

BANGALORE  **UNIVERSITY**

DEPARTMENT OF GEOGRAPHY
JNANABHARATHI, BENGALURU-56

Syllabus & Regulations
Choice Based Credit System (CBCS)
for the Two Years (Four Semesters)
Master of Science (M.Sc.) Geography
Programme
in the Faculty of Science

Effective from 2016-17 onwards

Dr. AshokHanjagi

Chairman, BOS

Syllabus & Regulations Governing the Choice Based Credit System (CBCS) for the Two Years (Four Semesters) Master of Science (M.Sc.) Geography Programme in the Faculty of Science

Eligibility for Admission:

Candidates who have passed any bachelor Degree Examinations of Bangalore University or any other Universities are eligible for admission to the course, provided they have secured 50% marks in the optional subjects (45% for SC / ST / Category-I Candidates).

Further, 50% of the seats are reserved for the candidates who have studied Geography as one of the optional subjects. The remaining 50% of seats are reserved for the candidates who have studied any other optional subjects. If vacancies arise in either of the cases inter-case filling up of seats can be considered.

Scheme and Duration of the Course:

M.Sc Geography course consists of 4 semesters in two academic years. First and second semesters will have five theory papers four hard core and one paper is soft core and four practical. Four practical and one theory paper as soft-core. Third semester will have four theory papers (core) of which, three papers are elective and one is open elective and four practical. Fourth semester will have four theory papers (hard core), of which three papers are elective; four practical including project work / Field Work and Field Study Tour.

Students are required to undertake project work and field study tour for 50 marks each as part of practical at the fourth semester. There shall be University examination at the end of each semester. The course pattern and the scheme of examinations are as follows:

Proforma for the Scheme of Study & Examination of Choice Based Credit System, Master of Science in Geography Semester - I

Paper Code	Title of the Paper	Type	Instruction Hour per Week	Total No. of Hours	Duration of Exam	IA Marks	Exam Marks	Total Marks	Credits
HC 1.1	Development of Geographic Thought	Theory	4	52	3	30	70	100	4
HC 1.2	Fundamentals of Geographical Information Systems	Theory	4	52	3	30	70	100	4
HC 1.3	Advanced Geomorphology	Theory	4	52	3	30	70	100	4
HC 1.4	Geography of India/ Geography of Trade & Transport	Theory	4	52	3	30	70	100	4
HC 1.5	Computer Application in Geography	Practical	4	52	3	15	35	50	2
HC 1.6	Techniques in Physical Geography	Practical	4	52	3	15	35	50	2
HC 1.7	Interpretation of Indian Weather and Topomaps	Practical	4	52	3	15	35	50	2
HC 1.8	Techniques of Mapping & Mapping Analysis	Practical	4	52	3	15	35	50	2
SC 1.9	Fundamentals of Cartography	Theory	3	39+39	3	30	70	100	2
TOTAL			35 Hour /week	494 Hours / Sem		210	490	700	26

Semester - II

Paper Code	Title of the Paper	Type	Instruction Hour per Week	Total No. of Hours	Duration of Exam	IA Marks	Exam Marks	Total Marks	Credits
HC 2.1	Advanced Climatology	Theory	4	52	3	30	70	100	4
HC 2.2	Advanced Oceanography	Theory	4	52	3	30	70	100	4
HC 2.3	Basics of Remote Sensing	Theory	4	52	3	30	70	100	4
HC 2.4	Geography of Settlements / Geography of Karnataka	Theory	4	52	3	30	70	100	4
HC 2.5	Geo - Surveying	Practical	4	52	3	15	35	50	2
HC 2.6	Statistical Methods in Geography	Practical	4	52	3	15	35	50	2
HC 2.7	Map Projection	Practical	4	52	3	15	35	50	2
HC 2.8	Mapping through Bhuvan	Practical	4	52	3	15	35	50	2
SC 2.9	Research Methodology	Theory	3	39+39	3	30	70	100	2
TOTAL			35 Hour /week	494 Hours / Sem		210	490	700	26

