

**DEPARTMENT OF GEOGRAPHY
FACULTY OF NATURAL SCIENCES
JAMIA MILLIA ISLAMIA
NEW DELHI - 110 025**

(A Central University by an Act of Parliament)



M.A. / M.Sc. Geography

Syllabus (w.e.f. 2015-2017)

Course Structure M.A. / M.Sc. Geography

SEMESTER - I

Paper	Code	Title	Credits	Type
Paper - I	GGM-101	Advanced Geomorphology	4	CC
Paper - II	GGM-102	Resource and Economic Geography	4	CC
Paper - III	GGM-103	Regional Geography of India	4	CC
Practical - I	GGM-104	Cartographic Methods	2	CC
Practical - II	GGM-105	Quantitative Methods in Geography	2	CC
Theory Paper - I	GGM-106	Hydrology and Water Resources	4	CB

SEMESTER - II

Paper	Code	Title	Credits	Type
Paper - IV	GGM-201	Remote Sensing, GIS and GPS	4	CC
Paper - V	GGM-202	Climatology and Oceanography	4	CC
Paper - VI	GGM-203	Evolution of Modern Geographical Thought	4	CC
Practical - III	GGM-204	Remote Sensing and Image Processing	2	CC
Practical - IV	GGM-205	Socio-Economic Survey	2	CC
Paper	GGM-206	Land Surveying and GPS	4	SEC
Theory Paper - II	GGM-207	Human Ecology	4	CB

SEMESTER - III

Paper	Code	Title	Credits	Type
Paper - VII	GGM-301	Social Geography	4	CC
Paper - VIII	GGM-302	Urban Geography	4	CC
Paper - IX	GGM-303	Agriculture Geography	4	CC
Practical V	GGM-304	Geographical Information Systems	2	CC
Practical VI	GGM-305	DIP Training	2	CC
Theory Paper - III	GGM-306	Political Geography	4	CB
Practical	GGM-307	Advance Statistical Methods	2	AECC
Practical	GGM-308	Digital Cartography	2	AECC

SEMESTER - IV

Paper	Code	Title	Credits	Type
Paper - X	GGM-401	Regional Development and Planning	4	CC
Paper - XI	GGM-402	Population Geography	4	CC
Any One of the following:				
Paper - XII	GGM-403 (A)	Geography of Urban Environment	4	CC
	GGM-403 (B)	Geography of Health and Well-Being	4	CC
	GGM-403 (C)	Geography of Rural Development	4	CC
	GGM-403 (D)	Land Evaluation	4	CC
	GGM-403 (E)	Gender Geography	4	CC
	GGM-403 (F)	Geography of Crimes - MT	4	CC
Practical VIII	GGM-404	Project	4	CC
Theory Paper- IV	GGM-405	Watershed Management - HS	4	CB

GRAND TOTAL

Semester	Core Course (CC)			Choice Based (CB)	Skill Enhancement (SEC)	Ability Enhancement (AECC)	Total Papers	Credits
	Theory	Practical	Total					
I	03	02	05	01	-	-	06	20
II	03	02	05	01	01	-	07	24
III	03	02	05	01	-	01	07	24
IV	03	01	04	01	-	-	05	20
Total Papers	12	07	19	04	01	01	25	-
Total Credits	48	16	64	16	04	04	-	88

M.A. / M.Sc. Geography
Semester - I
Credits: 4 (CC)
Paper - I (GGM - 101)
Advanced Geomorphology

UNIT - I: FUNDAMENTAL CONCEPTS

Fundamental concepts in Geomorphology: Concept of time and space; Concept of morphogenetic regions; Concept of dynamic equilibrium; Models in Geomorphology; Recent trends in Geomorphology.

UNIT - II: EVOLUTION OF LANDFORMS

Significance of geological structures, climatic factors and the geomorphic processes in the evolution of landforms; Interruption in the evolution of landforms: Tectonic, climatic and base level changes; Slope Form, Processes and Evolution.

UNIT - III: GEOMORPHIC PROCESSES AND LANDFORMS

Drainage basin as geomorphic unit; Morphometric Laws; Morphometric analysis; Denudation and Morpho chronology; Soil erosion and its measurement. Fluvial : Evolution of river valley; Glacial : Glaciations & Forms. Aeolian : Evolution of arid landscapes ; Coastal Geomorphology : Recession of shorelines and evolution of coastal landforms.

UNIT - IV: APPLIED GEOMORPHOLOGY

Geomorphic hazards and mitigation; Geomorphology and Soils; Geomorphology in mineral and Groundwater prospecting; watershed management.

Books Recommended:

1. Dury, G.H. Ed. 1966. Essays in Geomorphology. Heinmann Educational Books Ltd., London.
2. Fairbridge, R.W. 1968. (Ed.). Encyclopedia of Geomorphology. Rein-hold Book Corp., New York.
3. Garner, H.F. 1974. The Origin of Landscape: A Synthesis of Geomorphology. Oxford Univ. Press, New York.
4. Jhon, R. Hails. 1977. Applied Geomorphology, Elsevier.

5. Way, D. 1978. *Terrain Analysis: A Guide to Site Selection using Aerial Photo Interpretation*. Dowden, Hutchinson & Ross, Stroudsburg.
6. Dayal, P. 2015. *Text-Book of Geomorphology*, Shukla Book Depot, Patna.
7. Gable R.E, Peterson. J.F., Trapasso, L.M. 2009. *Essentials of Physical Geography* Brooks/Cole Cengage Learning.
8. Kale, V. and Gupta, A., 2004. *Elements of Geomorphology*. Oxford University press, Calcutta.
9. Strahler, A.H., 2013(6th edition). *Introducing Physical Geography*. Wiley Pub.
10. Thornbury, W.D., 1991. *Principles of Geomorphology*, Wiley Eastern Ltd., New Delhi.
11. Worcester, P.C. 1969. *Text Book of Geomorphology*. East West Press, New Delhi.
12. Savindra Singh. *Fundamental Concepts in Geomorphology*. Prayag Pustak Bhawan, Allahabad.
13. Gautam, A. 2015. *Geomorphology*. Sharda Pustak Bhawan.
14. Hugget, R.J. 2011. *Fundamentals of Geomorphology*. Routledge Pub.
15. Harvey, 2012. A. *Introducing Geomorphology: A Guide to Landforms and Processes*.

M.A. / M.Sc. Geography
Semester - I
Credits: 4 (CC)
Paper - II (GGM - 102)
Resource and Economic Geography

UNIT I: FUNDAMENTAL CONCEPTS

Definitions and Scope of Economic Geography: its place in Human Geography, Development of the discipline after Second World War with special reference to New Economic Geography (NEG).

UNIT II: THEORIES AND MODELS

A) Agricultural Land Use – Ricardian Rent theory, Von Thunen’s rent theory with modern interpretations.

B) Basic concepts in location problems; Demand, Scale, Agglomeration and Time dimension in Economic location; Locational Models of Weber and Isard.

C) Christaller’s Central Place Theory and modifications by Losch.

UNIT III: RESOURCE BASE OF THE ECONOMY

Resource base of the Economy; Concept of Resources, Classification of Resources; Factors of Resource Creation; Resources and Environment – scarcity and sustainability, conservation of resources; Sectors of the Economy: agriculture, manufacturing and tertiary activities.

UNIT IV: TRADE AND EXCHANGE

Concepts of trade and exchange – opportunity costs, absolute, comparative and competitive advantage; Movements of capital and labour; Core-periphery concept in trade; Commodities in world trade; Trade Blocs; The Information Economy – Spatial and transportation implications of e-commerce.

Books Recommended:

1. Conkling, E. C. and Yeates, M. 1976. Man’s Economic Environment. McGraw – Hill Book Company, New York.
2. Friedmann, J. and Alonso, W. 1964. Regional Development and Planning: A Reader. The M.I.T Press, Cambridge.
3. Gore, C. 1984. Regions in Question: Space, Development Theory and Regional Policy. Methuen, London.
4. Hartshorne, T. A. and Alexander, J. W. 1988. Economic Geography. Prentice Hall, New Delhi
5. Hurst, E. M. 1972. The Geography of Economic Behaviour: An Introduction. Duxbury Press, California.

6. Peat, W.N. and Constant, J. A. 1972. Zimmermann's World Resources and Industries. Harper and Row Publishers, London
7. Wheeler, J.O, Muller, O. M, Thrall, G.I. and Timothy, J. F. 1998. Economic Geography. John Wiley and Sons Inc., New York.
8. Hussain, M. 2008. Models in Geography. Rawat Publications.
9. Gautam, A. 2015. Geography of Resources: Exploitation Conservation And Management. Sharda Pustak Bhawan.
10. Gautam, A. 2015. Advanced Economic Geography. Sharda Pustak Bhawan.

M.A. / M.Sc. Geography
Semester - I
Credits: 4 (CC)
Paper - III (GGM - 103)
Regional Geography of India

UNIT - I: REGION AND REGIONALIZATION

India as a Geographical Unit; Concept of Region: Scheme of Regionalization: O.H.K. Spate and R.L. Singh, Agro-climatic Regions, Watershed as a Planning Region.

