

EXISTING SCHEME OF PAPERS IN GEOGRAPHY

Sl.No.	Title of the Paper	L:T:P	Type	
FIRST SEMESTER				
1	Geographical Information System	2:0:1	HC	
2	Geomorphology	2:1:0	HC	
3	Techniques of Analysis in Physical Geography	0:0:3	HC	
4	Tourism Geography	2:1:0	SC	
5.	Natural Resources Management	2:1:0	SC	
6	Medical Geography	2:1:0	SC	
7	Thematic Cartography	2:1:0	SC	
8	Water Resources Management	2:1:0	SC	
9	Geography of Settlements	2:1:0	SC	
SECOND SEMESTER				
1	Applied Climatology	2:1:0	HC	
2	Conceptual Development in Geography	2:1:0	HC	
3	Techniques of analysis in Human Geography	0:0:3	HC	
4	Models in Geomorphology	2:1:0	SC	
5.	Research Methods in Geography	2:1:0	SC	
6	Agricultural Geography	2:1:0	SC	
7	Geography of Population Dynamics	2:1:0	SC	
8	Political Geography	2:1:0	SC	
9	Social Geography	2:1:0	SC	
10	GIS & Remote Sensing	3:1:0	OE	
11	Physical Geography	3:1:0	OE	
12	Geography of Karnataka	3:1:0	OE	
THIRD SEMESTER				
1	Introduction to Remote Sensing	2:1:1	HC	
2	Methods of Regional Analysis	2:2:0	HC	
3	Advanced Surveying	0:0:3	HC	
4	Transportation Geography	2:1:0	SC	
5.	Monsoon Climatology	2:1:0	SC	
6	Environmental Geography	2:1:0	SC	
7	Population Resources and Development	2:1:0	SC	
8	Urban Geography	2:1:0	SC	
9	Human Geography	3:1:0	OE	
FOURTH SEMESTER				
1	Economic Geography	3:1:0	HC	
2	Multivariate Statistics	2:1:1	HC	
3	Dissertation	0:0:5	HC	
4	Disaster Management	1:1:0	SC	
5	Regional Development Planning in India	1:1:0	SC	
6	Bio Geography	1:1:0	SC	
7	Advanced applications in Remote Sensing	1:0:1	SC	
8	Applied Geomorphology	1:0:1	SC	
9	Geography of India	3:1:0	OE	

PROPOSED SCHEME OF PAPERS IN GEOGRAPHY- June: 2019onwards (Annexure-II)

Sl. No.	Title of the Paper	L:T:P	Type	
FIRST SEMESTER				
1	Conceptual Development in Geography	2:1:0	HC	
2	Principles of Geomorphology and Geology	2:1:0	HC	
3	Techniques of Analysis in Physical Geography	0:0:3	HC	
4	Tourism Geography	2:1:0	SC	
5.	Natural Resources Management	2:1:0	SC	
6	Political Geography	2:1:0	SC	
7	Social Geography	2:1:0	SC	
8	Water Resources Management	2:1:0	SC	
9	Geography of Settlements	2:1:0	SC	
SECOND SEMESTER				
1	Applied Climatology	2:1:0	HC	
2	Geographical Information System	2:0:1	HC	
3	Techniques of analysis in Human Geography	0:0:3	HC	
4	Concepts in Geomorphology	2:1:0	SC	
5.	Research Methods in Geography	2:1:0	SC	
6	Agricultural Geography	2:1:0	SC	
7	Geography of Population Dynamics	2:1:0	SC	
8	Bio Geography	2:1:0	SC	
9	Thematic Cartography	2:1:0	SC	
10	GIS & Remote Sensing	3:1:0	OE	
11	Physical Geography	3:1:0	OE	
12	Geography of Karnataka	3:1:0	OE	
THIRD SEMESTER				
1	Introduction to Remote Sensing	2:1:1	HC	
2	Methods of Regional Analysis	2:2:0	HC	
3	Advanced Surveying	0:0:3	HC	
4	Transportation Geography	2:1:0	SC	
5.	Monsoon Climatology	2:1:0	SC	
6	Environmental Geography	2:1:0	SC	
7	Population Resources and Development	2:1:0	SC	
8	Urban Geography	2:1:0	SC	
9	Fluvial Geomorphology	2:1:0	SC	
10	Human Geography	3:1:0	OE	
FOURTH SEMESTER				
1	Economic Geography	3:1:0	HC	
2	Multivariate Statistics	2:1:1	HC	
3	Dissertation	0:0:5	HC	
4	Disaster Management	1:1:0	SC	
5	Regional Development Planning in India	1:1:0	SC	
6	Medical Geography	1:1:0	SC	
7	Advanced applications in Remote Sensing	1:0:1	SC	
8	Applied Geomorphology	1:0:1	SC	
9	Geography of India	3:1:0	OE	

FIRST SEMESTER

Paper-1

CONCEPTUAL DEVELOPMENT IN GEOGRAPHY

(HARD CORE) (L: T :P = 2:1:0 = 3 credits)

UNIT-I. Growth of Geography as a systematic science.

- i. Development of Geographical thought during pre and post - modern period – An overview:
- ii. Dualism in geography: Determinism V/S Possibilism; General Vs Particular; Quantitative vs qualitative

UNIT-II. Revolution in Geography:

a. Conceptual revolution:

- i) Philosophy of Space and distance in geography- Spatial implications and distance decay.
- ii) Spatial diffusion behavior and movements. Theory of diffusion.
- iii) Regional concepts and Regional methods in geography and regionalism

b. Quantitative revolution

- 1 Development of theories, Laws, models in geography
2. Paradigms in geography

UNIT-III. Contemporary issues in geography

A) Approaches in geography: Systems approach. Multi-disciplinary and inter disciplinary approach
Ecological approach.

B) Dimension in geography: Traditions in geography Global and local dimensions: Spatial dimensions:

C) Contemporary themes in Geographical perspective: gender geography;

UNIT-IV Themes in geography

Pragmatism; Positivism; functionalism; Existentialism; Idealism; Realism; Marxism; Radicalism;
Behaviouralism; Humanism.

References:

1. Milton E. Harvey and Brian P. Holly: themes in geographical thought, Rawat publication.
2. Sharma Y.K. : geographical thoughts, Lakshmi Narain Agarwal.
3. Dikshit. R.D. Geographical thought:A contextual history of ideas eastern economy edition.
4. LalithRana: Geographical thought: A systematic record of evolution. Concept publications.
5. David Harvey: explanation in geography, Rawat Publication.
6. Majid Husain: Evolution of geographical thought, Rawat Publication.

Paper-2

Principles of Geomorphology and Geology
(HARD CORE) (L:T:P = 2:1:0 = 3 credits)

UNIT-I. Geological Time Scale

- i) Era, Period and Epoch
- ii) Major events in Precambrian era
- iii) Major events in Carboniferous period
- iv) Mountain building activity
- v) Tertiary and quaternary geology

UNIT-II. Stratigraphy

1).Classification of rocks

- i) Physical and chemical composition of rocks
- ii) Factors effecting physical and chemical composition of rocks
- iii) Hard and Soft rocks
- iv) Weak and Strong rocks

2) Stratification

- i) Layers ii) Structures iii) Horizontal and vertical structure iv) Conformities and un-conformities
- v) Stratigraphic classification

UNIT-III. Structural Geology

- i) Elements of structural geology ii) Deposition textual and structure iii) Non – diastrophic structures

UNIT-IV. Major Structures and Tectonic events

- i) Convergent plate margin and associated landforms ii) Divergent plate margin and associated landforms iii) Transform plate margin and associated landforms

Reference:

1. Structural Geology by Robert J. Twiss and Eldridge M. Moores (Hardcover - Dec 15, 2006)
2. Structural Geology of Rocks and Regions, 2nd Edition by George H. Davis and Stephen J. Reynolds (Hardcover - Jan 19, 1996)
3. Fundamentals of Structural Geology by David D. Pollard and Raymond C. Fletcher (Hardcover - Sep 19, 2005)
4. Basic Methods of Structural Geology by Stephen Marshak and Gautum Mitra (Paperback - April 4, 1988)
5. Earth Structure: An Introduction to Structural Geology and Tectonics (Second Edition) by Stephen Marshak and Ben A. van der Pluijm (Hardcover - Dec 29,2003)
6. 3-D Structural Geology: A Practical Guide to Quantitative Surface and Subsurface Map Interpretation by Richard H. Jr. Groshong (Hardcover – Jul 24, 2008).

TECHNIQUES OF ANALYSIS IN PHYSICAL GEOGRAPHY (Practical)
(HARD CORE) (L:T:P = 0:0:3 = 3 credits)

UNIT I. Profile Drawing: Introduction, Uses, Types. Drawing and Extraction of Topographic profiles
Serial Profiles, Superimposed profiles, projected profiles, Composite profiles.

UNIT-II. Techniques of terrain mapping: Slope and Aspect map, Calculation of Gradient, Expression of slope in different forms- per cent and Angle of the slope, conversion of slope values, construction of slope maps using grids: Went worth's method, Dhurandhar's method and Smith's method. Altimetry frequency analysis, Hypsometric analysis.

