminars, Presentations, Case Studies, Tutorials, Assignments, Blended learning, Gamification, Problem-solving approach through logic, Experiential learning, Multi-literacies and discussion-based teaching, Brainstorming, Guided Questioning, Interpretive Trails, Stimulus activities, Critical incidents, Fieldwork and outdoor learning, Flipped classroom pedagogy, Art Integrated | |

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| | Learning, Cutting Edge, Cooperative Learning Strategies. Flipped classroom, Art Integrated Learning, Project-based Learning, Cutting Edge Pedagogy, and Cooperative Learning Strategies. | |
| References/ Readings: | 1. Cole, John P. and King, Cuchlaine A. M. (1968). Quantitative Geography. John Wiley. London.<br>2. Gregory, S. (1978). Statistical Methods and the Geographer. Longman. London.<br>3. Haining, R. (2003). Spatial Data Analysis: Theory and Practice. Cambridge University Press.<br>4. Hammond, R and McCullagh, P. S. (1974). Quantitative Techniques in Geography: An Introduction. Oxford: Clarendan Press.<br>5. Johnston, R. J. (1973). Multivariate Statistical Analysis in Geography. London: Longman, London.<br>6. Lee, J., & Wong, D. W. S. (2001). Statistical Analysis with ArcView GIS. Wiley.<br>7. O'Sullivan, D., & Unwin, D. J. (2014). Geographic Information Analysis (2nd ed.). Wiley.<br>8. Rogerson, P. A. (2010). Statistical Methods for Geography: A Student's Guide. Sage Publications<br>9. Unwin, David (1981). Introductory Spatial Analysis. Methuen and Co. London.<br>10. Wong, D. W. S. (2010). Spatial Statistics for Geoscientists: An Introduction. Springer.<br>11. Yeats, Maurice (1974). An introduction to Quantitative Analysis in Human Geography. MacGraw Hill. New York. | |
| Learning outcomes: | On completion of the course, students will be able to:<br>1. **Explain** the role of quantitative information in geographic research and applications.<br>2. **Demonstrate** an understanding of basic descriptive statistics and regression methods as they apply to problem solving in Geography.<br>3. **Perform** basic data manipulation, statistical calculations and graphical presentation by hand, and using spreadsheets or statistical software (e.g. Microsoft Excel etc).<br>4. **Identify** when and where statistical procedures are appropriate. | |

Programme: M. A. (Geography)
Course Code: **GOG-608** **Title of the Course: Theory:** Principles and Practices of Settlement Geography

Number of Credits: 4
Effective from AY: 2023-2024

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| Prerequisites for the course: | No prerequisites are identified for this course | |
| Objectives: | The main focus of this course is to development of theoretical and methodological approaches in settlement geography by helping correlate various land use related to urban morphological theories with urban centers. Further fosters ability to think in spatial terms, using geographic principles to understand the past as well and present growth of settlements. | |
| Content: | 1. Settlement Geography: Nature, scope and significance, Approaches to study Settlement Geography. Evolution and growth of human settlements, Definition and types of settlements, Factors affecting settlement development: Site, situation and location. Settlement Patterns: Spacing, dispersion and localization. Factors affecting growth of settlement | 15 Hours |
| | 2. Geography of Rural Settlements: Introduction to rural settlement geography, Approaches to rural settlement geography; Morphology of rural settlements; Rural service centers: nature, hierarchy, service area and interaction; functional growth, Socio-economic transformation in rural areas. Rural planning and challenges. | 15 Hours |
| | 3. Geography of Urban Settlements: Introduction to urban settlement geography, Concept and processes of urbanization, sub-urbanization, Rural-urban fringe, urban sprawl, conurbation; Functional classification of urban settlements; Size and spacing of cities: rank-size rule, law of primate city, urban hierarchies; Urban problems, Urban planning and challenges, Concept of smart city, Garden city movement, Urban agriculture. | 15 Hours |
| | 4. Theories and Models in Settlement Geography: Multiple nuclei theory; Central place theory; Concentric zone model; Sector model. | 15 Hours |

