

MA/MSc Syllabus, CBCS Pattern
Department of Geography, BU,2019
Total Credits: 92
Core papers: 20, DSE: 1, OE: 2

SEMESTER– I

Paper code	Credit	Credit Distribution (L+T+P)	End Semester Marks	Internal Marks	Total Marks	Paper Name
GGY101	4	3+1+0	80	20	100	Geomorphology
GGY102	4	3+1+0	80	20	100	Climatology
GGY103	4	3+1+0	80	20	100	Geographic Thoughts
GGY104	4	3+1+0	80	20	100	Cartographic Methods and Quantitative techniques
GGY105	5	1+0+3	80	20	100	Practical on Geomorphology, Climatology and Cartographic Methods
Department will choose one of the following three elective papers						
GGY106(OE)	2	2+0+0	50	0	50	1. Environment and Sustainable Development 2. Basics of Cartography and GIS 3. Natural Hazards and Disaster

SEMESTER-II

Paper code	Credit	Credit Distribution (L+T+P)	End Semester Marks	Internal Marks	Total Marks	Paper Name
GGY201	4	3+1+0	80	20	100	Geography of India
GGY202	4	3+1+0	80	20	100	Economic Geography
GGY203	4	3+1+0	80	20	100	Population and Settlement Geography
GGY204	4	3+1+0	80	20	100	Social, Cultural and Political Geography
GGY205	5	1+0+3	80	20	100	Quantitative Techniques in Geography
Department will choose one of the following two elective papers						
GGY206(OE)	2	2+0+0	50		50	1. Agricultural Geography 2. Climate Change and Adaptations

SEMESTER-III

Paper code	Credit	Credit Distribution (L+T+P)	End Semester Marks	Internal Marks	Total Marks	Paper Name
GGY301	4	3+1+0	80	20	100	Regional Planning and Development
GGY302	4	3+1+0	80	20	100	Basics of Remote Sensing And GIS
GGY303	4	3+1+0	80	20	100	Research Methodology
GGY304	4	3+1+0	80	20	100	Environmental Geography
GGY305	5	1+0+3	80	20	100	Digital Cartography and Survey
Department will choose one of the following two elective papers						
GGY306(DSE)	3	3+0+0	80	20	100	1. Population Data and its use in social Geography 2. Environment and Ecology

:

SEMESTER- IV**SPECIAL PAPERS FOR GEOMORPHOLOGY**

Paper code	Credit	Marks	Paper Name
GGY401	4	100	Advance Geomorphology
GGY402	4	100	Environmental Geomorphology
GGY403	4	100	Fluvial Geomorphology
GGY404	4	100	Geomorphological Techniques
GGY405	6	100	Dissertation

SPECIAL PAPER FOR SOCIAL GEOGRAPHY

Paper code	Credit	Marks	Paper Name
GGY401	4	100	Social Dynamics and Change
GGY402	4	100	Political and Cultural Geography
GGY403	4	100	Population Geography and Resource Interface
GGY404	4	100	Practical on Social Geography
GGY405	6	100	Dissertation

SPECIAL PAPER FOR POPULATION GEOGRAPHY

Paper code	Credit	Marks	Paper Name
GGY401	4	100	Dynamics of Fertility and Mortality
GGY402	4	100	Migration and Related Issues
GGY403	4	100	Population, Resource and Development
GGY404	4	100	Practicing Population Geography (Practical)
GGY405	6	100	Dissertation

SEMESTER– I
PAPER TITLE: GEOMORPHOLOGY
PAPER CODE: GGY 101
CREDIT: 4
MARKS: 100

UNIT I: Fundamentals

Development History of Geomorphic ideas: recent trends in Geomorphology, fundamental concepts of geomorphology, Geological Time Scale and geomorphology, Rocks, Concepts of Uniformitarianism, Catastrophism, System approach, Steady state, Dynamic equilibrium and Threshold.

UNIT II: Geomorphic Processes

Concept of Gradation: degradation and aggradation

Weathering, Mass movement: types and processes

Endogenetic: orogenetic and epeirogenetic, folds and faults, exogenetic: glacial, fluvial aolian

River and terraces: types and origin

UNIT III: Crustal Movement

Continental drift, sea floor spreading and expanding earth, plate tectonics-plates, boundaries, movements and criticism

Isostasy, crustal equilibrium and earth's major relief features.

UNIT IV: Geomorphology and Landforms

Palaeogeomorphology: concept, relict, exhumed and buried landforms

Environmental Geomorphology: Concept; climate change and environment

Origin, structure and landscape: The Himalaya, deccan plateau, and thar desert

Morphogenetic region

SUGGESTED READING LIST:

1. Ahmad, E., 1985: Geomorphology, Kalyani Publishers, New Delhi.
2. Bloom, Arthur L., 1978: Geomorphology - A Systematic Analysis of Late Cenozoic Landforms, Prentice Hall, Englewood Cliffs, New Jersey.
3. Chorley, Richard J., 1972: Spatial Analysis in Geomorphology, Harper & Row Publishers, New York, London.
4. Dayal, P., 1996: A Textbook of Geomorphology (2nd edition), Shukla Book Depot, Patna
5. Derbyshire, E. (ed), 1976: Geomorphology and Climate, Wiley, London
6. Dixit, K. R.(ed), 1983: Contribution to Indian Geography/Geomorphology, Heritage, New Delhi
7. Embelton, C, Brunsdon, D, and Jones, D.K.C., (ed), 1978: Geomorphology: Present Problems and Future Prospects, Oxford University Press, London.
8. Embleton, C. and Thorns, J. 1982: Processes in Geomorphology, Arnold Heinemann, First Indian Edition.
9. Engeln, O. D. Von, 1942: Geomorphology, McMillan, London.
10. Fairbridge, R.W. (ed), 1968: Encyclopedia of Geomorphology, Reinhold, New York.

11. Goudie, Andrew, et. Al. (eds), 1981: Geomorphological Techniques, George Allen & Unwin, London.
12. Gregory, K.J., 1985: The Nature of Physical Geography, Edward Arnold, London.
13. Hart, M. G., 1986: Geomorphology: Pure and Applied, Allen & Unwin (Publishers), London.
14. Holmes, A., 1968: Principles of Physical Geology, Nelson, London.
15. Jensen, J. R., 2011: Remote Sensing of the Environment – An Earth Resource Perspective, 3rd Impression, Chapter-14, Pearson, New Delhi.
16. Penck, W., 1924: Morphological Analysis of Landforms, Mc Millan, London.
17. Sharma, V. K., 1986: Geomorphology, Earth Surface Processes and Forms, Tata Mc Graw Hill, New Delhi.
18. Steers, J. A., 1958: The Unstable Earth, Methuen, London.
19. Strahler, A.N., 1969: Physical Geography, 3rd edition, Wiley.
20. Thornbury, W. D. 1969: Principles of Geomorphology, 2nd ed., Wiley International Edition, Wiley Eastern Reprint. 15. Young, A., 1972: Slope, Longman, New York, Oliver and Boyd, Edinburgh.
21. Wooldridge, S. W. and Morgan, R. S., 1948: The Physical Basis of Geography, Longman (First Published in 1937).

PAPER TITLE: CLIMATOLOGY

PAPER CODE: GGY 102

CREDIT: 4

MARKS: 100

UNIT I: Introduction

Climatology and its relationship with atmospheric science, atmospheric composition and structure, insolation and heat budget

UNIT II: Temperature

Process of heat energy transfer, Insolation, Horizontal and vertical distribution of temperature; Global climate change and its effects on sea level, Bio-diversity, Migration and Human health

UNIT III: Atmospheric Moisture and Precipitation

Concept and measurement of atmospheric moisture; Condensation - forms of condensation; Global distribution of precipitation; Clouds; Air pressure system and air circulation; Air masses and fronts

UNIT IV: Climatic Disturbances

Cyclone, Drought, El nino and La nina Phenomena, Ocean currents; mechanism of Monsoon wind and its distribution; classification of world climate: Koppens, Thornthwaite and Trewartha

Applied climatology: Data collection, archiving, accessing, interpretation and generation of climatic information specially for water balance studies, soils, agriculture activities, house types and health.

SUGGESTED READING LIST:

1. Barry, R. G. and Chorley, R. J. 1971: Atmosphere, Weather and Climate, Methuen Co. Ltd, London.
2. Blair, T. A., 1954: Weather Elements, Prentice-Hall, New York.
3. Critzfield, H. J., 1975: General Climatology, Prentice Hall of India, New Delhi.
4. Das, P. K., 1968: The Monsoons, National Book Trust, New Delhi.
5. Griffith, J. F., 1966: Applied Climatology, Oxford University Press.
6. Hobbs, J. E., 1980: Applied Climatology, Butterworths.
7. Keshavamurty, R. N., and Rao, M. S., 1992: The Physics of Monsoons, Allied Publishers Ltd., New Delhi.
8. Lal, D. S., 1998: Climatilogy, Sharda Pustak Bhawan, Allahabad.
9. Miller, A. A., 1953: Climatology, Dutton.
10. Strahler, A. N., 1971: Physical Geography, John Wiley, New York
11. Trewartha, G. T. and Horn, L. A., 1980: An Introduction to Climate, International Series.
12. India Meteorological Department (IMD), 1968: Climatological Tables of Observatories in India, Govt. of India.
13. Thompson, R. D. and Perry, A (ed.), 1997: Applied Climatology, Principles and Practice, Routledge, London.

PAPER TITLE: GEOGRAPHIC THOUGHTS

PAPER CODE: GGY 103

CREDIT: 4

MARKS: 100

UNIT I: Geography as Discipline of Knowledge

Place of Geography in the classification of knowledge: Defining the field of Geography, Relation of Geography with other natural and social sciences; Geography as a science of: (i) Distributions; (ii) Relationships; (iii) Areal differentiation; and (iv) Spatial organisation.

UNIT II: Historical Development

Contribution of Ancient and Mediaeval period in Geographic knowledge; Role of Discoveries and Renaissance on the Emergence of modern Geography

UNIT III: Foundations of Modern Geography

Contribution of German, French , British and American Geographers.
Models in Geography and their applications; impact of technological advances on Geographic methodology

UNIT IV: Evolution of Geographic Thought

Human Ecology, Neo-Determinism, Neo-Environmentalism, Positivism and Quantitative revolution, Behaviouralism, Radicalism, Humanism, Post-Modernism, Dualisms-Regional vs Systematic, Physical vs Human.

SUGGESTED READING LIST:

1. Abler, R., Adams, J. and Gould, P., 1971: *Spatial Organization: The Geographers' View of the World*, Prentice-Hall, Englewood Cliff.
2. Ackerman, E. A., et al, 1965: *The Science of Geography*, Washington D.C., National Academy of Science / National Research Council Pub. No. 1277.
3. Adhikari, S., 1992: *Geographical Thought*, Chaitanya Pub. House, Allahabad.
4. Berry, B. J. L., 1973: 'A Paradigm for Modern Geography', in R. J. Chorley (ed), *Directions in Geography*, London Methuen.
5. Bunge, W., 1962: *Theoretical Geography*, Lund Studies in Geography, Lund, C.W.K. Gleerup.
6. Buttimar, A., 1978: 'On People, Paradigms and Progress in Geography', in D.R. Stoddart (ed), *Geography, Ideology and Social Concern*, Oxford, Blackwell.
7. Dickinson, R. E., 1969: *Makers of Modern Geography*, Routledge and Kegan Paul, London.
8. Dikshit, R. D., 1994: *The Art and Science of Geography*, Prentice Hall of India, New Delhi.
9. Dikshit, R. D., 1997: *Geographical Thoughts: A Contextual History of Ideas*, Prentice Hall of India, New Delhi.
10. Gold, J. R., 1980: *An Introduction to Behavioural Geography*, Oxford University Press.
11. Hartshorne, R., 1939: *The Nature of Geography*, Association of American Geographers, Lancaster, Penn.
12. Hartshorne, R., 1959: *Perspective on the Nature of Geography*, Rand Mckully, Chicago.
13. Harvey, D., 1989: *The Connection of Post modernity*, Oxford, Basil Blackwell.
14. Harvey, D., 1969: *Explanation in Geography*, St. Martin's Press, New York.
15. Harvey, Milton and Holly, Brian P.1989: *Themes in Geographic Thought*, Routledge, London.
16. James, P. E., 1972: *All Possible World: A History of Geographic Ideas*, The Odyssey Press, New York.
17. Johnston, R. J. (ed), 1983: *Geography and Geographers*, Edward Arnold, London.
18. Ley, S. and Samuels, M. S. (eds), 1978: *Humanistic Geography: Prospects and Problems*, Maaronfa Press, Chicago.
19. Peet, R., 1977: *Radical Geography*, Methuen, London.
20. Soja, E. W., 1990: *Postmodern Geography*, Verso, London.

PAPER TITLE: CARTOGRAPHIC METHODS AND QUANTITATIVE TECHNIQUES

PAPER CODE: GGY 104

CREDIT: 4

MARKS: 100

UNIT I: Field of Cartography

- Nature and scope of Cartography, history of development and present day relevance of Cartography in Geography, traditional and digital cartography.
- The concept of coordinate system, latitude and longitude, direction and distance of earth.

UNIT II: Fundamental Concepts in Cartography

- Concept of Scale and Application, Map Scale and Types,
- Graphic representation, Concept of map, symbolization of maps, map Classification and Types, Thematic maps and their classification, Base map, Principles of Map Design and layout,
- International map series

UNIT III: Map Projection and Surveying

- Map projection and Basic Problems of map projection
- Choice of map projection and construction of selected map projection
- Principles of surveying: Geodatic and Plane Surveying
- Principles of Triangulation
- Techniques of topographic surveying and mapping

UNIT IV: Quantitative Techniques

- Need and use of quantitative techniques in geography
- Measures of central tendency: mean, median, mode and their uses
- Measure of dispersion
- Correlation and Regression

Books Suggested:

1. Cuff J. D. and Mattson M. T., 1982: *Thematic Maps: Their Design and Production*, Methuen Young Books.
2. Dent B. D., Torguson J. S., and Holder T. W., 2008: *Cartography: Thematic Map Design* (6th Edition), Mcgraw-Hill Higher Education.
3. Gupta K. K. and Tyagi V. C., 1992: *Working with Maps*, Survey of India, DST, New Delhi.
4. Kraak M.-J. and Ormeling F., 2003: *Cartography: Visualization of Geo-Spatial Data*, Prentice-Hall.
5. Mishra R. P. and Ramesh A., 1989: *Fundamentals of Cartography*, Concept, New Delhi.
6. Sharma J. P., 2010: *Prayogic Bhugol*, Rastogi Publishers, Meerut.
7. Singh R. L. and Singh R. P. B., 1999: *Elements of Practical Geography*, Kalyani Publishers.
8. Slocum T. A., McMaster R. B. and Kessler F. C., 2008: *Thematic Cartography and Geovisualization* (3rd Edition), Prentice Hall.
9. Tyner J. A., 2010: *Principles of Map Design*, The Guilford Press.
10. Sarkar, A. (2015) *Practical geography: A systematic approach*. Orient Black Swan Private Ltd., New Delhi
11. Singh, L R & Singh R (1977): *Manchitra or Pnyaogatamek Bhugol* , Central Book, Depot, Allahabad.
12. Bhopal Singh R L and Dutta P K (2012) *Prayogatama Bhugol*, Central Book Depot, Allahabad.