UNIT-III. Fluvial Analysis: Morphometric analysis- Stream order analysis, Bifurcation Ratio Analysis, Sinuosity Index, Drainage density Analysis, Drainage Frequency Analysis, River flow analysis, Rainfall discharge relationship,

UNIT-IV. Geological Maps : Meaning, importance, important concepts like Dip – Direction and Angle of Dip, Plunge Lines, Strike Lines, Folds : cylindrical and non cylindrical folds, geometrical features of folds. Orientation of folds, **FAULTS :** Fault planes, slip and separation, classification of faults based on slip. Unconformity : Types of unconformity – overstep and over lap unconformity.

Reference:

1. R.L Singh: Elements of practical Geography, Kalyani Publications. 2005
2. RP. Mishra: Fundamental Cartography, Concept publication, New Delhi. 2001
3. R.Hammond and P.Mecullagh: Quantitative techniques in Geography. Claredon press, oxford. 1975.
4. Anson R.W and Colour use guidelines for mapping and visualization "visualization in modern Geography" Oxford.

TOURISM GEOGRAPHY
(SOFT CORE) (L:T:P = 2:1:0 = 3 credits)

UNIT – I. Nature, Scope, Definition & importance of Tourism. Approaches to the study of Tourism. Types of Tourism , Types of Tourist. Factors affecting Tourism (Tourist attraction)

UNIT- II. Tourism Motivations, Tourist Behaviour, Travel Agencies, Types of travel agents & tour operators. Organizational structure of travel Agencies, Membership & Types, Organizational structure of IATA Rules & conditions for Recognition of Travel Agency.

UNIT- III. Tour packaging – Definition, Components, types of package tour & Tour package – Designing & Developing Process, Destination & Market & Demand & Dimensions of Tourism. Tourism and GPS.

UNIT- IV. Travel & accommodation: Structure of accommodation. Travel & Transport – Modes of Transport, Tourism Planning & Environment.

Reference:

1. Rana Pratap and Kamala Prasad (2003) “Tourism Geography” Shree Publishers and Distributors, New Delhi.
2. Krishan K.Kamra & Mohinder chan (2006) basics of Tourism theory, operatuion & practice, Kanishka publishers New Delhi.
3. Batta.N (2004), “Tourism and the Enronment” Indus Book, New Delhi.
4. Bhatia A.K (2006) The business of Tourism concepts & strategies, sterling publishers prorate limited, New Delhi.
5. Bhardwaj, Kandan and Choudary (2004), “Domestic Tourism in India” Indus Books.
6. Bhatia A.K (2002) Interntional Tourism management, sterling publishers prorate limited, New Delhi.
7. Pran Nath Seth & Sushma Seth Bha2006t An introduction to Travel & Tourism , sterling publishers prorate limited, New Delhi.

NATURAL RESOURCES MANAGEMENT

(SOFT CORE) (L:T:P = 2:1:0 = 3 credits)

UNIT-I. Concept of Resources- Meaning, Definition, importance and classification of Resources, Appraisal of Natural Resources, Natural Resources Economics, History of Conservation, need for conservation and Management of Natural Resources –Role of Government and NGO Agencies, Resource Creating Factors. Environmental Risk- types, wildlife, forest risk and its impact on environment and its management.

UNIT- II. Land Resources-Land Evaluation Methods, Land classification Methods, Land use and Land cover Mapping changes. Issue related to land use change –Land use and population, Land use pattern in the world. Land source at stress, land use planning and development. Soil erosion, soil degradation, methods of conservation.

UNIT-III. Water Resources- Importance of water, Recent trends in water use in the world and in India, water crises, (stress) causes and consequences of water stress or crises , methods of water conservation, watershed management, coastal and ocean Resources management, Fisheries Management.

UNIT-IV. Minerals Resources: types of minerals, classifications of Major Minerals, their distribution and production. Such as Petroleum, Coal, Iron ore, Bauxite and Copper etc, and its uses. Mineral exploration methods, Mining and its effects on environment. Minerals conservation and mining policy

Reference:

1. Dr.Alka Gautham: Geography of Resources: Exploitation, Conservation and Mangement, Sharada Pustak Bhavan, Allahabad.
2. Dr.P.S.Negi: Geography of Resources: Kedarnath Ramnath Publishers, New Delhi
3. Dr.Rajashekara Shetty(2009): An Analysis of World Resources with reference to India, Sarala Raj, Ria Publishers, Mysore
4. Khanna K.K and Gupta V.K.(1993): Economic and Commercial Geography, Sultan Chand, New Delhi
5. Prof. Zimmerwan – World Resources and Industries
6. Roy, P.R(2001) Economic Geography – A Study of Resources, New Central Book Agency, Calcutta.

POLITICAL GEOGRAPHY
(SOFT CORE) (L:T:P = 2:1:0 = 3 credits)

UNIT-I. Concept of state and nation's state i) Spatial factor of state ii) Frontiers and Boundary

UNIT-II. Concepts of geo-politics and models of geo-politics i) Rim land ii) Heart land theory model iii) Sea Pointer model iv) Territorial Sea and Maritime Boundaries

UNIT-III. Geo – politics and world organization i) UNO ii) WHO iii) IMF iv) ADB v) WB vi) FAO

UNIT- IV. Global politics and global strategy i) Pre – world war period ii) Post – world war period iii) Post – communist downfall geopolitics iv) Post – global economic change geopolitics

Reference:

1. Australia and the Insular Imagination: Beaches, Borders, Boats, and Bodies by Suvendrini Perera
(Hardcover - Oct 27, 2009)
2. States of Emergency: The Object of American Studies by Russ Castronovo and Susan Gillman
(Hardcover - Nov 15, 2009)
3. The Impact of 9/11 on the Media, Arts, and Entertainment: The Day that Changed Everything?
by Matthew J. Morgan and Rory Stewart (Hardcover - Nov 24, 2009)
4. The 2008 Presidential Elections: A Story in Four Acts by Erik Jones and Salvatore

SOCIAL GEOGRAPHY
(SOFT CORE) (L:T:P = 2:1:0 = 3 credits)

UNIT-I. Nature, scope and development of social Geography, Social structure, Social process and Elements of Social Geography: ethnicity, tribe, dialect, language, caste and religion.

UNIT-II. Conceptual and methodological approaches in Social Geography, Philosophical basis of Social Geography Positivism, Humanism, Idealism, Phenomenalism, Existentialism, Structuralism and Radicalism. .

UNIT-III. Space and Society, Individual's space, Intimate, Personal Public and social space ,Spatial Interaction and Social relations, Theoretical space organic, perspective and symbolic space, Interaction and social relations

UNIT-IV. Social Groups, Primary and Secondary Groups, Social Structure, Models of Assimilation and Segregation. Social Wellbeing, Concepts, Components and Indicators of measurement of social wellbeing. Patterns of social wellbeing in world and India.

References:

1. Anand Aijazuddin(1999) : Social Geography, Rawat publications, Newdelhi.
2. Bulsara J.F(1970) : patterns of social life in metropolitan areas , Popular Prakashan Bombay.
3. Orang Mike (1998) Cultural Geography,Routledge Publication London.
4. Dubey, S.C (1991) Indian Society, National bank Trust, New Delhi.
5. Gergom. D and Lassy J (1985): Social relations and spatial structure Mcmillan .
6. Messey D et all (Eds) 1999: Human Geography today, policy press Combridge .
7. Herbert D.T and Smith D.M (1979): Socia problems and city Geographical Perspective Oxford

WATER RESOURCES MANAGEMENT

(SOFT CORE) (L:T:P = 2:1:0 = 3 credits)

UNIT-I. Sources of water, Atmospheric relationship of water: rainfall and temperature, evapo- transpiration, rainfall and runoff relationship, hydrological cycle. Rain harvesting as strategies of water resource conservation, other strategies of water conservation; water recycling.

UNIT-II. Hydrological, hydro-morphological and hydro-pedagogical assessment. assessment of surface and sub surface (ground water) discharge and recharge condition and water table relationship. Measurement of soil moisture, soil classification and water quality; Water logging and salinization, floods and droughts.

UNIT-III. Watershed management; concept of watershed; morphological units, morphogenetic classification, morphometric analysis, importance of watershed protection and approaches to watershed protection, watershed management.

UNIT-IV. Impact of modern development on water resource: - need of water for domestic and non-domestic use. Irrigation development and water resource management, Big and Small irrigation project and their impact on water resource, Tank and Well irrigation and their impact on water resource. Industrialization and its impact on water resource, Urbanization and its impact on water resource. Demand and supply position of water resource, contemporary water crisis.

Reference:

1. Bruce J.P. & R.H. Clerk, Introduction to hydrometeorology, pergamon press, Oxford, 1996.
2. David Keith todd, Ground water hydrology, John Willy and sons, New York, 1959.
3. Robert J. Reimold, watershed management, practice, policies and co-Ordination, McGraw-Hill, New Delhi, 1998.
4. B.D. Dhawan, Indian water resource management for Irrigation : Issues Critiques reiews, Commonwealth publishers, New Delhi, 1993.
5. Ravi Misra, Fresh water Environment, Anmol publication pvt.LTD, New Delhi, 2002.
6. Ramaswamy R. Iyer, water perspective, Issues, concerns, SAGE publications, New Delhi, 2003.