UNIT - II: GEOGRAPHY OF INDO-GANGETIC PLAIN

Introduction to Indo-Gangetic Plain; Upper Ganga, Middle Ganga and Lower Ganga Plains: Physiography, Drainage, Climate, Soil; Population and Economy.

UNIT - III: GEOGRAPHY OF HIMALAYAS

Introduction to Himalayas; A Regional Study of Himalayas: Physiography, Drainage, Climate, Soil, Natural Vegetation, Population and Economy.

UNIT - IV: GEOGRAPHY OF PENINSULAR INDIA

Introduction to Peninsular India; A Geographical account of Chotanagpur and Deccan plateau: Physiography, Drainage, Climate, Soil; Population and Economy.

Books Recommended:

1. Deshpande C.D. 1992. Indian-A Regional Interpretation. Northern Book Centre, New Delhi.
2. Farmer, B.H. 1983. An Introduction to South Asia. Methuen, London, 1983.
3. Govt. of India: India-Reference Annual, 2001 Pub. Div., New Delhi.
4. Govt. of India: National Atlas of India. NATMO Publication, Calcutta.
5. Govt. of India: The Gazetteer of India. Vol. I & III Publication Division.
6. Learmonth A.T.A et.al. 1982(ed.) Man and land of South Asia. Concept Pub.
7. Mitra, A. 1967. Levels of Regional Development of India. Census of India, Vol. I, Part I- A (i) and (ii), New Delhi.
8. Routray, J.K. 1993. Geography of Regional Disparity. Asian Institute of Technology, Bangkok.
9. Shafi, M. 2000. Geography of South Asia. McMillan & Co., Calcutta.
10. Singh, R.L. 1971(ed). India A Regional Geography. National Geographical Society, Varanasi.
11. Spate, O.H.K. and Learmonth A.T.A. 1967. India and Pakistan – Land, People and Economy Methuen & Co., London.

12. Valdiya, K.S. 1998. Dynamic Himalaya. University Press, Hyderabad.
13. Singh, Gopal. 1988. Geography of India. Atma Ram Pub., Delhi.
14. Tirth Ram. 1996. Geography of India. Rawat Pub., Jaipur.
15. Gopal Krishnan, R. 1996. Geography of India. Jawahar Pub. & Dist., New Delhi.
16. Gautam, A. 2015. Advanced Geography of India.. Sharda Pustak Bhawan.
17. Chand, M., Puri, V. K. 2011. Regional Planning in India. Allied Publishers Limited.

M.A. / M.Sc. Geography

Semester - I

Credits: 2 (CC)

Practical - I (GGM - 104)

Cartographic Methods

UNIT - I: FUNDAMENTALS OF CARTOGRAPHY

Maps and their significance; Classification of maps; Theory of communication; Elements of maps: Generalization, Symbolization and Classification; Techniques of mapping: dot, choropleth, isopleths and diagrammatic; Principles of map designing.

UNIT - II: RELIEF MAPPING

Relative relief: GH Smith and Robinsons methods; Morphometric Analysis: Drainage Density, Stream order, Elongation ratio, Circularity ratio, Bifurcation ratio.

UNIT - III: MAPPING OF SOCIO-ECONOMIC DATA

Population Density; Rural – Urban population; Patterns of irrigation, Location of Industries; Cartograms.

UNIT - IV: APPLIED CARTOGRAPHY

Any one of following:

1. Topographic mapping
2. Tourist mapping
3. Service and utility mapping

Note: Students will have to prepare a set of ten maps on selected theme.

Books Recommended:

1. Dickinson. G.C. 1968. Statistical Mapping and Presentation of Statistics. Arnold, London.
2. Lawrence. G.R.P. 1971. Cartographic Methods. Methuen, London.
3. Monkhouse. F.J and Wilkinson. H.R. 1972. Maps and Diagrams. Methuen, London.
4. Misra. R.P.1969. Fundamentals of Cartography. Prasaranga. University of Mysore, Mysore.
5. Raisz. E. 1962. Principles of Cartography. McGraw Hill, New York.
6. Robinson. A.H. 1978. Elements of Cartography. John Wiley, New York.

M.A. / M.Sc. Geography
Semester - I
Credits: 2 (CC)
Practical - II (GGM - 105)
Quantitative Methods in Cartography

UNIT - I: MEASURES OF GEOGRAPHICAL PATTERNS

Nearest Neighbour Analysis; Gini's Co-efficient; Lorenz curves; Location quotient; Rank size rule.

UNIT - II: NETWORK ANALYSIS

Indices of transport network efficiency; Compositing the indices of transport network efficiency; Indices of nodal accessibility; Local degree – Road Local degree - Rail. Weighed road capacity and tortousrity ratio; Compositing the indices of nodal accessibility.

UNIT - III: METHODS OF PREDICTIONS AND LEVELS OF MEASUREMENT

Levels of measurement; Methods of sampling; Simple linear regression analysis; Plotting of regression line; Plotting of absolute and relative residuals; Explanation of residuals plotted on the maps.

UNIT - IV: MEASURES OF DISPARITIES AND POTENTIAL MODELS

Gravity and potential models; Delimitation of hinterlands; Combinational analysis of Weaver, S.M. Rafiulla's method, Measures of Disparities: Kendall's ranking method.

Books Recommended:

1. Berry, B.J.L. and Marble, D.R. (ed.). 1968. Spatial Analysis: A Reader in Statistical Geography. Prentice Hall, New York.
2. Cole, J.P. and Kind, C.A.M. 1968. Quantitative Geography. John Wiley Pub., New York.
3. Ibrahim, R. 1984. Market Centers and Regional Development. B.R. Publisher, New Delhi.
4. Mahmood, A. 1986. Statistical Methods in Geographic Studies. Rajesh Publishers, New Delhi.
5. Smith, D.M. 1975. Patterns in Human Geography. Penguin Books, England.
6. Maurice, Yeats. 1974. An Introduction to Quantitative Analysis in Human Geography. McGraw Hill, New York.
7. Peter Hagget, Andrew. D. Cliff and Allen Frey. 1977. Locational Methods. Vol. 1 and 11. Edward Arnold, London.

M.A. / M.Sc. Geography
Semester - I
Credits: 4 (CB)
Paper - I (GGM - 106)
Hydrology and Water Resources

UNIT - I: INTRODUCTION

Definition and scope of Hydrology, Hydrological cycle, Structure and properties of water, inventory of earth's water resources, quality and quantity of available water, Water as a cyclic resource.

UNIT - II: SURFACE WATER DYNAMICS

Surface water: sources and factors affecting quality and quantity; Precipitation: forms and factors; Interception: factors; Runoff: sources and factors affecting runoff; Evaporation: measurement and factors; Evapotranspiration: control and factors.

UNIT - III: GROUND WATER DYNAMICS

Ground water: Characteristics of stream flow, Darcy's Law, permeability, Infiltration, Ground water storage, Ground water aquifers in different rock systems, movement and discharge.

UNIT - IV: WATER RESOURCE PROBLEMS

Environmental influences on water resources; sectoral demands for water; urban water supply; water management; water harvesting; water pollution and control.

SUGGESTED READINGS:

1. Timothy, Davie. 2003. Fundamentals of Hydrology. Routledge, Taylor and Francis Group, U.K.
2. Todd, D.K. 2009. Groundwater Hydrology. John Wiley & Sons Inc.
3. Mahajan, G. 1989. Evaluation and Development of Groundwater. Ashish Publishing House, New Delhi.
4. Karanth, K.R.C. 1988. Ground Water: Exploration, Assessment and Development. Tata-Mcgraw Hill, New Delhi.
5. Andrew D. Ward and Stanley Trimble. 2004(2nd edition). Environmental Hydrology. Lewis Publishers.

6. Wright. R.T and Nebel. B.J. 2002(8th Edition). Environmental Science: Toward a Sustainable Future. Prentice Hall India Ltd.
7. Vijay P. Singh. 1995. Environmental Hydrology. Kluwer Academic Publications, The Netherlands.
8. Subramaniam V. 2002. Text Book of Environmental Science. Narosa Publishing House, Delhi.
9. Santhosh Kumar Garg. 2007. Hydrology and Water Resources Engineering. Khanna Publishers, Delhi.
10. Patra, K.C. 2004. Hydrology and Water Resources Engineering. Narosa Publications, New Delhi.
11. Viessmann, Warren., Lewis, Gary. 2002(5th edition) Introduction to Hydrology. Prentice Hall.
12. Hendriks Martin. 2010. Introduction to Hydrology. Oxford University Press, London.
13. Raghunath H.M.2006. Hydrology: Principles, Analysis and Design. New Age International Publishers, Mysore.

M.A. / M.Sc. Geography
Semester - II
Credits: 4 (CC)
Paper - IV (GGM - 201)
Remote Sensing, GIS and GPS

UNIT - I: BASICS OF REMOTE SENSING

Stages in Remote Sensing data acquisition; Physics of Remote Sensing; Electro Magnetic Spectrum (EMS); EMR and its interaction with atmosphere and earth surface features.

UNIT - II: REMOTE SENSING PLATFORMS, SENSORS, AND SATELLITE SERIES

Platforms: Types and their orbital characteristics; Sensors types: active and passive; Sensors systems: whiskbroom and push broom; Satellite series: IRS, SPOT, IKONOS and Quick bird.

