Syllabus
for
B.A. Geography

Mizoram University

Under

NEP

2023

Revised 2024

Re-revised JULY 2025 (Approved by AC:49:3(4))

Semester	Course	Course Code	Category	Credit
I	Physical Geography	GEOG100	Major 1	4
	Human Geography	GEOG101	Major 2/Minor	4
	Minor Course			4
	Geography of Mizoram	GEOG110	MDC	3
	Ability Enhancement Course	ENG150/MIZ150/HIN150	AEC	3
	Universal Human Values	VAC100	VAC	2
	Total Credits			**20**
II	Geography of India	GEOG160	Major 1	4
	Environmental Geography	GEOG161	Major 2/Minor	4
	Minor Course			4
	Geography of Mizoram	GEOG110	MDC	3
	Skill Enhancement Course	SEC160	SEC	3
	Understanding India	VAC120	VAC	2
	Total Credits			**20**
UG CERTIFICATE				
III	Climatology	GEOG200	Major 1	4
	Economic Geography	GEOG201	Major 2/Minor	4
	Minor Course			4
	Geography of Mizoram	GEOG110	MDC	3
	Skill Enhancement Course	SEC270	SEC	3
	Value Added Course	VAC230/VAC231	VAC	2
	Total Credits			**20**
IV	Geomorphology	GEOG260	Major 1	4
	Population and Settlement Geography	GEOG261	Major 2/Minor	4
	Minor Course			4
	Ability Enhancement Course	ENG250/MIZ250/HIN250	AEC	3
	Skill Enhancement Course	SEC280	SEC	3
	Value Added Course	VAC240/VAC241/VAC242	VAC	2
	Total Credits			**20**
UG DIPLOMA				
V	Geographical Thought	GEOG300	Major 1	4
	Cartographic Techniques (P)	GEOG301	Major 2	4
	Agricultural Geography	GEOG302	Major 3/Minor	4
	Minor Course			4
	Ability Enhancement Course	ENG350/MIZ350/HIN350	AEC	2
	Internship/Apprenticeship/Field Project	IAF300		2
	Total Credits			**20**
VI	Fundamentals of RS and GIS	GEOG360	Major 1	4
	Surveying and Research Methodology (P)	GEOG361	Major 2	4
	Remote Sensing, GIS & Project Work (P)	GEOG362	Major 3	4
	Urban Geography	GEOG363	Major 4/Minor	4
	Minor Course			4
	Total Credits			**20**
BACHELOR'S DEGREE				

VII	Digital Remote Sensing	GEOG400	Major 1	4
	Political Geography	GEOG401	Major 2/Minor	4
	Social Geography	GEOG402	Major 3/Minor	4
	Minor Course			4
	Minor Course			4
	Total Credits			**20**
VIII	Regional Development and Planning	GEOG460	Major 1	4
	Resource Geography	GEOG461	Major 2	4
	Geography of Health and Wellbeing	GEOG462		
	Hydrology and Soil Studies	GEOG463		
	Remote Sensing and GIS (P)	GEOG464		
	Research Project/Dissertation	RPD470	RPD	12
	Total Credits			**20**
BACHELOR'S DEGREE (HONOURS WITH RESEARCH)				
VIII	Regional Development and Planning	GEOG460	Major 1	4
	Resource Geography	GEOG461	Major 2	4
	Geography of Health and Wellbeing	GEOG462	Major 3	4
	Hydrology and Soil studies	GEOG463	Major 4	4
	Remote Sensing and GIS (P)	GEOG464	Major 5	4
	Total Credits			**20**
BACHELOR'S DEGREE (HONOURS)				

SEMESTER - I
PHYSICAL GEOGRAPHY
Course No: GEOG100
Credits: 4

UNIT-I

1. Nature and Scope of Physical Geography; Origin of the Solar System-Nebular Hypothesis of Laplace, Inter-Stellar Dust Hypothesis and Big Bang Theory.

UNIT-II

2. Earth Movement: Endogenetic Forces – Epeirogenetic and Orogenic; Plate Tectonic Theory; Continental drift Theory; Seafloor Spreading.

UNIT-III

3. Interior structure of the earth; Earthquakes; Volcanoes; Rocks and minerals: Origin and composition.

UNIT-IV

4. Surface Configuration of the Ocean Floor; Tides; Oceanic Currents – Pacific and Atlantic Oceans; Distribution of Ocean Salinity.

Suggested Readings:

1. Mankhouse, F.J. (1960): *Principles of Physical Geography*; Hodder and Stoughton, London.
2. Strathler, A.N. and Stratler, A.H. (1992): *Modern Physical Geography*, John Wiley & Sons.
3. Thornbury, W.D. (1969): *Principles of Geomorphology*, Wiley.
4. Bryant Richard H. (2001): *Physical Geography*, Rupa & Co., New Delhi, 2001.
5. King, C.A.M. (1980): *Physical Geography*, Blackwell, Oxford.
6. Singh, Savindra (2020): *Physical Geography*, Pravalika Publications, Allahabad
7. Khullar, D.R. (2017): *Physical Geography*, Kalyani Publishers, Reset edition, New Delhi.
8. Hanwell, J. (1980): *Atmospheric Processes*, Allen and Unwin, London.

SEMESTER - I

HUMAN GEOGRAPHY

Course No: GEOG101

Credits:4

UNIT-I

1. Nature and Scope of Human Geography; Fundamental concepts in Human Geography: Space, Place, Landscape, Region.

UNIT-II

2. Culture and Society: Cultural Regions; Global Distribution of Race, Religion and Language.

UNIT-III

3. Human Adaptation to the Environment with Special References to the Eskimos, Bushman, Masai and Gujjars.

UNIT-IV

4. Population: Growth, Density and Distribution of Developed and Less Developed Countries; Population Composition – Age and Sex.