GEOGRAPHY OF SETTLEMENTS

(SOFT CORE) (L:T:P = 2:1:0 = 3 credits)

UNIT-I. Concept of rural and urban settlements; Nature, Scope, Significance and Recent Trends in Settlement Geography. Evolution of Settlements in India: Emergence of Village Settlements; rural settlement patterns, Origin and Growth of Towns; Basic and Non-Basic Concepts in Settlement formation. Distribution of Settlements, Spacing of Settlements –Application of Models of Christaller and Losch.-

UNIT-II. Rural Settlements Types & patterns of Rural Settlements, House Types, Morphology and Functions of Rural Settlements; Rural Service Centers and their Role in Urbanization Process. Indian Rural Settlements in Different Micro-Environmental Conditions: (a) Mountains (b) Desert Region (c) In the vicinity of Urban Centers.

UNIT-III. Urban Settlements: Urban morphology, sphere of urban influence, Classification of Urban Places, Non-Functional and Functional. Morphology of Indian Cities and Its Comparison with Western Cities; Functional Relations between Urban Settlements and their umlands. Settlement systems; primate city, rank-size rule, settlement hierarchy.

UNIT-IV. Theories in Settlement Geography –CBD, Centrifugal and centripetal forces theory, Urban Fringe, Urban structures theories. Rank size relationship. Settlement Geography of selected Indian Cities: Mumbai, Kolkata, Bangalore, Delhi, Chennai, Hyderabad, Pune, Laknow, Patna, Jaipur and Chandigarh. Urban development in India.

References:

1. Hudson, F. S. (1976) Geography of Settlements, Macdonald, London.
2. Northam Ray, M. (1979). Urban Geography, John Wiley and Sons, New York.
3. Ambrose, Peter, 1970: Concepts in Geography, Vol.-I, Settlement Pattern, Longman.
4. Baskin, C., (Translator) 1996: Central Places in Southern Germany, Prentice-Hall Inc. Englewood Cliffs New Jersey.
5. Haggett, Peter, Andrew D. Cliff and Allen Frey (Ed.) 1979: Locational Models Arnold Heinemann.
6. King, Leslie, J., 1986: Central Place Theory, Saga Publications, New Delhi.
7. Mayer, M. Harold and Clyde F. Kohn (Ed.) 1967 Readings in urban Geography, Central Book Depot, Allahabad.
8. Mitra, Asok, Mukherjee S and Bose, R., 1980: Indian Cities Abhinav Publications, New Delhi.
9. Nangia, Sudesh, 1976: Delhi Metropolitan Region, K.B. Publications, New Delhi.
10. Prakasa, Rao, V. L. S., 1992: Urbanisation in India: Spatial Dimensions, Concept Publishing Co., New Delhi.
11. Ramachandran, R., 1992: Urbanisation and Urban Systems in India, Oxford University Press, New Delhi.
12. Singh, R. L. and Kashi Nath Singh (Ed.) 1975: Readings in Rural Settlement Geography, National Geographical Society of India, Varanasi.

SECOND SEMESTER

Paper-1

APPLIED CLIMATOLOGY **(HARD CORE) (L:T:P = 2:1:0 = 3 credits)**

Unit- I: Nature and Scope, History, Development and Importance of Applied Climatology, Weather Analysis: Data Acquisition and Dissemination, Weather Instruments: Use and Functions.

Unit- II: Weather Forecasting Methods, Types and Accuracy, Medium Range and Long Range Forecasts, Role of Satellites in Weather Analysis and Forecasting; Relationships between Climate and Ocean; El-Nino, La-Nino effects.

Unit- III: Climate Change: Definition and Detection; Sea floor Sediment, Glacial Ice, Tree Rings and Oxygen Isotopes Analysis.

Unit- IV: Natural and Human Causes of Climate Change: Plate Tectonics, Volcanic Activity, Orbital Variations, Solar Variability, Global Warming, Ozone Depletion; Impact of Human Activities on Global Climate.

REFERENCES :

- 1) Thompson Russel D: 1997: Applied Climatology, John Wiley, New York.
- 2) Berry and Perry: Synoptic Climatology.
- 3) Mather J.R.: 1974: Climatology Fundamentals and Applications.
- 4) Stinger: Techniques in Climatology.
- 5) Lal D.S.: 2014: Climatology.
- 6) Trewartha G.T.: An Introduction to Climate
- 7) Davis R.J.A: 1986: Oceanography; An Introduction to Marine Environments, Winc- Brown Publication, Iowa
- 8) Patterson: Introduction to Meteorology.
- 9) Critchfield H.J.: 1975: General Climatology, Prentice Hall, New-Jersey.

Paper-2

GEOGRAPHICAL INFORMATION SYSTEM (G.I.S) (HARD CORE) (L:T:P = 2:0:1 = 3 credits)

UNIT-I. Definition and components of GIS, History of GIS, Objectives of GIS, Geospatial data- Spatial data, Attribute data, integration of Spatial and Attribute data

UNIT-II. Coordinate systems; Map projections, Type of map projection, Datum Plane, Structuring of spatial data - scanning, digitizing, error detection and Correction, topology

UNIT-III. Conceptual models of Spatial Information - Raster data model, Vector data model, Integration of Raster and Vector data model, Conceptual Models of non-spatial Information – Hierarchical, Network and Relational data models.

UNIT-IV. Practical exercises in GIS : Geo-referencing, Assigning suitable Projection and Rectification, Structuring of spatial data Digitizing Distance measurement Area measurement Editing: Error Detection & Correction Topology Building : Attribute Query SQL: Spatial Query Buffer Analysis : Point, Line and Area Surface analysis Symbolization Annotations and Labeling Map layout and Output.

Reference:

1. P. A. Burrough and R. A. McDonnell, Principles of Geographical Information System, 2000, Oxford University Press.
2. C.P.Lo and AlbertK. W. Yeung, Concepts and Techniques of Geographic Information System, 2002Prentice –Hall, India.
3. Paul A. Lonfley, Michel F. Goodchild, D J. Maguire and D.W. Rhind, Introduction to Geographic Information Systems and Science, 2002, John Wiley and Sons Ltd.
4. Kang – tsung – Chang, Introduction to Geographical Information System, 2002, McGraw Hill.
5. George Joseph, Fundamentals of Remote Sensing, 2004, Universities Press Pvt. Lillesand T.M. and Kiefer R.W., 2002, Remote Sensing and Image Interpretation, John Wiley and Sons, New Delhi.
6. Lillesand T.M. and Kiefer R.W., 2002, Remote Sensing and Image Interpretation, John Wiley and Sons, New Delhi.
7. J.R.Jensen, Remote Sensing of Environment, An Earth Resource Perspective, 2003, Pearson Education Pvt. Ltd.,
8. Heywood I, (el.) An Introduction to Geographical Information Systems , Pearson (2011).

Paper-3

TECHNIQUES OF ANALYSIS IN HUMAN GEOGRAPHY (Practical)

(HARD CORE) (L:T:P = 0:0:3 = 3 credits)

UNIT-I. Nature of Geographical Data. Need for quantitative techniques in geography and limitations of these techniques. Measures of point distribution – centrality index, Central location- Median Centre, Mean Centre, Central location by formula method. Measures of dispersion of point, Dispersion about the median or mean center, Dispersion about some other specific location, Dispersion of point in relation to each other. (Barthelme, Demangeon and Deboures methods of dispersion analysis)

UNIT-II. Nearest neighbor analysis, Rank size Rule, Gravity model. Measures of line distribution, Accessibility of nodes. Route density, Route sinuosity, Detour index, shortest path and shortest distance analysis, Traffic flow, Measure of connectivity- Beta index, Connectivity, Gamma index, Cyclomatic number, Alpha index, Eta index.

UNIT-III. Measures of Area Distribution. Lorenze curve, Gini-coefficient, Index of dissimilarities and Similarities, Location Quotient, Index of concentration, Gibbs Martin index, shift-share analysis

UNIT-IV. Measures of Disparities – Kendall's method, Bhatia's method. Combinational analysis – Weaver's method, Ternary diagram.

References:

1. Aslam Mahmood (2007) – Statistical Methods in Geographical studies, Rajesh Publications, New Delhi.
2. R.B. Mandal (2005) – Introduction to Rural Settlement, Concept Publishing Company, New Delhi.
3. R. Hammand and P. Mcchllagh (1975) – Quantitative Techniques in Geography, Clarendon press, Oxford.
4. J.P. Cole and C.A.M. King (1968) – Quantitative Geography, John Willey & Sons Ltd, London.

Paper-4

CONCEPTS IN GEOMORPHOLOGY

(SOFT CORE) (L:T:P = 2:1:0 = 3 credits)

UNIT-I : Fundamental Concepts of Geomorphology:

- a. Ten Concepts of Thornbury
- b. Principle of Uniformitarianism
- c. Cycle concepts, Views of W.M.Davis, Penck and L.C.King.