Semester - III

Paper Code	Title of the Paper	Type	Instruction Hour per Week	Total No. of Hours	Duration of Exam	IA Marks	Exam Marks	Total Marks	Credits
HC 3.1	Geography of Resources / World Geography	Theory	4	52+52	3	30	70	100	4
HC 3.2	Urban Geography / Political Geography	Theory	4	52+52	3	30	70	100	4
HC 3.3	Population Geography / Industrial Geography	Theory	4	52+52	3	30	70	100	4
HC 3.4	Interpretation of Aerial Photographs and Satellite Images	Practical	4	52	3	15	35	50	2
HC 3.5	GIS	Practical	4	52	3	15	35	50	2
HC 3.6	Open Source GIS Software	Practical	4	52	3	15	35	50	2
HC 3.7	Techniques in Human Geography	Practical	4	52	3	15	35	50	2
OE 3.8	Geography for all	Theory	4	52	3	30	70	100	4

TOTAL	32 Hour /week	572 Hours / Sem		180	420	600	24
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Semester - IV

Paper Code	Title of the Paper	Type	Instruction Hour per Week	Total No. of Hours	Duration of Exam	IA Marks	Exam Marks	Total Marks	Credits
HC 4.1	Regional Planning & Development	Theory	4	52	3	30	70	100	4
HC 4.2	Agriculture and Food Security / Economic Geography	Theory	4	52+52	3	30	70	100	4
HC 4.3	Geography of Tourism / Environment Geography	Theory	4	52+52	3	30	70	100	4
HC 4.4	Cultural Geography / Natural Disaster Management	Theory	4	52+52	3	30	70	100	4
HC 4.5	Analysis of Climatic Data	Practical	4	52	3	15	35	50	2
HC 4.6	Analysis of Socio- Economic Data	Practical	4	52	3	15	35	50	2
HC 4.7	Field Study Tour & Viva-voce	Practical	4	52	3	15	35	50	2
HC 4.8	Project & Viva-voce	Practical	4	52	3	15	35	50	2
TOTAL			32 Hour /week	572 Hours / Sem		180	420	600	24

Grand Total Marks of all the four semesters: **2600**

Duration of the Course: The duration of the M.Sc. Geography Course shall extend over 4 semesters (two academic years) of 16 weeks or more each with a maximum of 90 actual working days of instruction in each semester.

Course pattern: In the faculty of Science, the number of credits per semester may vary from 24 to 26, an average of 25 credits per semester and a total of around 100 credits for the programme. The credits shall be based on the number of instructional hours per week, generally 1 credit per hour of instruction in theory and 1 credit for 2 hours of practical or project work or internship per week.

The courses offered in a programme may be the core, elective and soft courses. There shall be soft core courses of 3 hours of instruction per week in the first and second semesters, open electives in the third semester, electives in the fourth semester, and project work in lieu of one or two theory / practical in the second / third and / or fourth semesters.

Medium of instruction: The medium of instruction shall be English only.

Attendance: The course (Theory, practical etc.) shall be treated as an independent unit for the purpose of attendance. A student shall attend a minimum of 75% of the total instruction hours in a course including assignments and seminars in each semester. There shall be no provision for condonation of shortage of attendance and a student who fails to secure 75% attendance in a course shall be required to repeat that semester.

Internal Assessment: Marks for internal assessment shall be awarded on the basis of Attendance, Test and Assignments/Seminars. The internal assessment marks shall be notified on the department/ college notice board for the information of the students and it shall be communicated to the Registrar (Evaluation) within 10 days before

the commencement of the University examinations, and the Registrar (Evaluation) shall have access to the records of such internal assessment evaluations.

Board of Examiners (BOE): Board of examiners constituted by the University shall consist of a Chairman, internal and external members out of which at least one shall be from the Department/College offering the course and at least two external members from other universities. The board shall scrutinize the question papers and shall forward for the approval of university.

Results: A candidate should obtain a minimum of 40% marks in each of the papers in the University examination and 50% marks including internal assessment marks. A candidate should obtain a minimum of 50% marks in all Semesters). The candidates who have passed in all the semester examinations are eligible for the M.Sc. Degree in Geography.