PAPER TITLE: PRACTICAL ON GEOMORPHOLOGY, CLIMATOLOGY AND CARTOGRAPHIC METHODS

PAPER CODE: GGY105

CREDIT: 5

MARKS: 100

UNIT I: Fundamentals of Geomorphology

- (i) Topographical map analysis and interpretation.
- (ii) Slope map by Wentworth's method
- (iii) Relative and Absolute relief
- (iv) Hatching Method for relief study
- (v) Watershed and Catchment study: Stream Ordering, bifurcation ratio, drainage frequency and density

UNIT II: Analysis of Climatic Data

- (i) Ergograph
- (ii) Weather map interpretation
- (iii) Climograph and hythergraph
- (iv) Rainfall dispersion graph, rainfall variability
- (v) Water deficiency and surplus graphs

UNIT III: Map Projection

- (i) Lambert's conical equal-area projection
- (ii) Conical projection with two standard parallels
- (iii) Zenithal Gnomonic Projection (Equatorial case)
- (iv) Mercator's Projection
- (v) Sinusoidal Projection

SUGGESTED READING LIST:

1. Campbell, J., 1984: Introductory Cartography, Prentice Hall Inc., Englewood Cliffs N.J.
2. Kellaway, G. P., : Map Projections, Methuen & Co., London
3. Lawrence, G. R. P., 1964: Cartographic Methods, Oxford University Press, London.
4. Misra, R. P., and Ramesh, A., 1989: Fundamentals of Cartography, Concept Publishing co. New Delhi
5. Monkhouse, F. J., and Wilkinson, H. R., 1989: Maps and Diagrams, B. I., Publications Pvt. Ltd., New Delhi
6. Robinson, A. H., et al., 1995: Elements of Cartography, 6th Edition, John Wiley & Sons, New York.
7. Steers, J. A., 1965: An Introduction to the Study of Map Projection, University of London, London.
8. Talukder, S., 2008: Introduction to Map Projections, EBH Publishers (India), Guwahati.

DEPARTMENT WILL CHOOSE ONE OF THE FOLLOWING THREE ELECTIVE PAPERS AS OPEN ELECTIVE

PAPER TITLE: ENVIRONMENT AND SUSTAINABLE DEVELOPMENT

PAPER CODE: GGY 106 (OE)

CREDIT: 2

MARKS: 50

UNIT-I: Sustainable Development

Concept and philosophy
Development of the concept of sustainable Development
Nature as resource and sinks
Natural Resource Management and Sustainable Development

UNIT-II: Inequality around the World

Concept of developed and developing countries, development parameters
Global Incomes and Inequality

Measuring Inequality and Wellbeing within Countries

UNIT-III: Environmental Strategies

Human Population and Sustainability
Ecology, economy and sustainable development
Sustainable Development and world forum
Sustainable development goals
Climate change and sustainable development: adaptive strategies.

UNIT-IV- Energy and Sustainable Development

Clean energy and sustainable development, Economic and Social Impact of Energy
Production and Use
Policy and Politics of Energy
International Politics of Climate Change

SUGGESTED READING LIST:

1. Balakrishnan, M., 1998: *Environmental Problems and Prospects in India*, Oxford & IBH Publication, New Delhi.
2. Friedmann, J. and Alonso, W., 1966: *Regional Development and Planning: A Reader*, MIT Press, Massachusetts.
3. Friedmann, J. And Alonso, W., 1975: *Regional Policy: Readings in Theory and Applications*, MIT Press, Massachusetts.
4. Goudie, A., 1984: *The Nature of Environment*, Basil Blackwell, London.
5. Misra, R. P.,: *Regional Planning: Concepts, Techniques and Policies*, University of Mysore, Mysore.
6. Misra, et. al, 1974: *Regional Development Planning in India- A Strategy*, Institute of Development Studies, Mysore.
7. Park, C., 1997: *The Environment*, Routledge, London.
8. Pickering, K. T. & L. A. Owne, 1994: *An Introduction to Global Environmental*
9. Sengupta, R., 2009: *Ecology and Economics: an approach to sustainable Development*.
10. Sharieff, A., 2010: *Sustainable Development and Geography. Issues*, Routledge, London.
11. Singh, S., 1991: *Environmental Geography*, Prayag Pustak Bhawan, Allahabad.
12. Strahler, A. N. and A. H. Strahler, 1976: *Geography and Man's Environment*, John Willey, New York. Version 1.0, 2014 Page 11 of 52

FURTHER READINGS:

1. Cantledge, B (ed), 1992: *Monitoring the Environment*, Oxford University Press, Oxford.
2. Rostow, W., 1960: *The Stages of Economic Growth: A Non-communist Manifesto*, Cambridge University Press, Cambridge.
3. Simon, I. G., 1982: *Biogeographical Process*, Allen & Unwin, London.
4. Newson, M., 1992: *Land, Water and Development*, Routledge, London.
5. Varma, P. S. and Agarwal, V. K., 1989: *Principles of Ecology*, S. Chand & Co., New Delhi.

PAPER TITLE: BASICS OF CARTOGRAPHY AND GIS
PAPER CODE: GGY 106 (OE)
CREDIT: 2
MARKS: 50

UNIT-I: Field of Cartography

- Field of Cartography and its development
- Relevance of cartography in present studies
- traditional and digital cartography

UNIT-II: Fundamental Concepts in Cartography

- Concept of Scale and Application, Map Scale and Types, Scale factor, Conversion of scale, Concept of map, map Classification and Types, Thematic maps and their classification, Base map, Principles of Map Design and layout.
- Concept of Geographical data representation through Chorochromatic, Choroschematic, Isopleths and Choropleth maps.
- Concept of spot heights, Bench Mark, Triangulation stations, Contours and their use in Topographical Maps of India.

UNIT-III: Cartographic data representation

- Cartogram and Diagrammatic Data Presentation by Line, Bar and Circle
- Point, Line and Areal Data representation through Cartographic Overlays
- Definition, need of Map Projection, Principles, Function and Classification of map projection, Choice of Map Projection
- Concept and Principles of Geodetic and Plane Surveying, Principles of triangulation

Books Suggested:

1. Cuff J. D. and Mattson M. T., 1982: *Thematic Maps: Their Design and Production*, Methuen Young Books.
2. Dent B. D., Torguson J. S., and Holder T. W., 2008: *Cartography: Thematic Map Design* (6th Edition), Mcgraw-Hill Higher Education.
3. Gupta K. K. and Tyagi V. C., 1992: *Working with Maps*, Survey of India, DST, New Delhi.
4. Kraak M.-J. and Ormeling F., 2003: *Cartography: Visualization of Geo-Spatial Data*, Prentice-Hall.
5. Mishra R. P. and Ramesh A., 1989: *Fundamentals of Cartography*, Concept, New Delhi.
6. Sharma J. P., 2010: *Prayogic Bhugol*, Rastogi Publishers, Meerut.
7. Singh R. L. and Singh R. P. B., 1999: *Elements of Practical Geography*, Kalyani Publishers.
8. Slocum T. A., McMaster R. B. and Kessler F. C., 2008: *Thematic Cartography and Geovisualization* (3rd Edition), Prentice Hall.
9. Tyner J. A., 2010: *Principles of Map Design*, The Guilford Press.
10. Sarkar, A. (2015) *Practical geography: A systematic approach*. Orient Black Swan Private Ltd., New Delhi
11. Singh, L R & Singh R (1977): *Manchitra or Paryaogatamek Bhugol* , Central Book, Depot, Allahabad.
12. Bhopal Singh R L and Dutta P K (2012) *Prayogatama Bhugol*, Central Book Depot, Allahabad.
13. Campbell, J., 1984: *Introductory Cartography*, Prentice Hall Inc., Englewood Cliffs N.J.
14. Kellaway, G. P., : *Map Projections*, Methuen & Co., London

15. Lawrence, G. R. P., 1964: Cartographic Methods, Oxford University Press, London.
16. Misra, R. P., and Ramesh, A., 1989: Fundamentals of Cartography, Concept Publishing co. New Delhi
17. Monkhouse, F. J., and Wilkinson, H. R., 1989: Maps and Diagrams, B. I., Publications Pvt. Ltd., New Delhi
18. Robinson, A. H., et al., 1995: Elements of Cartography, 6th Edition, John Wiley & Sons, New York.
19. Steers, J. A., 1965: An Introduction to the Study of Map Projection, University of London, London.
20. Talukder, S., 2008: Introduction to Map Projections, EBH Publishers (India), Guwahati.

PAPER TITLE: NATURAL HAZARDS AND DISASTER

PAPER CODE: GGY 106(OE)

CREDIT: 2

MARKS: 50

UNIT I: Concepts of Hazards and Disaster

- Concept of hazards and disasters;
- Types of hazards: natural and man-made;
- Concept of risk and vulnerability;
- Analysis of risks and vulnerability.

UNIT II: Spatial Dimension of Disaster

- Spatial dimension (global and regional) and distribution of natural hazards (Floods, drought and desertification, earthquakes, landslides, avalanches, cyclones, forest fires),
- frequency of occurrences and trends;
- Hazard / disaster prone zone identification.

UNIT III: Consequences of Hazards and Disaster

- Impact of natural hazards and disasters- displacement of people, loss of life and properties, infrastructure, health, economy and livelihood (with special reference to flood hazards in the Brahmaputra valley)

UNIT IV: Disaster Management and Mitigation

- Components of disaster management cycle (Concepts relating to the Pre-disaster phase, emergency phase, post-disaster phase);
- Response to disasters by international, national, government and non- government agencies, media, community and individual
- Engineering, socio-economic, political framework of disaster mitigation and management plans, policies and implementing agencies.
- Disaster awareness plans and programmes: role of institutions, government and non-governmental agencies; technological advances.

SUGGESTED READING LIST:

1. Burton, I., Kates, W. And White, G. F., 1993: *Environment as Hazard*, Guildford Press, New York.
2. Blaikie, P., Cannon, T., Davis, I. Et al., 1994: *At Risk: Natural Hazards, People's Vulnerability and Disasters*, Routledge, London.

3. Framton, C., Hardwick and McNaught, 1999: *Causes, Consequences and Management of Disasters*, Hodder and Stoughton, London.
4. Godschalk, D. R. Et. Al., 1999: *Natural Hazard Mitigation Recasting Disaster Policy and Planning*, Island Press, Washington, D. C.
5. Gupta, M. C., Gupta, L.C., Tamini, B. K., Sharma, Vinod, K., 2000: *Manual on Natural Disaster Management in India*, National Disaster Management Centre, New Delhi
6. Hewitt, K., 1997: *Regions of Risk: A Geographical Introduction to Disasters*, Longman, London.
7. Kapur, Anu and Others, 2005: *Disasters in India: Studies of Grim Reality*, Rawat, Jaipur.
8. Paraswamam, S., Unnikrishnan, P. V., 2000: *India Disaster Report*, Oxford University Press, New Delhi.
9. Quarantelli, E. L. (ed), 1998: *What is Disaster? Perspective on the Question*, Routledge, London.
10. Schneid, T., and Collins, L., 1998: *Disaster Management and Preparedness*, Lewis Publishers, Washington, D.C.

SEMESTER– II
PAPER TITLE: GEOGRAPHY OF INDIA
PAPER CODE: GGY 201
CREDIT: 4
MARKS: 100

UNIT- I: PHYSICAL AND REGIONAL BASES

India as a geographical entity; unity in diversity;
Regionalization of India based on OHK Spate and R L Singh
Physical background - relief, drainage, climate, soil, agro-climatic and vegetation

UNIT - II: SOCIO-ECONOMY

Demography: Population growth and its socio- economic implications,
Literacy, urbanization, occupation and socio-cultural structure
Agriculture: characteristics of India agriculture, modernization of
India agriculture, distribution of different crops: rice, wheat, sugarcane,
Cotton, tea, pulses;
Industry: distribution factors and patterns of location of different industries:
Iron and Steel, Aluminum, Oil refining and Petrochemical, Textile, transport and communication

UNIT-III: GEOPOLITICS OF INDIA:

India's geopolitical and economic position in Asia and the world; its
Economic development policies and international relations

UNIT-IV: NORTH EAST REGION:

Unity in Diversity of the North East,
Physical divisions and characteristics (Physiography, drainage, climate and Biodiversity)
Population growth and distribution
Economic activities: agriculture (types and patterns) and natural resources and manufacturing
industries; development issues and problems

SUGGESTED READING LIST:

1. Agarwala, S. N., 1988 (First reprint): *India's Population Problems*, Tata McGraw Hill Publishing Co. Ltd. New Delhi.
2. Bhatt, L. S., 1973: *Regional Planning in India*, Statistical Publishing Society, Calcutta.
3. Bose, A., (ed) 1967: *Pattern of population Changes in India- 1951-61*, Allied Publishers, Bombay.
4. Davis, K., 1951: *Population of India and Pakistan*, Princeton University Press, Princeton.
5. Deshpande, C. D., 1992: *India: A Regional Interpretation*, ICSSR, New Delhi.
6. Duncan, G., 1967: *Resource Utilization and the Conservation, Concept in Readings in Economic Geography*, New York.
7. Gananathan, V.S., 1967: *Economic Geography of India*, NBT, India, New Delhi.
8. Govt. of India, 1965: *The Gazetteers of India*, Publication Division, Ministry of Information and Broadcasting, New Delhi.
9. Khuller, D.R., 2013: *India- A comprehensive Geography*.
10. Singh, R. L., (ed), 1968: *India- Regional Studies*, 21st IGC, New Delhi

11. Singh, R. L., (ed), 1971: *India: A Regional Geography*, National Geographical Society of India, Varanasi.
12. Sharma, T. R., 1949: *Location of Industries in India*, Hind Kitab, Bombay.
13. Spate, O. H. K. and Learmonth, A. T. A., 1967: *India and Pakistan- Land, People and Economy*, Methuen & Co. London.
14. Srivastava, M. A., 1967: *Trade of India*, S. Chand & Co., Delhi.
15. Tirtha R. & Gopal Krishna, 1996: *Emerging India* Reprinted by Rawat Publications, Jaipur.

FURTHER READINGS:

1. Centre for Science & Environment (1988): *State of India's Environment*, New Delhi.
2. Deshpande C. D. 1992: *India: a Regional Interpretation*, ICSSR & Northern Book Centre.
3. Dreze, Jean & Amartya Sen (ed.), 1996: *India Economic Development and Social opportunity*, Oxford University Press, New Delhi.
4. Kundu A. Raza Moonis, 1982: *Indian Economy: the Regional Dimension*. Spectrum Publishers, New Delhi.
5. Robinson, Francis, 1989 : *The Cambridge Encyclopaedia of India, Pakistan, Bangladesh, Sri Lanka, Nepal, Bhutan & Maldives*. Cambridge University Press, London.

SEMESTER- II
PAPER TITLE: ECONOMIC GEOGRAPHY
PAPER CODE: GGY 202
CREDIT: 4
MARKS: 100

UNIT-I: FUNDAMENTALS

Scope, content and recent trends in economic geography,
 Relation of economic geography with economics and other branches of social sciences,
 Classification of economies; sectors of economy (primary, secondary and tertiary)
 Concept of Resource: classification and evolution of resources, Functional theory of resources

UNIT-II: AGRICULTURE:

Place of agriculture in global economy,
 Von Thunen's model of agricultural landuse,
 Critical study of large scale and small-scale agriculture,
 World distribution factors and patterns of location of different agricultural products: wheat, rice
 corn, tea, coffee, cotton.