UNIT - III: DIGITAL IMAGE PROCESSING

Digital data formats; Image Restoration: geometric radiometric corrections and filtering. Image Enhancement: linear and non linear contrast stretch; Band combinations; Image Classifications: supervised and unsupervised.

UNIT - IV: GEOGRAPHIC INFORMATION SYSTEM AND GLOBAL POSITIONING SYSTEM

Components of GIS; Data Structures; Data Base Management System (DBMS); Data Models; spatial data analysis and applications; Fundamentals of GPS; Segments of GPS; GPS Applications.

Books Recommended:

1. Lillesand T.M and Keifer R.W. 2008 (6th edition). Remote Sensing and Image Interpretation. John Wiley and Sons, New York.
2. Joseph George. 2005 (2nd edition), Fundamentals of Remote Sensing. University Press. Hyderabad.
3. Sabins, F.F. 1986. Remote Sensing: Principles and Interpretation. Freeman, New York.
4. Rashid S.M. and Mazhar A.K. 1993. Dictionary of Remote Sensing. Manak Publishing House, Delhi.
6. Lo, C.P.and Yeung AKW. 2006(2nd edition). Concepts and Techniques of GIS, Prentice – Hall of India, New Delhi.
7. Masood, A. S . 2006. Introduction to GIS, Allahabad.
8. Fazal S. and Rahman A. 2007. GIS Terminology. New Age International Publishings, New Delhi.

9. Leick, A. 2003 (2nd edition). GPS Satellite Surveying. John Wiley and Sons, New York.
10. N.K.Agarwal. 2004. Essentials of GPS, Spatial Network Pvt. Ltd.
11. Campbell, J.B. 1996 (2nd edition). Introduction to Remote Sensing. Taylor and Francis, London.
12. Curran, P. 1985. Principles of Remote Sensing. Longman, London.
13. Sabins, J.F.F. 1997. Remote Sensing: Principles and Interpretation. W.H. Freeman & Co., New York.
14. Jenson, J.R. 2013. Remote Sensing and Environment. Pearson India.
15. Kumar, S. 2005. Basics of Remote Sensing and GIS. Laxmi Pub.

M.A. / M.Sc. Geography
Semester - II
Credits: 4 (CC)
Paper - V (GGM - 202)
Climatology and Oceanography

UNIT - 1: GENERAL CLIMATOLOGY

Meaning, scope and objectives of climatology and its relations with meteorology. Structure and composition of the atmosphere. Heat budget and insolation. Atmospheric equilibrium, air masses and fronts. Atmospheric disturbances: cyclones, tornadoes and water spouts. Classification of climate by Trewartha, Koppen and Thornthwaite.

UNIT - 2: APPLIED CLIMATOLOGY

Climate and biosphere. Climate and human environment: agricultural and industrial. Climate, urbanization and urban planning. Weather forecasting and recent trends in climatology. Air pollution, global warming and climatic change. Micro climates.

UNIT - 3: GENERAL OCEANOGRAPHY

Meaning, scope and objectives of oceanography. Submarine topography and configuration of Pacific, Atlantic and Indian ocean floors. Ocean temperature and salinity. Ocean dynamics: currents, tides, tsunamis and El Nino. Ocean deposits. Coral reefs.

UNIT - 4: APPLIED OCEANOGRAPHY

Ocean routes and world economics. Marine resources and their conservation. Marine Pollution and ocean dumping. Global warming and transgression of seas. Remote sensing in oceanographic studies. Laws of the sea.

Books Recommended:

1. Barry, R.G. and Chorley R.J. 2009(9th edition). Atmosphere Weather and climate, Routledge.
2. Barret, E.C. 1974. Climatology from Satellites. Methuen London.
3. Critchfield, J.H. 1983(4th edition). General Climatology. Phi Learning Pub.
4. Davis, R.J.A. 1986. Oceanography-An Introduction of the Marine Environment. Win C. Brown, Iowa.
5. Griffiths, J.F. 1976. Applied climatology. Oxford press, New York.
6. Hobbs, J.E. 1996. Applied Climatology. Oxford University Press.
7. Huntington, E. and S.S. Visher. 1922. Climatic Changes. Yale University Press.

8. Hussain, T. and Tahir, M. 2012. Climatology. Jawahar, New Delhi.
9. Hussain, T. and Tahir, M. 2012. Oceanography. Jawahar, New Delhi.
10. Kings, C.A.M. 1969. An Introduction to Oceanography. McGraw, New York.
11. Lamb, H.H. 1991. Climate : Present, Past and Future. Vol.1&2. Routledge.
12. Siddhartha, K. 2013. Oceanography-A Brief Introduction, Kisalya Pub., New Delhi.
13. Singh, S. 2013. Physical Geography. Prayag Pub., Allahabad.
14. Trewartha, G.T. and Horn, L.A., 1980(5th edition). Introduction to Climate, International Studies.
15. Trujillo, A.P., Thurnman, H.V. 2016. Essentials of Oceanography, Prentice Hall.
16. Trujillo, A.P., Thurnman, H.V. 2010(10th Edition). Introductory Oceanography. Prentice Hall.
17. Weyl, P.K. 1970. Oceanography-An Introduction of the Marine Environment, John Wiley and Sons, London.

M.A. / M.Sc. Geography

Semester - II

Credits: 4 (CC)

Paper - VI (GGM - 203)

Evolution of Modern Geographical Thought

UNIT – I: GENESIS OF GEOGRAPHICAL THOUGHT

Ancient Geography Contributions of Greek, Roman and Arab Geographers. Impact of voyages; Discoveries and Renaissance on Geographical Thought. Foundation of Scientific Geography (Contributions of Varenus and Kant).

UNIT - II: EVOLUTION OF MODERN GEOGRAPHICAL THOUGHT - I

Classical period of modern geography contributions (Humboldt and Ritter) and Darwin's impact on Geography; Contributions of Ratzel and Blache; Shifting viewpoints in Geography during the latter half of Nineteenth Century.

UNIT - III: EVOLUTION OF MODERN GEOGRAPHICAL THOUGHT - II

The debate between Determinist and Possibilists; Geography as science of relationships and as science of distributions. Geography as Chorological science and as Morphology of Landscape.

UNIT - IV: CONTEMPORARY GEOGRAPHY POST SECOND WORLD WAR

Exceptionalism and the Schaefer-Hartshorne debate, Positivism and its reactions (behavioral and radical approaches). Post modernism and feminist Geography.

Books Recommended:

1. Dickinson. 1969. The Maker's of Modern Geography. Routledge and Kegan Paul, London.
2. Hartshorne. R. 1939. The Nature of Geography. Association of American Geographers, Lancaster, Pennsylvania.
3. Hartshorne.R. 1959. Perspective on the Nature of Geography. Rand McNally and Company, Chicago.
4. Harvey, D. 1991. The Condition of Post Modernity: An Enquiry into the Origins of Cultural Change. Wiley-Blackwell, Oxford.
5. Husain, M. 2002. Evolution of Geographic Thought (also in hindi). Rawat Publications, Jaipur.
6. Singh, J. 1988. Bhaugolik Chenta ka karam vikas. Gyanodaya. Gorakhpur.
7. Peet, R. 1998. Modern Geographical Thought. Blackwell, Oxford.
8. Adhikari, S. 2015. Fundamentals of Geographical Thought. India Orient Blackswan.
9. Dikshit, R.D. Geographical Thought. 1997. PHI Learning Pvt. Ltd., New Delhi.
10. Martin G.J. 2005. All Possible World. OUP, USA.

11. Cresswell, T. 2012. *Geographical Thought: A Critical Introduction*. Wiley Pub.
12. Lalita Rana. 2008. *Geographical Thought: A Systematic Record Of Evolution*. Concept Publishing Company.
13. Arild Holt-Jensen. 2009 (2nd edition). *Geography: History and Concepts*. Sage Pub.

M.A. / M.Sc. Geography
Semester - II
Credits: 2 (CC)
Practical - III (GGM - 204)
Remote Sensing and Image Processing

UNIT - I: REMOTE SENSING AND IMAGE INTERPRETATION

Referencing layout and indent of Landsat TM and IRS imageries; Identification of objects / features on multiband imageries; Detection of defined objects/features; Preparation of Image interpretation keys; Interpretation, classification using aerial photographs.

UNIT - II: DIGITAL IMAGE PROCESSING

Digital Images: User Interface with Image Processing Software: Image Registration: Image to map and Image to Image; Selection of training sets; Image Classification: Supervised and Unsupervised classification.

UNIT - III: MAPPING GEOMOGRAPHIC FEATURES

Geomographic mapping using aerial photographs and satellite imageries; Morphometric analysis: Drainage density, Stream order; Channel change.

UNIT - IV: URBAN LAND USE / LAND COVER MAPPING

Urban Land use/Land cover classification of Chandigarh / Delhi/ Bangalore / Mumbai / Hyderabad / Kolkata/ Varanasi using IRS data.