Suggested Readings:

1. Hussain, M. (1994): *Human Geography*, Rawat Publication, Jaipur.
2. Haggett, P. (1975): *Geography: A Modern Synthesis*, Happer & Raw, N.Y.
3. Boek, J.O.M. (1978): *A Geography of Mankind*, McGraw Hill, N.Y.
4. Rubenstein, J.M. (2002): *Cultural Landscape: Introduction to Human Geography*, Prentice Hall, New Delhi.
5. Singh, L.R. (2012): *Fundamentals of Human Geography*, Third Revised Edition, Sharda Pushtak Bhawan, Allahabad
6. Perpillon, A.V. (1986): *Human Geography*, 2nd Edition, Longman, N.Y.
7. Holt-Jensen, A. (1999): *Geography, History and Concepts: A Student's Guide*, Sage Publications.

SEMESTER - I
GEOGRAPHY OF MIZORAM
Course No: GEOG110
Credits: 3

UNIT-I

1. Physical Aspects: Relief, Drainage, Climate, Biodiversity

UNIT – II

2. Human Aspects: Population – Distribution, Growth and Density; Ethnic Diversity; Urbanization

UNIT – III

3. Economic Aspects: Land use pattern; Agricultural Practices, Industries, Transportation

Suggested Reading:

1. Pachuau, Rintluanga (2009) : *Mizoram : A Study in Comprehensive Geography*, Northern Book Centre., New Delhi.
2. Prasad, R.N. and A.K. Agarwal (1991) : *Political and Economic Development of Mizoram*, Mittal Publication, New Delhi.
3. Ray, A.C. (1982): *Mizoram: A Dynamic of Change*, Pearl Publishers, Culcatta.
4. Singh, S.N (1994) : *Mizoram : Historical, Geographical, Social, Economic, Political and Administrative*, Mittal Publications, New Delhi.
5. Kumar, G. (2012): *Dynamics of Development and Planning: Mizoram a Comprehensive Regional Analysis*, Kalpaz Publications, New Delhi.
6. Sati, V.P. (2022): *Mizoram: Land and People*, TTPP, New Delhi

SEMESTER - II

GEOGRAPHY OF INDIA

Course No: GEOG160

Credits: 4

UNIT-I

1. Physical Setting: Physiographic Division, Climate, Drainage and Vegetation

UNIT-II

2. Population: Distribution, Density and Growth; Patterns of Urbanization; Internal Migration

UNIT-III

3. Economic: Mineral and Power Resources - Distribution of Iron Ore, Coal, Petroleum; Agriculture – Production and Distribution of Rice, Wheat and Tea.

UNIT-IV

4. Social: Distribution of Population by - Race, Religion, Language and Tribes.

Suggested Readings:

1. Singh, R.L. (Ed.) (1972): *India – A Regional Geography*, Varanasi.
2. Singh, Jagdish, (2003): *India: A Comprehensive Systematic Geography*, Radha, New Delhi
3. Sharma, R.C. (2004): *Geography of India*, Jawahar Pub. & Distributor, N. Delhi.
4. Singh, L.R. (2012): *Fundamentals of Human Geography*, Third Revised Edition, Sharda Pushtak Bhawan, Allahabad
5. Chandna, R.C. (2015): *Geography of Population: Concepts, Determinants and Patterns*, Kalyani Publishers, New Delhi.
9. Deshpande, C.D. (1990): *India: A Regional Interpretation*, ICSSR, New Delhi

SEMESTER - II

ENVIRONMENTAL GEOGRAPHY

Course No: GEOG161

Credits: 4

UNIT-I

1. Definition and Scope of Environmental Geography; Meaning and Components of Environment; Ecosystem– Concept, Components and Functions

UNIT-II

2. Energy Flow in the Ecosystem; Bio-geochemical Cycles: Hydrological Cycle, Carbon Cycle; Nitrogen Cycle

UNIT - III

3. Environmental Problems and Management – Air, Water, Forest and Biodiversity

UNIT - IV

4. Environmental Policies – Global and National; Bio-diversity Hotspots; National Parks & Wildlife Sanctuaries.

Suggested Readings:

1. Chandna, R. C. (2002): *Environmental Geography*, Kalyani, Ludhiana.
2. Cunninghum W. P. and Cunninghum M. A., (2004): *Principals of Environmental Science: Inquiry and Applications*, Tata Macgraw Hill, New Delhi
3. Goudie A., (2001): *The Nature of the Environment*, Blackwell, Oxford.
4. Singh, R.B. (Eds.) (2009). *Biogeography and Biodiversity*, Rawat Publication, Jaipur
5. Miller G. T., (2004): *Environmental Science: Working with the Earth*, Thomson Brooks Cole, Singapore.
6. MoEF (2006): *National Environmental Policy-2006*, Ministry of Environment andForests, Government of India.
7. Odum, E. P. et al, (2005): *Fundamentals of Ecology*, Ceneage Learning India.
8. Singh S., (1997): *Environmental Geography*, Prayag Pustak Bhawan. Allahabad.

SEMESTER - II

GEOGRAPHY OF MIZORAM

Course No: GEOG110

Credits: 3

UNIT-I

1. Physical Aspects: Relief, Drainage, Climate, Biodiversity

UNIT – II

2. Human Aspects: Population – Distribution, Growth and Density; Ethnic Diversity; Urbanization

UNIT – III

3. Economic Aspects: Land use pattern; Agricultural Practices, Industries, Transportation

Suggested Reading:

7. Pachuau, Rintluanga (2009) : *Mizoram : A Study in Comprehensive Geography*, Northern Book Centre., New Delhi.
8. Prasad, R.N. and A.K. Agarwal (1991) : *Political and Economic Development of Mizoram*, Mittal Publication, New Delhi.
9. Ray, A.C. (1982): *Mizoram: A Dynamic of Change*, Pearl Publishers, Culcatta.
10. Singh, S.N (1994) : *Mizoram : Historical, Geographical, Social, Economic, Political and Administrative*, Mittal Publications, New Delhi.
11. Kumar, G. (2012): *Dynamics of Development and Planning: Mizoram a Comprehensive Regional Analysis*, Kalpaz Publications, New Delhi.
12. Sati, V.P. (2022): *Mizoram: Land and People*, TTPP, New Delhi