UNIT-III: INDUSTRY:

Place of Industries in global economy,
 Weber's industrial location theory,
 Classification of industries: Resource based and footloose industries,
 World distribution factors and patterns of location of different industries: Iron and Steel,
 Aluminum, Chemical, Oil refining and Petrochemical, Engineering, Textile

UNIT-IV: ECONOMIC GEOGRAPHY OF INTERNATIONAL TRADE:

Food grain (wheat and rice), tea, petroleum, iron and steel; Special Economic Zones (SEZ);
 regional trade blocs of the world: WTO, BRICS, ASEAN, SAARC and EU, levels of economic
 Development - global perspectives.

SUGGESTED READING LIST:

1. Alexander, J. W., 1986: *Economic geography*, Prentice Hall Inc. (E.E.Edition)
2. Bhalla, G. S. and Tyagi, D. S., 1989: *Indian Agricultural Development*, I.S.I.D., New Delhi.
3. Chaudhury, M. R., 1970: *Indian Industries: Development and Location*, Oxford & IBH, Calcutta
4. Das, M. M., 1984: *Peasant Agriculture in Assam*, Inter India Publications, New Delhi.
5. Forbes, D. K., 1984: *Geography of Under Development*, John Hopkins Univ. Press, Baltimore.
6. Gunner Alexanderson, 1988: *Geography of Manufacturing*, Prentice-Hall Inc, (E.E. Edition)
7. Isard, W., 1956: *Location and Space Economy*, MIT Press, Cambridge.
8. Losch, A., 1954: *The Economics of Location*, New Haven.
9. Miller, E. W., 1977: *Manufacturing: A Study of Industrial Location*, Pennsylvania State University Press, Pennsylvania.
10. Smith, David M., 1981: *Industrial Location: An Economic Geographical Analysis*, Wiley, New York
11. Symons, L., 1979: *Agricultural Geography*, West view Press, Colorado
12. Thomas, R. S. and Corbin, P. B., 1974: *The Geography of Economic Activity*, McGraw Hill, New York
13. Wheeler, J. O. and Muller, P. O., 1981: *Economic Geography*, John Wiley & Sons, New York

FURTHER READINGS:

1. Isard, W., 1975: *Introduction to Regional Sciences*, Engle Wood Cliffs
2. Mohammad, N. (ed), 1992: *New Destinations in Agricultural Geography*, Concept Publishing Co., New Delhi.
3. Pryde, P. R., 1983: *Non -Conventional Energy Resources*, Wiley, New York.
4. Rostow, W. W., 1960: *The Stages of Economic Growth*, Cambridge University Press, New York.
5. Roy. and Mukherjee, S. 1993 (2nd Edition): *Economic Geography*, Central Education Enterprises, Calcutta.
6. Sushkin, Yulian, G., 1980: *Economic Geography: Theory and Models*, Progress Publishers, Moscow.
7. Tarrant, J. R., 1980: *Agricultural Geography: Problems in Modern Geography*, Wiley, New York

SEMESTER– II**PAPER TITLE: POPULATION AND SETTLEMENT GEOGRAPHY****PAPER CODE: GGY 203****CREDIT: 4****MARKS: 100****UNIT-I: FUNDAMENTALS OF POPULATION GEOGRAPHY**

Defining the field of Population Geography; Definition, nature and scope
Population-resource relationship; population- resource regions;
Conceptual bases of under population, optimum population, over population, population explosion and population pressure.

UNIT-II: STRUCTURAL COMPONENT

Components of population growth: fertility, mortality and migration;
Population composition: literacy, age, sex, child sex ratio, ageing and associated issues;
Demographic Transition theory,
Global and local food security issues

UNIT-III: FUNDAMENTALS OF SETTLEMENT GEOGRAPHY

Defining the field of settlement of geography;
Site and situation; origin of settlement growth of rural and urban settlements;
Tribal settlements of North East India

UNIT-IV: MORPHOLOGY OF SETTLEMENT

Function and morphology of rural and urban settlements;
Rural- urban relationship: dichotomy and continuum; urban fringe

SEMESTER– II

PAPER TITLE: SOCIAL, CULTURAL AND POLITICAL GEOGRAPHY

PAPER CODE: GGY 204

CREDIT: 4

MARKS: 100

UNIT -I: FUNDAMENTALS OF SOCIAL GEOGRAPHY

Introduction: Definition Nature and scope of cultural geography, cultural element and components of culture; cultural changes: perception, Behaviouralism and cultural relativism;
Geography of ethnic groups and tribal groups: Diffusion of ethnic traits in world as well as India; ethnic landscape and economy of the area, Patterns of livelihood: various economic activities & cultural adaptations

UNIT -II: FUNDAMENTALS OF CULTURAL GEOGRAPHY

Nature and development of social geography;
Space and society: Understanding society and its structure and process; geographical bases of social formations;
Social geography of India: Social differentiation and region formation; evolution of socio-cultural regions of India; race, caste, ethnicity; religion and languages; social transformation and change in India

UNIT -III: FUNDAMENTALS OF POLITICAL GEOGRAPHY

Emergence and development of political geography; approaches to study; major schools of thought, Geographic Elements and the State: Physical Elements; Human elements; Economic elements; Political geography and environment interface.

UNIT-IV: THEMES IN POLITICAL GEOGRAPHY

Themes in Political Geography: State, Nation, Nation-State and Nation- building, Frontiers and boundaries, Colonialism, decolonization, Neocolonialism, Federalism and other forms of governance. The changing patterns of World Powers Perspectives on core-periphery concept, Conflicts and cooperation

Suggested Reading

1. Ahmad, A., 1999: *Social Geography*, Rawat Publications, Jaipur and New Delhi.

2. Ahmad, A., (ed), 1993: ***Social Structure and Regional Development: A Social Geography Perspective***, Rawat Publications, Jaipur.
3. Jones, E. and Eyles, J., 1977: ***An Introduction to Social Geography***, Oxford University Press, Oxford and New York
4. Milton, Keynes, 1972: ***Social Geography: New Trends in Geography***, Open University Press.
5. Taher, M., 1994: ***Social Geography: Concept and Theories***, NEIGS, Guwahati.(2000), NSA, New Delhi.
6. Smith, D. M., 1977: ***Human Geography : A Welfare Approach***, Edward Arnold,
7. Anderson, J.R., 1970: ***A Geography of Agriculture***, Iowa: WMC Brown Co.
8. Clark, Colin and Haswell, Margaret, 1964: ***The Economy of Subsistence Agriculture***, St. Martin's, London.
9. Chorley, R. J. and Haggett, P., 1971: ***Socio-Economic Models in Geography***, Methuen and Co. Ltd., London.
10. Dunn, E. S., 1954: ***The Location of Agricultural Production***, University of Florida Press, Gainesville.
11. Hussain, M., 2001: ***Systematic Agricultural Geography***, Rawat Publication, Jaipur and New Delhi.
12. Morgan, W.B. and Munton, R.J.C., 1971: ***Agricultural Geography***, Methuen, London.
13. Singh, J., 1974: ***Agricultural Atlas of India: A Geographical Analysis***, Vishal Publishers, Kurukhsetra.
14. Singh, J., 1976: ***Agricultural Geography***, Tata McGraw Hill Pub. Co., New Delhi.
15. Symons, L., 1967: ***Agricultural Geography***, G. Bells and Sons, London.
16. Tarrant, John, R., 1974: ***Agricultural Geography***, David and Charles, Newton Book House, Delhi.
17. Tiwari, 1991: ***Agricultural Geography***, International Book House, Delhi.

SEMESTER– II

PAPER TITLE: QUANTITATIVE TECHNIQUES IN GEOGRAPHY

PAPER CODE: GGY 205

CREDIT: 5

MARKS: 100

UNIT-I: INTRODUCTORY STATISTICS:

Measures of central tendency: mean, median, mode;
 Measure of dispersion
 Elementary matrix algebra: addition, multiplication and determinants of matrix

UNIT-II: RELATIONSHIP REPRESENTATION:

Correlation and Regression, regression residual
 Lorenz curve, Gini's Coefficient

UNIT-III: SOCIO ECONOMIC REPRESENTATION:

Crop intensity
 Pie chart
 Histogram and bar graph
 Moving average

UNIT-IV: POPULATION AND SETTLEMENT:

Distribution, hierarchy, organization and pattern
Nearest Neighbor Analysis
Sphere method
Age sex pyramid
Population projection

* Field Study report

SUGGESTED READING LIST:

1. Gregory, S., 1978: *Statistical Methods and the Geographer*, Longman, London.
2. Hammond R and P. S. McCullagh, 1974: *Quantitative Techniques in Geography: An Introduction*, Clarendon Press, Oxford.
3. Johnston R. J., 1973: *Multivariate Statistical Analysis in Geography*, Longman, London.
4. King, L. J., 1969: *Statistical Methods in Geographical Studies*, London.
5. Mahmood, A., 1977: *Statistical Methods in Geographical Studies*, Concept Publications, Delhi.
6. Maurice Yeats, 1974: *An Introduction to Quantitative Analysis in Human Geography*, McGraw, Hill, New York.
7. Paul, S. K., 1998: *Statistics for Geoscientists*, Tata McGraw Hill, New Delhi.
8. Robinson, G. M., 1998: *Methods and Techniques in Human Geography*, John Wiley & Sons, Chichester.

FURTHER READINGS:

1. David Unwin, 1981: *Introductory Spatial Analysis*, Methuen, London.
2. John P. Cole and Cuchlaine A. M. King, 1968: *Quantitative Geography*, John Wiley, London.
3. Koutsoyiannis, 1973: *Theory of Econometrics*, Mcmillan, London.
4. Peter Haggett, Andrew D. Cliff, & Allan Frey, 1977: *Location Methods Vol. I and II*, Edward Arnold, London. Version 1.0, 2014 Page 20 of 52

SEMESTER– II
PAPER TITLE: AGRICULTURAL GEOGRAPHY
PAPER CODE: GGY 206 (OE)
CREDIT: 2
MARKS: 50

Unit I: Introduction

Nature & scope, Origin and dispersal of agriculture – Major theories of origin of agriculture and gene-centres of agriculture - New World and Old World
Models and Regions in Agricultural Geography: Bases of classification; normative models;
Regionalisation: Concept and criteria; Agricultural regions of India.

Unit II: Agricultural Development and Productivity in India

Concept, Criteria of agricultural development; Agricultural Productivity: Concept and Determinants, Regional imbalances, Socio-economic and human health consequences.

Unit IV: Environmental Consequences of Agriculture in India

Concept, process, regional patterns and consequences: ground water depletion and contamination; salinity and alkalinity, deterioration of soil fertility and soil erosion; Case Studies.

Unit V: Emerging Perspectives

Perspectives in Agriculture and Government Initiatives: Sustainable urban agriculture, food security and safety, national agriculture policy.

Suggested Readings:

1. Bryant, C.R., Johnston, T.R. 1992. Agriculture in the City Countryside, Belhaven Press, London.
2. Burch, D., Gross, J. and Lawrence, G. (eds.), 1999. Restructuring Global and Regional Agriculture, Ashgate Publishing Company, Burlington. Department of Geography University of Delhi Delhi - 110 007
3. Cakmak, I. and Welch, R. M. (eds), 2009. Impacts of agriculture on Human Health and Nutrition, EOLSS Publications, UK.
4. Ferroni, Marco, 2013. Transforming Indian agriculture- India 2040: Productivity, Markets and Institutions, Sage Publications, New Delhi.
5. Grigg, D.B. 1984. Introduction to Agricultural Geography, Hutchinson, London.
6. Mohammad, N. 1992. New Dimension in Agriculture Geography, Vol. I to VIII, Concept Publishing Company, New Delhi.
7. Mohammad, N. and Rai, S.C. 2014. Agricultural Diversification and Food Security in the Mountain Ecosystem, Concept Publishing Company, New Delhi.
8. Roling, N.G., and Wageruters, M.A.E. (eds.) 1998. Facilitating Sustainable Agriculture, Cambridge University Press, Cambridge.
9. Shafi, M. 2006. Agricultural Geography. Pearson Education, Delhi.
10. Singh, J., and Dhillon, S.S. 1994. Agricultural Geography, Tata McGraw Hill, New Delhi.
11. Singh, R. B. 2000. Environmental Consequences of Agricultural Development: A Case Study from the Green Revolution state of Haryana, India, Agriculture, Ecosystems and Environment 82, 97–103.
12. Tiwari, R. and Singh, B. 1994. Krishi Bhoogol, PrayagPustakBhandar, Allahabad. (Hindi).
13. White P. 2007. Emergence of agriculture: A global view, Routledge, London.
14. Wright J. 2009. Sustainable agriculture and food security in an era of oil scarcity, Earthscan, London.
15. Young, A. 1998. Landuse Resources: Now and for the Future, Cambridge University Press, Cambridge.

SEMESTER– II

PAPER TITLE: CLIMATE CHANGE AND ADAPTATIONS

PAPER CODE: GGY 206 OE

CREDIT: 2

MARKS: 50

UNIT I: SCIENCE OF CLIMATE CHANGE

Meaning, Concept and Approaches of Climate Change;

Measuring Climate Change: Stress, exposure, risk and vulnerability related to climatic hazards and disasters.

UNIT II: EMPIRICAL ASSESSMENT OF CLIMATE CHANGE ADAPTATION

Introduction, Assessment in fragile ecosystems; Mountain, Desert and Coastal

UNIT III: CLIMATE CHANGE ADAPTATION

Role of Indigenous Traditional Knowledge (ITK) and Resilience for Future Sustainability

UNIT IV: POLICY FRAMEWORK FOR CLIMATE CHANGE ADAPTATION

SDGs Approach, International Climate Change Agreements and Local Governance

Suggested Readings:

1. Adger, W. N. 2006. Vulnerability, *Global Environmental Change*, 16 (3), 268-281
2. Agrawala, S. and Fankhauser, S. (Eds.), 2008. *Economic Aspects of Adaptation to Climate Change: Costs, Benefits and Policy Instruments*, OECD, Paris
3. Barros, Vicente R. (eds.), 2014. *Climate Change 2014. Impacts, Adaptation and Vulnerability: Global and Sectoral Aspects. Fifth Assessment Report of the Intergovernmental Panel on Climate Change (Part B; Regional Aspect)*, Cambridge University Press, New York.
4. Bergkamp, G., Orlando, B. and Burton, I. 2003. *Change: Adaptation of Water Resources Management to Climate Change*, IUCN, Gland
5. Brewster, E. N. 2010. *Climate Change Adaptation: Steps for a Vulnerable Planet*, New York, Nova Science.
6. IPCC, 2012. *Managing the Risks of Extreme Events and Disasters to Advance Climate Change Adaptation. A Special Report of Working Groups I and II of the Intergovernmental Panel on Climate Change* [Field, C.B., V. Barros, T.F. Stocker, D. Qin, D.J. Dokken, K.L. Ebi, M.D. Mastrandrea, K.J. Mach, G.-K. Plattner, S.K. Allen, M. Tignor, and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, UK, and New York, NY, USA, 582 pp.
7. IPCC, 2013. *Climate Change 2013: The Physical Science Basis, the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 1535 pp.
8. Mukherji Shormila, 2004. *Fragile Environment*, Manak Publication Pvt. Ltd.
9. NDMA, 2009. *National Disaster Management Guidelines-Management of Landslides and Snow Avalanches*. Publication of National Disaster Management Authority, Government of India. New Delhi
10. Pandey, R, Jha, S. 2011. *Climate vulnerability index –measure of climate change vulnerability to communities: a case of rural Lower Himalayas, India, Mitigation and Adaptation Strategies Global Change*, Published online December 2011
11. Rai, S.C. 2009. *Land Use and Climate Change*, Nova Science Publishers, Inc., New York.
12. Reid, Hannah. 2014. *Climate change and human development*, London, UK : Zed Books
13. Singh, Savindra, 2015. *Paryavaran Bhoogol*, Prayag Pushtak Bhavan Allahabad (Hindi).