Carry Over: A candidate who fails in a lower semester examination may go to the higher semester, however, the result of the candidates who have passed the IV semester examination but not passed the lower semester examinations shall be declared as NCL (not completed lower semester examinations). Such candidates shall be eligible for the degree only after completion of all the lower semester examinations.

Question Paper Pattern: The Theory exam will be conducting for 70 Marks and it consists of 3 Parts namely Short, Medium and Long answer questions.

Part – A Each questions carries 4 marks and students as to answer 4 questions.

Part – B Each questions carries 8 marks and students as to answer 3 questions.

Part – C Each questions carries 15 marks and students as to answer 2 questions.

Dr. Ashok Hanjagi
Chairman
BOS.PG. in Geography.

I SEMESTER

Paper 1.1: Development of Geographic Thought

Teaching Hour: 52

Unit 1

The Field of Geography: Definition, meaning nature and scope of Geography. Geography as a Social and Natural Science. Evaluation of Geographic Thought. Limits in Geography. Traditions in Geography: Area Differentiation, Landscape Theme, Environment Theme, Spatial Distribution and Geometric theme. Inter-disciplinary and Intra-disciplinary approaches in Geography. -13

Unit 2

Pioneers and their Contributions to Geography: Ancient period – Greek, Romans, Indians and Chinese. Medieval period - Arabs and Geographical Discoveries. Modern period – Alexander von Humbolt, Carl Ritter and Darwin. School of Geography – German, French, British, American and Russian. Foundation of modern geography. - 13

Unit 3

Dualism and Dichotomies in Geography – Determinism, Possibilism, Neo-Determinism and Social Determinism. Quantitative Revolution. Geographical Models – need, features, types and classification. Theory Building. Geographical Paradigms. Areal differentiation, regional synthesis and spatial organization. - 13

Unit 4

Explanations in Geography-Cognitive, Cause & Effect, Temporal & Functional, Systems Analysis and Regional Concepts. Modern Themes in Geographical Thought – Positivism, Pragmatism, Functionalism, Existentialism, Idealism, Realism, Marxism, Radicalism, Behaviouralism & Humanism. Quantitative revolution and locational analysis. -13

References:

1. Adhikari S. (2004) Fundamentals of Geographic thought, concept publishers, New Delhi.
2. Dikshit R.D. (2001). Geographical Thought: A Conceptual History of ideas, prentice Hall publishing Company, New Delhi-2
3. Harvey ME (2002) theme in Geographical thought, R.K. Publications and distributors, Ansari Road, New Delhi – 2.
4. MajidHussain (2001) Evolution of Geographic thought, Rawat Publications, New Delhi-02
5. David Harvey (2000) Explanations in Geography, Macmillan, New York.
6. Peter Hagget (1972): Geography: A Modern Synthesis
7. Frazier J.W. (1982); Applied Geography, Prentice Hall, New Delhi.
8. Singh. I (2006): Diverse aspect of Geographical thought: ALFA Publications, New Delhi.
9. Dikshit R.D. (1997) Geographical Thought: A Contextual History of Ideas, Prentice hall of India, New Delhi.

I SEMESTER
Paper 1.2: Fundamentals of Geographical Information Systems
Teaching Hour: 52

Unit 1

Basic Spatial Perspective and GIS Concepts: GIS definitions, concept of spaces, approaches and components, history and development of GIS. **Spatial & Non-spatial Data:** Data information, data type, data sources, characteristics of spatial and non-spatial data, raster and vector data models, geographical matrix, data stream. -13

Unit 2

Data Collection: Data Capture & geo-processing sources, input methods for spatial & non-spatial data, editing, re-projection, geometric transformation, geo-referencing, display. Map scale precision & accuracy. **Database Management System:** Characteristics, components, Data Quality: Definition, components of geographic data quality. Accuracy, precision, error and Uncertainty. Data Assessment and Evaluation. Linking spatial & non-spatial data. Database Types: Hierarchical, network, relational and object oriented. - 13