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| Pedagogy: | Lectures, Group Discussions, Student Seminars, Presentations, Case Studies, Tutorials, Assignments, Blended learning, Gamification, Problem-solving approach through logic, Experiential learning, Multi-literacies and discussion-based teaching, Brainstorming, Guided Questioning, Interpretive Trails, Stimulus activities, Critical incidents, Fieldwork and outdoor learning, Flipped classroom pedagogy, Art Integrated Learning, Cutting Edge, Cooperative Learning Strategies. Flipped classroom, Art Integrated Learning, Project-based Learning, Cutting Edge Pedagogy, and Cooperative Learning Strategies. | |
| References/ Readings: | 1. Carter, H. (1975). The study of urban geography. Edward Arnold, London.<br>2. Clark, J. I. (1981). Geography of Population: Approaches and Applications. Pergamon Press Ltd. Oxford.<br>3. David, P., Hopkinson M. (1983). The Geography of Settlements, Oliver & Boyd; 2nd Revised edition.<br>4. Deniel, P. (2002). Geography of Settlements. Rawat Publications, Jaipur and New Delhi.<br>5. Frazier, A. E., & Lee, J. (2017). Settlement Geography of the Roman Empire. Cambridge University Press.<br>6. Garnier J. Beaujeu 1989. Geography of Population, Longman Group Ltd. London.<br>7. Gosh, S. (1998). Introduction to Settlement Geography. Orient Longman.<br>8. Haggett, Peter (1991). Geography-A Modern Synthesis, Harper & Row, New York.<br>9. Hornby W F., Jones M. (1991). An Introduction to Settlement Geography. Cambridge University Press.<br>10. Jones, M. (2017). Settlement Geography. Routledge.<br>11. Johnston, J. H. (1974). Urban Geography, Pergoman Press, Oxford.<br>12. Leedy, P. D., & Ormrod, J. E. (2014). Practical Research: Planning and Design (10th ed.). Pearson. | |

13. Mandal, R.B. (2000). Urban Geography, Concept Publishing Co., New Delhi.
14. Mayer, H.M., Cohen (1967). Readings in Urban Geography, Central Book Depot. Allahabad.
15. Mishra, R. P (1986). Economics of Growth and Development: Somaiya Publication Pvt. Ltd. Mysore.
16. Mosely, M.J. (2005). Rural Development: Principles and Practice. Sage Publication, London.
17. Northamray, M. (1975). Urban Geography, John Willey & Sons, New York.
18. Pacione, M. (2014). Urban Geography: A Global Perspective (3rd ed.). Routledge.
19. Ramachandran, R. (1991). Urbanization and Urban Systems in India, Oxford Uni. Press. Delhi.
20. Rykwert, J. (2004). Settlements. University of Pennsylvania Press, University Park, USA.
21. Sidhartha, K. and Mukherjee, S. (2000). Cities-Urbanizations & Urban Systems. Kisalaya Pub. Pvt. Ltd., New Delhi
22. Singh, R. L.: Readings in Settlement Geography. The National Geographical Society of India, Varanashi.
23. Singh, RY. (1994). Geography of Settlements. Rawat Publications. New Delhi, Jaipur.
24. Singh, R.L. (eds.) (1973). Rural Settlements in Monsoon Asia, National Geographical Society of India, Varanasi.
25. Singh, R. L., Singh, K.N. and Singh, Rana P.B., (eds.) (1975). Readings in Rural Settlement Geography, National Geographical Society of India, Varanasi.
26. Singh, R. L. and Singh, Rana P. B. (eds.) (1978). Transformation of Rural Habitat in Indian Perspective, National Geographical Society of India, Varanasi.
27. Singh, R.L. and Singh, Rana P.B., (eds.) (1979). Place of Small Towns in India. National Geographical Society of India, Varanasi.
28. Singh, R.L., Singh, K.N and Singh Rana P.B., (eds.)