SEMESTER– III
PAPER TITLE: REGIONAL PLANNING AND DEVELOPMENT
PAPER CODE: GGY301
CREDIT: 4
MARKS: 100

UNIT-I: FUNDAMENTALS OF PLANNING AND DEVELOPMENT

Concept of Regional, Regional Development and Regionalization

History of Development of Regional Planning

Objectives and Scope of Regional Planning; Typology of Region: Formal, Functional, Planning Regions;

Regional Planning in Indian National Plans

UNIT-II: PROCESS OF REGIONALIZATION

Approaches to Planning: Sectoral and Spatial Planning, Short, Medium and Perspective Planning; Multi Regional and Multi Level Planning in India;

Principles of Regionalization; Indicators of Development and Data sources; Measures of Regional Development and Disparities in India

UNIT-III: PLANNING STRATEGIES IN INDIA

Planning practices in India, Metropolitan Planning; River Valley Planning, National Capital Region Planning; Resource Development Region Planning; Spatial Purpose Regions Planning; DPAP, Western Ghats and KBK regions

UNIT-IV: METHOD OF PLANNING

Methodology of Plan preparation: surveys: Baseline, Diagnostic and evaluative; macro planning: input-output methodology and inter-regional input output framework; meso planning: project planning-cost benefit and EIA; micro planning: IADP methodology

Suggested Reading

1. Alden J. and R. Morgan, 1974: ***Regional Planning: A Comprehensive View***, Leonard Hills Books, U.K.
2. Chand, M. and Puri, V. K. 1993: ***Regional Planning in India***, Allied Publishers Limited, B/M Asraf, Ali Road, New Delhi-110002.
3. Chandna, . R. C., 2000: ***Regional Planning: A Comprehensive Text***, Kalyani Publishers, New Delhi .
4. Hilborst,J. G. M. (1971) : ***Regional Planning: A System Approach***, Notterdam University Press.
5. Mishra, R. P, 1992: ***Regional Planning: Concept, Techniques, Policies and Case Studies***,Concept Publications, New Delhi.
6. Mishra, R. P., Sundaram, K.V. and Roa, P.V.S, 1974: ***Regional Development Planning in India: A New Strategy***,Vikas Publication, New Delhi.
7. Mohapatra, A. C. and Pathak , C.R., 2003: ***Economic Liberalization and Regional Disparities in India-Special Focus on the North-Eastern Region***, Star Publishing House Shillong.
8. Sanyal,B. M, 2001: India: ***Decentralized Planning***, Concept, New Delhi ,

SEMESTER– III
PAPER TITLE: BASICS OF REMOTE SENSING AND GIS
PAPER CODE: GGY302
CREDIT: 4
MARKS: 100

Unit - I: Introduction to Remote Sensing

Historical development of remote sensing as a technology, History of world and Indian Space Research Program

Relevance of remote sensing in Geography-Concepts and basics: Energy source, energy and radiation principles, energy interactions in the atmosphere and earth surface features

Remote sensing systems: platforms, sensors and radiation records.

Spectral signatures & Resolutions: Spatial, Spectral, Radiometric and Temporal

Unit - II: Remote Sensing, Aerial Photography and Microwave Remote Sensing

Satellites & their characteristics – Geostationary & Sun Synchronous, Orbit

Camera system, types, filter, and film, Geometry of Aerial photography, Digital image, sensor, imaging techniques, Thermal remote sensing, Microwave remote sensing

Photogrammetry, Visual/Air photo interpretation: shape, size, pattern, tone, texture, shadows, site.

Geometric distortion and displacement, Digital Processing, Preprocessing, Enhancement, Transformation and Image classification

Unit - III: Introduction to Geographic Information System and Global Positioning System.

History of Geographic Information System, Concept of Geographic Information Systems, Coordinate systems and map projections, Data types and Spatial data model, Attribute data management and metadata concept, Process of GIS, Geospatial analysis, GIS and modeling

Fundamental of Global Positioning System, Components of global positioning system, factors affecting GPS accuracy and application of Remote Sensing, GIS and GPS.

Unit - IV: Application of Remote sensing data and GIS

Applications: Mapping land use and land cover, urban land use, landform and weather studies and studies of water resources; integration of Remote Sensing and GIS in hazard management, environmental management, decision making and planning.

Weather, Land observation and Marine Observation, Application of Unmanned Aerial Vehicle(UAV).

Earth Resource Satellite: (Sun Synchronous) IRS, LANDSAT, SPOT, IKONOS, QUICKBIRD, MODIS, RADARSAT, ERS, CARTOSAT etc.

Weather & Communication Satellites: (Geostationary) NOAA, TERRA, MOS, INSAT, GOES.

Suggested Reading

1. American Society of Photogrammetry: Manual of Remote Sensing. ASP, Falls Church, V.A., 1983.
2. Barrett E.C and L.F. Curtis : Fundamentals of Remote Sensing and Air Photo Interpretation, Mcmillan, New York, 1992.
3. Compbell J. : Introduction to Remote Sensing, Guilford, New York. 1989.
4. Curran, Paul J. : Principles of Remote Sensing, Longman, London, 1985.
5. Hord R.M. : Digital Image Processing of Remotely Sensed Data, Academic, New

York. 1989.

6. Luder D. : Aerial Photography Interpretation: Principles and Application, McGraw Hill, New York, 1959.

7. Pratt W.K. Digital Image Processing Wiley, New York, 1978.

8. Rao D.P. (eds.) : Remote Sensing for Earth Resources, Association of Exploration Geophysicist, Hyderabad, 1998.

9. Thomas M. Lillesand and Ralph W. Kefer, Remote Sensing and Image Interpretation, John Wiley & sons, New York, 1994. Pedagogy

SEMESTER– III
PAPER TITLE: RESEARCH METHODOLOGY
PAPER CODE: GGY303
CREDIT: 4
MARKS: 100

UNIT I: FUNDAMENTALS OF RESEARCH METHODOLOGY

Definition of research, essential features of good research;

Scientific Research: purpose and objectives.

Research design: Meaning, need and features of a good design,

Formulation of a research problem, objectives, and hypothesis/ research questions, methodology, significance, review of research works and referencing

UNIT II: PROCESS OF GEOGRAPHIC RESEARCH

Inductive and Deductive approaches in geographic research, concept of Laws, Theories, model building and hypothesis testing in Geography.

Problems of explanation in Geography

UNIT III: RESEARCH TOOL AND TECHNIQUE

Questionnaire design, data collection, Sampling, construction of indicators / variables, data processing and analysis,

Sources of geographic data: Conventional, Remote Sensing, GIS, GPS.

Scale of measurement in research

UNIT IV: ETHICS IN GEOGRAPHIC RESEARCH

Research ethics: Plagiarism; Data interpretation and

Research write-up: Structure, components and presentation

Suggested Reading

1. Ackoff, R. L., 1961: *The Design of Social Research*, University of Chicago Press, Chicago.

2. Goode William, J. and Hatt, Paul K., 1952: *Methods in Social Research*, McGraw Hill Company, Inc., New York.

3. Kothari, C. R., 1993: *Research Methodology: Methods and Techniques*, 2nd ed., Wiley Eastern Ltd., New Delhi.

4. Mishra, R. P., 1989: *Research Methodology: A Hand book*, Concept Publishing Company, New Delhi.

5. Misra, H. N. and Singh, V. P., 1998: *Research Methodology in Geography*, Concept Publishing Company, New Delhi.

6. Montello, Danial R. and Paul C. Sutton, 2006: ***An Introduction to Scientific Research Methods in Geography***, Sage Publications, London.
- 7.M,Hussain.,: ***Models in Geography***, Rawat Publication.
8. Nalwa, V., 1992: ***The A B C of Research for Behavioural and Social Sciences***, Wiley Eastern,New Delhi.
9. Prasad, H., 1992: ***Research Methods and Techniques in Geography***, Rawat Publications, Jaipur.

FURTHER READINGS (GPH903C)

1. Harvey, David, 1969: ***Explanation in Geography***, Arnold
2. Miller, D. C., 1977: ***Hand Book of Research Design and Social Management***, 3rd ed., David McKay Company, Inc. New York.
3. Ralph, Berry, 1990: ***The Research Project, How to Write it***, Routledge, London.
4. Selltiz, C. et al., 1959: ***Research Methods in Social Relations***, rev. ed., Rinehart and Winston, Inc., New York.
5. Thomas, S. Kuhn, 1970: ***The Structure of Scientific Revolution***, University of Chicago Press,University Press, Cambridge.
4. Ilbery, 1991: ***Agricultural Geography: Social and Economic Analysis***, International Book House, Delhi.
5. Mohammad, N. (ed), 1992: ***New Dimensions in Agricultural Geography*** (in 8 Volumes), Concept Publishing Company, New Delhi.
6. Wheeler, K. B., Ladley, A. M. and Leong, F. G., 1970: ***Studies in Agricultural Geography***, Bland Educational, London.

SEMESTER– III
PAPER TITLE: ENVIRONMENTAL GEOGRAPHY
PAPER CODE: GGY304
CREDIT: 4
MARKS: 100

Unit I: Bases

15 Classes

Meaning and scope of environmental geography; Approaches to study of environment; Types of environment, Environment and society, Environment and development, Environmental perception and cognitive maps;
 Biogeography definition, meaning, concept of bio-diversity; ecosystem and plant-animal association in varying habitats and environments, biome types
 Concept of biodiversity

Unit II: Pollution and Management

17 Classes

Environmental pollution: pollutants, sources and types of pollution; Water, soil, air, and noise pollution; Solid waste disposal; Environmental pollution and health; Environmental education; Environmental impact analysis; Environmental monitoring and standards; Environmental policy and legislation; Environmental management.

UNIT III: Soil Fundamentals

15 Classes

Soil formation factors: Parent material, Organic, Climatic, Topographic, Spatio-temporal; Processes of soil formation and soil development: Physical, Biotic and Chemical; Soil profile: Different layers of soil and soil types

Unit IV: Physical Properties of Soil

17 Classes

Morphology, Texture, Structure, Water, Air, Temperature and other properties of soil; Chemical Properties of soil and soil reaction; concepts of soil erosion, Degradation, and Conservation

Reading List:

1. Anjuneyulu, Y. (2002): Environmental Impact Assessment Methodologies. B. S. Publications, Hyderabad.
2. Anjuneyulu, Y. (2004): Introduction to Environmental Science. B. S. Publications, Hyderabad.
3. Athavale, R. N. (2003): Water Harvesting and Sustainable Supply in India. Rawat Publications., Jaipur.
4. Bilas, R. (1988): Rural Water Resource Utilization and Planning. Concept Publishing Company, New Delhi.
5. Blaikie, P., Cannon, T. and Davis, I. (eds.) (2004): At Risk: Natural Hazards, Peoples Vulnerability and Disasters. Routledge, London.
6. Clarke, J. I., Curson, P., Kayastha S. L. and Nag P. (eds.) (1991): Population and Disaster. Basil Blackwell, USA
7. Gautam, A. (2007): Environmental Geography, Sharda Pustak Bhawan, Allahabad
8. Huggett, R. J. (1998): Fundamental of Biogeography. Routledge, London.
9. Kayastha, S.L. and Kumra V.K. (1986): Environmental Studies. Tara Book Agency, Varanasi.
10. Khoshoo, T. N. (1981): Environmental Concerns and Strategies. Ashish Publishing House, New Delhi
11. Kumra, V.K. (1982): Kanpur City. A Study in Environmental Pollution. Tara Book Agency, V aranasi.
12. Mathur, H. S. (2003): Essentials of Biogeography. Pointer Publication, Jaipur.
13. Nag, P., Kumra, V.K. and Singh, J. (1990): Geography and Environmental Issues at Local, Regional and National Levels. (in 3 vols.), Concept Publishing Company, New Delhi.
14. Odum, E.P. (1975): Ecology. Rowman and Littlefield, Lanham USA.
15. Rajagopalan, R. (2005): Environmental Studies: From Crisis to Cure, Oxford University Press, New Delhi.
16. Reddy, M. A. (2004): Geoinformatics for Environmental Management. B. S. Publishers., Hyderabad.
17. Saxena, K.K. (2004): Environmental Studies. University Book House Private Ltd., Jaipur
18. Saxena, H. M. (1999): Environmental Geography. Rawat Publications., Jaipur and New Delhi.
19. Saxena, H. (2000): Environmental Management. Rawat Publications., Jaipur and New Delhi.
20. Singh, A.K., Kumra, V.K. and Singh, J. (1986): Forest Resource, Economy and Environment. Concept Publishing. Company, New Delhi.
21. Singh, D.N., Singh, J. and Raju, K.N.P. (eds.) (2003): Water Crisis and Sustainable Management, Tara Book Agency, Varanasi
22. Singh, J. (2001): *Paryavaran Evam Samvikas*. GyanodayaPrakashan, Gorakhpur.

22. Singh, O., Nag P., Kumra V.K. and Singh J. (eds.) (1993): Frontier in Environmental Geography. Concept Publishing Company, New Delhi.
23. Singh, O., Kumra V.K. and Singh J. (1988): India's Urban Environment. Pollution, Perception and Management. Tara Book Agency, Varanasi.
24. Singh, R. B. (ed.) (1990): Environmental Geography. Heritage Publication, New Delhi.
25. Singh, R. B. (ed.) (1995): Studies in Environment and Development. Rakesh Prakashan, Varanasi.
26. Singh, Rana P.B. (ed.) (1993): Environmental Ethics: Discourses and Cultural Traditions. National Geographical Society of India, BHU, Varanasi.
27. Singh, S. (2006): Environmental Geography. PrayagPustak Bhawan, Allahabad.
28. Singh, S. (2007): *ParyavaranBhugol*. PrayagPustak Bhawan, Allahabad.
29. Singh, S. N. (1993): Elements of Environmental Geography and Ecology in Hindi), Tara Book Agency, Varanasi
30. Wrigley, N. (1985): Categorical Data Analysis for Geographers and Environmental Scientists. Longman, London.
31. Bradshaw, M. J., 1979: Earth and Living Planet, ELBS, London.
32. Bunting, B. T., 1967: The Geography of Soil, Hutchinson, London.
33. Foth, H. D. and Turk, L. M. 1972: Fundamentals of Soil Science, John Wiley, New York.
34. GovindaRajan, S. V. and Gopala Rao, H. G., 1978: Studies on Soils of India, Vikas, New Delhi. Goudie,
35. Andrew, 1981: The Human Impact, Basil Blackwell, Oxford.
36. Hugget, R. J., 1988: Fundamentals of Biogeography. Routledge, London.
37. Hugget, R. J., 1995: Geocology: An Evolutionary Approach, Routledge, London.
38. Hussain, M. (ed), 1994: Biogeography (Part I&II), Anmol Publications Pvt. Ltd., New Delhi.
39. Pears, N., 1985: Basic Biogeography. 2nd Edition, Longman, London.
40. Robinson, H., 1982: Biogeography, E.L.B.S., Mc Donald & Evans, London.
41. Russell, E.W., 1973: Soil Condition and Plant Growth, Longman, London.

