

**Department of Geography**

**Faculty of Natural Sciences**

**Jamia Millia Islamia**

**New Delhi – 110025**

**(A Central University by an Act of Parliament)**

**B.A./ B.Sc. (H) Geography**

**Syllabus (w.e.f. 2019 – 2020)**

## Course Structure B.A / B.Sc (H) Geography (Code – H)

Paper No/Code	Title	Credit	Type
<b>Semester – I</b>			
Paper I (GEB 101- H)	Geomorphology	4	CC
Paper II (GEB 102 H)	Climatology and Oceanography	4	CC
Paper III (GEB – 103-H)	World Geography	4	CB
<b>Semester – II</b>			
Paper IV (GEB-201- H)	Hydrology	4	CC
Paper V (GEB – 202 -H)	Principles of Ecology	4	CB
Paper VI (GEB - 203 H)	Environmental Issues and Management	4	CC
<b>Semester – III</b>			
Paper VII (GEB – 301 H)	Human Geography	4	CC
Paper VIII (GEB – 302 H)	Economic Geography	4	CC
Paper IX (GEB – 303 H)	Basic Mathematics and Statistics	4	CC
Practical I (GEB – 304 H)	Land Surveying and GPS	4	AECC
<b>Semester – IV</b>			
Paper XI (GEB – 401 H)	Geography of India	4	CC
Paper XII (GEB – 402 H)	Population and Settlement Geography	4	CC
Paper XIII (GEB - 403 H)	Disaster Management	4	CC
Practical II (GEB – 404 H)	Cartographic Techniques	2	CC
<b>Semester – V</b>			
Paper XIII (GEB – 501H)	Urban Geography	4	CC
Paper XIV (GEB – 502 H)	Rural Geography	4	CC
Paper XV (GEB-503 H)	Fundamentals of Remote Sensing	4	CC
GEB-504 H			
Practical III (GEB-505 H)	Visual Image Interpretation	2	CC
<b>Semester – VI</b>			
Paper XVII (GEB – 601H)	Regional Development and Planning	4	CC
Paper XVIII (GEB-602 H)	Evolution of Geographical Thought	4	CC
Practical IV (GEB-603 H)	Fundamentals of Geographical Information System (GIS)	4	CC
Paper XIX GEB – 604 (H)	Acquisition and Analysis of Climatic Data	4	SEC

## **SEMESTER - 1**

### **Geomorphology**

#### **Paper -I (GEB 101- H)**

**Credits: 4**

#### **Unit I**

Nature and Scope of Geomorphology, Recent Trends in Geomorphological Studies, Geological Time Scale, Origin of the Continents and Oceans: Wegner's theory; Plate tectonics and Earth surface configuration, Interior Structure of the Earth.

#### **Unit II**

Major Landforms: Mountains, Plateaus, plains: their classification and distribution; Earth's Materials: Rocks- their origin, classification, and characteristics.

#### **Unit III**

Earth Movements: Endogenetic Processes: Eperogenetic and Orogenetic - Folds and Faults; Earthquakes- Classification and world distribution; Volcanic activity: causes, types, distribution and resultant landforms.

#### **Unit IV**

Geomorphic agents and processes: Exogenetic Processes- Denudational agents Weathering Process: Physical, Chemical and Biological; Mass wasting and resultant landforms; Fluvial, Aeolian, Karst, Coastal and Glacial landforms; Cycle of Erosion: Davis and Penck;

#### **Books Recommended:**

1. Dayal, P., 2015: Text-Book of Geomorphology, Shukla Book Depot, Patna.
2. Gabler R.E, Peterson. J.F., Trapasso, L.M. 2009. Essentials of Physical Geography Brooks/ Cole Cengage Learning.
3. Kale, V. and Gupta, A., 2004. Elements of Geomorphology. Oxford University press, Calcutta.
4. Strahler, A.H., 2013 (6th edition). Introducing Physical Geography. Wiley Pub.
5. Thornbury, W.D., 1991. Principles of Geomorphology, Wiley Eastern Ltd., New Delhi
6. Worcester, P.C. 1969. Text Book of Geomorphology. East West Press, New Delhi.
7. Savindra Singh. Fundamental Concepts in Geomorphology. PrayagPustakBhavan, Allahabad.
8. Gautam, A. 2015. Geomorphology. ShardaPustakBhawan.
9. Hugget, R.J. 2011. Fundamentals of Geomorphology. Routledge Pub.
10. Harvey, 2012. A. Introducing Geomorphology: A Guide to Landforms and Processes. Dunedin Academic Press

## SEMESTER - 1

### Climatology and Oceanography

#### Paper-II (GEB 102 H)

Credits: 4

#### Unit I

Introduction to Climatology; Climatology and Meteorology; Atmosphere: Origin, Composition and Structure; Weather and Climate: Elements and Controlling Factors; Temperature: Horizontal and vertical Distribution; Atmospheric Pressure and pressure belts; Winds: planetary, periodic and local

#### Unit II

Moisture in the Atmosphere: Humidity, Evaporation and Condensation, Precipitation, Thunderstorms. Atmospheric disturbances: Cyclones: Tropical and Temperate; Anti Cyclones; Climatic classification by Koppen Air Masses and Fronts: origin classification and characteristics; Climate change

#### Unit III

Oceanography: Definition, Nature and Scope; Reliefs of the Ocean Basins, Submarine Canyons: Origin and Significance, submarine Relief of Pacific, Atlantic and the Indian Ocean.