UNIT-II : Isostasy

- a. Views of Pratt, Airy and Bowie
- b. Concepts of Earth's Equilibrium and Gravity Anomaly

UNIT-III : Crustal Deformation theories and principles:

- a. Tetrahedron, Wegner's Continental Drift Theory.
- b. Holmes Convection Current Theory.
- c. Joly's Radio Activity Theory
- d. Daly's Subsidence Hypothesis

UNIT-IV : Plate Tectonics:

- a. Development of Plate Tectonic theory.
- b. Major and Minor Plates
- c. Plate Movement and Forces:
 - i. Convectional current
 - ii. Inner core current
 - iii. Thermal Flumes
 - iv. Paleo Magnetism
- d. Plate Margins and Associated Landforms - validation of Plate tectonics.

REFERENCES:

1. Thornbury William., 1954, "Principles of Geomorphology", Wiley Eastern Limited, New Delhi.
2. Douglas W.Burbank and Robert S. Anderson., 2001, "Tectonic Geomorphology", Backwell Science Inc., USA.
3. John R.Hails., 1977, "Applied Geomorphology" Elsevier Scientific Publishing Company, New York 10017.
4. Tikka , Physical Geography.

Paper-5

RESEARCH METHODS IN GEOGRAPHY (SOFT CORE) (L:T:P = 2:1:0 = 3 credits)

UNIT-I. Research Methodology: Meaning –Need for Scientific research Type of research-Approaches to geographical research: Defining the Research problem Ethics in Scientific Research Role Information Technologies in Research.

UNIT-II. Research design: Concepts relating to research design, Different type of Research design. Experimental and Non-Experimental Research Designs Sampling design: Need for Sampling Methods, Size of Sampling; Measurement and Scaling Techniques,

UNIT-III. Data Acquisition and Analysis; collection of data- sources of data- primary and secondary- Processing-diting, Coding, Classification and Tabulation, Analysis- data transformation- SPSS package in data analysis Data Display:Tables, Graphs, Maps, Visualizations

UNIT-IV. Interpretation and Report writing: meaning, techniques and significance of report writing- Drafting of the thesis-First, Second and Final- Writing of abstracts, Research papers for seminar and conferences, Journal Publications, case studies.

References:

1. Anderson, J. Durston, B.H. and Poole, M,(1970) Thesis and Assignment Writing, Wiley Eastern Ltd, New Delhi
2. Cooray, P.G (1992) Guide to Scientific and Technical Writing, Handagala, Srilanka
3. Davis J.C. (1986) Statistics and data Analysis, John Wiley and Sons NY.
4. Fitz Gerald, B.P. Ed (1974) Science in Geography, Series 1, 2, 3,4,5,6. Oxford University press, London
5. Hang, L.L. and Lounsbury, J.F. (1971) Research Methods in Geography,Brown company Publishers, Iowa
6. Kothari, C.r. (2015) Research methodology: methods and Techniques, Vishwaprakashana, New Delhi

Paper-6

AGRICULTURAL GEOGRAPHY (SOFT CORE) (L:T:P = 2:1:0 = 3 credits)

UNIT- I. Nature, Scope & Significance of Agricultural Geography, Origin and Diffusion of agriculture and approaches to the study of agriculture geography .World classification of agriculture bases for the whitteley.

UNIT- II. Determinants of agriculture: 1. Physical 2. Economic 3. Social 4. Institutional 5. Technological, Green Revolution, White Revolution Blue Revolution.

UNIT- III. Models in Agricultural Geography – Nature and Need of models, Significance of Agricultural models, Limitation of models, Classification of models, Input, output/Decision making/Diffusion/Von Tunen's, Olof Jonasson's model and Game Theory.

UNIT- IV. Agricultural Regionalization: Delimitation of Agricultural regions,Empirical/single Element/Multi-Element or statistical/Quantitative-cum- Qualitative Technique, Methodology for agricultural regionalization Cropping Pattern/Crop concentration, Crop combination Crop Diversification & Agricultural productivity.

Reference:

1. Majid Hssain, (2002)“ Systematic Agricultural Geography” Rawat Publication, Jaipur& New Delhi.
2. Noor Mohammed, “Perspectives in Agricultural Geography”, Vol. I to II, concept publishing company, New Delhi.
3. Sing and Dhillin, (2000) “Agricultural Geography”, Tata Mcgrow – Hill publishing company ltd, New Delhi.
4. Jasbir sing, “Agricultural Geography”
- 5 . M.Shafi,(2006) “Agricultural Geography” Dorling Kindersly (India) pvt, ltd, Licensees of Pearson Education in South Asia. New Delhi.

Paper-7

GEOGRAPHY OF POPULATION DYNAMICS

(SOFT CORE) (L:T:P = 2:1:0 = 3 credits)

UNIT-I Population dynamics and components of population dynamics. Fecundity and fertility. Measures of fertility determinants of fertility, world's pattern and trend. Theories of fertility. Fertility in India, trend and spatial patterns.

UNIT-II. Mortality – morbidity. Measures, determinants world's pattern and trend. Mortality in India-trend and pattern. Life table construction. Migration- measures, theories of migration. International migration – past and present trend. Migration in India, trend and pattern, problem of Brain drain and impact

UNIT-III. Population growth stepped and exponential growth and demographic transition. Population growth and Boserup theory, Malthusian trap. India and demographic transition. Economic implications of Demographic transition with reference to India. Current demographic status in MDCs and LDCs.

UNIT-IV. Population policies and population projections. Population policies – importance, various aspects of population policy. Policies in LDCs and MDCs. India's population policy, China's policy. Methods of population projections.

Reference

1. Asha A.Bhende & Tara Kanitkar – Principles of population studies, Himalayan publishing House, New delhi.
2. R.C.Chadana (2017) a geography of population, Kalyani publisher, New Delhi.
3. Mohammad Izhar Hassan (2005)- population geography, Rawat publication, Jaipur.
4. R.K.Tripati (2000)-population geography, commonwealth publisher, New Delhi.
5. Hornby & Jones (1983)-An introduction to principle Geography, Cambridge Univesity press, London.
6. Majid Husain (1994)-Human Geography, Rawat Publication, Jaipur.
7. Dina Nath Verma (1992)-population patterns, Jaitosh Prakashan, Lucknow.

Paper-8
BIO GEOGRAPHY
(SOFT CORE) (L:T:P = 1:1:0 = 2 credits)

UNIT-I. Nature, scope and significance, Branches of Bio Geography, Historical Development, Approaches to Bio Geography, Plant Geography and Zoo Geography, Eco-system structure function and development of Eco- system.

UNIT-II. Geography of Animals communities, classification origin and Evolution of Animals, Dispersal of animals, Zoo Geographical Regions of the World, Environmental adaptations of animals. Factors influencing world distributions of Animals, anthropogenic effects in animals.

UNIT-III. Geography of plant community, classification, origin, Evolution, Dispersal and distribution of plants. Major biomes of the world, Classification of soils, soil profiles, soil erosion, Degradation, world distribution of plants, causes and Adverse effects of deforestation and conservation measures, anthropogenic effects on plants.

UNIT-IV. Marine Ecology: Meaning and concept and Factors of Marine Ecology, Adaptation of Phytoplanktons to marine environment, Trophic level and energy flow in marine ecosystem, Bio diversity :- Bio-Diversity- meaning, importance, and types of biodiversity, hotspots, causes of bio-diversity loss, conservation and management.

Reference:

1. Bhattacharya N.N.(2005): Bio-Geography, Rajesh Publications, New Delhi.
2. Cox. C.D and Moore P.D (1993): Biogeography : An Ecological and Evolutionary Approach 5th Edn, Blackwell.
3. Darlington P.J.(1990): Zoogeography: The Geographic Distribution of Animals, Wiley and Sons, New York.
4. Huggett R.J.(2004): Fundamentals of Biogeography, Routledge
5. Husain M.(1994): Biogeography, Anmol Publication, New Delhi.
6. Lies .J (1974): Introduction to Zoo Geography, McMillan, London.
7. Mathur, H.S(1998): Essentials of Biogeography, Pointer Publishers, Jaipur
8. Pears Nigel (1985): Basic Biogeography, Longman, London, New York
9. Savindra Singh(2010): Biogeography, Prayag Pustak Bhavan, Allahabad.
10. Simmon I.G(1974): Biogeography, Natural and Cultural, Longman, London, 1985
11. Simmons T.G (1974): Biogeography: Natural and Cultural, Arnold Heinmann, London
12. Tivy Joy(1992): BioGeography, A Study of Plants in the ecosphere, oliver and Boyd, Edinburg.

Paper-9

THEMATIC CARTOGRAPHY

(SOFT CORE) (L:T:P = 2:1:0 = 3 credits)

UNIT-I.Nature of cartography

- a. Meaning of maps
- b. Forms of representation
- c. Categories of maps: classed by scale, classed by function, classed by subject matter.
- d. Impact of changing technology on cartography
- e. Cartography as a science of human communication
- f. Collection of data-Physical and cultural details.