SEMESTER– III

PAPER TITLE: DIGITAL CARTOGRAPHY AND SURVEY (PRACTICAL)

PAPER CODE: GGY305

CREDIT: 5

MARKS: 100

UNIT-I FUNDAMENTALS OF GIS AND REMOTE SENSING (30 Marks)

GIS Data Structures: Types (spatial and Non-spatial), Raster and Vector Data Structure
 Geo-Referencing; Editing and Output; Overlays
 Global Positioning System: Mapping and ground truth verification and application.

UNIT-II DIGITAL MAPPING (25 Marks)

Thematic mapping of physical and socio-economic data (Choropleth, isopleths method)
 Representation of physical and socio-economic data using bar graph, pie graph, sphere diagram, flow chart, isolines and transect chart.
 Interpretation and Application of Remote Sensing and GIS: Land use/ Land Cover, Urban Sprawl Analysis, Forests Monitoring, Flood Monitoring

UNIT-III SURVEYING**(25 Marks)**

Traversing and topographic surveying with the help of Plane tabling (radiation, intersection and resection);

Traversing and topographic surveying with the help of Prismatic Compass (Open and Closed traversing);

Traversing and topographic surveying with the help of Theodolite (Traversing and Height determination);

Topographic surveying with the help of Dumpy Level (Levelling and Contouring);

Unit-IV**Practical Note Book****(5 Marks)****Viva Voice****(5 Marks)****Unit-V****Internal Assessment****(10 Marks)****SEMESTER– III****PAPER TITLE: POPULATION DATA AND ITS USE IN SOCIAL GEOGRAPHY****PAPER CODE: GGY306 (DSE)****CREDIT: 3****MARKS: 100****Unit I: Nature of Population Data**

Data requirement, type of demographic data, Problems associated with reliability and comparability of data, Problems of mapping population data

Importance of the fertility, Morbidity and Mortality related data in Social Studies

Importance of causes of death statistics

Unit II: Source of Population Data

Population censuses across the world;

Indian censuses: details of different items on which Indian censuses collect data, Vital registration system, sample registration system, survey on causes of death.

Other Data Sources: National Sample Survey Organization's surveys, Nationwide sample surveys, National Family Health Survey, District Level Household Survey, etc.

Sources of morbidity and mortality data and their quality with special reference to the developing countries and India;

Definition and sources of causes of death statistics;

Source and quality of migration data

Unit III: Use of Population Data in Studying Dynamics of Age-Sex Structure

Role of the study of age-sex structure in population geography and demography

Present levels, past trends and probable future changes in age-sex structure of the world and major regions.

Present levels, past trends and probable future changes in age-sex structure of India and states.

Determinants and consequences of sex-age structure of population.

Demographic dividend

Unit IV: Demography of Ageing

Concepts and measures of population ageing; components of population ageing; Inter-relationship between population ageing, fertility, mortality and migration; population ageing and momentum of population growth, age structure transition and ageing, and declining population

Reading List:

1. Jacob S. Siegel and David a. Swanson (2004): *The Methods and Materials of Demography*, Second Edition, Chapters 1, 2, 3, 7, 9,10, Elsevier Science, USA.
2. John Weeks (2005): *Population: An Introduction to Concepts and Issues*, Wordsworth Learning, Singapore 9th edition.
3. United Nations, (1973): *The Determinants and Consequences of Population Trends*, Vol. I, *Population Studies*, No. 50, Chapter VII, New York.
4. Bhende, A., (1996): *Principles of Population Studies* (Seventh Edition), Himalaya Publishing House, Bombay.
5. United Nations, *World Population Ageing*, 1950-2050.

SEMESTER– III
PAPER TITLE: ENVIRONMENT AND ECOLOGY
PAPER CODE: GGY 306 (DSE)
CREDIT: 3
MARKS: 100

Unit I: Environment and Ecosystem

Basic ecological principles; Geo-biochemical cycles: carbon, nitrogen, oxygen and phosphorus cycles; Biome and biomass; World distribution of plants and animals; Biodiversity: depletion and conservation.

Unit II: Understanding Ecosystems

Mountain ecology, risks and vulnerabilities, highland-lowland interactive systems, biodiversity and conservation;

Desert and Coastal Ecosystems: Desertification-process and patterns, management strategies, issues and problems in coastal ecosystem, mangroves, integrated coastal zone management.

Unit II: Environmental Pollution and management

Concepts and approaches, global environmental problems and sustainable development; Urban Environmental Problems and their Management: Air, water and solid waste. Environmental Governance: Environmental policies and programs, environmental education and legislation and planning.

Unit VI: Environmental Impact Assessment

Principles of EIA, Concepts and approaches, methods and procedure and current issues in EIA, POSCO imbroglio;

EIA: evaluation and mitigation, cost-benefit analysis of DMRC and Golden Quadrilateral projects and valuation of environmental impacts, public participation, presentation and review. Selected National and International Procedures of EIA: Developed and Developing countries EIA Procedures, National Green Tribunal.

Suggested Readings:

1. Alexander, Mike. 2008. Management planning for nature conservation: A theoretical basis & practical guide, Springer.
2. Balakrishnan, M., 1998. Environmental Problems and Prospects in India, in Das, R.C., et. al. Oxford & IBH Pub., New Delhi.
3. Consensus Study Report, 2005. Valuing Ecosystem Services: Toward Better Environmental Decision-Making, National Research Council, Division on Earth and Life Studies, Water Science and Technology Board, Committee on Assessing and Valuing the Services of Aquatic and Related Terrestrial Ecosystems. National Academies Press, Washington.
4. Das, R. C., 1998. The Environmental Divide: The Dilemma of Developing Countries, A.P.H. Pub., New Delhi.
5. Freedman, Bill. 1995. Environmental Ecology: The Ecological Effects of Pollution, Disturbance, and Other Stresses, Academic Press. London.
6. Gole, P., 2001. Nature Conservation and Sustainable Development in India, Rawat Pub., Jaipur.
7. Hooja, R., et. al., (ed.) 1999. Desert, Drought and Development: Studies in Resource Management and Sustainability, Rawat Pub, Jaipur
8. Hussain, M., (ed.) 1996. Environmental Management in India, Rawat Pub., Jaipur
9. Munn, T., (ed.) 2001. Encyclopaedia of Global Environmental Change, John Wiley & Sons, West Sussex 7.
10. Ramakrishanan, P. S. 1997. Conservation and Management of Biological Resources in Himalaya, Oxford & IBH Pub., New Delhi.
11. Singh Savindra, 2015. ParyavaranBhoogol. PrayagPushtak Bhawan, Allahabad (Hindi).
12. Singh, R.B., (ed.) 1990. Environmental Geography, Heritage Pub., New Delhi.
13. Betty Bowers Marriott, 1997. Environmental Impact Assessment, Mc Graw Hill Professional Bookstore.
14. Goel ,R.S. 2000. Environmental Impacts Assessment of water Resources Projects - concerns, Policy Issues Perceptions and Scientific Analysis, Oxford Publishing Co. Pvt. Ltd.
15. Goel R.S., and R.N. Srivastava, 1999. Hydropower and River Valley Development Environment Management, Case Studies and Policy Issues, Oxford & IBH Publishing Co. Pvt., New Delhi.
16. Goudie, A. 2000. The Human Impact on the Natural Environment, Blackwell, Publishers, Oxford.
17. J. Glasson, R. Therivel and A. Chadwick, 1994. Introduction to Environmental Impact Assessment: Principles and Procedures, Process, Practice and Prospects, Research Press, Delhi.
18. Judith, Petts (eds.) 1999. Handbook of Environmental Impact Assessment, Blackwell Science Publication.
19. Prasad, K. and Goel, R. S. 2000. Environmental Management in Hydro Electric Projects, Concept Pub., New Delhi.
20. Richard, K. Morgan, 1999. Environmental Impact Assessment: A Methodological Perspective, Springer.
21. Sinclair, J., 2000. Canadian Environmental Assessment in Transition, University of Waterloo Press, Waterloo.

22. Smith, L.G., 1993. Impact Assessment and Sustainable Resource Management, Longman, Harlow.
23. Subramanian, V., 2001. Text Book on Environmental Sciences, Narosa Publishing House, N.Delhi.
24. Eccleston, C. H., 2017. Environmental Impact Assessment: A Guide to Best Professional Practices, CRC Press, New York

SPECIAL PAPERS FOR GEOMORPHOLOGY
SEMESTER– IV
PAPER TITLE: ADVANCE GEOMORPHOLOGY
PAPER CODE: GGY401
CREDIT: 4
MARKS: 100

Unit I: Fundamentals

Concept and development of advanced geomorphology and thoughts in late 20th Century

Major contemporary methodologies:

- a) Morphology based, b) Climate based, c) Process based, and d) Geotechnical Science based

Time and space in Geomorphology:

- b) Nature of time, sampling of time; entropy and equilibrium, b) Nature of space; distance and correctness; scale

Unit II: Theories of landform evolution

Development of geomorphological theories, significance and need of theories in geomorphology
 Major geomorphological theories of G.K.Gilbert, W.M.Davis, W.Penck, L.C.King, J.T.Hack, M.Morisawa, and S.A. Schumm

Unit III: Evolution of Landforms

Hill slope development

Earthquake and earth interior, Tectonic geomorphology, Karst topography

Range of coastal landforms, marine sediments and the ocean floor, atoll formation,

Periglacial Geomorphology, Vulcanicity and Landforms

Denudation Chronology, Erosion and Peneplains

Drainage System, patterns and evolution of landforms and drainage in domal, faulted and folded structure

Unit IV: Regional and applied Geomorphology

Geomorphology of North East India

Mountain building and Orogenic belts: The evolution of Fold Mountains in the world.

Morphometry and Geomorphological studies

Continents and Escarpment study

Emergence of applied geomorphology

Application of spatial technology in geomorphological studies; Process, landform, land use and settlement, transport and communication, and environmental problems

SUGGESTED READING LIST:

1. Ahmad, E., 1985: Geomorphology, Kalyani Publishers, New Delhi.
2. Bloom, Arthur L., 1978: Geomorphology - A Systematic Analysis of Late Cenozoic Landforms, Prentice Hall, Englewood Cliffs, New Jersey.
3. Chorley, Richard J., 1972: Spatial Analysis in Geomorphology, Harper & Row Publishers, New York, London.
4. Dayal, P., 1996: A Textbook of Geomorphology (2nd edition), Shukla Book Depot, Patna
5. Derbyshire, E. (ed), 1976: Geomorphology and Climate, Wiley, London
6. Dixit, K. R.(ed), 1983: Contribution to Indian Geography/Geomorphology, Heritage, New Delhi
7. Embelton, C, Brunnsden, D, and Jones, D.K.C., (ed), 1978: Geomorphology: Present Problems and Future Prospects, Oxford University Press, London.
8. Embleton, C. and Thorns, J. 1982: Processes in Geomorphology, Arnold Heinemann, First Indian Edition.
9. Engeln, O. D. Von, 1942: Geomorphology, McMillan, London.
10. Fairbridge, R.W. (ed), 1968: Encyclopedia of Geomorphology, Reinhold, New York.
11. Goudie, Andrew, et. Al. (eds), 1981: Geomorphological Techniques, George Allen & Unwin, London.
12. Gregory, K.J., 1985: The Nature of Physical Geography, Edward Arnold, London.
13. Hart, M. G., 1986: Geomorphology: Pure and Applied, Allen & Unwin (Publishers), London.
14. Holmes, A., 1968: Principles of Physical Geology, Nelson, London.
15. Jensen, J. R., 2011: Remote Sensing of the Environment – An Earth Resource Perspective, 3rd Impression, Chapter-14, Pearson, New Delhi.
16. Penck, W., 1924: Morphological Analysis of Landforms, Mc Millan, London.
17. Sharma, V. K., 1986: Geomorphology, Earth Surface Processes and Forms, Tata Mc Graw Hill, New Delhi.
18. Steers, J. A., 1958: The Unstable Earth, Methuen, London.
19. Strahler, A.N., 1969: Physical Geography, 3rd edition, Wiley.
20. Thornbury, W. D. 1969: Principles of Geomorphology, 2nd ed., Wiley International Edition, Wiley Eastern Reprint. 15. Young, A., 1972: Slope, Longman, New York, Oliver and Boyd, Edinburgh.
21. Wooldridge, S. W. and Morgan, R. S., 1948: The Physical Basis of Geography, Longman (First Published in 1937).

SEMESTER– IV

PAPER TITLE: ENVIRONMENTAL GEOMORPHOLOGY

PAPER CODE: GGY402

CREDIT: 4

MARKS: 100

UNIT I: Fundamentals

Emergence of environmental geomorphology;

Geomorphology and environmental management;

Climate change and environmental geomorphology, past and present,

Concepts of geo-environment, geosystem and threshold;

Concept of hazard, disaster, risk, vulnerability, exposure and response;
Distinction between natural hazards and anthropogenic environmental disturbances, Hybrid hazards

UNIT II: Geohazards

Environmental Hazards: Classification, Causes and Distribution;
Geological Hazards: Earthquakes – a plate tectonic perspective and seismic zonation, Volcanoes – types and geographical distribution, Mass-movement;
Tsunami and volcanoes, occurrence and mitigation;
Slope instability/ failure: types and mitigation;
Slope erosion: types and mitigation;

UNIT III: Environmental Resources, Management and Conservation

Human and ecological impacts; Risk assessment and vulnerability analysis; National preparedness and adaptation strategies;
Land use classification. Role of GIS and remote sensing in surveillance, monitoring, risk assessment, estimation of losses and planning
Terrain or land system evaluation and management;
Water resources evaluation and management; ground and surface water
Soil resources: development, types and management
Landscape conservation: methods/ techniques and application.
Hazards policies and agencies

UNIT IV Geomorphology of Tropics

Concept and History of tropical Geomorphology
The tropical environment, Climatic elements and its effects, nature of rocks and its importance, natural vegetation and its relevance, humid tropical landscape
Weathering- factors of weathering and its products, weathering profile and depth, duricrusts and laterites-origin and distribution, structure, morphology and profile
Human impact in tropics

SUGGESTED READING LIST:

- 1.Barret, E.C. and Curtis, L.F. (eds): Environmental Remote Sensing: Application and achievements, Edward Arnold, London, 1974.
- 2.Betz, Jr. F. (ed.): Environmental Geology, Dowden Hutchinson, Stroudsburg, 1975.
- 3.Bolt, B.A., et al.: Geological hazards, Springer-Verlag, Berlin, 1975.
- 4.Dikshit, K.R., Kale, V. And Kaul, M.N.: India Geomorphological Diversities, Rawat, Jaipur, 1994.
- 5.Douglas, I. And Spencer, T (eds): Environmental Changes and tropical Geomorphology, George Allen & Unwin, London, 1985
- 6.Faniran, A.K: Humid Tropical Geomorphology. Longman, New York, 1983.
- 7.Garner, H.F: Origin of Landscape-A Synthesis in Geomorphology, Oxford, NY, 1974.
- 8.Kellman, A. And Tackaberry, R.: Tropical Environments, Routledge, London, 1997.
- 9.Panniza, M.: Environmental Geomorphology, Elsevier, Amsterdam, 1996.
- 10.Ollier, C.D.: Weathering, Longman, London, 1975.