#### Unit IV

Oceanic Circulation: Tides and Currents; Origin of Tides and their types; Equilibrium theory of tides and Tsunamis; Ocean Deposits, Coral Reefs and Atolls; Salinity: Distribution and controlling factors, Marine resources: Conservation and management.

#### Books Recommended:

1. Andrew D. Ward and Stanley Trimble .2004(2nd edition). Environmental Hydrology, Lewis Publishers.
2. Barry, R.G. and Chorley R.J. 2009(9th edition). Atmosphere Weather and climate, Routledge Basu S.K. 2004(ed). Handbook of Oceanography. Global Vision, Delhi.
3. Critchfield, J.H. 1983(4th edition). General Climatology. Phi Learning Pub.
4. Das, P.K. 2011(3rd edition). The Monsoons. National Book Trust, New Delhi
5. Fein, J.S. and Stephens, P.N. 1987. Monsoon. John Wiley and Sons, New York
6. Garg, S.K. 2005. Hydrology and Water Resource. Khanna Publishers, New Delhi.
7. Garrison Tom. 2012. Geography: An Invitation to Marine Science. Brooks/Cole. New York Garrison Tom. 2008. Essentials of Oceanography. Brooks/Cole. New York
8. Hussain, Majid. 2010. Fundamentals of Physical Geography. Rawat Pub

9. Hussain, T and Tahir, M. 2012. Oceanography. Jawahar Pub., New Delhi
10. India Met. Deptt: Climatological Tables of observation in India
11. Lal, D.S. 2012. Climatology. ShardaPustakBhawan, Allahabad.
12. Lydolph.P.E. 1985. The Climate of the Earth. Roman &Allanheld Pub.
13. Menon,P.A. 1989. Our Weather, National Book Trust, New Delhi.
14. Savindra Singh. 2013. Oceanography. PrayagPustakBhawan, Allahabad.
15. Siddhartha, K. . 2013. Oceanography: A Brief Introduction. Kisalaya Pub., New Delhi
16. Singh, V.P., 1992. Elementary Hydrology. Prentice Hall Inc., Upper Saddle River, N.J. 9
17. Thompson, R.D. and Perry, A. 1997. Applied Climatology: Principles and Practice. Routledge.
18. Timothy, Davie,(2003), Fundamentals of Hydrology. Routledge, Taylor and Francis Group,U.K.
19. Trujillo, Alan P and Thurman Harold V. 2013. Essentials of Oceanography. Pearson - Prentice Hall

**SEMESTER – I**  
**World Geography**  
**Paper – III (GEB – 103 H)**  
**Credit: 4 (CB)**

**Unit - I: Geography of Asia**

Southeast Asia: Physical and Human Overview: Population, Climate and natural vegetation and mineral resources, Colonial and Modern Economics

Southwest Asia: Physical and Cultural overview: Population, Climate and natural vegetation and mineral resources, Petroleum economy

China: Physical and Human Overview: Population, Climate and natural vegetation and mineral resources, Economy

**Unit - II: Europe**

Geographical location, landforms, climate, resources, environmental modifications and crisis. History of Development; Population: Demographics, Religion, Languages, Level of Living, Distribution, Urbanization;

**Unit - III: US and Canada**

physical geography, resources for industrial growth, demographic characteristics, population mobility. Economic growth and restructuring.

**Unit - IV: Sub- Sahara Africa**

Sub-Saharan Africa: Physical and cultural Diversity, Climate, Colonial Legacy; Main Regions.

**Books Recommended:**

1. English, Paul Ward and James, A. Miller: World Regional Geography: A Question of Place, John Wiley, New York, 1989.
2. Jackson, Richard H. and Lloyd, E. Hudman: World Regional Geography: Issues for Today, John Wiley, New York, 1991.
3. Don, R. Hoy (ed.): Essentials of Geography and Development, MacMillan, New York, 1980.
4. Hussain, M. 2008, World Geography, Rawat Publications, Jaipur.
5. Khan, N. and Hoda, M. (2008) A Text Book on General Geography of Asia, Kalyani Publisher, New Delhi.
6. Goh, C.L., Morgan G.C. (1982) Human and Economic Geography, Oxford University Press.

**SEMESTER - II**  
**Hydrology**  
**Paper-IV (GEB-201 H)**  
**Credits: 4**

**Unit I**

Hydrology: Definition, Nature and Scope; Hydrological Cycle and its Components, Surface Water Sources: Precipitation, Runoff, Evaporation, Transpiration, Evapo-transpiration.