UNIT-II.Map Making Process:

- a) Scale, Reference and coordinate system
- b) Elements of generalization,
- c) Measurement of geographical variables (nominal. Ordinal, interval, ratio,)
- d) Thematic and complex mapping.

UNIT III Symbolization:

- a) Principles-Theory of Visual Perception
- b) Symbolizing: qualitative, quantitative, continuous and discrete data.
- c) Perceptual considerations - i. Graphic elements ii. Visual variables iii. Classes of symbols
- d) Mapping feature attributes using point, line and area ii. Point features - dot maps, iii. Line features - hatchures, profiles, oblique traces, isarithmic iv. Area features - choropleth mapping; dasymetric mapping v. Perspective features - Morphometric maps.

UNIT-IV.Map design and Layout:

- a) Objective of Map design
- b) Elements of map design
- c) Design principles: i) Legibility ii) Visual contrast iii) Figure – ground organization iv) Hierarchicalorganisation.
- d) Controls of map design (Purpose, Reality Available data Map scale Audience)
- e) Computer cartography- hardware and software,
- f) Toponymy and map reproduction: planning and process related to duplicating,
- g) Printing and latest methods.

References:

1. Misra R.P. and Ramesh.(1989) Fundamentals of Cartography, concept publishing Co.New Delhi.
2. Nag,P.ed.,(1992) Cartography and Remote Sensing concept Publishing Co. New Delhi
3. Robinson, A H, Sale AH. Morrison JL and Muerake (1985) Elements of Cartography, John wiles and sons
4. NY. Burrough P.A. (1986) Principles of GIS for land assessment.University press London.
5. Jones Emrys(1975): Readings in social Geography oxford University press London.
6. Knoy P.L (1978): Social Wellbeing a Spatial Perspective, oxford University press London.

Paper-10

GIS & REMOTE SENSING (OPEN ELECTIVE) (L:T:P = 3:1:0 = 4 credits)

UNIT-I. Introduction to remote sensing

- principles of remote sensing
- Electro-magnetic radiation (EMR)
- Electro magnet spectrum
- Energy interactions with atmosphere
- Energy interactions with earth-surface features.

UNIT-II. Satellites and sensors

- Microwave remote sensing
- SAR and SLAR
- Imaging interpretation and analysis

UNIT-III. Introduction to GIS

- definition, concepts and components of GIS - Geographical entities

UNIT-IV. Sources of spatial data

- data encoding-spatial data modeling-raster-vector data models
- Data management system: Relational and hierarchical modes
- GIS applications.

Reference:

1. Borrough P.A (1986), "Principles of Geographic information system for land resources," Clarendon press, Oxford
2. Chrisman N.R. (1997),"Remote sensing and Geographical information systems"
3. Sabbins.F.F (1987), "Remote sensing: principles and interpretations", W.H.Freeman and Co, New York
4. Haywood.L, Comelius.S and S. Carver (1988), "An introduction to Geographical information system", Addison Willey, New York.

Paper-11

PHYSICAL GEOGRAPHY (OPEN ELECTIVE) (L:T:P = 3:1:0 = 4 credits)

UNIT –I. Solar system – shape & size of the earth, Movement of the earth- Rotation & Revolution
Effects of the movement – Earth coordinates – Latitude Longitude & Time.

UNIT – II. Composition of the Earth's Interior, Rocks, –Minerals – Classification and rocks – Igneous rocks sedimentary rocks, Metamorphic rocks, Weathering – Mechanical, Chemical and Biological Work of Running Water and Glaciers.

UNIT – III. Composition of Atmosphere, Weather and Climate Factors affecting the Distribution of Temperature, Insulation, Horizontal and Vertical Distribution of Temperature- seasonal variation in the general distribution of Temperature pressure and winds, Rainfall – Types of rainfall.

UNIT – IV. Distribution of Land & Sea – submarine relief, surface relief of the ocean vertical distribution of Temperature, Salinity – Factors controlling Salinity, Distribution of the salinity, ocean currents, tides & Types of tides.

Reference:

1. B.S.Negi (1993) "Physical Geography" S.J Publication. Meerat.
2. R.N.Tikka (2002)"Physical Geography" Kedar nath ram nath & co. Meerat.
3. K.Siddhartha (2001) "Atmosphere, wheather and climate", Kisalaya publication, New Delhi.
4. William D. Thornbury (1997) "Principle of Geomorphology", New Age International (P) Limited, New Delhi.
5. D.S Lal (1998). "climatology" Chaitanya publishing house, Allahabad.

Paper-12

GEOGRAPHY OF KARNATAKA (OPEN ELECTIVE) (L: T: P = 3:1:0 = 4 credits)

UNIT-I. Location , Administrative divisions and Physiographic divisions of the Karnataka. Geology, Rivers, Climate, Soils, vegetation, Social forestry and National Parks and Birds sanctuaries.

UNIT-II. Development of Irrigation in Karnataka, Major Multipurpose river valley Projects, Krishna and Caveri water dispute. Agriculture : Distribution of crops, Rice, Jowar, Ragi, Bajara, Maize, Wheat, Tur, Oil Seeds ,Sugarcane ,cotton, Tobacco, Coffee, Mango, Coconut, Areca nut, Pepper, Cardamom , Coriander and Sericulture.

UNIT-III. Mineral resources: Distribution of Iron ore, Manganese, Bauxite, Copper, Gold. Major power Projects, Hydel power Projects, Thermal Power Plants and Atomic Energy centers. Industries: growth and Distribution of Cotton textile, Silk textile, Sugar, Iron and Steel, Cement and Paper Industries in Karnataka. Industrial Regions and Special Economic Zones in Karnataka.

UNIT-IV.Transportation : Development and distribution of Roads, Railway, Water way Ports and Harbors and Airways. Population: growth Distribution, Density and Composition of Population in Karnataka. Tourism: major Historical and geographical Places in Karnataka.

Reference:

1. R.P.Misra (1973) :Geography of Mysore.
2. N.B.K.Reddy &G.S.Murthy(1967); Regional Geography of Mysore State.
3. P.Mallappa(2008): Geography of Karnataka.
4. Ranganath: Geography of Karnataka
5. Karnataka State Gazetteer.
6. Karnataka: Directorate of Information and Tourism, Govt, of Karnataka.
7. Karnataka Wikipedia

THIRD SEMESTER
Paper-1
INTRODUCTION TO REMOTE SENSING
(HARD CORE) (L:T:P = 2:1:1 = 4 credits)

UNIT-I. Energy system for remote sensing

1. Sources of Energy used for Remote Sensing.
2. Energy interaction in the atmosphere,
 - a. Absorption and transmission
 - b. Atmospheric scattering
3. Energy interactions with earth surface features,
 - a. Spectral reflectance curves

UNIT-II. Sensors and Platforms.

1. Sensors: active sensors and passive sensors.
2. Platforms: Air borne remote sensing and space borne remote sensing.
3. Multispectral scanners
4. Remote sensing Resolution
5. Sensor Systems – Type and Characteristics of earth Resource satellite –
 - a. LANDSAT,
 - b. SPOT,
 - c. IRS,
 - d. IKONS

UNIT-III. Microwave Remote sensing

1. Principles of Microwave Remote sensing-
2. Geometric properties of RADAR
3. Distortions in radar images.
4. Active and passive remote sensing systems, SAR and SLAR systems.
5. Sensor Systems – Type of radar satellite data
 - a. SRTM
 - b. MODIS
 - c. ASTER

UNIT-IV. Digital Image Processing

1. Image rectification and restoration
2. Radiometric enhancement and Atmospheric correction.
3. Spectral enhancement.
4. Spatial enhancement.
5. Image classification.

Reference:

1. John R. Jensen: Remote sensing of the Environment. Pearson education publication
2. Jensen, John R., 2005, *Introductory Digital Image Processing*, 3rd Ed., Upper Saddle River, NJ: Prentice Hall, 526 pages.
3. Principles of Remote Sensing – An Introductory Textbook by W. H. Bakker et al
4. **Frontiers of Remote Sensing Information Processing.** by: C. H. Chen

Paper-2
METHODS OF REGIONAL ANALYSIS
(HARD CORE) (L:T:P = 2:1:1 = 4 credits)

UNIT-I. Regional concept and regional methods. Types of regions characteristics of different regions. Delineation of regions and methods of delineation. Regionalism v/s Sectionalism. Regional consciousness and contemporary regional movements in India- Telangana, Gorkaland, Kodagu etc.

UNIT-II. Analysis of regional growth and diffusion. Sector and Stage theory of Regional growth, Export base theory of Douglesic, North, economic base theory, convergence and divergence growth, multi plier effect. Analysis of spatial diffusion at local and regional level. Simulation analysis.

UNIT-III. Growth pole and growth centers in regional analysis. Growth pole theory perrolux, Mydral, Hermensons views. Limitations of the growth pole, modifications - R.P.Mishra's growth foci. growth poles and regional development. Input and output analysis in general and regional context.

UNIT-IV.Analysis of Regional disparities – Balanced and unbalanced growth, Williamson's views on region inequality, causes for disparities in regional growth causes and consequences. Measures of disparities. Extent of disparities in India and Karnataka.