Books Recommended:

1. K. K. Rampal. 1999. Handbook of Aerial Photography and Interpretation. South Asia Books
2. Dickinson, G.C. 1979. Maps and Aerial Photographs. Arnold – Heinemann, New Delhi.
3. Lillisand,T., Keifer, Ralph W., Chipman, J. 2011. Remote Sensing and Image Interpretation. John Wiley Pub., New York
4. Lindgren, D.T. 2010. Land Use Planning and Remote Sensing. Springer.
5. Miller, V.C., 1961. Photogeology. McGraw Hill, New York.
6. NRSA, Data User Handbook, Hyderabad.
7. Sabins, Floyd F. 2007. Remote Sensing : Principles and Interpretation, Waveland Pr Inc.
8. Siegal, B.S. and AR Gillespie, 1980, Remote Sensing in Geology, Wiley, New York.
9. Townshend, J.R.G. 1981. Terrain Analysis and Remote Sensing, HarperCollins Publishers
10. Way, D.S. 1978, Terrain Analysis : A Guide to Site selection using Aerial Photo Interpretation. Dowden, Hutchinson & Ross Pub.

M.A. / M.Sc. Geography
Semester - II
Credits: 2 (CC)
Practical - IV (GGM - 205)
Socio-Economic Survey

UNIT- I

Procurement of a topographic map of 1:50,000 to 1:25,000 scale to study the settlements selected in its regional setting.

UNIT- II

Collection of demographic, social & economic data of the village/town from Census Reports to study the temporal changes in the profile of such characteristics. Procurement of a cadastral map of the village/town for field mapping of the features of land-use and land quality. Procurement/preparation of the settlement-site map through rapid survey to map the residential, commercial, recreational (Parks, Playgrounds), educational, religious and other prominent features.

UNIT - III

Selection of sampling site, defining sampling size, and conducting socio-economic survey at households level with a self- structured questionnaire and supplementing the information by personal observations and perceptions.

UNIT- IV

Based on results of the land-use and socio-economic survey of the households, preparation of a critical field-survey report. Photographs and sketches, in addition to maps and diagrams, may supplement the report.

Books Recommended:

1. Gregory, S. 1980. Statistical methods and the Geographer. Longman, London.
2. Mahmood, A. 2008. Statistical Methods in Geographical Studies. Rajesh Pub., New Delhi.
3. Ibrahim, R. 1992. Socio-Economic Profile of Mewat. Radha Publishers, New Delhi.
4. Robinson, A.H., et.al. 1995(6th edition). Elements of Cartography. John Wiley , New York.
5. Raisz, E. 1962. Principles of Cartography. Mc Graw Hill, New York.

M.A. / M.Sc. Geography

Semester - II

Credits: 4 (SEC)

Practical - (GGM - 206)

Land Surveying and GPS

Unit - I: Theory and Principles

Surveying: Definition, classification, objectives, principles; Plane and geodetic surveys; Triangulation: Principles, base line measurement, extension of the base.

Unit - II: Field Work

Levelling by Dumpy level; Resection: (Two point and Three point problem) by Plane Table; Horizontal and Inclined Range Determination by Telescopic alidade; Triangulation by Theodolite.

Unit - III: GPS Theory

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

Unit - IV: Field Work

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

Books Recommended:

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

M.A. / M.Sc. Geography

Semester - II

Credits: 4 (CB)

Paper - II (GGM - 207)

Human Ecology

UNIT - I: INTRODUCTION

Human Ecology: Evolution & Development; Key Concepts: Anthropocentrism, cultural lag; Environmental ethics and institutions.

UNIT - II: HUMANS AND ENVIRONMENT

Humans and the Biosphere: Co-evolution and co-adaptation of human system and ecosystems; Resources and technologies; Environment and consumerism: Problems and consequences; Geographies of hunger and health.

UNIT - III: HUMANS AND BIOPHYSICAL SYSTEM

Humans as persons and agents of larger social system; Human population: size, growth and biophysical carrying capacity of Earth; Ecosystem: components and functions; Energy Flow: Food chain, Food Web and Trophic Levels; Material Cycles: Nitrogen and Carbon.

UNIT - IV: GLOBAL CHANGE ADAPTATION

Environmental Adaptations and behavioral changes; Environmental crises and Management: Eco regional and watershed management strategies; Landscapes restoration and conservation of biodiversity.

Books Recommended:

1. Dieter Steiner and Marcus Nauser (ed.). 1993. Human Ecology. Routledge.
2. Ehrlich, P.R, Ehrlich, A.H. and Holdren, J.P. 2000(Revised). Human Ecology. W.H.Freeman & Co. San Franchisco.
3. George Theodorson (ed.). 1961. Studies in Human Ecology. Harper & Row, New York.
4. Quinn, J.A. 1971. Human Ecology (2nd Edition). Archon Books, New York.
5. Odum, E.P. 2004. Fundamentals of Ecology. Cengage Learning, New York.
6. Arumugam, N. 2014. Concepts of Ecology. Saras Publication, Delhi.
7. Robert Ezra Park. 2003. Human Communities: The City and Human Ecology. Freeman Press.
8. Lovett G.M., Jones C., Turns M.G., Weather K.C. 2005. Ecosystem Function in Heterogenous Landscapes. Springer.

9. Pushpam Kumar, Reddy B. Sudhakar. 2007. Ecology and Human Well Being. Sage Publication.
10. Vladimir F. Krapivin., Costas A. Varotsos. 2005. Biogeochemical Cycles in Globalization and Sustainable Development. Springer.

M.A. / M.Sc. Geography

Semester - III

Credits: 4 (CC)

Paper - VII (GGM - 301)

Social Geography

UNIT - I: FUNDAMENTAL CONCEPTS

Definition, scope and development of Social Geography. Relationship of social geography with other branches of Social Science. Concepts of social space, social area analysis and social well being. Development of social geography in India.

UNIT - II: PATTERNS AND PROCESSES

World Distribution of religious and linguistic groups. Cultural realm and their distribution. Socio-economic and environmental issues of the developed and developing countries. Process and problems of social change in the traditional societies.

UNIT - III: SOCIAL STRUCTURE OF INDIA

Distribution of racial and linguistic groups of India. Distribution of various social groups (i.e., SC, ST, OBC) and their socio-economic issues. Regional imbalances with-reference to literacy, health, poverty and crimes in India. Levels of social well-being in India / HDI.

UNIT - IV: SOCIAL ISSUES IN INDIA

Unity in diversity. Regional consciousness and national integration. Social conflicts and violence. Emphasis of social planning during Xth and XIth Five Year Plans.

Books Recommended:

1. Ahmed, A. (1999), Social Geography, Rawat Publication, Jaipur.
2. Carter, John and Jones, T. (1989), Social Geography: An Introduction to Contemporary Issues, Edward Arnold, London.
3. Chandana R.C. (1989), Spatial Dimensions of Scheduled Castes in India, Intellectual Publishers House, New Delhi.
4. Crane, R.I. (1973), Regions and Regionalism in South Asia Studies: An Exploratory Study, Durham, Duke University.
5. D.M. Smith (1995), Geography and Social Justice, Black-well.
6. Dube, S.C. (1991), Indian Societies, National Book Trust of India, New Delhi.
7. Dube, S.C, Tribal Heritage of India, Vias Publishing Co, New Delhi.
8. Ghurye,G.S. (1963), The Scheduled Tribes, Bombay, Popular Prakashan.
9. Guha, B.S. (1944), Racial Elements in Indian Population, Oxford University Press, Bombay.
10. Knox,P. (1982), Urban Social Geography: An Introduction, Longman, London.
11. Konx, P.L. (1975), Social Well –being: A Spatial Perspective, Oxford London.

12. Manson, P., "Unity and Diversity: An Introductory Review" in P, Manson (ed.) *India and Ceylon: Unity and Diversity* pp. 1-19.
13. Morris, D. et. Al. (1982), *Measuring the Condition of India's Poor: The Physical Quality of life index*, Promila, New Delhi.
14. Sakharov, IV. (1971), "Ethno Linguistic Geography of India. Facts and Problems", In *Economic and Socio- cultural Dimensions of Regionalization, Census of India, Monograph.No.7.*
15. Singh, K.S. (1985), *Tribal Society in India*, Manohar.
16. Smith, D.M. (1977), *Human Geography: A Welfare Approach*, Edward Arnold.
17. Smith D.M., *Geography of Social Well Being.*
18. Sopher, D.E. (1980), *An Exploration of India: Cornell University, London.*

M.A. / M.Sc. Geography
Semester - III
Credits: 4 (CC)
Paper - VIII (GGM - 302)
Urban Geography

UNIT - I: CONCEPTS AND APPROACHES TO THE STUDY OF URBAN GEOGRAPHY

Nature and scope of Urban Geography; Different Approaches; Development and Recent Trends in Urban Geography; Evolution of towns during the Ancient, Medieval and Modern periods.

UNIT - II: MORPHOLOGY AND CLASSIFICATIONS OF TOWNS

Morphology and Models of Internal Structures of cities; Functional Classification of towns; Hierarchy and Spacing of cities: Model of Christaller; Urban Fringe; Primate City and Megalopolis.

UNIT - III: QUALITY OF LIFE AND HEALTH

Economic Base of Cities; Physical, Economic, Social and Cultural component; Quality of Urban Life; Air Pollution and Public Health.

UNIT - IV: URBAN PLANNING

Urban transportation; transport and environmental degradation; vehicular pollution and congestion; urban planning in India with special reference to Chandigarh and Jaipur.