**Unit II**

Water Bearing Properties of Rocks: Porosity, Permeability, Specific Yield and Specific Retention, Classification of Rocks According to Water Bearing Properties.

**Unit III**

Underground Water: Geologic and Geomorphic Controls on Ground Water, Aquifers: Classification of Aquifers, Parameters of Confined, Semi-Confined and Unconfined Aquifers.

**Unit IV**

Ground Water Problems: Over-exploitation of Ground Water and Ground Water Mining, Climate Change Impact on Ground Water Resources, Groundwater Management: Rain Water Harvesting and Aquifer Recharge.

**SEMESTER – II**  
**B.A. / B.Sc. (H) Geography**  
**Principles of Ecology**  
**Paper - V (GEB – 202 H)**  
**Credits: 4 (CC)**

**Unit - I: Introduction to Ecology**

Definition, Subject-matter, Scope; Typology; Evolution and Development of Ecology; Difference between Ecology and Human Ecology.

**Unit - II: Environmental Interaction and Adaptation**

Environmentalism; Man and Environment Interaction; Preservation and Conservation; Human Adaptation and Modification; Environmental Adaptation Types: Aquatic, Desert and Land Adaptations.

**Unit - III: Nutrient and Biogeochemical Cycles**

Biogeochemical Cycles: Water Cycle, Nitrogen Cycle, Carbon Cycle, Phosphorous Cycle; Human Population Size and Growth; Carrying Capacity of Earth.

**Unit - IV: Ecosystem and Energy Flows**

Ecosystem: Definition, Components and Functions; Types of Ecosystem; Food Chain, Food Webs and Energy Trophic Levels; Ecological Pyramids; Energy Flow within the Ecosystem: Linear and Y- Shaped Model.

**Books Recommended:**

1. Odum, E.P. 2004. Fundamentals of Ecology. Cengage Learning, New York.
2. Arumugam, N. 2014. Concepts of Ecology. Saras Publication, Delhi.
3. Pushpam Kumar, Reddy B. Sudhakar. 2007. Ecology and Human Well Being. Sage Publication.
4. Robert Ezra Park. 2003. Human Communities: The City and Human Ecology. Freeman Press.
5. Vladimir F. Krapivin., Costas A. Varotsos. 2005. Biogeochemical Cycles in Globalization and Sustainable Development. Springer.
6. Lovett G.M., Jones C., Turns M.G., Weather K.C. 2005. Ecosystem Function in Heterogenous Landscapes. Springer.
7. Yueh-Hsin Lo, Juan A. Blanco and Shovonlal Roy. Biodiversity in Ecosystem. InTech Publishers.
8. Herbert C. Hanson. 1962. Dictionary of Ecology. Philosophical Library Publisher .
9. Ehrlich, P.R, Ehrlich, A.H. and Holdren, J.P. 2000(Revised). Human Ecology. W.H. Freeman & Co. San Franchisco.



**SEMESTER - II**  
**Environmental Issues and Management**

**Paper - VI (GEB - 203 H)**

**Credit: 4 (CB)**

**Unit - I: Introduction to Environment**

Environment: Definition, meaning and components; Environment as the basis of life; Human and Environment Interaction; Humanisation of Nature and Naturalisation of Human; Environmental disorders: Human impact on land, climate, natural vegetation and non-renewable natural resources.

**Unit - II: Environmental Issues**

Global Problems: Climate change, Global warming and ozone depletion; Local and Regional Problems: Extreme hydrological events; deforestation and desertification; pollution of air and water; Depletion of freshwater resources and degradation of soils.

**Unit - III: Environmental Strategies**

Uncertainty in managing environmental problems; Sustainable environmental development; Preservation and conservation; Integrated management, and community participation in management.

**Unit - IV: Environmental Management**

Management of air and water resources; Management of soil and forest resources; Management of habitats; Population management and food security; Adaptation to climate change.

**Books Recommended:**

1. Adams, W.M.1995: Green development: Environmental sustainability in the Third World;
2. London: Rout ledge.
3. Alexander, D. 1993: Natural Disasters, New Delhi: Research Press.
4. Allaby, M. 1996: Basics of Environmental science, London: Routledge.
5. Baarshes, W.H. 1996: Eco-fiction: Understanding the Environmental Debate, London: Routledge.
6. Brayant, E.A.1991: Natural Hazards, Cambridge: Cambridge University press.
7. Canter,L. W.1996: Environmental Impact Assessment, 2nd edition, New Yprk: McGraw hill.
8. Chapman,D. 1994: Natural Hazards, Melbourne: Oxford University Press.
9. Chapman J.L. and Reiss, M.J. 1993: Ecology: Principles and applications, Cambridge: Cambridge; University Press.
10. Colls, J.1997: Air Pollution: An Introduction, London: Chapman and Hall.