References:

1. Abler, Adams and Gould (1971) – Spatial Organization, Prentice – Hall, Englewood Cliffs, New Jersey
2. R.P. Mishra (1992) – Regional Planning, Concept Publishing Company, New Delhi.
3. Jayasri Ray Chaudhuri – An Introduction to Development and Regional Planning, Orient Longman Ltd, Kolkata.
4. John Glasson (1975) – An Introduction to Regional Planning, Hutchinson Prakashan, Meerat.
5. Walter Isard (1960) – Methods of Regional Analysis: an introduction to Regionla Science, Published by, The Massachusetts institute of Technology & John Wiley & sons, Inc, Newyork.

Paper-3
ADVANCED SURVEYING (Practical)
(HARD CORE) (L:T:P = 0:0:3 = 3 credits)

UNIT- I. Basic Principles of surveying, Definition, Classification of Surveys, Planning of Maps, Scales, Units of Measurements, Errors of surveying, Field Work, Booking Field Notes.

UNIT- II. Modern Methods of Surveying, Application of Remote Sensing, Application of GIS, Application of Satellite-based Global Positioning System.

UNIT- III. Earth linear measurement Theodolite and Total Station, Mapping the ground object, Locating the ground object from the map, Area computation-Triangle methods, Square method, Trapezium method, Ordnance method, Mechanical method, Measurement of vertical angle Theodolite and Total station.

UNIT- IV. GPS Survey

- i) Mapping the ground object
- ii) Locating the ground objects from the maps

Reference :

01. R. Subramanian, Surveying and Levelling, Oxford University Press
02. P.C. Punmia, Surveying, Laxmi Publications, New Delhi-2005.
03. R.P. Mishra, Fundamental Cartography, Concept publication, New Delhi, 2005.

Paper-4
TRANSPORTATION GEOGRAPHY
(SOFT CORE) (L:T:P = 2:1:0 = 3 credits)

UNIT-I. Historical evolution of transportation, Transportation and spatial organization, Modes of Transport, Basic elements of transport network-Nodes & links, Topology of Network, Measures of Transport Network.

UNIT-II. Types of Movement and Causes of Movement, Spatial interaction and gravity model, spatial choices; destinations, modes & routes.

UNIT-III. Urban transportation; urban land use and urban transportation, urban Road classification, urban mobility, urban transport problems and its planning, land use modeling, Impact of Telecommuting on Transportation.

UNIT-IV. Transport planning & Policy: The nature of transport policies, the policy process, Transport policy in India, Transport Planning, Geographic Information Systems in transport (GIS-T), Transport impact analysis and Sustainable Transportation

Reference:

1. G.Gaile and C.Willmott (eds). "Transportation Geography" in Geography in American at the Dawn of the 21st century. New york. Oxford University press, 2004.
2. H.Dimitriou (ed) Transport planning for Third world cities. London. Routledge, 1990.
3. Jean – Paul, The geography of Transport system.
4. Saxena H.M (2005) "Transportation Geography"
5. William A Black-Transportation A Geographical Analysis. The Guilford Press, 2003
6. Bimal Dhawan-Transport Geography- Random Publications .2014
7. Moonis Raza (1999) Transportation Geography of India, Concept publishing,company, New Delhi

Paper-5
MONSOON CLIMATOLOGY
(SOFT CORE) (L:T:P = 2:1:0 = 3 credits)

UNIT-I : Introduction, Meaning of Monsoon, Areas of Monsoon Climate in the World, Summer Monsoon, Post Monsoon and Winter Monsoon, Nature of the Variability of the Indian Summer Monsoon. Atmospheric Rotating Systems, Convection and Rainfall in tropics, instability, Active and Weak Spells, Breaks in the Monsoon.

UNIT-II : Basis of the Monsoon Climate, Tropical Convergence Zones(TCZs) and the Indian Monsoon. Variations in the convectonal rainfall over the Oceans and land. Heat lows and Monsoon regions of the world.

UNIT- III : Seasonal Transitions (onset and retreat) and Climate Clusters, Intra seasonal Variation and Intra seasonal Oscillation, Study of Tropical Oceans, El Nino and Southern Oscillation. Indian Ocean and the Indian Monsoon.

UNIT- IV : Inter annual Variation of the Indian Summer Monsoon, rainfall links to events over the Indian and Pacific Ocean, Monsoon Variability, Agriculture and Economy, Monsoon Prediction, Problems and Prospects.

REFERANCES :

- 1) Ramage C.S. : 1971: Monsoon Meteorology, Vol-15, San Diego.
- 2) Rao Y.P. : 1976 : South West Monsoon: IMD: New-Delhi.
- 3) Riehl H. : 1979: Climate and Weather in Tropic Academic Press, San Diego, New-York.
- 4) Chang C.P. and T.N. Krishnamurty (ed) 1987: Monsoon Meteorology, Oxford University Press.
- 5) Fein J.S. and P.L. Stephens (Ed): 1987: Monsoons: John Wiley: New-York.
- 6) Wang B. (Ed):2006: Asian Monsoon: Springer: Praxis.
- 7) Chang C.P.Y. Ding, N.C. Lau, R.H. Johnson, B.Wang and T. Yasunari: 2011: The Global Monsoon System World Scientific.

Paper-6
ENVIRONMENTAL GEOGRAPHY
(SOFT CORE) (L:T:P = 2:1:0 = 3 credits)

UNIT-I. Definition, Nature ,scope and importance, Environment Geography and Related sciences, Environmental Perception, Levels of Environmental perception and environmental society, Ecological Approaches, Man and Environment, Historical Perspective of ecological changes.

UNIT-II. Concept of Ecosystem, structure, functioning and of development of ecosystem, Food chain and food web, food pyramid, energy flow in an ecosystem, energy loss in an Ecosystem, Major ecosystems, and historical development of ecology, principles of ecology, Human Ecological adaptations, Influence of Man on Environment global and regional ecological changes.

UNIT-III. Pollution and Environment Degradation, Meaning and concept- environmental degradation and pollution , sources, types, effects and measures of pollution in Air, Water, land, soil. Natural hazards and its impact on environment, Types of Environmental degradation, Processes , causes of Environmental degradation, population growth and environment, Agriculture development and Environmental degradation, deforestation and Environmental degradation, urbanization and Environmental degradation, industrial development and Environmental degradation.

UNIT-IV.Environmental Planning and Management, Meaning, Importance, needs of EIA and Emerging Issues, UN processes and procedures for EIA, Global Environmental Issues, Environmental conservation, management and its approaches to environmental management, wild life Management, solid waste Management, Environmental Planning. concept of sustainable development Environmental education and legislation .

Reference:

1. Dr. Alka Gautam(2013): Environmental Geography, Sharada Pustak Bhavan, Allahabad
2. Environmental Impact Assessment: A New Dimension in Decision Making, 2nd Ed. ,,
3. H.M.Saxena (1999): “ Environmental Geography”, Rawat Publications, Jaipur.
4. Prof. P.R.Trivedi(2011): Environment Impact Assessment, APH Publication Corp. New Delhi
5. R.R.Barthwal(2002): Environment Impact Assessment, New Age International Publishers. Bangalore.
6. Savindra Singh: Environmental Geography, Prayag Pustak Bhawan, Allahabad.

Paper-7
POPULATION RESOURCES AND DEVELOPMENT
(SOFT CORE) (L:T:P = 2:1:0 = 3 credits)

UNIT-I. Population Resource Nexus, limits to growth, optimum, over and under population. Population equilibrium, Concept of carrying capacity of the earth. Population pressure. Impact of population pressure on energy, water and other resources. Population and food security / supply. Hunger, health and malnutrition. Population – resource regions of the world.

UNIT-II. Population growth and its environmental implications. Direct and indirect impact on environment. Impact on lithosphere, Atmosphere, Hydrosphere, Biosphere. Other implications.

UNIT-III. Population and development relationship. Concept, content and measure of development. Human development Index and its spatial analysis. Population and development - Experiences of the western countries and third world countries. Impact of population on economic development with reference to India. Quality v/s quantity of population.

UNIT-IV. Emerging demographic issues.

- Demographic dividend, Ageing process, Gender issues
- Quality of life, Demographic regions.

References:

1. Lester R. Brown (1976) – In the Human Interest, A Strategy to stabilize world population, affiliated east – West Press, New Delhi.
2. B.N. Ghosh (1998) – Population Theories and Demographic Analysis, Meenakshi Prakashan, Meerat.
3. H.M. Saxena (1999) – Environmental Geography, Rawat Publication, Jaipur.
4. Nauhmal Singh (2002) – Population and Poverty, Mittal Publication, New Delhi.
5. Liebid and Iruday Rajan (2005) – An Ageing in India: Perspective, Prospects and Policies, Rawat Publication, Jaipur.

Paper-8
URBAN GEOGRAPHY
(SOFT CORE) (L:T:P = 2:1:0 = 3 credits)

UNIT-I. Urbanization Concepts and process: meaning of urban settlements and Urbanization. Criteria used to distinguish urban settlements, Behavioral structural and demographic concept of Urbanization, distribution and evolution of cities through historical times, Urbanization curve.