BOOKS RECOMMENDED:

1. Michael.P. (2009). Urban Geography: A Global Perspective, Taylor & Francis, Great Britain.
2. Marcotullio, P. Mc Granahan. G. (2007). Scaling Urban Environmental Challenges: From Local to Global and Back, Earthscan, Great Britain.
3. Hardoy, J. E., Mitlin. D. Satterthwaite. D. (1992). Environmental Problems in Third World Cities, Earthscan, Great Britain.
4. Jensen, J.R. (2007). Remote Sensing of the Environment: An Earth Resource Perspective, Prentice-Hall, NJ, USA.
5. Goudie, A, (2000). The Human Impact on the Natural Environment, MIT Press, Great Britain.
6. Paul. K. Pinch. S. (2006). Urban Social Geography: An Introduction, NJ, USA.
7. The Urban Environment: Twenty Sixth Report (2007) Royal Commission on Environmental Pollution, Great Britain.

M.A. / M.Sc. Geography

Semester - III

Credits: 4 (CC)

Paper- IX (GGM - 303)

Agriculture Geography

UNIT - I: APPROACHES PARAMETERS AND AGRICULTURAL SYSTEMS

Nature, scope and significance; Evolution in historical perspective; Approaches: commodity, systematic, regional and ecological; Determinants of agricultural development: physical, technological, institutional; World agricultural systems.

UNIT - II: MODELS AND AGRICULTURAL REGIONALIZATION

Cropping patterns and their measurements: crop concentration, crop diversification, crop combinations, measurement of agricultural efficiency, agricultural productivity; Agricultural location models: Von Thunen and Lössch.

UNIT - III: AGRICULTURAL DEVELOPMENT AND PLANNING IN INDIA

Agriculture during plan periods; Diffusion of agricultural innovations; Green revolution and its effects on economy, society and environment; Agro-climatic regions and their planning; Measurement and levels of agricultural development; Problems and prospects of Indian agriculture.

UNIT - IV: CONTEMPORARY ISSUES IN INDIAN AGRICULTURE

Nutrition, malnutrition and hunger; Rural poverty and unemployment; Poverty alleviation strategies; Food aid and nutrition programmes; Food security and its components; Sustainable agriculture.

BOOKS RECOMMENDED:

1. Berry,B.J.L.1976. The Geography of Economic Systems, Prentice Hall; New York.
2. Chauhan,D. 2010. Agricultural Geography, Ritu Publications
3. Brown,L.R. 1990The Changing World Food Prospects- The Nineties and Beyond, World Watch Institute,Washington D.C.
4. Dyson,T. 1996. Population and Food – Global Trends and Future Prospects, Routledge, London.
5. Gobind,N. 1986. Regional Perspectives on Agricultural Development ; Concept Publications;New Delhi
6. Gregory,H.F. 1970. Geography of Agriculture; Prentice Hall Englewood Cliff; New Jersey.

7. Grigg F.D.B. 1974. The Agricultural Systems of the World, Cambridge University Press; New York
8. Hussain,M. 1979. Agricultural Geography; Inter India Publishers; New Delhi.
9. Hussain,M. 1979. Systematic Agricultural Geography; Rawat Publishers; New Delhi.
10. Jasbir,S. and Dhillon,S.S. 1984. Agricultural Geography, McGraw Hill; New Delhi.
11. Mannion, A.M. 1995. Agriculture and Environment Change; John Wiley; London.
12. Shafi,M. 2006. Agricultural Geography, Pearsons Publications, New Delhi.
13. Shafi, M. 1984. Agricultural Productivity and Regional Imbalances: A Study of Uttar Pradesh, Concept Publication Company, New Delhi.

M.A. / M.Sc. Geography
Semester - III
Credits: 2 (CC)
Practical V (GGM-304)
Geographical Information Systems

UNIT - I: GIS SOFTWARE & DATA HANDLING

User interface with GIS software: Arc View, Geo- media, ILWIS and Arc GIS; Software and hardware interface and limitations; Data input: spatial and non-spatial; Scanning and Digitizing; Data import and export.

UNIT - II: DATA TRANSFORMATION

Data editing and cleaning; Projection and datum; Coordinate transformation; Geo-referencing; linking spatial and no-spatial data; Data base creation; Attribute handling.

UNIT - III: DATA BASE CREATION & DATA ANALYSIS

Spatial analysis: overlay, buffer and proximity, network analysis; Creation of digital elevation models (DEM): contours and spot heights; Determination of slope, aspect and hill shading; Data interpolation: point and line data; Output generation and layouts.

UNIT-IV: Applied GIS

Application of GIS in Agriculture, Urban Planning and Management, Watershed management, Suitability Analysis

BOOKS:

1. Lo C. P. & Yeung A. K. W., (2004). Concepts and Techniques of GIS, Prentice-Hall of India, New Delhi.
2. Heywood I, Cornelius S, Carver S. (2000). Introduction to GIS. Addison Wesley Longman, New York.
3. Burrough P.A. and Rachael A. McDonnell. Principles of Geographic Information Systems, 2nd Ed.
4. Masood A S, (2006). Introduction to GIS, Sharda Pustak Bhavan Allahabad.
5. Fazal. S. & Rahman A (2007). GIS Terminology, New Age International Publishers, New Delhi.
6. Fazal.S. (2008). GIS Basics, New Age International Publishers, New Delhi.
7. Leick A. (1995) GPS Satellite Surveying, 2nd Edition, John Wiley and Sons.
8. French. G.T. Understanding the GPS: An Introduction to the Global Positioning System.

M.A. / M.Sc. Geography

Semester - III

Credits: 2 (CC)

Practical VI (GGM-305)

DIP Training

M.A. / M.Sc. Geography

Semester - III

Credits: 4 (CB)

Theory Paper - III (GGM-306)

Political Geography

UNIT - I: Introduction

Nature and Scope of Political Geography; recent development in Political Geography; Approaches to study of Political Geography: 1. Whittlesey's Law-Landscape Approach 2. Hartshorne's Functional Approach 3. Jone's Unified Field Theory: Idea-area Chain 4. Political Systems Model 5. Wallerstein's World-Systems Approach.

UNIT - II: Geographic elements and the state

State, Nation, Nation-state and Nation-building; Physical, Human, and Economic Elements; State and Environment Inter-face.

UNIT - III: Themes in political geography

Frontiers and Boundaries; Colonialism, Decolonization, Neo-colonialism, Federalism; Perspectives on core periphery concepts, Aggression, Conflicts and cooperation.

UNIT - IV: Regional Political Issues

Geopolitical significance of Indian ocean; Political geography of any one of the following regions; SAARC region, South East Asia, West Asia, East Asia. Political Geography of contemporary India.

BOOKS RECOMMENDED:

- 1) Alexander, L.M. (1963). World Political Patterns. Ran McNally, Chicago.
- 2) D Blij, H. J. and Glassner, M. (1968) Systematic Political Geography, John Wiley, New York.
- 3) Dikshit R.D. (1996) Political Geography; A Contemporary Perspective, Tata McGraw Hill, New Delhi.
- 4) Taylor, P. (1985) Political Geography, Longman, London. 30
- 5) Fisher, C. A. (1968), Essays in Political Geography, Methuen, London.
- 6) Pounds, N.J.G. (1972), Political Geography Tata McGraw Hill, New York.
- 7) Short, J.R. (1982), An Introduction to Political Geography, Routledge, London.
- 8) Deshpandey, C.D. (1992) India –a Regional Interpretation, Northern Book Centre, New Delhi.
- 9) Panikkar, K.M. (1959) Geographical Factors in Indian History; II Volumes – Asia Publishing House, Bombay.
- 10) Martin Jones, Rhys Jones, Michael Woods (2004) An Introduction to Political Geography: Space, Place and Politics, Routledge
- 11) William B. Wood, George J. Demko (1999) Reordering the World: Geopolitical Perspectives on the Twenty-First Century : Westview Press.
- 12) Husain, Majid (1994); Political Geography; Anmol, New Delhi.
- 13) Adhikari, S (2010); Political Geography; Rawat, New Delhi

M.A. / M.Sc. Geography
Semester - III
Credits: 2 (AECC)
Practical (GGM-307)
Advance Statistical Methods

UNIT - I: ELEMENTS OF PROBABILITY DISTRIBUTIONS AND STATISTICAL INFERENCE

Population and sample; Theory of probability and probability distributions: Binomial, Poisson and Normal; Estimation: Spatial probability distribution; Spatial sampling techniques; Level of confidence; One and two tail tests; Type I and Type II error.

UNIT - II: NON-PARAMETRIC TESTS

Non-parametric data: Chi-square; Kolmogrove-Smirnov; Mann-Whitney U-Test; Phi Coefficient.

UNIT - II: I PARAMETRIC TESTS

Parametric data: Analysis of Means; Analysis of Variance; Point Biserial Co-efficient.

UNIT - IV: MEASURES OF ASSOCIATION: ATTRIBUTE AND SPATIAL

Pearson's product-moment coefficient of correlation; spatial auto correlation; geographically weighted regression; Court's Method of Map comparison.