12. Das, R.C. and Behera, B.K. 2008: Environmental Science: Principle and Practice, Prentice
13. Hall of India Pvt. Ltd., Delhi

**SEMESTER - III**  
**Human Geography**  
**Paper - VII (GEB - 301)**  
**Credit: 4 (CC)**

**Unit - I: Introduction to Human Geography**

Definition, nature and scope of human Geography; Branches of human Geography; Dichotomy of physical and human geography; Concepts of man and environment relationship; Environmental Determinism and Possibilism.

**Unit - II: Patterns of Population**

Growth and distribution of population in the world; Age sex structure; Theories of Population growth: Malthus, Demographic transition; Human Migration: Causes and consequences; Human Development Index.

**Unit - III: Human Settlements**

Settlement: Size, situation and classification; Origin and evolution of rural settlements; Types and patterns of rural settlement; Origin and growth of urban settlements; Process and pattern of urbanization, classification of cities based on site, size and functions.

**Unit - IV: Human Adaptation to Environment**

Evolution of man; Man in ecosystem; Ecological adaptation; Human adaptation in equatorial, monsoon, tundra and hot desert; Habitat, Economy and Society of Bakarwals, Tharus, Naga and Bhills.

**Books Recommended:**

1. Ahmad, Q.S. (1963): Major Natural Regions, S. Chand Publisher, Delhi.
2. Amit Harichandran, M.A. Chaudhry (2010): Global Vision Publication House, New Delhi-11002.
3. Kaushik, S.D. (1970): Manav Bhoogol, Rastogi & Co., Meerut.
4. Hoyt, J.B. (1973): Man and the Earth, Prentice Hall, New Jersey.
5. Husain, Majid (2010): Human Geography, Rawat Publication, Jaipur.
6. Husain, Majid (2010): Manav Bhoogol, Rawat Publication, Jaipur.

7. Leong, G. C.(1995): Certificate Physical and Human Geography, Oxford Publication.

**SEMESTER – III**  
**Economic Geography**  
**Paper - VIII (GEB - 302)**  
**Credit: 4 (CC)**

**Unit - I: Introduction to Economic Geography**

Definition, Subject Matter and Scope of Economic geography; Approaches to the Study of Economic Geography; Classification of Economic Activities; Economic Resources: Concept and Classification.

**Unit - II: Primary Activities**

Geographical factors, production and world distribution of crops: rice, wheat, tea, sugarcane; Whittlesey's classification of agricultural systems; Von Thunen's model of agricultural location.

**Unit-III: Secondary Activities**

World Distribution and Production of Iron ore, coal, petroleum; Factors of Industrial location; Distribution and potential growth of Iron and Steel industry, Cotton Textiles Industry; Weber's theory of industrial location.

**Unit - IV: Tertiary Activities**

Changing forms of international trade; International trade with references to GATT and WTO; Free trade initiatives; Regional Trade Organizations: SAARC, OPEC, BRICS.

**Suggested Books:**

1. T. A. Hartshorn and J. W. Alexander: Economic Geography, Latest edition. Prentice Hall, PHI Learning New Delhi.
2. P. K. Roy: Economic Geography - A Study of Resources. Latest Edition, New Central Book Agency
3. W. P. Anderson: Economic Geography, Latest Edition. Routledge
4. R. Knowles and J. Wareing: Economic and Social Geography Made Simple, Latest Edition. Rupa Publications
5. B. J. L. Berry, E. C. Conklin and M. D. Ray: The Geography of Economic System, Latest edition. Prentice Hall
6. J. L. Guha and P.R. Chattarji: A New Approach to Economic Geography – A Study of Resources, Latest Edition. World Press, Kolkata
7. G. Alexandersson: Geography of Manufacturing, Latest Edition. Prentice Hall, New Delhi
8. Hartshorn, T.A. and Alexander, J.W. 1988: Economic Geography, Prentice Hall India, New Delhi.
9. Jones, C.F. and Darkenwald, G.G. 1954, Economic Geography, Macmillan, New York.
10. Leong. G.C. and Morgan, G.C. 1975: Human and Economic Geography, Oxford University Press, Hong Kong.

**SEMESTER - III**  
**Basic Mathematics and Statistics**  
**Paper - IX (GEB - 303)**  
**Credit: 4 (CC)**

**Unit - I: Measures of Central Tendency and Association**

Measures of Dispersion: Mean Deviation, Quartile Deviation, Standard Deviation; Karl Pearson's Correlation; Spearman's Rank Correlation; Simple Linear Regression.

**Unit – II:** Types of Sampling; Nature of Statistical Data: Discrete, Continuous; Measures of Data: Quantitative and Qualitative Data; Quartile; Nested Mean; Bar Graph, Histogram, Line Graph, Frequency Polygon, Ogive Curve, Normal and Skewed, Pie-Chart.

**Unit-III:** Algebra, Trigonometry, Geometry and Mensuration

Polynomials, zeros, pair of linear equation, quadratic equation, trigonometric ratios, 2D and 3D geometry, circles, ellipse, parabola, hyperbola, surface area and volume (circle, cylinder, cone and sphere etc.)