11. Thomas, D.S.G. and Allison, R.J. (eds.): Landscape Sensitivity, John Wiley, Singapore, 1993.
12. Tricart, I & A. Cailleux: Introduction to Climatic Geomorphology, Longman, London, 1972.
13. Twidale C.R.: Analysis of Landform, John Wiley, London, 1976.
14. Sexena K.G. et al., (eds.); Shifting Agriculture in Asia: Implications for Environmental Conservation and Sustainable Livelihood, Dehradun, 2007.

SEMESTER– IV
PAPER TITLE: FLUVIAL GEOMORPHOLOGY
PAPER CODE: GGY403
CREDIT: 4
MARKS: 100

UNIT I: Fundamentals

Meaning, scope and evolution of fluvial geomorphology; Relation between fluvial geomorphology and hydrology

Drainage basin as a fluvial system: inputs and outputs in the basin; drainage basin as fundamental geomorphic unit.

Channel at grade: concept of grade, attainment of grade, channel equilibrium.

UNIT II: Channel Form and Processes

Channel process: forces acting in channel, velocity distribution, flow types and water and sediment discharge in channel, channel erosion and deposition.

Channel form: cross-section geometry, long profile and plan geometry.

Channel patterns: straight, meandering and braided; geometry of meanders, development and causes of meandering; mechanics and causes of braiding.

Channel changes in time and over space.

Flood Geomorphology: flood as a geomorphic agent, flood frequency analysis, causes and effects of floods; formation of floodplain.

UNIT III: The River Floodplain

Fluvial –geomorphic hazards: flood and bank erosion, sedimentation, landslides and soil erosion with special reference to north east India.

Fluvial Geomorphology of the Brahmaputra Valley

River basin planning and development

UNIT IV: Human impact in Fluvial Landscape and Systems

Human impact on river basins and fluvial systems: effects of basin, land-use and land cover changes and dam construction on catchment ecosystem, hydrology and channel morphology.

Modern methods and techniques in fluvial geomorphological studies: Sedimentological techniques, remote sensing, GIS and computer applications.

SUGGESTED READING LIST:

1. Babar.M.: Hydrogeomorphology; Fundamentals, Applications and Techniques, New India Publishing Agency, New Delhi. 2005.
2. Chorley, R.J., Schumm.S.A. and Sugden. D.E.,: Geomorphology, London; Methuen, 1985.

3. Charlton. C.: Fundamentals of Fluvial Geomorphology, Routledge Taylor & Francis Group 2008.
4. Leopold, L.B., Wolman. M.G. and Miller.J.P.: Fluvial processes in Geomorphology, Dover Publications, INC. New York. 1995.
5. Maiti. R.: Modern Approaches to Fluvial Geomorphology, Primum Books, Delhi. 2016.
6. Morisawa, M., Rivers, orms and processes, London: Longman, 1985.
7. Ritter, D.F., Process Geomorphology, Dubuque, Iowa: Wm. C. Brown Publishers, 1989.

SEMESTER– IV

PAPER TITLE: GEOMORPHOLOGICAL TECHNIQUES (PRACTICAL)

PAPER CODE: GGY404

CREDIT: 4

MARKS: 100

UNIT I: Analysis of River Basin

Stream ordering, calculation of bifurcation ratio, length ratio, basin circularity ratio, analysis of laws of stream number, Stream length and drainage basin area, etc
 Preparation of drainage density, drainage frequency and drainage texture map
 Grain-size analysis of alluvial sediments in the laboratory and fluvio-geomorphic interpretation of the results
 Basin area and stream discharge
 Flood frequency analysis

UNIT II: Geomorphological Mapping and Interpretation

Hypsometric curve and hypsometric integral
 Altimetric frequency curve and histogram
 Longitudinal profile and Cross section
 Rock characteristics, Identification and Stratigraphy
 Geomorphological, ground water and site suitability mapping
 River Braiding analysis
 Tectonic and river valley analysis (William B. Bull's method)
 Rose Diagram in Geomorphological analysis

UNIT III: PRACTICAL NOTE BOOK

VIVA-VOCE

SUGGESTED READING LIST:

1. Campbell, J., 1984: Introductory Cartography, Prentice Hall Inc., Englewood Cliffs N.J.
2. Kellaway, G. P., : Map Projections, Methuen & Co., London
3. Lawrence, G. R. P., 1964: Cartographic Methods, Oxford University Press, London.
4. Misra, R. P., and Ramesh, A., 1989: Fundamentals of Cartography, Concept Publishing co. New Delhi
5. Monkhouse, F. J., and Wilkinson, H. R., 1989: Maps and Diagrams, B. I., Publications Pvt. Ltd., New Delhi
6. Robinson, A. H., et al., 1995: Elements of Cartography, 6th Edition, John Wiley & Sons, New York.

7. Steers, J. A., 1965: An Introduction to the Study of Map Projection, University of London, London.
8. Talukder, S., 2008: Introduction to Map Projections, EBH Publishers (India), Guwahati.

SEMESTER– IV
PAPER TITLE: DISSERTATION
PAPER CODE: GGY405
CREDIT: 6
MARKS: 100

SPECIAL PAPER FOR SOCIAL GEOGRAPHY

SEMESTER– IV
PAPER TITLE: SOCIAL DYNAMICS AND CHANGE
PAPER CODE: GGY 401
CREDIT: 4
MARKS: 100

Unit I: Fundamentals of Social Geography

1. The nature and development of Social Geography, approaches of study, philosophical and methodological development and contemporary trends in Social Geography; development of Social Geography in India.
2. Concepts of social space, social organization, social area analysis and factorial ecology, understanding society and its structure and process, geographical bases of social formations.

Unit II: Social Structure and Change

3. Social evolution in India: The pre-history and historic scene with special reference to the *Janapadas* of ancient India and the Mughal *Subahs*. Processes of social change in India: Sanskritization, Westernization and Modernization.
4. Social groups, social structure and social development: an international perspective, processes of social change: modernization, urbanization, industrialization and other socio-economic and cultural processes.

Unit III: Development and Social Well-being

5. Conceptual basis of social well-being: Social well-being as reflected in the indicators: Literacy and education, health care, civic amenities and economic condition.
6. Human development; measurement of human development with social, economic and environmental indicators.

Unit IV: Gender Geography

7. Gender perspective in Social Geography: Status and role of women in a society, gender discrimination, participation in politics and enfranchisement.

8. Gender gaps in social and public life: Education, wage differentials in economic activities, health care and nutrition. Scope for bridging gender gap: Empowerment of women with education and economic opportunities.

SUGGESTED READING LIST:

1. Ahmad, A., 1999: *Social Geography*, Rawat Publications, Jaipur and New Delhi.
2. Ahmad, A., (ed), 1993: *Social Structure and Regional Development: A Social Geography Perspective*, Rawat Publications, Jaipur.
3. Eyles, J.: 'Social Geography', in Johnston, R.J., et al, *The Dictionary of Human Geography*.
4. Jones, E. and Eyles, J., 1977: *An Introduction to Social Geography*, Oxford University Press, Oxford and New York.
5. Hannett, Caris. (eds), 1996: *Social Geography: A Reader*, Arnold, London.
6. Jones, E., (ed), 1975: *Readings in Social Geography*, Oxford University Press, Oxford. London.
7. Milton, Keynes, 1972: *Social Geography: New Trends in Geography*, Open University Press.
8. Taher, M., 1994: *Social Geography: Concept and Theories*, NEIGS, Guwahati.
9. Carter, John and Trevor, Jones., 1989: *Social Geography: An Introduction to Contemporary Issues*, Edward Arnold, London.
10. Gregory, D. and Urry, J. (eds), 1985: *Social Relation and Social Structure*, Macmillan, London.
11. Harvey, D., 1972: *Social Justice and the City*, Arnold, London.
12. Jackson, P. and Smith, S., 1984: *Exploring Social Geography*, George Allen and Unwin (Publishers) Ltd., London
13. Knox, P., 1995: *Social Well-being: A Spatial Perspective*, Oxford University Press, Oxford.
14. Momsen, J. H. and Townsend, G., 1987: *Geography of Gender in the Third World*, Hutchinson, State University of New York Press, London, New York.
15. Sharma, H. N., 2000 : 'Social Geography' in Singh, J.(ed.) *Progress in Indian Geography(1996- 2000)*, INSA, New Delhi.
16. Smith, D. M., 1977 : *Human Geography : A Welfare Approach*, Edward Arnold,
17. Noble, A. G. and Dutta, A. K. (eds): *India: Cultural Pattern and Processes*, West View Press, Colorado.
18. Srinivas, M.N., 1986: *India: Social Structure*, Hindustan Publishing Corporation, Delhi.
19. Pecion, M., 1987: *Social Geography: Process and Prospect*, Croom Helm, London.
20. Smith, D.M., 1977: *Human Geography: A Welfare Approach*, Edward Arnold, London.
21. Smith, D.M., 1979: *Where the Grass is Greener: Living in an Unequal World*, Penguin Books Australia Ltd, Victoria.
22. Sopher, D.E.(ed): *An Exploration Of India: Geographical Perspectives on Society and Culture*, Longman, London
23. Carter, J and Turner, J., 1989: *Social Geography: An Introduction to Contemporary Issues*, Edward Arnold, London.
24. Eyles, J., 1983: *Social Geography in International Perspective*, Croom Helm, Sydney.
25. Eyles, J., 1981: *Social Geography*, in Johnston, R.J. et al, *The Dictionary of Human Geography*, Basil Blackwell, Oxford.
26. Jones, E. and Eyles, J., 1977: *An Introduction to Social Geography*, Oxford University Press, Oxford and New York.

27. Gregory, D. and Urry, J. (eds), 1985: *Social Relation and Social Structure*, Macmillan, London.
28. Harvey, D., 1972: *Social Justice and the City*, Arnold, London.
29. Hannett, Caris. (eds), 1996: *Social Geography: A Reader*, Arnold, London. Jackson, P. and Smith, S., 1984: *Exploring social Geography*, George Allen and Unirn (Publishers) Ltd., London.
30. Jones, E.(ed), 1975: *Reading in Social Geography*, Oxford University Press, Oxford. Knox, P., 1995: *Social Well-being: A Spatial Perspective*, Oxford University Press, Oxford. Milton, J., 1972: *Social Geography: New Trends in Geography*, Open University Press.
31. Keyness, 1972: *Social Geography: New Trends in Geography*, Open University Press.
32. Keynes, 1972: *Social Geography: New Trends in Geography*, Open University Press.
33. Noble, A. G. and Dutta, A. K. (eds): *India: Cultural Pattern and Processes*, West View Press, Colorado.
34. Pecionb, M., 1987: *Social Geography: Process and Prospect*, Croom Helm, London.
35. Sharma, H. N., 2001: *Social Geography*, Singh, J. (ed), *Progress in Geography (1996-2000)*, INSA, New Delhi.
36. Smith, D.M., 1977: *Human Geography: A Welfare Approach*, Edward Arnold, London.
37. Smith, D.M., 1973: *A Geography of Social Well-being*, McGraw Hill, New York.
38. Smith, D.M., 1979: *Where the Grass is Greener: Living in an Unequal World*, Penguin Books Australia Ltd, Victoria.
39. Sopher, D.E.(ed): *An Exploration Of India: Geographical Perspectives on Society and Culture*, Longman, London.
40. Srinivas, M.N., 1986: *India: Social Structure*, Hindustan Publishing Corporation, Delhi.

SEMESTER– IV

PAPER TITLE: POLITICAL GEOGRAPHY AND CULTURAL GEOGRAPHY

PAPER CODE: GGY402

CREDIT: 4

MARKS: 100

Unit I: Geography of Political Choice and World Politics

1. The changing patterns of World Powers Perspectives on core-periphery concept.
2. Political Ecology, Political Economy.
3. Electoral geography: spatial organization of electoral areas and geography of representation; world political regions, geopolitics since World War II.
4. Politico-geographic factors in the rise of Indian federalism.

Unit II: Geopolitical Perspective in India

5. India and her neighbours from geopolitical perspective, Geopolitical significance of the Indian Ocean as a zone of peace, problem and prospect.
6. Political geography of contemporary North East India with special reference to the changing political map; stability & instability; Interstate issues (like water disputes & riparian claims).
7. Insurgency in the states, conflict resolutions; demands and emergence of new states.

Unit III: Nature of Culture and Ethnic Geography

8. Geography of ethnic groups and tribal groups: Diffusion of ethnic traits in world as well as India; ethnic landscape and economy of the area.

9. Patterns of livelihood: various economic activities & cultural adaptations; Convergence and divergence in cultural processes;
10. Cultural changes: Perception, behaviouralism, cultural adaptations and cultural relativism; social processes in the city.

Unit IV: Applying Cultural Geography: Case Study Approach

11. Cultural diffusion in India with reference to green revolution.
12. Cultural ecology of India.
13. Cultural ecology and Conflicts of North-east India.

SUGGESTED READING LIST:

1. Broek, J. C. and Webb, J. W., 1978: *A Geography of Mankind*, McGraw Hill, New York.
2. Crans, Mike, 1998: *Cultural Geography*, Routledge, London.
3. Jackson, Richard.H. and Hudman, Lloyel. E., 1990: *Cultural Geography*, West Publishing Company, New York.
4. Noble, A. G. and Dutt, A. K. (eds), 1982: *India: Cultural Pattern and Processes*, West View Press / Boulder, Colorado.
5. Sauer, Carl.O., 1963: *Land and Life*, University of California Press, Berkley.
6. Zelinsky, W., 1973: *The Cultural Geography of America*, Princeton University Press, Princeton, N. J.
7. Alexander, L. M., 1963: *World Political Patterns*, Ran McNally, Chicago.
8. De Blij, H. J. and Glassner, Martin, 1968: *Systematic Political Geography*, John Wiley, New York.
9. Dikshit, R. D., 1996: *Political Geography: A Contemporary Perspective*, Tata McGraw Hill, New Delhi..
10. Dikshit, R. D., 1999: *Political geography: A Century of progress*, Sage, New Delhi.
11. Sukhwai, B. L., 1968: *Modern Political Geography of India*, Sterling Publishers, New Delhi.
12. Pounds N. J. G. 1972: *Political Geography*, McGraw Hill, New York.
13. Prescott. J. R. V.: *The Geography of Frontiers and Boundaries*, Aldine, Chicago.
14. Deshpande C. D., 1992: *India - A Regional Interpretation*, Northern Book Centre, New Delhi.
15. Thomas, W. L. (ed.), 1959: *Man's Role in Changing the Face of the Earth*, University of Chicago Press, Chicago.
16. Gritzer, Charion, F., 1984 : '*The Scope of Cultural Geography*', *Journal of Geography*, Volume 65, pp.4-11.
17. Duncan, J. and Ley, D. (eds) , 1992 : *Place/Culture/Representation*, Routledge, London.
18. Johnston, R. J., Gregory, Derek and Smith, David M. (eds), 1994 :*The Dictionary of Human Geography*, Blackwell, Oxford
19. Jordan, T. G. and Rowntree, L.: *The Human Mosaic: A Thematic Interpretation in Cultural Geography*.
20. Fisher Charles A, 1968: *Essays in Political Geography*, Methuen, London.
21. John R. S., 1982: *An introduction to Political Geography*, Routledge, London.
22. Moddie, A.E.: *Geography Behind Politics*, Hutchinson, London, Latest edition.
23. Muir, R., 1975: *Modern Political Geography*, Macmillan Ltd., London.
24. Taylor, Peter, 1985: *Political Geography*, Longman, London. 1985.