Unit 3

Manipulation and Analysis of Data: Measurement of lengths, perimeter and areas, queries, buffer analysis, topology, neighborhood operations, network operations, overlay analysis, location-allocation analysis problems, & surface analysis. Interpolation and its methods. - 13

Unit 4

Global Positioning System: Concept, GPS reference Systems, Components-Space segment, Control segment, User segment. GPS Signal Propagation and Quality, GPS Observations: Pseudo ranges, Differential GPS, Relative Positioning, Errors in GPS Observations, errors in GPS Observation, GPS observing Techniques- Static, Rapid Static, Pseudokinematic, kinematic, Real time Kinematic (RTK). - 13

References:

1. Ian Heywood, Sarah Cornelius & Steve Carver, (2000), An Introduction to Geographic Information Systems, Addison Wesley Longman Limited, New York.
2. Kang-stung Chang, (2002), Introduction to Geographical Information Systems, Tata McGraw-Hill Publishing Company Limited, New Delhi,
3. Stat J & JE Estes, (1990), Geographic Information Systems: An Introduction, New Jersey, Prentice-Hall ,
4. Kang-stung Chang,(2002),Introduction to Geographic Information Systems, Tata McGraw Hill, New Delhi,
5. AUTOCAD Drafting Package, Autodesk Inc, (2003)
6. Aronoff, S,(1991),Geographic Information Systems: A Management perspective, WDL Publications, Ottawa, Canada.
7. David J Maguire, Michael F Goodchild& David W Rhind (Ed.), (1991), Geographic Information Systems, Longman Scientific & Technical co-published in the USA with John Diley& Sons, Inc. New York.

I SEMESTER
Paper 1.3 Advanced Geomorphology

Teaching Hour: 52

Unit 1

Geomorphology: Origin and evolution of the earth's crust; Fundamental Concepts of Geomorphology. Interior of the Earth: Structure and convectional currents. Theory of Isostasy: Views of Pratt and Aries. Geological-time-scale. Fundamentals of geomagnetism. - 13

Unit 2

Theory of Plate Tectonics and Sea Floor Spreading, Geosynclines; Wegener's Theory of Continental drift. Earth Movements: Orogenic, Eperogenic Movements and Resultant landforms: Folds and Faults and their types. Rocks and its types. Volcanoes: reasons, types of eruptions, significance, volcanic activity, products, landforms, geographical distribution and major volcanic eruptions occurred. Earthquakes: Causes, measuring earthquake, landforms, geographical distribution and key earthquakes so far. Tsunamis: Causes, consequences and major tsunamis taken places. Recent views on mountain-building. - 13

Unit 3

Process of Weathering and Mass Wasting, Landforms Produced by – Drainage system and drainage patterns. Glaciers, Wind, Underground water and Sea Waves: process of these and land forms produced. - 13

Unit 4

Slope development; Factors controlling landforms development; Critical Study of the Concept of Cycle of Erosion – W.M. Davis and W. Penk – Recent Trends in Geomorphology. -13

References:

1. Ahmed E. (1985) Geomorphology, Kalyani Publishers, New Delhi.
2. Strahler A.N. (1968) The Earth Sciences, Harper & Row Intl. Edn, New York
3. Thornberry W.D. (1969) Principles of Geomorphology 2nd Edition, Wiley Intl. Edn. & Wiley Eastern Reprints 1984.
4. Verstappen H. (1983) Applied Geomorphology, Geomorphological Surveys for Environmental Development, Elsevier, Amsterdam
5. Woodridge S.W and R.S. Morgan (1991) An Outline of Geomorphology, The Physical Basis of Geography, Orient Longman, Kolkata.
6. Dayal P. (1995) A Text Book of Geomorphology 2nd Edition. Sukla Book/Dept. Patna.
7. Homes A. (1965) Principles of Physical Geology, 3rd Edition, ELBSS Edn.
8. Goudie Andrew et.al. (1981) Geomorphological Techniques, George Allen & Unwin, London.
9. Bloom A.L. (1978) Geomorphology: A Systematic Analysis of Late Cenozoic Landforms Prentice – Hall of India, New Delhi.
10. Brunnsden D. (1985) Geomorphology in the Service of Man: The Future of Geography, Methuen, U.K.
11. Worcester P.G. (1965), A Text Book of Geomorphology, Can North and 2nd Edition, East West Edn. New Delhi.
12. Board Shaw M.J. Et. Al. (1979) The Earth's Changing Surface, Hodder & Stoughton London.
13. J.A. Steers: Unstable Earth