**Unit-IV:** Matrix and calculus

Introduction to matrix; order, type and operation on matrix; Transpose, inverse Adjoint and rank of matrix; Determinants of a matrix, Introduction to functions, limits of continuity, Differentiation, integration; Differential Equation

**Books Recommended:**

1. Alvi, Z; 1995: Statistical Geography, Rawat Publication, Jaipur.
2. Mahmood, A; 1986: Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi.
3. Goon, A.M; Gupta, M.K. & Dasgupta, B. 1992: Fundamentals of Statistics, Volume I, The World Press Pvt. Ltd; Kolkata.
4. Gregory, S.1985. Statistical Methods and the Geographers, Longman, London.
5. Peter A. Rogerson; 2006: statistical methods for Geography, Sage Publication, Asia Pacific Ltd. Singapore.
6. Johnson. R.A. Bhattacharyya. G.K. (2009): Statistics: Principles and Methods, John Wiley and Sons, USA.
7. Micheal C.J. (2005): Statistics: An Introduction. R. John Wiley and Sons, USA.
8. Norcliff, G.B., (1977): Inferential Statistics for Geographers: An Introduction, Hutchinson, London.
9. David. E. (1985): Statistics in Geography, Basil Blackwell Ltd, Oxford.
10. Johnston, R.J. (1978): Multivariate Statistical Analysis in Geography, Longman Group Limited, London.
11. Burt J.E. Barber. G.E. Rigby D.L. (2009): Elementary Statistics for Geographers, Guilford Press, New York.

**SEMESTER - III**  
**Land Surveying and GPS**  
**Practical - I (GEB - 304)**  
**Credit: 4 (AECC)**

**Unit - I:**

Surveying: Definition, Principles, Methods, Classification; Plane and Geodetic Surveys;  
Triangulation: Principles, baseline measurement, extension of the base.

**Unit - II:**

Plane Table Survey: Radiation, Intersection and Resection Methods; Dumpy Level Survey:  
Simple and Compound Levelling.

**Unit - III:**

Overview of Global Positioning System; GPS: Receivers, Satellite Constellations, Segments,  
Antennas, Signal Codes and Errors; Accuracy of GPS measurements; Application of GPS.

**Unit - IV:**

GPS Surveying and Mapping: Field Exercises using Hand Held GPS.

**Books Recommended:**

1. Aylmer Johnson. 2004. Plane and Geodetic Surveying. CRC Press.
2. Singh R. L. and Singh R. P. B., 1999: Elements of Practical Geography, Kalyani Publishers.
3. Gupta K.K. and Tyagi, V. C., 1992: Working with Map, Survey of India, DST, New Delhi.

**SEMESTER - IV**  
**Geography of India**  
**Paper - XI (GEB – 401 H)**  
**Credit: 4 (CC)**

**Unit – I: Physical**

Geology and Structure, Physical Divisions of India, Drainage, Soil, Climate, Natural Vegetation, Agro-climatic Regions.

**Unit – II: Population**

Population: Growth and Distribution, Population Composition: Sex ratio, Rural and Urban population, Literacy, Urbanization, Social structure of population: Distribution by Race, caste, religion and language.

**Unit – III: Agriculture**

Agriculture: Production and Distribution of Food crops- Rice and Wheat, Maize; Production and Distribution of Cash crops- Cotton, Sugarcane and Tea, Green Revolution, Minerals: Production and Distribution of iron ore, coal and petroleum.

**Unit – IV: Industry**

Energy resources: Conventional and Non-Conventional; Industries: Mineral-based and Agro-based; Industrial Regions, Industrial Policy, SEZ, Transport and Communication. Regionalization of India: Physiographic Regional scheme of R.L. Singh.

**Books Recommended:**

1. Hussain.M. 2009, Geography of India, Tata McGraw-Hill companies Book.
2. Kalpana Raja Ram, 2007, Geography of India, Spectrum Books, New Delhi 110058.
3. Learmonth A.T.A et.al (ed) Man and land of South Asia, Concept
4. Shafi, M: Geography of South Asia, McMillan & Co; Calcutta, 2000.
5. Singh, R.L. (Ed). India: A Regional Geography, National Geographical Society, India.
6. Alexander, J.W.1965 Economic Geography.
7. Deshpande C. D., 1992: *India: A Regional Interpretation*, ICSSR, New Delhi.
8. Grigg, D. B. , 1974 *The Agricultural Systems of the World: An Evolutionary Approach*. Cambridge: The University Press.
9. Routray, J.K.: *Geography of Regional Disparity*, Asian Institute of Technology, Bangkok, 1993.
10. Sdhekhar.S.(edt.)2004, *Regional Planning in India*, Anmol Publications, New Delhi-2

**SEMESTER - IV**  
**Population and Settlement Geography**

**Paper - XII (GEB – 402 H)**  
**Credit: 4 (CB)**

**Unit - I: Introduction to Population Geography**

Subject matter and scope of Population geography, Sources of Population Data: Census, Vital Statistics and National Sample Survey, Trends of Population Growth in the World; World Pattern of population distribution.