25. Panikkar K. M., 1959: Geographical Factors in Indian History: 2 Volumes. Asia Publishing House, Bombay.

Common Paper for Social geography and Population Geography

SEMESTER– IV

PAPER TITLE: POPULATION, RESOURCE AND DEVELOPMENT

PAPER CODE: GGY403

CREDIT: 4

MARKS: 100

Unit I: Linkages of Population on Development

Classes 17

Effect of development on demographic variables: Demographic transition theory, age structure transition; effects of fertility and mortality declines

Divergent views regarding the relationship between population and development:

Pre-modern, Mediaeval and classical writings on population: Chinese philosopher Confucius writings on optimum population; Classical Mercantilist and Physiocrats views, Socialist and Marxist views.

Modern theories of population and development: three major viewpoints – pessimist, optimist and neutralist: Malthus, Ricardo, Marx, Tragedy of Commons, Limit to growth Study; Colin and Condorcet views, views of Colin Clark, Ester Boserup and Julian Simon; Simon Kuznets, Allan Kelly and Robert Schmidt, and Bloom and Williamson.

Population, poverty and vulnerability

Unit II: Population and Resources

Classes 17

Concept of Natural resources, Capital Resources and Human Resources

Quantitative aspects of Human Resource: concepts labour force, economically active population, unemployment and types of unemployment: disguised, seasonal frictional and chronic.

Factors affecting demand and supply of labour, effect of population growth and development on structure of employment.

Qualitative aspects of Human Resource: factors influencing productivity of human beings need for investment in human capital, implications of population growth on food, sanitation, housing, employment, education and health and social security to improve the quality of human resources.

Population and common property resources

Unit III: Population and Environment

Classes 15

Ecological and environmental dimensions of sustainable development;

Approaches to environment: Gandhian approach, Marxian/Socialist approach, Neo-classical approach, Market approach; Population growth and climate change; Population matters to sustainable development and environment (growth, age structure, spatial distribution)

Pressure of population growth on water resources, land use, soil erosion, desertification, deforestation, soil salinity and energy resources; environmental degradation and its implications for health; environmental health hazards

Sustainable livelihoods

Unit IV: Population Policies

Classes 15

Definition of Population Policy; principal features of a population policy; policies in the context of population growth, structure and distribution;

Population Policies of Pro-natalist and Anti-Natalist Countries with special reference to population policy of India: Fertility influencing policies, fertility control policies- direct and indirect.

Policies and programmes for special groups: women and children, youth and aged;

Health influencing policies; National health and family planning programmes: CNA, RCH, National Population Policy 2000, National Health Policy 2002, and National Rural Health Mission 2005.

Suggested Readings:

1. Todaro, Michael P. (1981): *Economic Development in the Third world*. New York: Longman, Chapter 3.
2. Sen, Amartya, (2002): The concept of development in Chenery Hollis and T.N. Srinivasan (eds), *Handbook of Development Economics* Vol. 1. Amsterdam: Elsevier. Chapter 1.
3. Haq, Mahbul (1996): *Reflections on Human Development*, Delhi: Oxford University Press. Chapters 1 & 2.
4. United Nations Development Programme (2006): *Human Development Report 2006*, New Delhi: Palgrave Macmillan Technical Note 1. pp. 393-99.
5. Ray, Debraj (1998): *Development Economics*. Delhi: Oxford University Press. Chapters 3 & 4.
6. Kapila, Ray and Uma Kapila (2001): *India's Economy in the Twenty First Century*. 2nd Revised Edition. New Delhi: Academic Foundation. Chapters 1 to 5, 15, 16 & 21.
7. Birdsall, Nancy, Kelley, Allen C. and Sinding, Steven W. (2001). *Population Matters: Demographic Change, Economic Growth and Poverty in the Developing World*, Oxford: Oxford University Press Chapters 2, 4 and 5.
8. Jamison D. et al. (eds) (2006): *Disease Control Priorities in Developing Countries*, New York: Oxford University Press and World Bank. Chapter 1.
9. David E Bloom, David Canning, Jaypee Sevilla, (2003): *The Demographic Dividend*. Sanata Monica, CA: Rand Corporation. Chapter 2.
10. National Research Council (1986): *Population Growth and Economic Development: Policy Questions*. Washington D.C.: National Academy Press. Chapters 1, 2, 3, 4, 6 & 8.
11. United Nations (1973): *The Determinants and Consequences of Population Trends*, Volume 1, Chapters 11 & 13.
12. Chenery Hollis and T.N. Srinivasan (eds), (2002): *Handbook of Development Economics*, Vol 1, Amsterdam: Elsevier. Chapters 10, 11, 13 & 15.
13. Kawadia, G. and K. Ahuja, (2006): *Environmental Issues of Development*. Sections A and E, Ambala: Associated Publishers. Chapters 1, 3 & 13.
14. Chrissie, P. and Selwyn S. T. Leger, (1993): *Assessing Health Need Using Life Cycle Framework*, Open University, Buckingham.
15. Peabody, J.W.; Rahman, H. Omar; Gertlor, Paull, J.; Haan, Joyce, (1999): *Policy and Health Implication for Development in Asia*, Cambridge University Press. Cambridge.
16. Peters, David H. Yazbeek Abdo S.; Sharma, Rashmi R.; Ramana G.N.V., (2002): *Better Health Care Systems in India*, World Bank, Washington D.C.

17. Stephen, Chee, William, J. House and Laurie Lewis, (1999): "Population Policies and Programmes", in Post- ICPD Era: "Can the Pacific Island Countries Meet the Challenges" *Asia Pacific Journal*; United Nations, New York.
18. UNESCAP, (1988): *Asia Pacific Population Policies and Programmes; Future Directions*, New York.
19. United Nations, (1974): "World Population Plan of Action", *Studies in Family Planning*, 5(12).
20. United Nations, (1998): *National Population Policies*, Department of Economics and Social Affairs, New York.
21. Agarwal, S. N., 1988: *India's Population Problems*, Tata McGraw Hills Publishing Publishing Co. Ltd. New Delhi.
22. Ahmad, A. et al (eds), 1997: *Demographic Transition: The Third World Scenario*, Rawat Publications, Jaipur and New Delhi.
23. Beaujeu- Garnier, J., 1966: *Geography of Population*, Longman, London.
24. Bhende, A. and Kanitkar, T.: *Principles of Population Studies*, Himalaya Publishing House, Bombay.
25. Chandna, R. C., 1988: *A Geography of Population*, Kalyani publishers, New Delhi.
26. Clark, J.I., 1971: *Population Geography and Developing Countries*, Pergamon Press, Oxford.
27. Clark, J. I., 1972: *Population Geography*, Pragamon Press, Oxford.
28. Demko, G. J. et al, 1970: *Population Geography: A Reader*, McGraw Hill, New York.
29. Gosal, G. S., 1984: *Population Geography in India*, in *Geography and Population, Approaches and Applications*, John I. Clarke (ed), Pergamon Press, Oxford.
30. Mehta, S., 1990: 11. *Migration, A Spatial Perspective*, Rawat Publications, Jaipur and NeDelhi.
31. Raza, M. and Ahmad, A., 1990: *An Atlas of Tribal India*, Concept Publishing Company, New Delhi.
32. Robinson, H., 1983: *Population and Resources*, Macmillan Press, London.
33. Trewartha, G. T., 1969: *A Geography of Population: World Pattern*, John Wiley, New York.
34. Woods, R., 1979: *Population Analysis in Geography*, Longman, London.
35. Zelinsky, W., 1966: *A Prologue to Population Geography*, Prentice- Hall, Englewood Cliffs.

SEMESTER– IV
PAPER TITLE: PRACTICAL ON SOCIAL GEOGRAPHY
PAPER CODE: GGY 404
CREDIT: 4
MARKS: 100

Unit I: Measuring Population Dynamics

Mapping of population distribution, density and concentration in World and India
 Population growth trend analysis and population projections in World and India
 Population- Resource Regions in the World

Unit II: Socio-Cultural Index

Levels of socio-economic well-being and demographic zones in India (by Composite Index)
Measuring the level of Urbanisation
Measuring Disparity Index in literacy, education attainment and work participation
Mapping the Spatial Pattern of Tribal Population in India
Distribution Pattern of World Religion and Language

Unit III: Political map

Major sea routes around: South China Sea, Suez Canal, Panama Canal
Mapping of strategically significant areas between India and its neighbours:
India- Pakistan, India-Bangladesh, India-Sri Lanka, India-China
Mapping of Geography of Autonomous Movement in India

SUGGESTED READING LIST:

1. Gregory, S., 1978: *Statistical Methods and the Geographer*, Longman, London.
2. Hammond R and P. S. McCullagh, 1974: *Quantitative Techniques in Geography: An Introduction*, Clarendon Press, Oxford.
3. Johnston R. J., 1973: *Multivariate Statistical Analysis in Geography*, Longman, London.
4. King, L. J., 1969: *Statistical Methods in Geographical Studies*, London.
5. Mahmood, A., 1977: *Statistical Methods in Geographical Studies*, Concept Publications, Delhi.
6. Maurice Yeats, 1974: *An Introduction to Quantitative Analysis in Human Geography*, McGraw, Hill, New York.
7. Paul, S. K., 1998: *Statistics for Geoscientists*, Tata McGraw Hill, New Delhi.
8. Robinson, G. M., 1998: *Methods and Techniques in Human Geography*, John Wiley & Sons, Chichester.

SEMESTER– IV
PAPER TITLE: DISSERTATION
PAPER CODE: GGY405
CREDIT: 6
MARKS: 100

SPECIAL PAPER FOR POPULATION GEOGRAPHY

SEMESTER– IV
PAPER TITLE: Dynamics of Fertility and Mortality
PAPER CODE: GGY401
CREDIT: 4
MARKS: 100

Unit I: World Fertility Transition

15 Classes

Levels, Trends and Differentials in fertility of Developed and Developing Countries with special reference to fertility transition in India.
Factors affecting fertility: Below-replacement level fertility in developed countries and its implications, Causes of high fertility in developing countries etc.
Fertility Surveys (WFS, DHS, NFHS) - substantive findings, Emerging research issues

Unit III: Theories of Fertility**15 Classes**

Determinants of natural fertility; Theory of Social Capillarity, Theory of Change Response, Theory of Diffusion and Cultural Lag, Liebenstein Theory, Becker's Theory, Easterlin Framework of Fertility, Caldwell's Theory, U. N. Threshold Hypothesis and Reproductive motivations and value of children theories.

Unit III: World Mortality Transition**19 Classes**

Levels and trends in mortality by developed and developing regions with special reference to India;

Age and sex specific mortality with a focus on excess female mortality; differentials in mortality by place of residence and socio-economic characteristics, Factors responsible for high mortality in the past;

Main reasons for mortality decline in developing countries, Mortality Transition

Importance of infant mortality in population and health; Causes of infant mortality (endogenous and exogenous); Levels and trends of infant and child mortality (global and south Asia/India);

Global leading causes of death with special reference to Asia and India; Distribution of deaths by main causes by age, development, life expectancy (UN)

Unit IV: Population Ageing**15 Classes**

Ageing of the population, Demographic dividend and population Ageing, Relative role of low fertility and low mortality in ageing, Socio-economic consequences of population ageing Population ageing trends and patterns in developed and developing countries; Factors determining ageing trends and patters; Population ageing trends and patterns in India; state variations; future scenario of population ageing in states.

Reading List:

1. David G. Mandelbaum, (1974), *Human Fertility in India: Social Components and Policy Perspectives*, University of California Press, Berkeley.
2. Gray, R et al (eds.), (1993), *Biomedical and demographic determinants of reproduction*, Oxford University Press, Oxford.
3. Van De Ka, (1996), "Anchored Narratives: Fifty Years of Research into the Determinants of Fertility" *Population Studies*, 50,1.
4. Sydney H. Coontz, (1968), *Population Theories and the Economic Interpretation*, Routelage, London.
5. United Nations, (1999), *Below Replacement Fertility*, Population Bulletin of the UN, Special Issue Nos. 40/41, Department of Economic and Social Affairs, UN, New York.
6. United Nations, (1973), *Determinants and Consequences of Population Trends, Vol. 1*, pages 96-104, UN, New York.
7. Siegel, J and D.A. Swanson (2004). *The Methods and Materials of Demography (Second Edition)*. Elsevier Academic Press, USA. Chapter 15, Pp.371-405; Chapter 16, Pp.407-428; Chapter 17, Pp.429-453.
8. Bhende, Asha A. and Tara Kanitkar (2004) *Principles of Population Studies*, Mumbai: Himalaya Publishing House, Chapter 8, Pp.241-288.

9. Pathak, K.B. and F.Ram (1998) *Techniques of Demographic Analysis*, Mumbai: Himalaya Publishing House, Chapter 4 Pp.108-153 and Chapter8, Pp.339-372.
10. Mishra, B.D.(1981) *An Introduction to the Study of Population*, New Delhi: South Asian Publishers, Pvt. Ltd., Chapter 7, Pp.
11. Srinivasan K. (1998) *Basic Demographic Techniques and Applications*. New Delhi: Sage Publications. Chapter IV, Pp.59-85
12. Caldwell, J, Sally Findley, Pat Caldwell and Gigi Santow (1990): What we know about health transition: The cultural, social and behavioural determinants of health. *The proceedings of an international workshop, Vol.1&2, ANU, Canberra*, Health Transition Centre.
13. Mosley, W. H. and L. C. Chen (1984): Analytical framework for the study of child survival in developing countries, *Population and Development Review* 10 (Supplementary Copy).
14. Murray, C. J. L., (1994): Quantifying the Burden of Disease: The Technical Basis for Disability Adjusted Life Years, *Bulletin of the WHO*, Vol. 72(3), pp.429-445.
15. Omran, A. R. (1971): The epidemiologic transition: a theory of the epidemiology of population change, *Milbank Memorial Fund Quarterly*, Vol. XLIX, pp. 509-538.
16. Park, J.E. and K. Park (1989): *Text Book of Preventive and Social Medicine (Twelfth Edition)*, M/S BanarsidasBhanot Publishers, Jabalpur (Chapters 2 & 3).
17. F. Ram and K.B. Pathak (1998): *Techniques of Demographic Analysis*, Himalaya Publishing house, Bombay(Chapters 2 & 3).
18. Preston, S. H., Patrick Heuveline and Michel Guillot (2001): *Demography: Measuring and Modeling Population Process*, Blackwell Publishers, Oxford, UK (Chapters 2, 3 & 4).
19. Shryock, Henry S. Jacob Siegel and Associates (1980): *The Methods and Materials of Demography*, Vol. 2, Fourth printing (revised), US Department of Commerce. Washington DC, pp. 389-393, Chapter 14.
20. WHO (1992): *International Statistical Classification of Diseases and related Health Problems*, Tenth Revision, Vol. 1, Geneva.
21. United Nations (1994), *Ageing and the Family*, United Nations, New York
22. United Nations (1998), *Economic and Social Implications of Population Ageing*, Department of International Economic and Social Affairs, UN, New York.
23. United Nations (2001): *Living Arrangements of Older Persons: Critical Issues and Policy Responses*. Population Division, Department of Economic and Social Affairs, Special Issue Nos. 42/43, 2001, New York.
24. UNFPA, 2001, *Population Ageing and Development: Social, Health and Gender Issues*, United Nations, Malta.
25. Bloom, D.E., D. Canning, et.al. (2002): *The Demographic Dividend: A New Perspective on the Economic Consequences of Population Change*. Santa Monica, CA, RAND.
26. Bose, A.B. (2006). *Social Security for the Old*. New Delhi: Concept Publishing Company.
27. Mason, A. (2000). *Population Change and Economic Development in East Asia: Challenges Met, Opportunities Seized*. Stanford: Stanford University Press.
28. Linda J. Waite (ed.) (2004) *Aging, Health, and Public Policy: Demographic and Economic Perspectives*, Supplement to Population and Development Review
29. IrudayaRajan, (2007) *Social Security for the Elderly Experiences from South Asia*, Routledge, New Delhi.