BOOKS RECOMMENDED:

1. Johnson. R.A. Bhattacharyya. G.K. (2009). Statistics: Principles and Methods, John Wiley and Sons, USA.
2. Micheal C.J. (2005). Statistics: An Introduction. R, John Wiley and Sons, USA.
3. Norcliff, G.B., (1977). Inferential Statistics for Geographers: An Introduction, Hutchinson, London.
4. David. E. (1985). Statistics in Geography, Basil Blackwell Ltd, Oxford.
5. Johnston, R.J. (1978). Multivariate Statistical Analysis in Geography, Longman Group Limited, London.
6. Burt J.E. Barber. G.E. Rigby D.L. (2009). Elementary Statistics for Geographers, Guilford Press, New York.

M.A. / M.Sc. Geography

Semester - III

Credits: 2 (AECC)

Practical (GGM-308)

Digital Cartography

UNIT - I: DIGITAL CARTOGRAPHY

History and development of Digital cartography, Cartographic and GIS software, Digital cartography, web cartography, Computer Aided Design (CAD), Spatial registration; spatial and non spatial data entry.

UNIT - II: DIGITAL MAPPING

Land use mapping (Choropleth mapping), Terrain mapping (isolines); urban land use mapping (Choropleth); Dot mapping.

UNIT - III: DIGITAL MAP ANALYSIS

Overlay analysis; buffer analysis; Network analysis; nearest neighbor analysis, 3D modeling.

UNIT - IV: Map Designing

Map designing and layout creation.

BOOKS RECOMMENDED:

1. Cromley, R.G. 1992 Digital Cartography, Englewood Cliff, New Jersey, Prentice Hall
2. Monmonier, M.; 1982 Computer Assisted Cartography: Principles and Prospects, Englewood Cliffs, New Jersey, Prentice Hall,
3. LO & YEUNG (2009) *Concepts and Techniques of Geographic Information Systems*, 2nd Ed., PHI Learning Pvt. Ltd, New Delhi.
4. Robinson (2003) *Elements of Cartography*, Wiley India Pvt. Ltd., New Delhi.
5. Monkhouse. F.J and Wilkinson.H.R.(1999) *Maps and Diagrams*. Methuen , London
6. Raisz, E. 1962. Principles of Cartography, Mc Graw Hill, New York.

M.A. / M.Sc. Geography

Semester - IV

Credits: 4 (CC)

Paper - X (GGM-401)

Regional Development and Planning

UNIT - I: BASIC CONCEPTS

Region: Concepts and types; Formal and functional; Delineation of region. Development and Planning: Concepts, need and scope; Types of planning.

UNIT - II: FRAME WORK OF DEVELOPMENT AND PLANNING

Regional development: concepts, levels, and indicators; Regional Planning: concepts and scope; Levels of planning: local, regional, national and multi-level; Master Plans; Environmental issues in regional planning; Planning for sustainable development.

UNIT - III: THEORIES AND MODELS

Theories and models of the regional development: Hirschman's model; Growth centers and Growth pole theory of Perroux, Rostow's model; Gunnar Myrdal model.

UNIT - IV: PLANNING AND REGION

Five Year Plans: command area development, planning for backward area, desert drought-prone, hill and tribal area development; Decentralized planning and Panchayati raj; watershed management; Regional economic imbalances and inequalities in India; SEZs in regional development.

BOOKS RECOMMENDED:

1. Mishra. R. P. (1992). Regional planning: concepts, techniques, policies and case studies.
2. Bhat. L. S. (1972) Regional planning in India.
3. Chaudhary. J.R. (2001) Introduction to Development and Regional Planning: With Special Reference to India.
4. Mishra. J. Sinha. C. (1985) Planning and regional development in India.
5. Prasad B.K. (2005) India's development agenda: issues, challenges and policies.
6. Nath V. Aggarwal S.K. (2009) (Edited), Regional Development and Planning in India selected Essays Concept Publishing Company.
7. Compton Paul A. Pecsí Marton. (1976). Regional Development and planning, Akademiai Kiado Publishers.
8. Chand. M. Puri V.K. (1983) Regional planning in India.
9. Aziz. A. Krishna. S. Regional development: problems and policy measures.
10. Mishra. S. Pal. C. (2000) Decentralized planning and Panchayati Raj institutions.
11. Thakur. B. (2005) Urban and regional development in India.
12. Tiwari.P.C. (1988) Regional development and planning in India.

M.A. / M.Sc. Geography

Semester - IV

Credits: 4 (CC)

Paper - XI (GGM-402)

Population Geography

UNIT - I: CONCEPTUAL FRAME WORK

Population Geography and Demography; Approaches to Population Geography; Sources of Census Population data; History and Changing Methodology of Indian census taking.

UNIT - II: POPULATION DYNAMICS

Population change and growth; Historical trends of population growth; Trends and patterns of fertility; Trends and patterns of mortality; Trends and patterns of child mortality; Migration: Types, patterns, causes and consequences.

UNIT - III: POPULATION DISTRIBUTION AND REDISTRIBUTION

Population distribution in the world and India; Patterns and Trends of population Redistribution: Urbanization in the developed and developing world; urbanization in India: Trend and pattern; world population-resource regions: Ackerman's scheme; Prospects of habitation of non- ecumene regions.

UNIT - IV: POPULATION PROBLEMS AND POLICIES

Population: a problem (liability) or resource (asset); Problem of Aging, Health –care and food security; Critical appraisal of population policy of India; Population in the context of environmental crises.

BOOKS RECOMMENDED:

1. Ackerman, E.A. (1967). Population, Natural Resources and Technology. Annals of the Academy of Political and Social Science, 369: 84-97.
2. Ali-Ali Sidiq, N. and Koser. K. (2002). New Approaches to migration. New York: Routledge.
3. Bloom, D.E., D. Canning and J. Sevilla. 2003. The Demographic divided: A new perspective on the consequences of population change. Santa Monica: Environmental law Institute.
4. Cassen, R. (Ed.). (1990). Population and Development: Old debates, New Conclusions. New Brunswick, Transaction Publishers. New Jersey.
5. Jones, H. (1990). Population Geography. Sage: London.
6. Voss, P.R, White K.J.C. and Hammer. R.B (2004). The (re) emergence of spatial Demography. Wisconsin: Centre for Demography and Ecology.
7. Weeks, J. R. (2005) Population: An introduction to concepts and issues. Belmont, C.A: Wadsworth Publications.

M.A. / M.Sc. Geography

Semester - IV

Credits: 4 (CC)

Paper - XII (GGM-403) (A)

Geography of Urban Environment

UNIT - I: URBAN ENVIRONMENT IN CONTEXT

Urban Environment: Concept; Components and Levels of Analysis; City and Region Environmental Interactions: Local, Regional and Global Impacts; Approaches to the Study of Urban environment.

UNIT - II: URBAN ENVIRONMENTAL ISSUES: DEVELOPED AND DEVELOPING WORLD

Urbanization; Physical Expansion of Cities: Urban Encroachment, Urban Land use, Urban Congestion and Crowding; Urban hydrology; Urban Climate and its Impacts on Human Health.

UNIT - III: URBAN ENVIRONMENTAL ISSUES IN METRO CITIES OF INDIA

Urban Poverty, slums and crimes; Urban Pollution (Air, Water, Noise, Land) and its Health Impacts; Water crises and Water Management; Municipal Waste and its Management.

UNIT - IV: SUSTAINABILITY OF URBAN ENVIRONMENT

Concept of Urban Sustainability; Environmental Impact Assessment; Remote Sensing and GIS Applications for Urban Studies; Conventions and Strategies for Urban Environmental Monitoring.

BOOKS RECOMMENDED:

1. Michael.P. (2009). Urban Geography: A Global Perspective, Taylor & Francis, Great Britain.
2. Marcotullio, P. Mc Granahan. G. (2007). Scaling Urban Environmental Challenges: From Local to Global and Back, Earthscan, Great Britain.
3. Hardoy, J. E., Mitlin. D. Satterthwaite. D. (1992). Environmental Problems in Third World Cities, Earthscan, Great Britain.
4. Jensen, J.R. (2007). Remote Sensing of the Environment: An Earth Resource Perspective, Prentice-Hall, NJ, USA.
5. Goudie, A, (2000). The Human Impact on the Natural Environment, MIT Press, Great Britain.
6. Paul. K. Pinch. S. (2006). Urban Social Geography: An Introduction, NJ, USA.
7. Munn, R.E. (1979), Environmental Impact Assessment: Principles and Procedures, John Wiley and Sons, New York.
8. The Urban Environment: Twenty Sixth Report (2007) Royal Commission on Environmental Pollution, Great Britain.

M.A. / M.Sc. Geography
Semester - IV
Credits: 4 (CC)
Paper- XII (GGM - 403) (B)
Geography of Health and Well-Being

Unit - I: Concepts, Approaches and Determinants

Basic Concepts, Scope and significance of Health, Disease and Wellbeing; Approaches to the Study of Health Geography: Ecological, Social and Spatial; Approaches to the Study of Wellbeing: Need-based, Relative Standard and Capability; Geographical Factors affecting Human Health and Wellbeing.

Unit - II: Diseases and their Typology

WHO Classification of Diseases and their Major Types: Genetic; Communicable and Non-communicable; Occupational and Deficiency Diseases; Epidemics and Pandemic.