**Unit - II: Population Dynamics**

Population Dynamics: Fertility, Mortality and Migration, Composition of population: Rural and Urban, Literacy, Sex ratio, Trend and pattern of Urbanization, Population Policy of India.

**Unit - III: Settlement Geography**

Definition and scope of settlement geography, Historical evolution of settlements, Types of Settlements, factors affecting growth of settlements.

**Unit - IV: Settlements: Types and function**

Rural and Urban Settlements: Types and Classification, Theories of City Structure: The Concentric Ring Theory, The Multiple Nuclei Theory, Settlements as Service Centres.

**Books Recommended:**

1. Ramachandran, R., Urbanization and Urban Systems in India, Oxford University Press, New Delhi, 1992.
2. Singh, R.L. and KashiNath Singh (editors), Readings in Rural Settlement Geography, National Geographical Society of India, Varanasi, 1975.
3. Chandana, R.C. (2008): Geography of Population: Concepts, Determinants and Patterns, 7th Edition, Kalyani Publishers, New Delhi.
4. Clarke, J.I. (Ed.) (1984): Geography and Population: Approaches, Pergamon Press Ltd; Oxford.
5. Demco, G.J; Rose, H.M. Schnell, G.A. (1970): Population Geography, McGraw Hill Book Co; New York.
6. King, Leslie, J., Central Place Theory, Sage Pub., New Delhi, 1986..
7. Mayer, M. Harold and Clyde F. Kohn (editors), Reading in Urban Geography, Central Book Depot, Allahabad, 1967.
8. Trewartha, G.T. (1969). A Geography of Population: World Patterns, John Wiley and Sons, New York.



**SEMESTER - IV**  
**Disaster Management**  
**Paper - XIII (GEB – 403 H)**  
**Credit: 4 (CC)**

**Unit - I: Introduction**

Disasters: Concept and Nature, Magnitude and Types; Consequences of Disaster; Social, Economic and Environmental.

**Unit - II: Vulnerability, Preparedness and Risk Assessment**

Risk and Vulnerability: Concept and Classification, Types of Risk and Vulnerability, Disaster Preparedness; Concept and Nature, Public Awareness Programs.

**Unit - II: Mitigation and Planning**

Meaning, Concept and Strategies of Disaster Mitigation, Pre-Disaster and Post-Disaster planning, Role of International Agencies in Disaster Mitigation and Planning, Significance of Information Technology, Remote Sensing and GIS in Planning and Management

**Unit - IV: National Perspective**

Disaster Prone Areas of India; Seismic Zones, Areas prone to Floods and Droughts, Landslides, Cyclones , Industrial Disaster, National Disaster Management Plan (NDMP)-2016.

**Books Recommended:**

1. Bryant Edwards (2005): Natural Hazards, Cambridge University Press, U.K.
2. Carter, W. Nick, 1991: Disaster Management, Asian Development Bank, Manila.
3. Singh, R. B. (ed.), (2006) Natural Hazards and Disaster Management: Vulnerability and Mitigation, Rawat Publications, New Delhi.
4. Kapur, A. (2010) Vulnerable India: A Geographical Study of Disasters, Sage Publication, New Delhi
5. Government of India, 1997, Vulnerability Atlas of India, New Delhi
6. Sahni, Pardeep et.al. (Eds.) 2002, Disaster Mitigation, Experiences and Reflections. Prentice Hall of India, New Delhi.

**SEMESTER - IV**  
**Cartographic Techniques**  
**Practical - II GEB – 404 (H)**  
**Credits: 2 (CC)**

**Unit - I: Fundamentals of Cartography**

Definition and Scope of Cartography; Scale: Concept and Methods of Representation; Drawing of Plain, Comparative and Diagonal Scales.

**Unit - II: Cartographic Techniques**

Diagram: Bars- Simple, multiple and compound; Wheel Diagram-simple, compound and proportional circle; Thematic Mapping: Choropleth and Isopleth

**Books Recommended:**

1. Monkhouse. F. J. and Wilkinson. H. R. 1972: Maps and Diagrams. Methuen, London
2. Robinson A. H., 2009: Elements of Cartography, John Wiley and Sons, New York.
3. Khan Jabir, Hasan T & Shamshad, Scales, Academic Publications, 2014
4. Misra, R. P. 1969. Fundamentals of Cartography, Prasaranga. University of Mysore, Mysore.
5. Singh R. L. and Singh R. P. B., 1999: Elements of Practical Geography, Kalyani Publisher

**SEMESTER - V**  
**Urban Geography**  
**Paper - XIII (GEB – 501 H)**  
**Credit: 4 (CC)**

**Unit - I: Basic Concepts**

Urban Geography: Definition, Nature and Scope; Evolution of Towns: Ancient, Medieval and Modern Period; Trend of Urbanization, Urban Sprawl.

**Unit - II: Cities: Growth and Evolution**

Urban morphology and Land use patterns, models of urban growth and evolution: Burgess's Concentric Zone Theory; Hoyt's Sectoral Model; Harris and Ullman's Multiple Nuclei Model.