UNIT-II. Urban Morphology- Models of Urban structure: Park and Burgess Model.Homer And Hoyt model, Harris and Ullman model. Rural- Urban fringe: Meaning, characteristics, Suburbanization, Concepts of conurbation, megalopolis, Satellite towns. Factorial ecology and social area analysis.

UNIT-III. City and its region, Contemporary Urban issues: Concepts of city region, Characteristics and demarcation, Nature of Urban influence. Contemporary Urban issues: Price of land and vertical and horizontal growth of cities, Urban sprawl, Scarcity of housing and growth of slums, problems of civic amenities, urban transport problem, Environmental pollution.

UNIT-IV. Urban policy and planning with special reference to India: Policies of Urban development: Smart cities, AMRUT,(Atal Mission for Rejuvenation and Urban Transformation) PMAY (Pradhan Mantri Awaz yojana) DAY (Deen Dayal Antyodaya Yojana) RAY (Rajiv Gandhi Awaz Yojna) JNNURM (Jawaharlal Nehru National Urban Renewal Mission) SBM-U (Swachh Bhart Mission –Urban) Urban regeneration, City Planning; Need and elements of city planning, Master plans of towns. The concept of sustainable cities and Sustainable Urban growth.

References:

1. Roberts, Brian K. (1996): Landscapes of settlement: Prehistory to the Present, Routledge, London.
2. Gates, Richard and stout, Fredric (2000): The city Reader, Rout ledge (London and New York)
3. O'sullivan, A. (2000): Urban Economies, 4th Edition, Me Graw Hill, Boston
4. Knox, Paul and Pinch Steven (1996): Urban Social Geography: An Introduction
5. Carter (1972): The study of urban geography, Edward Arnold, London.
6. Kundu.A (1992): Urban development and urban research in India, Khanna Publications
7. Hall P (1992): Urban and regional planning, Rout ledge, London
8. Tim Hall: Urban Geography
9. K Siddhartha and S Mukherji: Cities, Urbanizations and urban systems.
10. Shah Manzoor Alam: Urbanization in developing countries.

Paper-9
FLUVIAL GEOMORPHOLOGY
(SOFT CORE) (L:T:P = 2:1:0 = 3 credits)

UNIT-I. The Application of GIS and Remote Sensing In Study of Fluvial Geomorphology

UNIT-II. Tectonic modification of Rivers

- i) Co- seismic modification of River system
- ii) Gradual change of river system
- iii) Longitudinal profiles
- iv) River pattern sinuosity
- v) Bed rock channel path river
- vi) Alluvial channel path river
- vii) Integrated models of tectonic adjustment of rivers

UNIT-III. Ground Fluvial Hydrology

- i) drainage network and drainage pattern
- ii) open channel hydraulics'
 - a) Types of flow
 - b) Regimes
 - c) Stream density
 - d) Gradient geological structure

UNIT-IV: Fluvial geomorphology with reference to Cauvery river basin
The applied geomorphology and ground water studies
Watershed Management in Cauvery basin.

Reference:

1. Fundamentals of Fluvial Geomorphology by Charlton Ro (Paperback - Dec 26, 2007)
2. Fluvial Processes in Geomorphology by Luna B. Leopold, M. Gordon Wolman, and John P. Miller (Paperback - Jun 28, 1995)
3. Tools in Fluvial Geomorphology by G. Mathias Kondolf and Hervé Piégay (Hardcover - April 11, 2002)
4. Fluvial Forms and Processes: A New Perspective by David Knighton (Paperback – April 1998)
5. Rivers and Floodplains: Forms, Processes, and Sedimentary Record by John S. Bridge (Paperback - April 25, 2003)

Paper-10
HUMAN GEOGRAPHY
(OPEN ELECTIVE) (L:T:P = 3:1:0 = 4 credits)

UNIT-I. Field and Scope of Human Geography. Branches of Human Geography. Approaches – Nomethetic and Idiographic. Development of Human Geography – Germans, French and American contribution.

UNIT-II. Cultural Diversities – Race, Religion and Language. Major tribes of the World.

UNIT-III. Survey of World Resources – Concept and Types of Resources. Forest resources, Mineral and Power resources – Iron, Manganese, Bauxite, Gold, Coal, Petroleum, Atomic and Hydro. Agricultural region of the World.

UNIT-IV. Population of the World – Density and Distribution, Growth and Composition. Human Migration – types, Causes and Consequences.

References:

1. Majid Husain (2002) - Human Geography, Rawat Publication, Jaipur.
2. Rubenstein and Baoon (1990)- The cultural Landscape: An Introduction to Human Geography, Prentice – Hall of India Ltd, New Delhi.
3. Brek and Webb (1968) – A Geography of Mankind, McGraw – Hill Book Company, New York.
4. Peter Hagget (1972) – Geography: A modern Synthesis, Harper & Row Publishers, New york.

FOURTH SEMESTER
Paper-1
ECONOMIC GEOGRAPHY
(HARD CORE) (L:T:P = 3:1:0 = 4 credits)

UNIT I. Meaning, nature, scope and importance of Economic Geography. Simple model of the Economy, spatial structure of the Economy, Environmental relations of the economy. The Economy and Economic Geography, spatial and systematic Approaches.

UNIT-II. Decisions making in the economy: Types and mechanics of decision making, Effect of time and space on price formation, government intervention in price mechanism. Firms, functions of firms, decision making and the process of production, choice of output choice of technique.

UNIT-III.Theories of Industrial location:- Factors of industrial Location Geographical , Social , Economic, Environment , historical and political, types of industries, Resource based and foot loose industries. Industrial growth and its impact on environment and remedial measures, problem and prospects of industrialization. Theories of industrial location:- Least cost school, Transport cost school, market area school, marginal location school, and Behavioral school.

UNIT-IV.Consumer's behavior and the economy- Analysis of consumer's behavior, spatial variation in consumption, consumer behavior in space. Market centres- origin and types periodic and daily markets, sequential development. Movement, the generation of movement between areas, spatial and non-spatial factors. The Distribution of Movement.

Reference:

1. David M.Smith(1984) – Human Geography, A Welfare approach, Arnold Heinemann, London
2. Dr.Alka Gautham(2013) – Advance Economic Geography, Sharada Pustak Bhavan, Alahabad
3. Hodder and Lee (1982) – Economic Geograpy, Methuen and Co, London
4. John W.Alexander and Gibson (1979) – Economic Geography, Prentice – Hall of India Private Limited, New Delhi.
5. K.Siddhartha (2000) – Economic Geography, Kisalaya Publications, New Delhi.
6. Prithwish Roy(2005) – Economic Geography, New Central Book Agency, Kolkatta.
7. Smith (1978) Industrial Location, Prentice Hall, Englewood Cliffs, N.J.
8. Truman A. Hartshorn and John W.Alexander – Economic Geography

Paper-2
MULTIVARIATE STATISTICS
(HARD CORE) (L:T:P = 2:1:1 = 4 credits)

UNIT-I. Significance of Statistics in Geography, Review of basic statistical measures. Measures of Central tendencies, Measures of variation, Analysis of Variance (ANOVA),

UNIT-II. Basic Multi Variate Analysis. Correlation Analysis - Correlation coefficient for grouped and Unigrouped data, Rank Correlation. Regression Analysis – Simple Linear regression, Residual Analysis, Multiple Regression.

UNIT-III. Theory of Sampling and Testing of Hypotheses: Types of Sampling, Sampling distribution and standard error. Testing of Hypotheses – t test, f test and Chi-square Test.

UNIT-IV. Advanced Multivariate Analysis: Introduction, Factor Analysis and its methods, Centroid method, Principal Component Method, Use of SPSS in Statistical Analysis.

References:

1. R.Pannerselvam- Research methodology, Prentice hall India, New Delhi, 2008.
2. C.K Kothari - Research methodology, New Age International publishers, New Delhi, 2007.
3. Aslam Mohammad – Statistical methods in Geographical Studies. Rajesh Publishers, New Delhi, 2007.
4. RSN Pillai and Bhagavathi – Statistics –Theory and Practice, S Chand and Co.Ltd. New Delhi. 2007.

Paper-3
DISSERTATION
(HARD CORE) (L:T:P = 0:0:5 = 5credits)

Paper-4
DISASTER MANAGEMENT
(SOFT CORE) (L:T:P = 1:1:0 = 2 credits)

UNIT –I. Disasters: Definition and Concepts: Hazards, Disasters; Risk and Vulnerability; Classification

UNIT- II . Types of Environmental hazards & Disasters: Natural hazards and Disasters, Man induced hazards & Disaster-Earthquake, Tsunami, Landslides, Cyclones, Floods, Drought, Desertification Distribution and Mapping

UNIT - III. Manmade disasters: Causes, Impact, Distribution and Mapping, Response and Mitigation to Disasters: Mitigation and Preparedness, NDMA and NIDM; Indigenous Knowledge and Community-Based Disaster Management; Do"s and Don"ts During and Post Disasters

UNIT-IV. Harnessing Information and Technology: Application of GIS.GPS and Remote Sensing in Disaster Management.