SEMESTER - III

CLIMATOLOGY

Course No: GEOG 200

Credits: 4

UNIT-I

1. Meaning And Scope of Climatology; Composition and Structure of Atmosphere; Insolation; Heat Budget of The Earth

UNIT-II

2. Air Masses – Origin, Growth, Classification and Distribution; Global Wind Circulation; Tropical and Temperate Cyclones

UNIT-III

3. Mechanism of Monsoon: Classical and Modern Theories; Jet Stream, El-Nino, La-Nina and their Impact on Indian Climate.

UNIT-IV

4. Climatic Classifications- Koppen, Thornthwaite and Trewartha; Climate Change and Global Warming – Causes and Effects

Suggested Readings:

1. Critchfield, H.J. (1975): *General Climatology*, Prentice Hall, India.
2. Lal, D.S. (2012): *Climatology*, Revised Edition, Sharda Pushtak Bhawan, Allahabad.
3. Bryant Richard H. (2001): *Physical Geography*, Rupa & Co., New Delhi, 2001.
4. King, C.A.M. (1980): *Physical Geography*, Blackwell, Oxford, 1980.
5. Lockwood, J.G. (1978): *The Causes of Climate*, Edward Arnold, London, 1978.
6. Trewartha, G.T. & Horn, L.A. (1980): *An Introduction to Climate*, International Series, New Delhi.
7. Singh, Savindra (2020): *Climatology*, Pravalika Publication, Allahabad.

SEMESTER - III
ECONOMIC GEOGRAPHY

Course No: GEOG201

Credits: 4

UNIT - I

1. Concept and Classification of Economic Activities; Characteristics of Developed and Developing Countries.

UNIT – II

2. Primary Activities: Subsistence and Commercial Agriculture, Forestry, Fishing and Mining.

UNIT - III

3. Secondary Activities: Manufacturing (Cotton Textile, Iron and Steel); Industrial Regions, Special Economic Zones (SEZs) and Technology Parks.

UNIT – IV

4. Factors Affecting the Location of Industry; Weber's Industrial Location Theory; Economic Globalization.

Suggested Readings:

1. Barnes, T.J. & Christophers, B. (2017): *Economic Geography: A Critical Introduction*, Wiley.
2. Thoman, R.S., Conkling E.C. and Yeates, M.H. (1968). *Geography of Economic Activity*, Mc Graw Hill Book Company.
3. Miller, E. (1962): *Geography of Manufacturing*, Printice Hall - Englewood Cliff, New Jersey
4. Alexandersson, G. (1967). *Geography of Manufacturing*, Prentice Hall, New Jersey
5. Truman, A. Harishorn, John W. Alexander (2000): *Economic Geography*, Prentice Hall of India Ltd., New Delhi.

6. Alexander J.W. (1979): *Economic Geography*, Prentice Hall of India Pvt. Ltd., New Delhi.
7. Goh Cheng Leong (1997). *Human and Economic Geography*, Oxford University Press, New York.

SEMESTER - III
GEOGRAPHY OF MIZORAM
Course No: GEOG110
Credits: 3

UNIT-I

1. Physical Aspects: Relief, Drainage, Climate, Biodiversity

UNIT – II

2. Human Aspects: Population – Distribution, Growth and Density; Ethnic Diversity; Urbanization

UNIT – III

3. Economic Aspects: Land use pattern; Agricultural Practices, Industries, Transportation

Suggested Reading:

13. Pachuau, Rintluanga (2009) : *Mizoram : A Study in Comprehensive Geography*, Northern Book Centre., New Delhi.
14. Prasad, R.N. and A.K. Agarwal (1991) : *Political and Economic Development of Mizoram*, Mittal Publication, New Delhi.
15. Ray, A.C. (1982): *Mizoram: A Dynamic of Change*, Pearl Publishers, Culcatta.
16. Singh, S.N (1994) : *Mizoram : Historical, Geographical, Social, Economic, Political and Administrative*, Mittal Publications, New Delhi.
17. Kumar, G. (2012): *Dynamics of Development and Planning: Mizoram a Comprehensive Regional Analysis*, Kalpaz Publications, New Delhi.
18. Sati, V.P. (2022): *Mizoram: Land and People*, TTPP, New Delhi

SEMESTER – IV

GEOMORPHOLOGY

Course No: GEOG 260

Credits: 4

UNIT-I

1. Nature And Scope of Geomorphology; Fundamental Concepts – Uniformitarianism, Process, Climate (Based on Thornbury); Modern Trends in Geomorphology.

UNIT-II

2. Geomorphic Process: Weathering, Mass Wasting; Cycle of Erosion – Davis and Penck.

UNIT-III

3. Geomorphic Landforms: Fluvial, Glacial, Aeolian; Karst Topography.

UNIT-IV

4. Characteristics and Evolution of Hillside Slope: Down-Wasting Model of Davis, Parallel Retreat Model of Wood and King, Slope Replacement Model of Penck.

Suggested Readings:

1. Huggett, R. (2011). *Fundamentals of Geomorphology*, Routledge
2. Dayal, P. (1996): *A Textbook of Geomorphology*, Shukla Book Depot, Patna.
3. Dury, G.H.(1980): *The Face of the Earth*, Penguin.
4. Earnst, W.G. (2000): *Earth Systems-Process and Issues*, Cambridge Univ. Press.
5. Kale V. & Gupta, A. (2001): *Elements of Geomorphology*, OUP, Kolkata.
6. Singh, S. (1998): *Geomorphology*, Prayag Pustakalaya, Allahabad.
7. Sparks, B.W. (1960): *Geomorphology*, Longmans.
8. Thornbury, W.D. (2002): *Principles of Geomorphology*, Second Edition, First Indian Reprint, CBS Publishers, New Delhi
9. Burchfield, B.Clark, Foster Robert, J.et al. (1980): *Physical Geology*, Charles E. Merril, Columbus.
10. Bloom, Arthur L. (1998): *Geomorphology*, Pearson Edn. (Singapore) Pvt. Ltd.
11. Bryant, Richard H. (2001): *Physical Geography*, Rupa & Co., New Delhi.