Unit - III: Global Patterns of Human Health and Wellbeing

Ecology, Etiology, Diffusion and Distribution Pattern of Malaria, Tuberculosis, Hepatitis, AIDS, Glycemia and Cardiovascular Diseases; Poverty; Food Security; Nutrition Deficiency; Health and Sanitation Facilities.

Unit - IV: International and National Concerns

Role of WHO, UNICEF, Red Cross; Indian Health Care Planning: Child and Family Health Welfare, Immunization, Rural Health and Health for All Programmes, National Health Care Infrastructure; Health GIS.

Suggested Readings:

1. Cliff, A. & Haggett, P. (1989). Atlas of Disease Distribution, Basil Blackwell, Oxford.
2. Digby, A, & Stewart, L. (eds.) (1996). Gender, Health and Welfare, Routledge, New York.
3. Fouberg, E.H., Murphy, A.B., H. J. de Blij.(2009). Human Geography: People, Place, and Culture, Wiley and Sons, Eagle Lake.
4. Hardill, I., Graham. D.T., Kofman, E. (2001). Human geography of the UK: an introduction, Routledge, N.Y.
5. Hazara, J. (ed) (1997). Health Care Planning in Developing Countries, University of Calcutta, Kolkata.
6. Knox, P.L. (1975). Social Well-being: A Spatial Perspective, Oxford University

- Press
7. Learmonth, A.T.A. (1978). Patterns of Disease and Hunger, a Study in Medical Geography, Davis and Charls, Victoria.
 8. May, J.M. (1970). The World Atlas of Diseases, National Book Trust, New Delhi.
 9. May, J.M. (1959). Ecology of Human Diseases, M.D. Pub., New York.
 10. Narayan, K.V. (1997). Health and Development: Inter-sectoral linkages in India, Rawat Pub., Jaipur.
 11. Phillips, D.R. (1990). Health and Health Care in the Third World, Longman, London.
 12. Pyle, G. (1979). Applied Medical Geography, Winston Halsted Press, Silver Spring, USA.
 13. Rais, A. and Learmonth, A.T.A., (1986). Geographical Aspects of Health and Diseases in India, Cocept Publishing Company, New Delhi.
 14. Shannon, G.M. et. Al, (1987). The Geography of AIDS, Guiford Press, N Y.
 15. Smith, D. (1997). Human Geography-A Welfarwe Approach, Arnold Heinemann, London.
 16. Smith, D.M. (1973). The geography of social well-being in the United States: An introduction to territorial social indicators, McGraw-Hill.
 17. Izhar, N. (2004). Geography and Health; A study in Medical Geography, Saujanya Books, Delhi.
 18. Peter, A. and Hazen, H. (2011). An Introduction to the Geography of Health, Routledge, New York.
 19. Takehito, T. (ed.) (2003). Health Cities and Urban Policy Research, Routledge, New York.
 20. Wilbert, M.G. & Robin, A.K. (2001). Culture/ Place/ Health, Routledge, New York.
 21. http://en.wikipedia.org/wiki/Health_geography
 22. <http://www.esri.com/industries/health/geomedicine/index.html>

M.A. / M.Sc. Geography
Semester - IV
Credits: 4 (CC)
Paper - XII (GGM-403) (C)
Geography of Rural Development

UNIT - I: CONCEPT, HISTORY AND APPROACHES

Development and Rural Development: elements, objectives, scope and significance; Rural development theories: Linear stage models, Structural change models, Development themes during 1970s-1990s; Approaches to rural development: Community development approach, sectoral approach, target approach, integrated approach, participatory development approach.

UNIT - II: RURAL ECONOMICS AND RURAL DEVELOPMENT

Rural economics: concept and scope; Stages in rural economic development; Modernization theory; Gandhian Model of rural development; Determinants of rural development; Rural Industrialization.

UNIT - III: SPATIAL ANALYSIS OF FACILITIES & SERVICES

Types of community facilities and services - water, sanitation, electricity; Provider of community facilities- governmental, non-governmental and philanthropic organizations; Community facilities and services programmes; Rural transportation; Rural education, health and health care delivery systems.

UNIT - IV: RURAL DEVELOPMENT & PLANNING

Rural planning: District and block level planning; Area specific projects/programmes: Tribal Area Development and Integrated Wasteland Development programme; Agricultural specific Programmes: High Yielding Variety programme, Integrated Rural Development Programmes (IRDP), Panchayati Raj Institutions; Sustainable rural development.

BOOKS RECOMMENDED:

1. Sahu, B.K. (2003). Rural Development in India; Anmol Publishers, Delhi.
2. Maheshwri, S. (1995).
3. Jha, U.M. (1995) Rural Development in India: Problems and Prospects.
4. Mathew, T. (1981). Rural Development in India: Papers Presented at National Conference.
5. Madan, G.R. (2010). Indian Rural Problems, Radha Publications, New Delhi.

6. Garg, A. (1992). Working and Impact of Integrated Rural Development Programme; Deep and Deep Publishers, New Delhi.
7. Das, K.D. 2007. Dynamics of Rural Development; Deep and Deep Publishers, New Delhi.
8. Sinha,S.P. & Singh, S. 2007. Strategies for Sustainable Rural Development; Deep and Deep Publishers, New Delhi.
9. Armendera, 1998. Poverty Rural Development and Public Policy; Deep and Deep Publishers, New Delhi.
10. Sinha,R.N.P., Geography and Rural Development; Manohar Publishers and Distributors, New Delhi.
11. Satendra and Sharma,V.K.2004. Sustainable Rural Development for Disaster Mitigation, Concept, New Delhi.
12. Nath,V.2010. Rural Development and Planning in India, Concept, New Delhi
13. Nikkiran,S. and Ramesh,G. 2010. Research Methods in Rural Development, Deep and Deep Publications, New Delhi.

M.A. / M.Sc. Geography
Semester - IV
Credits: 4 (CC)
Paper - XII (GGM-403) (D)
Land Evaluation

UNIT - I: FUNDAMENTALS OF LAND EVALUATION

Basic concepts, approaches and criteria of land evaluation; Geoinformatics for data storage and analysis: Land Information System (LIS) and Geographic Information System (GIS); Cadastral mapping; Land use and land cover mapping; Physical and economic land evaluation.

UNIT - II: SOURCES OF DATA FOR LAND EVALUATION

Types of land resource data; Data sources: Land survey records, Remote Sensing, Digital Elevation Models and the Global Positioning System; Estimation of uncertainty: Concepts and Methods: Spatial variability and 'fuzzy' logic.

UNIT - III: METHODS OF LAND EVALUATION AND SUITABILITY

Land parcel ownership and land quality; Land evaluation using RS and GIS; Land suitability classification for different uses; Evaluation of land degradation and land capability assessment; Principal modeling approaches: empirical (or, statistical) and dynamic simulation modeling (Cellular automata and Genetic Algorithm).

UNIT - IV: LAND USE PLANNING

Planning: Planning vs. adaptation; Collective vs. individual rights planning; Strategic vs. tactical planning; Rural land use planning on private land and state-owned land; Proscriptive vs. prescriptive planning; Legal and institutional structure of land use planning.

READING LIST OF BOOKS AND JOURNALS:

1. Barlowe, R. 1986. Land resource economics: the economics of real estate. 4th ed. Englewood Cliffs, NJ: Prentice-Hall.
2. Burrough, P.A. and McDonnell, R.A. (1998) Principles of geographical information systems. Oxford University Press, Oxford, 327 pp.
3. Burrough, P.A., MacMillan, R.A. & van Deursen, W. 1992. Fuzzy classification methods for determining land suitability from soil profile observations and topography. J. Soil Sci. 43: 193-210.
4. Chang, K. T. (2008). Introduction to Geographical Information Systems. New York: McGraw Hill.

5. Elangovan, K (2006) "GIS: Fundamentals, Applications and Implementations", New India Publishing Agency, New Delhi" 208 pp.
6. Food and Agriculture Organization of the United Nations. 1976. A framework for land evaluation. Soils Bulletin 32, Rome, Italy: FAO. S590 .F68 no. 32 Mann
7. Food and Agriculture Organization of the United Nations. 1993. Guidelines for land-use planning. FAO Development Series 1, Rome, Italy: FAO. 96 pp. ISBN 92-5-103282-3
8. Goodchild, M.F. & Gopal, S. (ed). 1989. The accuracy of spatial databases. London: Taylor & Francis.
9. Goodchild, Michael F., (2010). Twenty years of progress: Geosciences in 2010. JOURNAL OF SPATIAL INFORMATION SCIENCE, No. 1, pp. 3–20.
10. Heywood, I., Cornelius, S., & Carver, S. (2006). An Introduction to Geographical Information Systems (3rd ed.). Essex, England: Prentice Hall.
11. Jensen, J.R. 1986. Introductory digital image processing. Englewood Cliffs, NJ: Prentice-Hall.
12. Klir, G.J. & Folger, T.A. 1988. Fuzzy sets, uncertainty, and information. Englewood Cliffs, NJ: Prentice-Hall. Law, A.M. & Kelton, W.D. 1991. Simulation modeling and analysis. 2nd ed. New York: McGraw-Hill.
13. Leick, A. 1990. GPS satellite surveying. New York: John Wiley & Sons.
14. Lillesand, T.M. & Kiefer, R.W. 1987. Remote sensing and image interpretation. 2nd ed. New York: John Wiley & Sons.
15. Longley, P.A., Goodchild, M.F., Maguire, D.J. and Rhind, D.W. (2005) Geographic Information Systems and Science. Chichester: Wiley. 2nd edition.
16. Mark, D.M. 1984. *Automated detection of drainage networks from digital elevation models*. Cartographica 21: 168-178.
17. Morgan, M.G. & Henrion, M. 1990. *Uncertainty : a guide to dealing with uncertainty in quantitative risk and policy analysis*. New York: Cambridge University Press.
18. Tomlin, C.D. 1990. *Geographic information systems and cartographic modeling*. Englewood Cliffs, NJ: Prentice-Hall.
19. Webster, R. & Oliver, M.A. 1990. *Statistical methods in soil and land resource survey*. Oxford: Oxford University Press.
20. Young, A. & Goldsmith, P.F. 1977. *Soil survey and land evaluation in developing countries: a case study in Malawi*. Geogr. J. 143: 407-431.