14. <http://www.solarviews.com/eng/earth.htm>
 15. <http://www.moorlandschool.co.uk/earth/tectonic.htm>
 16. <http://library.thinkquest.org/5818/maps.html>

I SEMESTER
Paper: 1.4 (A) Geography of India

Teaching Hour: 52

Unit 1

Physical Setting: Space relationship of India with neighboring countries; Structure and relief; Drainage system and watersheds; Mechanism of Indian monsoons; Tropical cyclones and western disturbances; Floods and droughts; Climatic regions; Natural Vegetation; Soil types and their distributions. Resources: Land, surface and ground water, energy, minerals, biotic and marine resources; Forest and wildlife resources and their conservation; Energy crisis. -13

Unit 2

Agricultural infrastructure: Irrigation, seeds, fertilizers, power; Institutional factors: land-holdings, land tenure and land reforms; Cropping pattern, agricultural productivity, agricultural intensity, crop combination, land capability; Agro and social forestry; Green Revolution and its socio-economic and ecological implications; Significance of dry farming; Livestock resources and white revolution; Aquaculture; Sericulture; Apiculture and poultry; Agricultural regionalization; Agro-climatic zones; Agro-ecological zones. -13

Unit 3

Industry: Evolution of industries; Locational factors of cotton, jute, textile, iron and steel, aluminum, fertilizer, paper, chemical and pharmaceutical, automobile, cottage and agro-based industries; Industrial houses and complexes including public sector undertakings; Industrial regionalization; Multi-nationals and liberalization, Special economic zones; Tourism including eco-tourism. -13

Unit 4

Transport, communication and trade: Road, railway, waterway, airway and pipeline networks and their complementary roles in regional development; Growing importance of ports on national and foreign trade; Trade balance; Trade policy; Export processing zones; development in communication and information technology and their impacts on economy and society; Indian space programme. -13

References:

1. Khullar DR. (2009): India: A Comprehensive Geography, Kalyani Publishes, New Delhi, Hyderabad, Kolkata.
2. AlkaGautam (2009) Geography of India, Sharadapustakbhawan, University Road, Allahabad – UP.
3. Sharma TC & Coutinho O (2005) : Economic and Commercial geography of India, Vikas Publishing House Ltd., New Delhi-14
4. Tiwari RC. (2008) Geography of India, PrayagpustakBhavan, 20-A, University Road, Allahabad- UP
5. Pritivish Nag & Smitasengupta (1992) Geography of India, Concept Publishing Company, New Delhi – 59.
6. Ranganath (2007) Geography of India, VidhyanidhiPrakashan, Station Road, Gadag-01.
7. PhaniDeka&AbaniBhagabati (1992) Geography: Economic and Regional, Wiley Eastern Limited, Ansari Raod, Daryaganj, N. Delhi-01.
8. Majid Husain (2008): Geography of India, Tata Mc. Graw hill publishing co. ltd. N. Delhi.
9. Singh R.L. (1971); India A Regional Geography, Natinal Geographical Society of India, Varanasi, UP.
10. Jadish Sing (2003): India: A comprehensive systematic geography, GyanodayaPrakashanGorakhpur- UP.
11. India: Year Books- 2005-2010.