SEMESTER – IV

POPULATION AND SETTLEMENT GEOGRAPHY

Course No: GEOG261
Credits: 4

UNIT – I

1. Nature and Scope of Population Geography; Growth, Distribution and Density of World Population.

UNIT – II

2. Migration: Types and Determinants; Population Composition: Age and Sex Composition and its Determinants; Workforce and Occupational Composition.

UNIT – III

3. Theories of Population - Malthusian Theory and Marxian Theory; Demographic Transition Theory; Concept of Over-, Under- and Optimum Population.

UNIT – IV

4. Settlement: Types, Patterns and Morphology of Rural Settlement; Census Classification of Indian Towns-Notified Towns and Census Town; Rural-Urban Fringe; Satellite Towns.

Suggested Readings:

1. Chandna, R.C. (2000): *Geography of Population: Concepts, Determinants and Patterns*, Kalayani Publishers, New Delhi.
2. Clark, J.I. (1965): *Population Geography*, Pergamon Press, New York.
3. Sundram, K.V. & Nangia Sudesh, (editors) (1986): *Population Geography*, Heritage Publishers, Delhi.
4. Peters, G.L. and Larkim, R.P. (1979): *Population Geography: Problems, Concepts and Prospects*, Kendele-Hunt Iowa.
5. GOI (2011): Census of India 2011 Series-I India Provisional Population Totals, Published by Registrar General & Census Commissioner, India.
6. GOI(1991): Census of India, 1991 India: A State Profile, Published by office of the Registrar General of India, Census Operations, New Delhi.

SEMESTER – V

GEOGRAPHICAL THOUGHT

Course No: GEOG300

Credits: 4

UNIT-I

1. Geographical Thought of Greek, Roman and Arab Geographers.

UNIT-II

2. Methodological Foundations: Contributions of Kant, Varenius, Humboldt, Ritter.

UNIT-III

3. Environmental determinism, Possibilism and Neo-Determinism; Areal Differentiation.

UNIT-IV

4. Quantitative Revolution in Geography; Behavioral Geography; Humanistic Geography; Radical Geography.

Suggested Readings :

1. Hartshorne, R. (2000): Nature of Geography, A.A.G. Lancaster, Penn.(Indian Reprint)
2. Holt-Jensen, A. (1999) *Geography, History and Concepts: A Student's Guide*, Sage Publications
3. Dickinson, R.E. (1969): *The makers of Modern Geography*, Edward Arnold, London.
4. James, P.R. (1980 Ind. Ed.): *All possible World*, Sachin Pub., New Delhi.
5. Dixit, R.D. (1997): *Geographical Thought*, Prentice Hall, New Delhi.
6. Hagget, P. (1975): *Geography of Modern Synthesis*, Harper & Raw, New York.
7. Hussain, M. (2000): *Evolution of Geographical Thought*, Rawat, Jaipur.
8. Adhikari, S. (1998): *Fundamentals of Geographical Thought*, Chaitanya Pub., Allahabad.
9. Rana, Lalita (2008): *Geographical Thought: A Systematic Record of Evolution*, Concept Publishing Company, New Delhi.

SEMESTER – V

CARTOGRAPHIC TECHNIQUES
(PRACTICAL)

Course No: GEOG301
Credits: 4

UNIT-I

1. Meaning and Importance of Cartography; Types of Scales; Graphical Construction of Plain and Diagonal Scales.

UNIT-II

2. Contours and Profiles- Hills; Cliff; V-Shape Valley; River Meander.

UNIT-III

3. Maps-Classification and Types; Map Projections- Graphical Construction of Polar Zenithal Stereographic, Bonne's and Mercator's Projections

UNIT-IV

4. Cartograms- Dot Method, Shade Method; Interpretation of topographical maps in relation to Relief, Drainage, Transportation and Settlements; Slope Analysis – Wentworth's Method.

Suggested Readings:

1. Monkhouse, F.J. (1967): *Maps and Diagrams*, Methuen, London.
2. Singh, R.L. (1970): *Elements of Practical Geography*, Banaras.
3. Kanitkar, T.P. (1974): *Surveying and Levelling*, Poona Vidyarthi Griha Prakashan, Pune.
4. Misra, R.P. and Ramesh, A. (1986): *Fundamentals of Cartography*, McMillan Co., New Delhi.
5. Robinson, A.H. et al. (1995): *Elements of Cartography*, John Wiley and Sons, USA.
6. Sarkar, A. (1997): Practical Geography: A Systematic Approach, Orient Longman, Kolkata.
7. Singh, R.L. and Singh, Rana .P.B (1991): *Elements of Practical Geography*, Kalyani Publishers, New Delhi
8. Singh, L.R. (2006): *Fundamentals of Practical Geography*, Sharda Pustak Bhawan, Allahabad.

SEMESTER - V

AGRICULTURAL GEOGRAPHY

Course No: GEOG302

Credits: 4

UNIT-I

1. Nature and Scope of Agricultural Geography; Approaches to the Study of Agricultural Geography: Environment, Economic, Ecological and Systematic Approaches; Origin and Dispersal of Agriculture.

UNIT-II

2. Determinants of Agriculture- Physical, Socio-Economic, Technological and Institutional; Whittlesey's Agricultural Systems of the World; Von Thunen Agricultural Land Use Model.

UNIT-III

3. Concepts of Agricultural Productivity and Efficiency; Agricultural Regionalisation: Agro-Climatic Regions of India, Major Agricultural Regions of India– Characteristics and Cropping Pattern.

UNIT-IV

4. Agricultural Development in India: Green Revolution; Issues and Problems of Agricultural Development in N.E. Region – Shifting Cultivation and Plantation Agriculture; Agriculture in Mizoram – Problems and Prospects.