WEB LINKS:

Open Geospatial Consortium, Inc. (<http://www.opengeospatial.org/>)
 Open Source Geospatial Foundation (<http://www.osgeo.org/>)

M.A. / M.Sc. Geography
Semester - IV
Credits: 4 (CC)
Paper - XII (GGM-403) (E)
Gender Geography

UNIT - I: CONCEPTS AND APPROACHES

Feminism and feminist movement, Feminist epistemology, scope, nature and development of gender geography.

UNIT - II: ATTRIBUTES OF FEMALE POPULATION

Quality of life among female in the developed and developing countries; sex-ratio and child and maternal mortality rate, Literacy and education; Status of females in the society in Development and Developing countries with special reference to India.

UNIT - III: FEMALE PARTICIPATION IN ECONOMIC ACTIVITIES

Gender and Work: Historical developments in the sexual division of labour, Crime against women with special reference to domestic violence; Participation in economic activities: Primary, Secondary and Tertiary Sector, Domestic work and its significance.

UNIT - IV: EMPOWERMENT OF WOMEN

Empowerment of women: education, economic opportunities, access to health services; Involvement in decision making processes from local bodies to parliaments: Role of women in development, environmental management and disaster management.

BOOKS RECOMMENDED:

1. Boserup, E. 1989, Women's Role in Economic Development Earthscan, London.
2. Dankelman, I & Davidson, J. 1989, Women and environment in the Third world, Earthsan, London.
3. Deblig, H,J. 1996, Human geography-Culture, society and space (5th edition), John Wiley, New York.
4. Johnston, R.J. et, al(eds), 1996. The health of women, A global perspective, Westview Press, Boulder.
5. Koblinsky, M.et. Al (eds), 1993. The health of women- A global perspective, Westview press, Boulder.
6. Lee, D, 1988. Women in geography – A Comprehensive Bibliography, Boca Raton, Florida.

7. Haraway, D, 1991, *Simians, Cyborgs and women- The Reinvention of nature*, Routledge, New York.
8. Lewis, R, 1995. *Race, Femininity and Representation*. Routledge, New York.
9. Momsen, J.H & Townsend, J (eds),1987. *Geography of gender in the third world*, Albany New York.
10. Montagu, A, 1964, *Man's most dangerous myth-the fallacy of race*, Cleveland.
11. Reagent, A.C & Monk J.J (eds), 1982. *Women and spatial change*, Kendall & Hunt, Dubuque, Iowa.
12. Rhodda, A, 1991. *Women and environment*, Zed, London.
13. Seager, J. &Olson, A, *Women in the world- An international Atlas*.
14. Siviant, R.L, 1985. *Women – A world survey*, World priorities, Washington D.C.
15. Skjelsback, I and Smith, D, 2001. *Gender, peace and conflict*. Sage, London.
16. Sowell, T, 1994. *Race and culture- A world view*, Basic Books, New York.
17. UNICEF, 1990, *The Lesser child – the girl in India*, United Nations, Geneva.
18. United Nations 1991. *The World's Women , 1970-1990*, United Nations, New York.
19. United Nations 1995, *World resources 1994-95*. Chapter 3: *Women and sustainable development*, United Nations, New York.

M.A. / M.Sc. Geography
Semester - IV
Credits: 4 (CC)
Paper - XII (GGM - 403) (F)
Geography of Crimes
UNIT - I: Introduction

Meaning, development and scope of Geography of Crime; Sources of crime data; Types of crime and their spatio-temporal variations; Theories of Crime: Determinism Theory, Theory of Social Disorganization and Cultural Transmission, Environmental Criminology.

UNIT - II: Causes of Crime

Causes of crime; Crime in developed and developing countries with special reference to India; Crime and season; Crime and poverty; Crime and illiteracy; Crime and politics.

UNIT - III: Consequences and Impact of Crime

Impact of Crime on Society; The physical impacts of crime on the natural and built environments; Perception of crime; Influence of media and politicians on people's perception of crime.

UNIT - IV: Management of Crime

International, National and Local initiatives; Role of Government and Non-government Organizations in Crime control; Rehabilitation of criminals; Criminal Laws.

Books Recommended:

- David J. Evans, David T. Herbert (2013) *The Geography Of Crime*, Routledge.
- David J. Evans (1995) *Crime and Policing: Spatial Approaches*, Avebury.
- Tahir, Mary (1996) *Crime in Delhi*, National Book Organisation.
- Boba Rachel, (2005) *Crime Analysis and Crime Mapping*, Sage Publications Inc. ISBN 0-7619-3092-2.
- Canter, David, (2003) *Mapping Murder, The secrets of geographic profiling*, London: Virgin Books GEOG.
- Cameron, J., Leitner, M., and R. Wilson, *Spatial Analysis Tools For Identifying Hot Spots*. In: Eck., J., Chainey, S.P., Cameron, J., Leitner, M., and R. Wilson (eds.) *Mapping Crime: Understanding Hotspots*. Washington DC: National Institute of Justice (2005).
- Chainey S. P. and Thompson, L. (2008) *Crime Mapping Case Studies: Practice and research*. Chichester: John Wiley & Sons Ltd.
- Ronald V. Clarke & John Eck (2003) *Become a Problem-Solving Crime Analyst in 55 small steps*. University College London: Jill Dando Institute of Crime Science.
- Leipnik M. R. and D. P. Albert, (Eds) (2003) *GIS in Law Enforcement: Implementation issues and case studies*, London: Taylor and Francis.
- Leitner, M. (ed.) (2013) *Crime Modeling and Mapping Using Geospatial Technologies*. Heidelberg: Springer, 446 pages.
- Paynich R. and B. Hill (2013) *Fundamentals of Crime mapping*. 2nd ed. Sudbury, MA: Jones and Bartlett Publishers.
- Wang, Fahui (2005) *Geographic Information Systems and Crime Analysis*, Hershey, PA: Idea Group Publishing.

M.A. / M.Sc. Geography
Semester - IV
Credits: 4 (CC)
Practical VIII (GGM-404)
Project

M.A. / M.Sc. Geography
Semester - IV
Credits: 4 (CB)
Theory Paper- IV (GGM-405)
Watershed Management

Unit - I: Introduction and Basic Concepts

Concepts of the watershed and its management; Delineation and Codification of watershed; Watershed management policies.

Unit - II: Morphometric Analysis

Watershed hydrology and surface runoff; Conventional methods: Smith, Wentworth and Robinson; Linear parameters of watershed; Aerial parameters of watershed; Relief parameters of watershed; Land use/ land cover of watershed.

Unit - III: Management of Natural Resources

Watershed prioritization: USLE, RUSLE, MUSLE, Sediment Yield Index, Soil information system; ground water recharge; wetland ecosystem; forest ecosystem.

Unit - IV: Integrated Watershed Management

Integrated watershed management for natural resources; Social aspects: Participation of local community and stakeholders (government and non-government organizations); IWM for livelihood generation; Role of IWM in local and regional planning.

Suggested Books:

1. K. N. Brooks, P. F. Folliott & J. A. Magner: Hydrology and the Management of Watersheds, Fourth Edition. John Wiley & Sons, Inc., Publication.
2. J. V. S. Murty: Watershed Management, Second Edition. New Age International (P) Limited.
3. I.W. Heathcote: Integrated Watershed Management: Principles and Practices, Second Edition. John Wiley & Sons, Inc., Publication.
4. T. O. Randhir: Watershed Management: Issues and Approaches, Latest Edition. IWA Publication
5. R. S. Kurothe, G. Kumar & A. K. Vishwakarma: Watershed Management: An Encyclopedia, Latest Edition. Biotech Books
6. S. Menon & P. A. Pillai: Watershed Management: Concepts and Experiences, Latest Edition. SBS Publishers
7. R. John: Watershed Management, Latest Edition. Alfa Publications
8. L. Rattan: Integrated Watershed Management in The Global Ecosystem, Latest Edition. CRC PRESS
9. R. Patel: Watershed Management Planning Using Remote Sensing and GIS, Latest Edition. LAP Lambert Academic Publishing
10. IWMP: Department of Land Resources, Ministry of Rural Development, Government of India, New Delhi. (http://dolr.nic.in/iwmp_main.htm)