**Unit - III: Cities: Functions**

Functional Classification of Towns: Harris, Nelson, Law of Primate City, Rank-Size Rule; Hierarchy of central Place: Growth Pole Theory,

**Unit - IV: Contemporary Issues**

Contemporary Urban Issues: Urban Poverty, Slums, Urban crimes; Urban pollution: Air, water and Noise; Emerging Issues: Concept of Urban Heat Island, Problems of Indian Cities.

**Books Recommended:**

1. Alam, S.M., 1964. Hyderabad-Secunderabad Twin Cities. Asia Publishing House. Bombay.
2. Berry, B.J.L. and Horton F.F; 1970 Geographic Perspectives on Urban Systems. Prentice Hall, Englewood Cliffs, New Jersey.
3. Carter, H; 1976. The Study of Urban Geography, Edward Arnold Publishers, London.
4. Hall, T; 2001. Urban Geography. Routledge, London.
5. Kundu, A; 1992. Urban Development and Urban Research in India. Khanna Publication.
6. Ramchandran. R; 1988. Urbanization and Urban System in India, New Delhi, Oxford Publication.
7. Krishan, Gopal; 1974. Nagar Bhugol, Punjab State University Text Book board, Chandigarh.
8. Hughes, Sara, Chu, Eric K., Mason, Susan G. (Eds.) (2018) Climate Change in Cities, Springer Publishers.

**SEMESTER - V**  
**Rural Geography**  
**Paper - XIV (GEB – 502 H)**  
**Credit: 4 (CC)**

**Unit - I: Introduction to Rural Geography**

Concept and scope of rural geography; different approaches to the study of rural settlement geography; rural development indicators: agricultural sector, industrial sector, social sector, and infrastructural sector.

**Unit - II: Rural Settlement**

Rural settlement: Definition and characteristics; Types and pattern of rural settlement; Rural-urban Continuum; Rural-urban Fringe: Structure, characteristics and functions.

**Unit - II: Rural Economy**

Agriculture; Non-farm Occupation; Agro-based Industry; Household Industry; Rural Economy and Social Development; Rural service centers and their hierarchy.

**Unit - IV: Rural Development**

Rural Development: elements, objectives, scope and significance; Determinants of rural development; Rural development programmes; Role of Panchayati Raj Institution; Sustainable rural development.

**Books Recommended:**

1. Chisholm, M., Rural Settlement and Land Use, Hutchinson, London, 1970
2. Clout, H. D., Rural Geography: An Introductory Survey, Pergamon Press, 1972.
3. Clout, R.D., Rural Geography, Pergamon Press, London, 1970
4. Nath, V. 2010. Rural Development and Planning in India, Concept Pub., New Delhi.
5. Sinha, R.N.P; Geography and Rural development; Manohar Publishers and distributors, New Delhi.
6. Woods, M., Rural Geography: Processes, Responses and Experiences in Rural Restructuring, Sage Publications, 2005.
7. Woods, M., Rural, Routledge, Oxon, 2011.

**SEMESTER-V**  
**Fundamentals of Remote Sensing**  
**Paper-XV (GEB-503 H)**  
**Credits: 4**

**Unit I**

Introduction, Types and Historical Development of Remote Sensing, Remote Sensing as a Tool for Geographers, Satellite Remote Sensing VS Aerial Photography, Remote Sensing Data Acquisition and Analysis, Remote Sensing Processes.

**Unit II**

Basic Principles of Remote Sensing: Electromagnetic Radiation, Electromagnetic Spectrum, Atmospheric Interaction with Electromagnetic Radiation, Energy Interaction with Earth's Surface Material, Spectral Signature and Curve.

**Unit III**

Microwave Remote Sensing: Introduction, The Radar Principle, Factors Affecting Microwave Measurements, Side Looking Airborne Radar (SLAR) System, Synthetic Aperture Radar (SAR), Interpretation of SAR Images

**Unit IV**

Remote Sensing Platforms and Sensors: Satellite System Parameters: Instrumental Parameters and Viewing Parameters, Sensor parameters: Spatial Resolution, Spectral Resolution, Radiometric Resolution, Imaging Sensor Systems: Multispectral Imaging Sensor System, Thermal Sensing System, Microwave Imaging System, Earth Resource Satellites: Landsat, SPOT and IRS Satellite Programme System.

**SEMESTER V**  
**Visual Image Interpretation**  
**Practical Paper-III (GEB-505- H)**  
**Credits: 2**

**Unit I**

Introduction, Nature and Scope of Photogrammetry, Fundamental Concepts of Photogrammetry, Types and Scale of Aerial Photographs.