Suggested Readings:

8. Critchfield, H.J. (1975): *General Climatology*, Prentice Hall, India.
9. Lal, D.S. (2012): *Climatology*, Revised Edition, Sharda Pushtak Bhawan, Allahabad.
10. Bryant Richard H. (2001): *Physical Geography*, Rupa & Co., New Delhi, 2001.
11. King, C.A.M. (1980): *Physical Geography*, Blackwell, Oxford, 1980.
12. Lockwood, J.G. (1978): *The Causes of Climate*, Edward Arnold, London, 1978.
13. Trewartha, G.T. & Horn, L.A. (1980): *An Introduction to Climate*, International Series, New Delhi.
14. Singh, Savindra (2020): *Climatology*, Pravalika Publication, Allahabad.

SEMESTER – VI
FUNDAMENTALS OF REMOTE SENSING & GIS
Course No: GEOG360
Credits: 4

UNIT-I

1. Remote Sensing: Definition and Components, Development; Remote Sensing Platforms; Sensors; Satellite Orbits

UNIT-II

2. Process of Remote Sensing: Electromagnetic Radiation and Electromagnetic Spectrum; EMR Interaction with Atmosphere and Earth Surface; Sensor Resolutions (Radiometric, Spectral, Spatial and Temporal)

UNIT-III

3. Geographical Information System: Definition, Concepts and Components; Types of data: Spatial and Non-spatial; Data Models: Raster and Vector; Geo-referencing.

UNIT-IV

4. Interpretation and Application of Remote Sensing and GIS: Basic Elements of Visual Image Interpretation; Land Use / Land Cover; Urban Sprawl Analysis; Forest Monitoring.

Suggested Reading:

1. Pratip Kumar Guha (2013): *Remote Sensing for the Beginner*, East-West Press.
2. Burrough, P.A. (1986): *Principles of Geographic Information Systems*, OUP, Oxford.
3. Campbell, J.B. (2002): *Introduction to Remote Sensing*, Guilford Press, New York
4. Chang, Kang-tsung, (2002): *Introduction to Geographic Information Systems*, Tata- McGraw-Hill, New Delhi.
5. Curran, P.J. (1985): *Principles of Remote Sensing*, Longman, London.
6. Deekshatulu, B.L. & Rajan, Y.S. (1984): *Remote Sensing*, Indian Academy of Science, Bangalore.
7. DeMers, M.N. (2000): *Fundamentals of Geographic Information Systems*, John Wiley, New York.
8. Joseph, Geogre and Jeganathan, C. (2003): *Fundamentals of Remote Sensing*, Third Edition, Universities Press, Hyderabad
9. Bhatta, Basudeb (2008): *Remote Sensing and GIS*, Second Edition, Oxford Universitiy Press
10. Reddy, M. Anji (2002): *Textbook of Remote Sensing and Geographical Information Systems*, Fourth Edition, BS Publications, Hyderabad.
11. Lillesand, Thomas M., Kiefer, Ralph W. and Chipman, Jonathan W. (2004) *Remote Sensing and Image Interpretation*, Fifth Edition, Wiley

SEMESTER - VI

SURVEYING AND RESEARCH METHODOLOGY

(PRACTICAL)

Course No: GEOG361

Credits: 4

UNIT-I

A. Surveying (20 + 5 = 25 marks)

1. Plane Table (Intersection and Radial Methods, Plotting and Interpretation of the Surveyed Map)
2. Dumpy Level
3. Prismatic Compass Survey-Open and Closed Traverse.

UNIT-II

B. Research Methodology (15 marks)

1. Research: Meaning, Objectives, Types
2. Research process: Problem Identification; Literature Review; Objectives, Data Collection
3. Report Writing: Abstract; Synopsis; Citation Style, Reference and Bibliography; Plagiarism.

UNIT - III

C. Data Collection (10 marks)

1. Data: Nature, Types, Sources
2. Methods of Data collection: Sampling – Types and techniques; Questionnaire Design
3. Data Tabulation: Data Cleaning: Outliers, Normality (Skewness & Kurtosis).

UNIT - IV

D. Data Analysis (20 + 5 = 25 marks)

1. Measures of Central Tendency: Mean, Median, Mode
2. Measures of Dispersion: Range, Variance, Standard deviation, Coefficient of variation.
3. Measures of Association: Correlation (Pearson's & Spearman's); Simple (Linear) Regression.

Suggested Readings:

1. Misra, R.P.& Ramesh, A. (1989): *Fundamental of Geography*, Concept, New Delhi.
2. Monkhouse, F.J. (1967): *Maps & Diagrams*, Methuen, London.
3. Raize, I. (1982): *Principles of Cartography*, McGraw Hill,N.Y.
4. Mahmood Aslam, (1973): *Statistical Methods in Geography*, Concept, New Delhi.
5. Alvi, Zamir(1995): *Statistical Geography*, Rawat Pub. New Delhi
6. Singh, R.L. and Singh, Rana .P.B (1991): *Elements of Practical Geography*, Kalyani Publishers, New Delhi
7. Singh, L.R. (2006): *Fundamentals of Practical Geography*, Sharda Pustak Bhawan, Allahabad.
8. Khan, Md. Zufelguar Ahmad (1998): *Text Book of Practical Geography*, Concept, New Delhi

SEMESTER – VI
REMOTE SENSING, GIS AND PROJECT WORK (PRACTICAL)
Course No: GEOG362
Credits: 4

UNIT-I

Section-A (40 marks including practical record book (5 marks) and Viva-Voce (5 marks)

1. Two (2) exercises will be done from satellite imageries (thematic mapping and interpretation of Land Use/Land Cover and Geomorphic).

2. Three (3) exercises in GIS:

i. Toposheet Geo-referencing and Identification of point, linear and aerial features.
ii. Choropleth Mapping Techniques and
iii. Map Layouting should be done by using GIS software.

UNIT-II

Section B- Project Work (35 marks)

The candidates are expected to study Socio-economic condition or Environmental condition of any village/Town/City/Region for a period not exceeding one week and prepare a report (to be typed at A4 size, containing about 40 pages) on a theme assigned to them. The concerned department (College) must assign supervisor and the topic be decided at the end of the fifth semester to enable the student to put in the required time to complete the project report. The project report is expected to reflect some original interpretation of the theme based on field observations and collected secondary data. (For end Semester examination, the project work will carry thirty (35) marks including twenty five (25) marks for project report and ten (10) marks for viva voce.)