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| | (1976). Geographic Dimensions of Rural Settlements. National Geographical Society of India, Varanasi.<br>29. Wood, M. (2005). Rural Geography: Processes, Responses and Experiences of Rural Restructuring. Sage Publication, London.<br>30. Yeates & Garner (1971). Readings in Urban Geography. The North American City. Harper & Row. New York | |
| Learning outcomes: | At the end of the course, students will be able to:<br>1. **Analyze** the evolution of settlements and settlement Patterns<br>2. **Understand** the morphogenesis of Rural Settlements and their transformation.<br>3. **Evaluate** the urban problems & their planning<br>4. **Apply** theories and models of settlement geography to understand the structure of settlements. | |

Programme: M. A. (Geography)
Course Code: **GOG-609** **Title of the Course: Theory:** Research Techniques in Tropical Geomorphology

Number of Credits: 4
Effective from AY: 2023-2024

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| Prerequisites for the course: | Knowledge of Geomorphology | |
| Objectives: | This course is aimed to develop in-depth understanding of various processes and products of the Tropical Geomorphology | |
| Content: | 1. Definition of Tropics; Peculiar features of tropical climate; intensity and erosivity of rainfall, role of vegetation, Morphogenetic classification. | 15 Hours |
| | 2. Geomorphic Processes and products: Weathering profiles, tropical soils and clay minerals, Relief, drainage and landforms-slopes, valleys, domes, inselbergs, tors and ventifacts-pediments; characters, distribution and origin and theories of development-plane surfaces in tropical region, Duricrusts: Definition and Types. | 15 Hours |
| | 3. Mass movement, denudation, Fluvial processes in tropics Surface processes, pipe flows, gully erosion, fluvial erosion. | 15 Hours |
| | 4.Quaternary glaciations in the tropics, Climate change, Sea-level change; The Ganga River system: Quaternary, adjustments; Quaternary changes around the Sunda Shelf, Anthropogenic alteration of geomorphic processes in the tropic's, Urban geomorphology in the tropics. The future with climate change | 15 Hours |
| Pedagogy: | Lectures, Group Discussions, Student Seminars, Presentations, Case Studies, Tutorials, Assignments, Blended learning, Gamification, Problem-solving approach through logic, Experiential learning, Multi-literacies and discussion-based teaching, Brainstorming, Guided Questioning, Interpretive Trails, Stimulus activities, Critical incidents, Fieldwork and outdoor learning, Flipped classroom pedagogy, Art Integrated Learning, Cutting Edge, Cooperative Learning Strategies. Flipped classroom, Art Integrated Learning, Project-based Learning, Cutting Edge Pedagogy, and Cooperative Learning Strategies. | |
| References/ Readings: | 1. Ahnert, F. (2006). Introduction to Geomorphology (2nd ed.). Oxford University Press.<br>2. Avijit Gupta (2011) "Tropical Geomorphology" - Cambridge University | |

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| | press Cambridge, UK.<br>3. Bloom, A. L. (2002). Geomorphology: A systematic analysis of late Cenozoic landforms. Prentice-Hall of India, New Delhi.<br>4. Faniran, A. and Jeje, L. K. (1983): Humid Tropical Geomorphology, Longman, London.<br>5. Ghosh, A. (2014). Tropical Geomorphology. Springer.<br>6. Gregory, K. J., & Thornes, J. B. (Eds.). (2013). The SAGE Handbook of Geomorphology. Sage Publications.<br>7. Goudie, A. (1985): Duricrusts in tropical and sub-tropical landscapes. Alien Unwin.<br>8. Kale, V. S. and Gupta, A. (2001): Introduction to Geomorphology, Orient Longman, Calcutta.<br>9. Singh, Savindra (2002): Geomorphology, Prayag Pustak Bhawan, Allahabad.<br>10. Summerfield, M. A. (1991). Global Geomorphology: An Introduction to the Study of Landforms. Longman.<br>11. Thomas, M. F. (1994): Geomorphology in the Tropics: A study of weathering and denudation<br>in low latitudes. John Wiley and Sons, Chichester.<br>12. Thornes, J. B., & Brunsden, D. (Eds.). (1977). Geomorphology in the Tropics: A Study of Weathering and Denuation in Low Latitudes. Wiley. | |
| Learning outcomes: | On completion of the course, students will be able to:<br>**1. Acquire** knowledge of the fundamental concepts of Tropical Geomorphology<br>**2. Understand** the tropical climate and its effects on tropical terrain and weathering<br>**3. Assess** the fluvial processes of the tropical region.<br>**4. Evaluate** the impact of anthropogenic interference in the geomorphic processes. | |