30. Prskawetz, Bloom, and Lutz, eds., 2008 *Population Aging, Human Capital Accumulation, and Productivity Growth*, A Supplement to Population and Development Review.
31. Sandra Gruescu, (2006), *Population ageing and economic growth*. Physica-Verlag
32. Heslop A (1999), *Ageing and Development, Social Development Working Paper: 3, Help Age International*.
33. M. Alam (2004). *Ageing, old age income security and reforms: An exploration of Indian situation. Economic and Political Weekly*, 39(33): 3731-3740.
34. Pool, Ian, Laura R. Wong and Eric Vilquin (ed) (2006), *Age-structural transitions: challenges for development*. Paris: CIRCRED.

SEMESTER– IV
PAPER TITLE: MIGRATION AND RELATED ISSUES
PAPER CODE: 402
CREDIT: 4
MARKS: 100

Unit I: Internal Migration

17 Classes

Internal migration patterns and characteristics in developing countries with a special focus on India.

Determinants of internal migration: Causes of migration at the place of origin and at the place of destination

Consequences of internal migration: demographic, economic, social and political consequences at the individual, household and community level

Migration Problem in Northeast India

Unit II: Sources of international migration data and problems

15 Classes

Patterns of international migration: Historical and recent trends, permanent immigrants, Indian Diaspora and people of Indian origin, labour migration, brain drain, refugee migration and Illegal migration.

Causes and consequences of international migration

Unit III: Migration theories and models

17 Classes

Ravenstein's Laws of Migration

Everett Lee's Theory of Migration

Theories of Migration-Reilly, Zipf, Staufer, Hagerstrand and Wolpert

Mobility Field Theory

Lewis-Fei-Ranis Model of Development

Todaro's Model of Rural-Urban Migration

Migration on economic growth

Unit IV: Measures of Migration

15 Classes

Direct estimation of lifetime and inter-censal migration rates from census data

Indirect measures of net internal migration: Vital Statistics Method, National Growth Rate

Method and Census and Life Table Survival Ratio methods

Methods of estimating international migration

Migration surveys

Reading List

1. Cohen, Robin, (1996): *Theories of Migration*, The International Library of Studies on Migration, Edward Elgar, Cheltenham
2. Eduardo Arriaga, (1975): "Selected Measures of Urbanization", in Sydney Goldstein and David Sly (Eds.) *Measures of Urbanization and Projections of Urban Population*, IUSSP Belgium
3. Oberai, A.S. (1987): *Migration, Urbanization and Development*, International Labour Office, Geneva
4. Gavin Jones and Visaria, Pravin, (Eds.), 1997: *Urbanization in large developing countries – China, Indonesia, Brazil and India*, Clarendon Press, Oxford
5. Mitra R. G., (2002): *Understanding Patterns of Migration from Census 2001 Data*, Population Stabilization and Development, Council of Cultural Growth and Cultural Relations, Cuttack
6. Shryock, Henry S. Jacob S. Siegel and Associate, (1980): *The Methods and Materials of Demography* Vol.1 U.S. Bureau of the Census, Washington D.C.
7. Todaro, Michael P.(1976), *Internal Migration in Developing Countries*, International Labour Office, Geneva
8. United Nations, (1979): "Trends and Characteristics of International Migration since 1950" *Demographic Studies* No. 64, UN, New York
9. United Nations, (1983): *Determinants and Consequences of Population Trends*, Vol 1, UN, New York, Chapter-VI.

SEMESTER– IV

PAPER TITLE: POPULATION, RESOURCE AND DEVELOPMENT

PAPER CODE: GGY403

CREDIT: 4

MARKS: 100

Unit I: Linkages of Population on Development

Classes 17

Effect of development on demographic variables: Demographic transition theory, age structure transition; effects of fertility and mortality declines

Divergent views regarding the relationship between population and development:

Pre-modern, Mediaeval and classical writings on population: Chinese philosopher Confucius writings on optimum population; Classical Mercantilist and Physiocrats views, Socialist and Marxist views.

Modern theories of population and development: three major viewpoints – pessimist, optimist and neutralist: Malthus, Ricardo, Marx, Tragedy of Commons, Limit to growth Study; Colin and Condorcet views, views of Colin Clark, Ester Boserup and Julian Simon; Simon Kuznets, Allan Kelly and Robert Schmidt, and Bloom and Williamson.

Population, poverty and vulnerability

Unit II: Population and Resources

Classes 17

Concept of Natural resources, Capital Resources and Human Resources

Quantitative aspects of Human Resource: concepts labour force, economically active population, unemployment and types of unemployment: disguised, seasonal frictional and chronic.

Factors affecting demand and supply of labour, effect of population growth and development on structure of employment.

Qualitative aspects of Human Resource: factors influencing productivity of human beings need for investment in human capital, implications of population growth on food, sanitation, housing, employment, education and health and social security to improve the quality of human resources. Population and common property resources

Unit III: Population and Environment

Classes 15

Ecological and environmental dimensions of sustainable development;

Approaches to environment: Gandhian approach, Marxian/Socialist approach, Neo-classical approach, Market approach; Population growth and climate change; Population matters to sustainable development and environment (growth, age structure, spatial distribution)

Pressure of population growth on water resources, land use, soil erosion, desertification, deforestation, soil salinity and energy resources; environmental degradation and its implications for health; environmental health hazards

Sustainable livelihoods

Unit IV: Population Policies

Classes 15

Definition of Population Policy; principal features of a population policy; policies in the context of population growth, structure and distribution;

Population Policies of Pro-natalist and Anti-Natalist Countries with special reference to population policy of India: Fertility influencing policies, fertility control policies- direct and indirect.

Policies and programmes for special groups: women and children, youth and aged;

Health influencing policies; National health and family planning programmes: CNA, RCH, National Population Policy 2000, National Health Policy 2002, and National Rural Health Mission 2005.

Suggested Readings:

1. Todaro, Michael P. (1981): *Economic Development in the Third world*. New York: Longman, Chapter 3.
2. Sen, Amartya, (2002): The concept of development in Chenery Hollis and T.N. Srinivasan (eds), *Handbook of Development Economics* Vol. 1. Amsterdam: Elsevier. Chapter 1.
3. Haq, Mahbubul (1996): *Reflections on Human Development*, Delhi: Oxford University Press. Chapters 1 & 2.
4. United Nations Development Programme (2006): *Human Development Report 2006*, New Delhi: Palgrave Macmillan Technical Note 1. pp. 393-99.
5. Ray, Debraj (1998): *Development Economics*. Delhi: Oxford University Press. Chapters 3 & 4.
6. Kapila, Ray and Uma Kapila (2001): *India's Economy in the Twenty First Century*. 2nd Revised Edition. New Delhi: Academic Foundation. Chapters 1 to 5, 15, 16 & 21.
7. Birdsall, Nancy, Kelley, Allen C. and Sinding, Steven W. (2001). *Population Matters: Demographic Change, Economic Growth and Poverty in the Developing World*, Oxford: Oxford University Press Chapters 2, 4 and 5.

8. Jamison D. et al. (eds) (2006): *Disease Control Priorities in Developing Countries*, New York: Oxford University Press and World Bank. Chapter 1.
9. David E Bloom, David Canning, Jaypee Sevilla, (2003): *The Demographic Dividend*. Sanata Monica, CA: Rand Corporation. Chapter 2.
10. National Research Council (1986): *Population Growth and Economic Development: Policy Questions*. Washington D.C.: National Academy Press. Chapters 1, 2, 3, 4, 6 & 8.
11. United Nations (1973): *The Determinants and Consequences of Population Trends*, Volume 1, Chapters 11 & 13.
12. Chenery Hollis and T.N. Srinivasan (eds), (2002): *Handbook of Development Economics*, Vol 1, Amsterdam: Elsevier. Chapters 10, 11, 13 & 15.
13. Kawadia, G. and K. Ahuja, (2006): *Environmental Issues of Development*. Sections A and E, Ambala: Associated Publishers. Chapters 1, 3 & 13.
14. Chrissie, P. and Selwyn S. T. Leger, (1993): *Assessing Health Need Using Life Cycle Framework*, Open University, Buckingham.
15. Peabody, J.W.; Rahman, H. Omar; Gertlor, Paull, J.; Haan, Joyce, (1999): *Policy and Health Implication for Development in Asia*, Cambridge University Press. Cambridge.
16. Peters, David H. Yazbeek Abdo S.; Sharma, Rashmi R.; Ramana G.N.V., (2002): *Better Health Care Systems in India*, World Bank, Washington D.C.
17. Stephen, Chee, William, J. House and Laurie Lewis, (1999): "Population Policies and Programmes", in Post- ICPD Era: "Can the Pacific Island Countries Meet the Challenges" *Asia Pacific Journal*; United Nations, New York.
18. UNESCAP, (1988): *Asia Pacific Population Policies and Programmes; Future Directions*, New York.
19. United Nations, (1974): "World Population Plan of Action", *Studies in Family Planning*, 5(12).
20. United Nations, (1998): *National Population Policies*, Department of Economics and Social Affairs, New York.
21. Agarwal, S. N., 1988: *India's Population Problems*, Tata McGraw Hills Publishing Publishing Co. Ltd. New Delhi.
22. Ahmad, A. et al (eds), 1997: *Demographic Transition: The Third World Scenario*, Rawat Publications, Jaipur and New Delhi.
23. Beaujeu- Garnier, J., 1966: *Geography of Population*, Longman, London.
24. Bhende, A. and Kanitkar, T.: *Principles of Population Studies*, Himalaya Publishing House, Bombay.
25. Chandna, R. C., 1988: *A Geography of Population*, Kalyani publishers, New Delhi.
26. Clark, J.I., 1971: *Population Geography and Developing Countries*, Pergamon Press, Oxford.
27. Clark, J. I., 1972: *Population Geography*, Pragamon Press, Oxford.
28. Demko, G. J. et al, 1970: *Population Geography: A Reader*, McGraw Hill, New York.
29. Gosal, G. S., 1984: *Population Geography in India*, in *Geography and Population, Approaches and Applications*, John I. Clarke (ed), Pergamon Press, Oxford.
30. Mehta, S., 1990: 11. *Migration, A Spatial Perspective*, Rawat Publications, Jaipur and NeDelhi.
31. Raza, M. and Ahmad, A., 1990: *An Atlas of Tribal India*, Concept Publishing Company, New Delhi.
32. Robinson, H., 1983: *Population and Resources*, Macmillan Press, London.

33. Trewartha, G. T., 1969: *A Geography of Population: World Pattern*, John Wiley, New York.
34. Woods, R., 1979: *Population Analysis in Geography*, Longman, London.
35. Zelinsky, W., 1966: *A Prologue to Population Geography*, Prentice- Hall, Englewood Cliffs.

SEMESTER– IV

PAPER TITLE: PRACTICING POPULATION GEOGRAPHY (PRACTICAL)

PAPER CODE: GGY 404

CREDIT: 4

MARKS: 100

Unit I: Framework for Fertility Analysis

Marital and Non marital specific fertility measures: General marital fertility rate (GMFR), Age-specific marital fertility rate (ASMFR), Total marital fertility rate (TMFR), General non marital fertility rate (GIFR), Age-specific non marital fertility rate (ASIFR) – Total non marital fertility rate (TIFR), Non-marital birth ratio (or illegitimacy ratio)
 Standardized Birth Rates: Direct Standardized (Crude) birth rate, Indirect Standardized (Crude) birth rate, Sex Age Adjusted Birth Rate (SAABR)
 Reproduction Measures: Gross reproduction rate (GRR), Net reproduction rate (NRR)
 Cohort measures of fertility: Cohort total fertility rate (CTFR), Mean number of children ever born (MNCEB), Parity Progression Ratios (PPR), Birth Interval Analysis (BIA)

Unit II: Framework for Mortality Analysis

Need and importance of standardization of mortality Ratios/Rates; Direct and indirect techniques of standardization of mortality rates; Decomposition
 Conventional measures of infant mortality (IMR) and its sub-divisions- Neo-natal (early and late) and Post-Neonatal mortality
 Need for adjustment of IMR; Numerator and denominator separation factor, Estimating IMR from large scale sample surveys.
 Construction of Life tables based on Age- specific death Rates (ASDRs),
 Need for Model Life Tables (MLT) for areas having poor vital registration statistics; Underlying principles of constructing important MLT systems - MLT by United Nation, MLT by WHO

Unit III: Indicators of Development

Concepts of development and measures: limitations of per capita income as an indicator of development; emphasis on equality, Lorenz curve and Gini's coefficient; towards human centered development-welfare approach, investment in human capital approach, physical quality of life index (PQLI); human development index (HDI), gender development index (GDI), Concepts and Measures of Poverty, human poverty index (HPI); concept of sustainable development; concepts of social development, social capital and social change.

Unit IV: Population Data handling

Introduction to SPSS-facilities, creating database structure, data entry, specifying scales; validation of data entry, importing and exporting data

Data Manipulation – recoding creating new variable, sorting, filtering and selection of specific data, generating simple frequencies, use of syntax editor.

Correlation and regression analysis – interpretation and regression diagnostic test

Multivariate analysis – concepts and interpretation of results of multiple regressions, logistic regression, ANOVA, with and without interaction

Introduction to GIS and illustration

Reading list: as suggested above

References:

1. *SPSS 14.0 Brief Guide* – SPSS Inc.
2. *SPSS regression models 14.0* - SPSS Inc.
3. *SPSS advanced models 14.0* - SPSS Inc.
4. *Stata user's guide: Release 10.*, 2nd Edition. Stata Press.
5. *Stata survey data reference manual: Release 8.*, 2nd Edition. Stata Press.
6. Cromley, Ellen K. and McLafferty, Sara L., (2002): *GIS and public health*. Guilford Press, New York.