* Colleges are expected to procure materials, instruments and software required to perform the practical works in GIS & RS.

Suggested Readings:

1. Monkhouse, F.J. (1967): *Maps & Diagrams*, Methuen, London.
2. Bhatta , B., (2008): Remote Sensing and GIS, Oxford University Press, New Delhi.
3. Campbell, J. B., (2007): *Introduction to Remote Sensing*, Guildford Press
4. Hord R.M.,(1989): *Digital Image Processing of Remotely Sensed Data*, Academic, New York.
5. Lillesand, T. M., Kiefer R. W. and Chipman, J. W., (2004): *Remote Sensing and Image Interpretatio*n, Wiley.
6. Richards, J. A. and JiaXiuping., (2005): *Remote Sensing Digital Image Analysis: An Introduction*, 4th Edition, Springer, Verlag, Berlin.
7. Chang, Kang-tsung, (2002): *Introduction to Geographic Information Systems*, Tata- McGraw-Hill, New Delhi.
8. Mahmood Aslam, (1973): *Statistical Methods in Geography*, Concept, New Delhi.

SEMESTER – VI

URBAN GEOGRAPHY

Course No: GEOG363

Credits: 4

UNIT-I

1. Meaning, Nature and Scope of Urban Geography; Approaches to the Study of Urban Geography; Concepts and Characteristics of Urbanization.

UNIT-II

2. Primate City Concept and Rank Size Rule; Concept of City Region and its Delimitation; Functional Classification of Urban Settlements

UNIT-III

3. Models of Urban Land Use- Concentric Zone Theory; Sector Theory, and Multiple Nuclei Theory; Central Place Theory

UNIT-IV

4. Urban Problems: Urban Poverty, Housing, Transportation and Environment.

Suggested Readings:

1. Carter, H. (1972): *The Study of Urban Geography*, Edward Arnold, London.
2. Hall T. (2006): *Urban Geography*, Taylor and Francis
3. Pacione, M. (2001): *Urban Geography: A Global Perspective*, Routledge, London.
4. Knox P. L. and Pinch S. (2006): *Urban Social Geography: An Introduction*, Prentice-Hall
5. Ramachandran R (1989): *Urbanisation and Urban Systems of India*, Oxford University Press, New Delhi
6. Ramachandran, R. (1992): *The Study of Urbanisation*, Oxford University Press, Delhi

SEMESTER – VII
DIGITAL REMOTE SENSING

Course No: GEOG400
Credits: 4

UNIT-I

1. Process and type of Remote Sensing: Multispectral Imaging Sensor System; Thermal Remote Sensing System; Microwave Remote Sensing System; Hyper-Spectral Remote Sensing.

UNIT-II

2. Image Processing: Pre-processing (Radiometric and Geometric Correction); Enhancement (Filtering); Image Classification (Supervised and Un-supervised).

UNIT-III

3. Data Analysis: Buffering; Overlay- Raster and Vector; Spatial Interpolation-Inverse Distance Weighted (IDW); Editing; Output.

UNIT-IV

4. Coordinate Systems: Cartesian Coordinate System, Geographic Coordinate System, Projected Coordinate System; Datum; Universal Transverse Mercator (UTM).

References:

1. Bhatta , B., (2008): *Remote Sensing and GIS*, Oxford University Press, New Delhi.
2. Campbell, J. B., (2007): *Introduction to Remote Sensing*, Guildford Press
3. Hord R.M.,(1989): *Digital Image Processing of Remotely Sensed Data*, Academic, New York.
4. Jensen, J. R., (2005): *Introductory Digital Image Processing: A Remote Sensing Perspective*, Pearson Prentice-Hall.
5. Jensen, J. R.,(2007): *Remote Sensing of the Environment: An Earth Resource Perspective*, Prentice-Hall Inc, New Jersey.
6. Joseph, G.,(2005): *Fundamentals of Remote Sensing*, United Press India.
7. Li, Z., Chen, J. and Batsavias, E., (2008): A*dvances in Photogrammetry, Remote Sensing and Spatial Information Science*s, CRC Press, Taylor and Francis, London
8. Lillesand, T. M., Kiefer R. W. and Chipman, J. W., (2004): R*emote Sensing and Image Interpretatio*n, Wiley. (Wiley Student Edition).
9. Nag, P. and Kudra, M., (1998): *Digital Remote Sensing*, Concept, New Delhi.
10. Richards, J. A. and JiaXiuping., (2005): *Remote Sensing Digital Image Analysis: An Introduction*, 4th Edition, Springer, Verlag, Berlin.

SEMESTER – VII
POLITICAL GEOGRAPHY

Course No: GEOG401

Credits: 4

UNIT – I

1. Nature and Scope of Political Geography; Concept of Nation-State, Boundary and Frontier; Elements of State.

UNIT – II

2. Theories of Political Geography: Organic State, Wallerstein's World System Theory, Heartland and Rimland.

UNIT – III

3. Electoral Geography – Geography of Voting, Geographic Influences on Voting Pattern, Geography of Representation; Gerrymandering

UNIT – IV

4. Geopolitics and the Second World War; Contributions of Karl Hausofer and Rudolf Kjellan; Geopolitics of Middle East; Geopolitics of South-East Asia.