**Unit II**

Determination of Photo Scale, Construction of Instrument Base, Photo Base and Stereo Modal, Determination of Height of Objects Using Single Vertical Aerial Photograph

**Unit III**

Detection of Defined Objectives: Interpretation of Stereo Grams: Fluvial and Industrial, Interpretation of Stereo Pair, Interpretation of Salt Affected and Ravenous Areas

**Unit IV**

Satellite Imageries: Types and border Information, Feature Identification from Multiband Imageries, Interpretation of FCC for Landuse/Land cover Mapping: Chandigarh/Kolkata/Delhi, Banaras.

**SEMESTER - VI**  
**Regional Development and Planning**  
**Paper - XVII (GEB – 601 H)**  
**Credit: 4 (CC)**

**Unit - I: Region and Development**

Region: Concept, Definitions and Types; Development: Concept and Definition, Types of Development: economic development, sustainable development and human development

**Unit - II: Regional Development and Regional Planning**

Regional development: Concepts and indicators; Regional Planning: Concepts and purpose; Delineation of Planning Region, Types of Regional Planning: short and long term, single and multilevel, centralized and decentralized.

**Unit - III: Development Theories and Models**

Rostow's model, Core-periphery model of Friedman, Hirschman theory of unbalanced growth, Myrdal Cumulative Causation Theory

**Unit - IV: National Perspective**

Regional Planning in India: Five-year plans - goals and achievements; Regional imbalances and inequalities in India; Area Development plans: Concept, Types, Indian examples of area development plans; Metropolitan Plans: Case Study of a Metropolitan Indian City.

**Books Recommended:**

1. Glasson, 1980, Regional Planning, Hutchinson, London.
2. Friedmann J. and Alonso W., 1975 Regional Policy-Readings in Theory and Applications, MIT Press, Massachusetts.
3. Haynes J. 2008 Development Studies, Polity Short Introduction Series
4. World Bank 2018, World Development Report, Oxford University Press
5. Ray Chaudhary, J., 2001, An Introduction to Development and Regional Planning, Orient Longman, Hyderabad.
6. L. S. Bhat, 1972 Regional planning in India.
7. Jayasri Ray Chaudhuri, 2001 Introduction to Development and Regional Planning: With Special Reference to India.
8. Peet R., 1999: Theories of Development, The Guilford Press, New York.
9. India Human Development Report, 2011 Towards Social Inclusion, Institute of Applied Manpower Research, Oxford University Press, New Delhi, India.

**SEMESTER-VI**  
**Evolution of Geographical Thought**  
**Paper- XVIII (GEB-602 H)**  
**Credits: 4**

**Unit I**

Early Origin of Geographical Thinking with Reference to Thales, Hecataeus, Herodotus, Eratosthenes, Ptolemy.

**Unit II**

Dark Age in Europe and its Impact on Geography, Development of Geography in Arab World During Medieval Time, Contribution of Ai-Masudi, Al-Biruni, Ibn-e-BaTuta, Ibn-e-Khaldun.

**Unit III**

Evolution of Geographical Thinking and Disciplinary Trends in Germany, France, Britain and United States of America.

**Unit IV**

Trends in Geography: Quantitative Revolution and Its Impact, Behaviouralism, Radicalism, System Approach, Changing Concept of Space in Geography, Future of Geography.



**SEMESTER-VI**  
**Fundamentals of Geographical Information System (GIS)**  
**Practical Paper IV (GEB-603 H)**  
**Credits: 4**

**Unit – I**

Introduction to GIS, Historical Evolution, Component and Scope of GIS, Functional Elements of GIS, GIS User Interface: Commercial GIS, Open Source GIS

**Unit II**

Data Import, Conversion of Data, Re-projection of Data: Raster and Vector, Attribute Handling.

**Unit III**

Spatial Analysis: Proximity, Overlay, Topographic Modeling: Digital Elevation Model (DEM), Triangulated Irregular Network (TIN), Slope, Aspect, Hill shading.

**Unit IV**

Application of GIS: Urban: Residential Area Analysis, Agriculture: Crop Acreage Yield Estimation, Forest: Susceptibility, Flood: Inundation.

**SEMESTER - VI**  
**Acquisition and Analysis of Climatic Data**  
**Paper - XIX (GEB – 604 H)**  
**Credit: 4 (SEC)**

**Unit -I: Climatic Data: Introduction**

Climatic Data: Concept and Utility; Types of Climatic Data: Temperature, Pressure, Humidity, Rainfall, Surface wind, Insolation, Clouds; types and their role in weather, Role of climatic data in Weather forecasting.

**Unit II Climatic Data: Acquisition**

Weather Instruments: Thermometer; Barometer; Wind vane; Rain gauge, Data sources: Weather Stations, Indian Meteorological Department, National Remote Sensing Centre (NRSC), Weather monitoring Satellites.

**Unit III Analysis of Data**

Interpretation of weather data: Temperature- Mean, Monthly, Diurnal range and trend analysis; Humidity; relative and absolute; Rainfall- trend and pattern; Wind speed and direction.

**Unit IV Representation of Data**

Climatic data representation: Iso-lines, Isobars, Line graphs; Wind roses; Climograph; Rainfall dispersion diagram; Ergograph, Synoptic charts; Weather maps