12. <http://www.mapsofindia.com/geography/>

I SEMESTER

Paper: 1.4 (B) Geography of Trade and Transportation

Teaching Hour: 52

Unit 1

Nature, scope, significance and development of transport geography. Factors associated with the development of transport system; economic, social, cultural and institutional. Economic and regional development and transport development. -13

UNIT-2

Characteristics and relative significance of different modes of transport: railways, roads, rways, and waterways, pipelines, etc. Structure- accessibility and flow models; network structure, graph theoretic measures, measurement of accessibility, models of network change, linear programming and gravity models. -13

UNIT-3

Theories related to freight route structure. Bases of spatial interaction, complementarity, intervening opportunities and transferability. Patterns of movement: the type, patterns of movement and transport modes. Transport network; the function, pattern of movement, geometry and transport development. -13

UNIT-4

Transport policy and planning in India. Urban transport: growth and problem of urban transportation. Environmental degradation: vehicular pollution and congestion alternatives to the transport system in mega cities in India National highway development and planning in India. -13

Suggest Readings:

1. Chorley R.J. & Haggett P.: Models in Geography Methuen & Co. London. 1967.
2. Hurst, M.E.(ed.): Transportation Geography, McGraw-Hill, 1974.
3. Haggett, F and Chorlley, R.J. Network Analysis', Edward Arnold, London, 1968.
4. Hay, A.: Transport Economy, MacMillan, London, 1973.
5. Hoyle, B.S.(ed): Transport and Development, MacMillan, London, 1973.
6. Raza, M. and Agrawal Y.P. :Transport Geography of India, Concept, New Delhi, 1985.
7. Robison H & Bamford C.G.: Geography of Transport Machdonals& Evans. London 1978.
8. Taffe, E.J. & Gauthier (Jr.) H.L. Geography of Transportation, Prentice-Hall, Englewood Cliffs, N.J., 1973.
9. Ullman E.L.: American Commodity Flow University of Washington Press 1957.
10. White H.P. and Senior, M.L. Transport Geography, Longman, London, 1983.
11. Mukherji

I SEMESTER
Practical: 1.5 Computer Applications in Geography

Teaching Hour: 52

Exercise No	Title of the Exercise (Total 52 Hrs)
1	Basic Operations in Computers
2	Windows Explorer
3	Creating Geographic related documents in MS – Word
4	Documentation Alignment
5	Mail Merge
6	Maintaining Weather and Climatic data in MS – Excel
7	Demographic data processing using Basic Calculations and formulas
8	Socio-economical Data Interpretation
9	Cartographical maps using MS – PowerPoint
10	Preparing Geographical importance slide shows
11	Basic P C Maintance for Geographers – Hardware and software
12	Understanding Networking – LAN, MAN and WAN –Wi-Fi
13	Email – cc, bcc and other formats
14	Web Browsing and Search Engines
15	E – resources in Geography

Reference:

1. Fundamentals of Computer(First Edition- 2009) Publisher: McGraw-Hill by Balaguruswamy
2. Computer Fundamentals(Fourth Edition- 2007) Publisher: BPB Publications by PradeepSinha and PritiSinha
3. Computer Fundamentals(First Edition-2010) Publisher: Pearson by Anita Goel
4. Introduction to Computers (First Edition 2008) Publisher : Cengage Learning By Gary B. Shelly, Thomas J. Cashman and Misty E. Vermaat
5. Fundamentals of Computers and Programming with C by A. K. Sharma DhanpatRai publications
6. Computer Networks (4th Edition) by Andrew S. Tanenbaum
7. Operating System Concepts, (6th Edition) by Abraham Silberschatz, Peter Baer Galvin, Greg Gagne

I SEMESTER
Practical: 1.6 Techniques in Physical Geography

Teaching Hour: 52

Exercise No	Title of the Exercise (Total 52 Hrs)
1	Profile – Definition, Importance and Uses
2	Methods Drawing of Profile
3	Types of Profiles – Serial, Superimposed Profile
4	Types of Profiles – Projected, Compositd and Longitudinal Profile
5	Construction of Land forms through Contour features – Hill, Plateau, George, Escarpment
6	Construction of Land forms through Contour features – Waterfall, V and U Shaped Valley, Hanging Valley, Cliffs
7	Morphometric Analysis (linear features)
8	Morphometric Stream Ordering,
9	Bifurcation Ratio and Drainage Density
10	Slope Analysis: Meaning, Definition
11	Smith's Method
12	Wentworth's Method
13	Block Diagrams – one point perspective
14	Block Diagrams – two point perspective
15	Geological Map Drawing