Suggested Readings:

1. Agnew J. (2002): *Making Political Geography*, Arnold.
2. Agnew J., Mitchell K. and Toal G., (2003): *A Companion to Political Geography*, Blackwell.
3. Cox K. R., Low M. and Robinson J. (2008): *The Sage Handbook of Political Geography*, Sage Publications.
4. Cox K. (2002): *Political Geography: Territory, State and Society*, Wiley-Blackwell
5. Gallaher C., et al. (2009): *Key Concepts in Political Geography*, Sage Publications.
6. Glassner M. (1993): *Political Geography*, Wiley.
7. Jones M. (2004): *An Introduction to Political Geography: Space, Place and Politics*, Routledge .
8. Mathur H M and M. M. Cernea (eds.) *Development, Displacement and Resettlement – Focus on Asian Experienc*e, Vikas, Delhi
9. Painter J. and Jeffrey A. (2009): *Political Geography*, Sage Publications.
10. Taylor P. and Flint C. (2000): *Political Geography*, Pearson Education.
11. Verma M K (2004): *Development, Displacement and Resettlement*, Rawat Publications, Delhi
12. Hodder Dick, Sarah J Llyod and Keith S McLachlan (1998), *Land Locked States of Africa and Asia* (Vol.2), Frank Cass.

SEMESTER – VII
SOCIAL GEOGRAPHY

Course No: GEOG402

Credits: 4

UNIT – I

1. Meaning, Scope of Social Geography; Society and Environment, Social Structure, Social Diversity and Plurality

UNIT – II

2. Concepts of Social Justice, Equality and Welfare; Social Indicators Movement and Territorial/Spatial Justice; Social Well-being and Quality of Life – Indicators, and measurement.

UNIT – III

3. Urban Social Space – Segregation, Gentrification and Residential Differentiation; Gender and Space - Gender disparities in Well Being; Cultural Globalization.

UNIT – IV

4. Social Categories: Caste, Class, Religion, Race and their Spatial Distribution (Indian Context); Level of Social Well-being in India.

Suggested Readings:

1. Ahmad Aijazuddin, (2006): *Social Geography*, Rawat Publications, Jaipur, India.
2. Harvey, David: S.,J, (1986) : *Exploring Social Geography*, George Allen and Unwin.
3. Jones, Emrys (ed.) (1975) :*Readings in Social Geography*, Oxford.
4. Mitchell, D, (2000) :*Cultural Geography : A Critical Introduction*, Blackwell Publishers.
5. Robertson, I and Richards, P.(eds.) (2003) : *Studying Cultural Landscapes*, Arnold, London.
6. Spencer J.E. and William L.T. Jr, (1969) :*Cultural Geography*, John Wily and Sons Inc. University of Hayward, USA.
7. Wagner, P.L. and M.W Mikesell, (eds.) (1962) :*Reading in Cultural Geography*, Chicago.

SEMESTER – VIII
REGIONAL DEVELOPMENT AND PLANNING
Course No: GEOG460
Credits: 4

UNIT – I

1. Concept of Regions, Regional Development and Planning; Concepts of Growth and Development; Types of Regions.

UNIT – II

2. Theories and Models for Regional Development: Cumulative Causation (Myrdal), Growth Pole Model (Perroux), Stages of Development (Rostow), Central Place Theory (Christaller).

UNIT – III

3. Concept and Causes of Underdevelopment; Human Development: Concept and Measurement (HDI and Human Poverty Index).

UNIT – IV

4. Regional Disparities in India and Regionalism; Parameters of Regional Development; Planning Regions of India.

Suggested Readings:

1. Chand, M., and Puri, V. K. (1983): *Regional Planning in India*, New Delhi: Allied Publishers

2. Chatopadhyay, B. & MoonisRaza (1975) Regional Development: Analytical Framework and indicators, *Indian Journal of Regional Sciences*, Vol. VII, No. 1, pp. 11-34.

3. Clark, Gordon L., Maryann P. Feldman, and Meric S. Gertler (eds.) (2000): *The Oxford Handbook of Economic Geography*, Oxford

4. Dawkins, C. J., (2003): Regional Development Theory: Conceptual Foundations, ClassicWorks and Recent development, *Journal of Planning Literature*, Vol. 18, No. 2, pp. 131-71.

5. Jayasri Ray Chaudhuri (2001): *An Introduction to development and regional planning: with special reference to India*, Orient Longman, Hyderabad

6. John Glasson (1974): *An introduction to regional planning: concept, theory and practice*, Hutchinson, London.

7. Patrick Abercrombie and Sydney A. Kelly (1971): *Growth poles and growth centres in urban and regional planning in India & Training programme for regional development in developing countries:an experiment in India*, Institute of development, Mysore.

SEMESTER – VIII
RESOURCE GEOGRAPHY

Course No: GEOG461

Credits: 4

UNIT – I

1. Nature and Scope Resource Geography; Classification of Resources: Bases and Types; Approaches to Resource Utilization: Utilitarian, Conservational, Community-Based Adaptive.

UNIT – II

2. Distribution and Production Pattern of Natural Resources: Land, Water and Forest and Basic Minerals: Iron, Coal, Petroleum, Uranium and Thorium.

UNIT – III

3. Significance of Resources: Backbone of Economic Growth and Development; Globalization and Pattern of International Trade in Mineral Resources (Oil and Natural Gas); Problems of Resource Depletion—Forest, Water, Fossil Fuels.

UNIT – IV

4. The Limit to Growth: Resource Scarcity Hypothesis; Contemporary Energy Crisis and Future Scenario; Concept of Sustainable Development; Concept of Resource Sharing.

Suggested Readings:

1. Adams, W.M., (1990): *Green Development: Environment and Sustainability in the Third World*, Routledge, London.
2. Burton, I. And Rates, R.W.: *Reading in Resource Management and Conservation.*
3. Group of Experts, (1980): *Global 2000 Reports to the President*, New York, 1980.
4. Meadows, D.H. (et al.) (1974): *The Limits to Growth*, New York
5. Meadows, D.H., Meadows, D.L. and Randers, J. (1992) :*Beyond the Limits*, Earthscan Publications, London.
6. Mitchell, Bruce (1979) :*Geography and Resource Analysis*, Longman, London.
7. Mitra, A. (1999) :*Resource Studies*; ShridharPubls., Calcutta.
8. Patking, A.E. and Whitaker, U.R.: Our *Natural Resources and Their Conservation.*
9. Reid, S., (2000): *Sustainable Development*, Earthscan, London.
10. Renner, G.T., et al., (1965) :*World Economic Geography* : An Introduction to Economics.
11. Sati, V.P. (ed.) (2008): N*atural Resource and Sustainable Development in the PinderValley, Himalayas*, Bishen Singh Mahendra Pal Singh, Dehradun
12. Simon, J.L.(1984) : The *Resourceful Earth : A Response to Global 2000,* New York.
13. W.C.E.D. (1987) :*Our Common Future*, Oxford, New Delhi.
14. Zimmermann, E.W., (1964): *Introduction to World Resources*, Harper, New York.