Programme: M. A. (Geography)
Course Code: **GOG-610** **Title of the Course: Theory:** Principles and Research in Coastal Geomorphology

Number of Credits: 4
Effective from AY: 2023-2024

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| Prerequisites for the course: | Knowledge of Bachelor's Programme in Geography | |
| Objectives: | The main focus of this course is to<br>• Provide a theoretical background of the coastal systems and which shape the coastlines around the world.<br>• Determine interactions between coastal geomorphic processes.<br>• Provide a detailed knowledge on all type's coastal environments. | |
| Content: | 1. Components of coastal systems processes, sediment transport, Morphology, Stratigraphy, Spatial and temporal scales in coastal Geomorphology, Coastal classification – Genetic and Morphological. | 15 Hours |
| | 2. Waves: Definition, Wave Characteristics, wave length, wave height, amplitude, depth, period, fetch, frequency; Types of waves, Process of shoaling, wave breakers. Ocean Currents: Currents – and its types<br>Tides: Equilibrium Theory of tides, semi-diurnal, diurnal, spring and neap tides, coastal tides, tides in bays and estuaries; Amphidromic point (tidal node) co-tidal lines. Mechanism of Transgression, Regression, Relative and eustatic sea level changes, sea level change: Causes and consequences. | 15 Hours |
| | 3. Fluvial dominated costal environments: Coastal deltas: Classification, formation, morphology of delta plain, Wave-dominated: Process, Formation and morphology of erosional and depositional landforms.<br>Tide-dominated: Introduction: Estuaries and mud flats: morphology and Hydrodynamics.<br>Biotic environments: Mangrove swamps and salt marshes, Corals and coral reefs. | 15 Hours |
| | 4. Current coastal issues: Sea level rise, Storm hazard management, Coastal erosion Wetlands, Kharlands, Estuarine reclamation, Salt intrusion and subsidence of coastal aquifers, Human Encroachments in Coastal Zones, Coastal Zone Protection Efforts and Implementation. Effect of Climate Change on Coastal Geomorphology: Any 2 Case Studies. | 15 Hours |
| Pedagogy: | Lectures, Group Discussions, Student Seminars, | |

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| | Presentations, Case Studies, Tutorials, Assignments, Blended learning, Gamification, Problem-solving approach through logic, Experiential learning, Multi-literacies and discussion-based teaching, Brainstorming, Guided Questioning, Interpretive Trails, Stimulus activities, Critical incidents, Fieldwork and outdoor learning, Flipped classroom pedagogy, Art Integrated Learning, Cutting Edge, Cooperative Learning Strategies. Flipped classroom, Art Integrated Learning, Project-based Learning, Cutting Edge Pedagogy, and Cooperative Learning Strategies. | |
| References/ Readings: | 1. Davis, J. L. (1980): Geographical Variation in Coastal Development, Longman, New York.<br>2. Embelton and Thornes (1979): Processes in Geomorphology, Arnold, London.<br>3. Hails, J. and Carr, A (1975): Nearshore Sediment Dynamics and Sedimentation, Wiley, London.<br>4. Karlekar, Shrikant (1993): Coastal Geomorphology of Konkan, Aparna Publication, Pune.<br>5. Masselink, G. and Hughes. M, G. (2003): Introduction to Coastal Processes and Geomorphology, Arnold, London.<br>6. Pethick, John (1984): An Introduction to Coastal Geomorphology, Arnold Heinemann, London.<br>7. Tooley, M. M. and Shennan, I. (1987): Sea Level Changes, Basil Blackwell, Oxford, U K. | |
| Learning outcomes: | On completion of the course, students will be able to:<br>1. **Understand** coastal systems and processes.<br>2. **Evaluate** the mechanisms that control these processes.<br>3. **Analyze** different types of coastal environments and processes present in them.<br>4. **Understand** the impact of human influence on the coastal environments and need for their management. | |