References:

1. R.B. Singh(Ed) Environmental Geography, Heritage Publishers New Delhi,1990
2. Savinder Singh Environmental Geography, Prayag Pustak Bhawan,1997
3. Kates,B.I & White. G.F. The Enviornment as Hazards, Oxford, New York, 1978
4. R.B.Singh(Ed) Disaster Management, Rawat Publication, New Delhi, 2000.
5. H.K.Gupta(Ed) Disaster Management, University Press, India, 2003.
6. A.S.Arya Action Plan for Earthquake, Disaster, Mitigation in V.K.Sharma(Ed)
7. Disaster Management IIPA Publication New Delhi, 1994
8. R.K.Bhandani An overview on Natural & Man made Disaster & their Reduction, CSIR, New Delhi.
9. M.C.Gupta Manuals on Natural Disaster Management in India, National Centre for Disastr Management, IIPA, New Delhi,2001
10. Global Environment Out look (2002) UNEP Earth Scan Publications Ltd, London.

Paper-5
REGIONAL DEVELOPMENT PLANNING IN INDIA
(SOFT CORE) (L:T:P = 1:1:0 = 2 credits)

UNIT-I. Planning – types, need for regional approach in planning- regional planning – nature and principles Top-down and bottom up strategies in planning. Multi – level planning, Block and district level planning. Approaches to Regional Planning, Total regional approach, selective regional approach and target group approach. Social and environmental issues in planning.

UNIT-II. Regional development policies and programmes in Indian five year plans – Regionalization process in India, A review. Backward area development programmes. Tribal area development programmes, Drought prone area development programmes, Hilly area development programmes, Command area development programmes, Metropolitan area development programmes.

UNIT-III. Rural development in India process and objectives – major rural development programmes in India- pre-independence efforts. A brief study of various rural development programmes during different five year plans up to NAREGA. Urban development programmes in India – A review.

UNIT-IV. Case study of regional development programmes in India. NCR region, Tungabhadra command area, Terai region, Baster region, Dandakaranya Region, Damodar Valley region.

References:

1. Hemalata Rao (1984) – Regional Disparities and Developmant in India, Ashish Publishing House, New Delhi.
2. Mahesh Chan and Puri (1997) – Regional Planning in India, Allied Publishers limited, New Delhi.
3. Mahapatra and Routray (1998) Regional Development and Planning, Rawat Publications, Jaipur.
4. Sudhanshu Shekar (2004) – Regional Planning in India, Anmol Publication, New Delhi.
5. T.N.A. Rao (1993) – Regional Development – Levels of Development of Karnataka, Printed by Impressions, Belgaum.

Paper-6

MEDICAL GEOGRAPHY (SOFT CORE) (L:T:P = 2:1:0 = 3 credits)

UNIT-I. Concepts and Traditions: Definition, scope, elements, Growth of medical Geography Methods and techniques.

UNIT-II. Human-Environment Interaction: Health and environment-concept of health, Geographical approaches of health, Natural environment and health- Inorganic and organic, Social environment and health : Food intake, Perception of diseases, Treatment of diseases, Socio-economic conditions and health.

UNIT-III. Modernization, Population change and health: Disease classification- Genetic, Communicable, communicable, Occupational, deficiency diseases, WHO Classification of diseases. Diseases Diffusion: non- Meaning, factors/barriers, Phases, Types of diffusion. Epidemiological Transition-The theory of epidemiological transition (Omran theory) factors of transition- Demographic, Changes in risk factors, Practices of modern medicine. Indicators.

UNIT-IV. Global Inequalities in Health care: Concept of health care, levels of health care, health care accessibility and utilization, Health care delivery system worldwide, health care services in India, health care policy in India.

Reference:

1. Husain Majid (1994): „Medical Geography“, Amol Publication Pvt.Ltd. New Delhi
2. Learmonth A T A (1978): „Patterns of diseases and hunger“, a case study in Medical Geography, David and Charles, Victoria
3. May J M (1970): „The world atlas of diseases“ National Book Trust, New Delhi
4. Mc. Glashan N.D (1972): „Medical Geography, Methuen, London
5. Misra R P (1970): „Medical Geography“ National Book Trust, New Delhi
6. Rais A S Learmonth A T A (1990): „Geographical aspects of health and diseases in India“ rawat Publication, Jaipur
7. Stamp L. D.(1964): „Some aspects of Medical geography“, Oxford University Press Oxford
8. M.S.Meade and R.J. Erickson (2005), Medical Geography Guilford press.

Paper-7
ADVANCED APPLICATIONS IN REMOTE SENSING
(SOFT CORE) (L:T:P = 1:0:1 = 2 credits)

UNIT I : Application of remote sensing in Agriculture a. Characteristics spectral reflectance
b. Phonological cycle c. Crop inventory d. Cropping system analysis.

Lab

1. Acreage estimation
2. Production estimation

UNIT II. Application of remote sensing in Forest resources.

- a. Characteristics of spectral reflectance b. Phonological cycle c. forest inventory

Lab

1. forest quantification
2. Biodiversity estimation.
3. Temporal changes.

UNIT III. Application of remote sensing in water resources

- a. Importance of remote sensing in water resources.
- b. Signature curves related to different types of water bodies.
- c. Detection of surface extent of water visibility of water vapor, cloud, snow, aerosol, etc.

Lab: 1. Texture, pattern, shape,

2. Image classification of different type of water bodies (water mixed with chlorophyll, sand, clay and salinity).

UNIT IV. Application of remote sensing in Urban landscape.

- a. Importance of remote sensing in urban studies.
- b. Remote sensing products and resolution in urban studies.
- c. Classification of land use and land cover.
- d. Characteristics of texture with respect to industrial, commercial, residential and recreational land uses.
- e. Population estimation
- f. Quality of life indicators.

Lab:

1. Urban land use classification
2. Population estimation
3. Quality of life indicators.

Reference:

1. John R. Jensen: Remote sensing of the Environment. Pearson education publication
2. Jensen, John R., 2005, *Introductory Digital Image Processing*, 3rd Ed., Upper Saddle River, NJ: Prentice Hall, 526 pages.
3. Principles of Remote Sensing – An Introductory Textbook by W. H. Bakker et al
4. **Frontiers of Remote Sensing Information Processing. by: C. H. Chen**

Paper-8
APPLIED GEOMORPHOLOGY
(SOFT CORE) (L:T:P = 1:0:1 = 2 credits)

UNIT-1: Basic Concepts in applied Geomorphology: Application of Geomorphic mapping and GIS, Terrain evaluation, Classification and its application.

UNIT-II: Applications of Geomorphology in Urban Planning:

- i. Urban Geomorphology
- ii. Geomorphic impacts on urbanization
- iii. Geomorphology and Habitat characteristics
- iv. Geomorphic controls in Urban expansion
- v. Geomorphology and Urban water supply and road construction.
- vi. Remote sensing application in Urban Geomorphology

UNIT-III: Applications of Geomorphology in Groundwater prospecting and watershed management

UNIT-IV: Application of Geomorphology in Regional Planning and Disaster Management.

Reference:

1. Singh R.L.: Elements of practical Geography, Kalyani Publications (2005).
2. Misra R.P. : Fundamentals of Cartography, Concept Publication, New Delhi (2001)
3. Hammond R and Mecullagh P : Quantitative techniques in Geography, Claredon Press, Oxford (1975).
4. Anson R.W and Colour use guidelines for mapping and Visualization “Visualization in Modern Geography”, Oxford.

Paper-9
GEOGRAPHY OF INDIA
(OPEN ELECTIVE) (L:T:P = 3:1:0 = 4 credits)

UNIT-I. Geographical location of India, Economic Position of India in relation to world, salient features of geological structures of India. Main Physiographic divisions: Northern Mountains, North Indian Plains, Peninsular Plateau ,Costal lowlands and islands, Drainage system of India, East flowing and West flowing rivers.

UNIT-II. Climate seasons and Climatic Regions: various seasons and associated weather conditions , mechanism of Monsoon , majors climatic regions of the India. Soils , types and their distribution , soil degradation and conservation. Forest, types and their distribution in India, deforestation and conservation of forest.

UNIT-III. Minerals and Power Resources ,distribution of Ironore, Manganese,Bauxite ,coal ,Petroleum and Natural gas , Major power projects in India(Hydro, Thermal, Atomic) Agriculture, Distribution of Major Crops, Rice, Wheat, Cotton, Sugarcane, and Maize. Green revolution in India.

UNIT-IV. Major Industries and Industrial development in India.Distribution of Industries, Cotton textile, Iron and Steel Sugar, Chemical fertilizers and engineering . Industrial Regions of the India. Transportation: Road, Railway, Airway and Inland Water transportation systems in India.Population growth , distribution and composition in India.

Reference:

1. Chopra S.N : India an area study.
2. Dubey and Negi: Economic Geography of India.
3. Gopal Singh: Geography of India.
4. Khulhar: Regional geography of India.
5. Singh R.L: Regional geography of India.
6. Sharma and Coutino: Economic and commercial Geography of India.