SEMESTER – VIII
GEOGRAPHY OF HEALTH AND WELL-BEING

Course No: GEOG462

Credits: 4

UNIT – I

1. Geographical Perspectives on Health and Well-Being: Definition; Linkages with Environment, Development and Health; Driving Forces in Health and Environmental Trends - Population Dynamics, Urbanization, Poverty and Inequality.

UNIT – II

2. Pressure on Environmental Quality and Health: Human Activities and Environmental Pressure, Land Use and Agricultural Development; Industralisation; Transport and Energy.

UNIT – III

3. Exposure and Health Risks: Air Pollution; Household Wastes; Water; Housing; Workplace.

UNIT – IV

4. Health and Disease Pattern in Environmental Context with Special Reference to India, Types of Diseases and their Regional Pattern; Climate Change and Human Health.

Reading List:

1. Akhtar, R. (Ed.) (1990): *Environment and Health Themes in Medical Geography*, Ashish Publishing House, New Delhi.
2. Akhtar, R. and Learmonth, A. (eds.) (2018): *Geographical Aspects of Health and Diseases in India*, Concept Publishing Company
3. Gatrell, A. (2002): *Geographies of Health: An Introduction*, Oxford: Blackwells.
4. Cliff, A.D. and Peter,H. (1988): *Atlas of Disease Distributions*, Blackwell Publishers.
5. Clemow, F.A. (2011): *The Geography of Disease*, Cambridge Geographical Series.
6. Meade, M.S. and Emch, M. (2010): *Medical Geography*, 3rd edition, Guilford Publications
7. Phillips, D.and Verhasselt, Y., (1994): *Health and Development*, Routledge, London.

SEMESTER – VIII
HYDROLOGY AND SOIL STUDIES

Course No: GEOG463

Credits: 4

UNIT – I

1. Hydrological Cycle; Human Impact on the Hydrological Cycle; Precipitation, Interception, Evaporation, Evapotranspiration, Infiltration, Groundwater, Run-off and Overland Flow.

UNIT – II

2. Water Balance: Input and Output; Floods and Droughts; Rain Water Harvesting; Integrated Water Resource Management.

UNIT – III

3. River Basin: Characteristics and Problems of River Basins, Basin Surface Run-Off, Measurement of River Discharge; Watershed Management; River Water Dispute; River Linkages.

UNIT – IV

4. Soil Resource: Definition, Types and Distribution, Utilisation, Problems and Management of Soil.

References:

1. Davie, T. (2003): *Fundamentals of Hydrology*, Routledge
2. Ward, A.D and Stanley, Trimble (2004): *Environmental Hydrology*, 2nd edition, Lewis Publishers, CRC Press.
3. Fetter, C.W. (2005): *Applied Hydrogeology*, CBS Publishers & Distributors, New Delhi.
4. Reddy, K. et al. (2014):*Hydrology and Watershed Management*, Allied Publishers.
5. Karanth, K.R., (1988): *Ground Water: Exploration, Assessment and Development*, Tata- McGraw Hill, New Delhi.
6. Lyon, J.G., (2003): *GIS for Water Resource and Watershed Management*, Taylor and Francis, New York.
7. Meinzer,.O.E., (1962):*Hydrology*, Dover Publication, New York.

SEMESTER – VIII

REMOTE SENSING & GIS (PRACTICAL)

Course No: GEOG464

Credits: 4

UNIT-I

1. Global Positioning System (GPS): Basic Concepts; Principles and Applications; Segments of GPS; Errors in GPS; GPS Operations and Methods; GPS Survey and Integrated with GIS Software; Mapping with GIS Software.

UNIT-II

2. Thematic Mapping and Lay outing: Isopleth (Including Scale, Direction, Lat-Long Value, Legend, etc., to be generated with GIS Software).

UNIT-III

3. Raster Data Analysis: Supervised Image Classification; DEM Analysis: Contour, Absolute Relief.

UNIT-IV

4. Sources Of Data: Bhuvan-NRSC; USGS Earth Explorer; Copernicus; Bhukosh-Geological Survey of India; Google Earth; Survey of India-Nakshe Portal (Access and download data from different sources)

References:

1. Bhatta , B., (2008): *Remote Sensing and GIS*, Oxford University Press, New Delhi.
2. Campbell, J. B., (2007): *Introduction to Remote Sensing*, Guildford Press
3. Hord R.M.,(1989): *Digital Image Processing of Remotely Sensed Data*, Academic, New York.
4. Jensen, J. R., (2005): *Introductory Digital Image Processing: A Remote Sensing Perspective*, Pearson Prentice-Hall.
5. Jensen, J. R.,(2007): *Remote Sensing of the Environment: An Earth Resource Perspective*, Prentice-Hall Inc, New Jersey.
6. Joseph, G.,(2005): *Fundamentals of Remote Sensing*, United Press India.
7. Li, Z., Chen, J. and Batsavias, E., (2008): A*dvances in Photogrammetry, Remote Sensing and Spatial Information Science*s, CRC Press, Taylor and Francis, London
8. Lillesand, T. M., Kiefer R. W. and Chipman, J. W., (2004): R*emote Sensing and Image Interpretatio*n, Wiley. (Wiley Student Edition).
9. Nag, P. and Kudra, M., (1998): *Digital Remote Sensing*, Concept, New Delhi.
10. Richards, J. A. and JiaXiuping., (2005): *Remote Sensing Digital Image Analysis: An Introduction*, 4th Edition, Springer, Verlag, Berlin.