Programme: M. A. (Geography)
Course Code: **GOG-611**

**Title of the Course: Theory:** Themes and Research of Industrial and Agricultural Geography

Number of Credits: 4
Effective from AY: 2023-2024

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| Prerequisites for the course: | Knowledge of Bachelor's Programme in Geography | |
| Objectives: | This course is aimed at acquiring knowledge of the fundamental and modern issues in Agricultural and Industrial Geography and also gain in-depth knowledge of the concepts and approaches of Agricultural and Industrial Geography | |
| Content: | 1. Industrial Geography: Definition, Nature, Scope, Manufacturing Industries and Regional economics. Characteristics of centralization and decentralization, Industrial Regions and Industrial Agglomerations. Weber's model, Losch's model, Greenhut's model, Israd's model, Agglomeration of industries, Industrial Linkages. | 15 Hours |
| | 2. Iron and steel, Cotton textile, Automobile, Chemical industries in First Ranking Nations in the World. Nature of industrial regions in India, Industrial location and Regional development of the surrounding, Case Studies of Locational factors for industries and the Characteristics of two industrial regions of India. | 15 Hours |
| | 3. Agriculture Geography: Nature, Scope and types of agriculture and Regional economics. Locational Factors: Geographical, Economical, Political, Socio-cultural; Characteristics of Agro-Climatic Regions of India, Agriculturally prosperous Regions and Agro-Product Agglomerations. Von Thunen's model, Agricultural-Industrial Linkages, Crop Combination, Crop Diversity, Agricultural Marketing Patterns. | 15 Hours |
| | 4. Rice, Wheat, Sugarcane, Cotton, Oil Seeds production and cultivation First Ranking Nations of the World, Nature of agricultural regions in India, Agriculture and Regional development, Case Studies of locational factors of two major agricultural regions of India | 15 Hours |
| Pedagogy: | Lectures, Group Discussions, Student Seminars, Presentations, Case Studies, Tutorials, Assignments, Blended learning, Gamification, Problem-solving approach through logic, Experiential learning, Multi-literacies and discussion-based teaching, Brainstorming, Guided Questioning, Interpretive Trails, Stimulus | |

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| | activities, Critical incidents, Fieldwork and outdoor learning, Flipped classroom pedagogy, Art Integrated Learning, Cutting Edge, Cooperative Learning Strategies. Flipped classroom, Art Integrated Learning, Project-based Learning, Cutting Edge Pedagogy, and Cooperative Learning Strategies. | |
| References/ Readings: | 1. Alexaderson, G. (1967): "Geography of Manufacturing", Prentice Hall, New Jersey.<br>2. Alexander, J. W. (1973): "Economic Geography", Prentice Hall, New Jersey.<br>3. Estall and Buchanan (1969): "Industrial Activity and Economic Geography"<br>4. Komar, P. D. (1998). Beach Processes and Sedimentation. Prentice Hall.<br>5. Masselink, G., & Gehrels, R. (2014). Coastal Environments and Global Change. Wiley.<br>6. Miller, E. C. (1977): "Manufacturing-A study of Industrial Location", Penn State University, University Park, U. S. A.<br>7. Riley, R. C. (1973): Industrial Geography, Progress Publication, Moscow.<br>8. Shaw, E. B. (1979): "An Anglo-America- A Regional Geography",<br>9. Short, A. D. (1999). Handbook of Beach and Shoreface Morphodynamics. Wiley.<br>10. Sloss, C. R., & Murray-Wallace, C. V. (2015). Coastal Tectonics. Geological Society of London.<br>11. Smith, David, M, (1971): "Industrial Location-An Economic Geographical Analysis", John Wiley and Son, New York.<br>12. Watts, H. D. (1989): Industrial Geography, Longman Group Ltd. Hong Kong. | |
| Learning outcomes: | On completion of the course, students will be able to:<br>1. **Understand** the relevance of Models and Theories of Industrial and Agricultural Geography in the modern context.<br>2. **Evaluate** the locational factors and their impact on the distribution of industries<br>3. **Analyze** the significance of agricultural marketing patterns<br>4. **Assess** the relationship between Agriculture and Regional development | |