Reference:

1. Monkhouse F.J and Wilkinson HR (1952) Maps and Diagrams, their compilations and concentration, Muthuen & Co. London.
2. Harwel JD, Newson MD. (1973)- Techniques in Physical Geography, Mc. Millan Edu. Ltd. London.
3. Mishra RP. And Ramesh A (1968) – Fundamentals of Cartography, Prasaranga, University of Mysore, Mysore.
4. Robinson & Marison (1995), Elements of Cartography USA.
5. R.L. Singh (2010) Practical Geography, Sharada Pustak Bhavan, 11, University Road, Allahabad, UP - India

I SEMESTER**Practical: 1.7 Interpretation of Indian Weather and Topomaps****Teaching Hour: 52**

Exercise No	Title of the Exercise (Total 52 Hrs)
1	Indian Topomaps– SOI
2	Conventional Signs and Symbols
3	Interpretation of SOI Topomaps: Marginal Information-
4	Physiography – Contour, Bench Mark and Spot Height
5	Water Bodies - Natural and Man Made Drainage
6	Vegetation - Natural and Human Induced Vegetation
7	Cultural Features - Transportation and Settlements
8	Special Features Interpretation in Topographical Maps
9	Components of Indian Daily Weather Maps
10	Sources of Weather Data IMD
11	Atmospheric Pressure Gradient
12	Isobar Trends
13	Wind Direction
14	Wind Rose
15	Other Weather Phenomena.

References:

1. Monkhouse F.J. & H.R. Wilkinson (1952) Maps and Diagrams, their compilations and concentration, Methuen & Co. London.
2. AshisSen (1997) Systematic Practical Geography, Oriental Longman Ltd. Kolkata
3. Namowitz S.N. & Donald B. Stone (1965) Earth Science – The World We Live in 3rd Edition, D. Van Nostrand and company Inc. New Jersey, USA, pp. 3-59
4. Mishra R.P. (1969) Fundamentals of Cartography, Prasanga University of Mysore.
5. Harwell J.D. & M.D. Newson (1973) Techniques in Physical Geography, Macmillan Edn, Ltd. London.
6. R.L. Singh (2010) Practical Geography, SharadaPustakBhavan, 11, University Road, Allahabad, UP - India

I SEMESTER
Practical: 1.8 Techniques of Mapping and Mapping Analysis
Teaching Hour: 52

Exercise No	Title of the Exercise (Total 52 Hrs)
1	Cartographic Appreciation
2	Representation of Data –Proportional symbols
3	Mono Dot Method
4	Multiple Dot Method
5	Circle Method
6	Sphere Method
7	Cube Method
8	Choropleth Method
9	Isopleth Method
10	Choro-chromatic Method
11	Choro-schematic maps
12	Block Pile Diagrams
13	Pie Diagrams
14	Flow diagrams
15	Method of Interpretation

References:

1. Monkhouse F.J. & H.R. Wilkinson (1952) Maps and Diagrams, their compilation and concentration, Methuen & Co, London
2. . Harwell J.D & M.S. Newson (1973) Techniques in Physical Geography, Macmillan Edn. Ltd, London.
3. Mishra R.P. & Ramesh A (1968) Fundamentals of Cartography, Prasaranga, University of Mysore.
4. Menno-Jan Kraak&FerjanOrmeling (2003) Cartography Visualization of Geospatial Data, Pearson Edn Pvt. Ltd. (Singapore) New Delhi.
5. Nag P (1992) Thematic Cartography and Remote Sensing, concept Publishing Co. New Delhi.

I SEMESTER
Paper: 1.9 Fundamentals of Cartography

Teaching Hour: 52

Unit 1:

Concept, scope & significance of Cartography. Growth & Development of cartography: Impact of Technology on Cartography. Map as tool in Geographical studies, Choropleth, Isopleths and Chorochromatic maps. Cartography as a science of human communication. Map-making process: Elements of generalization. Thematic and composite mapping. Measurement of Geographical variables: Nominal, Ordinal, Interval and Ratio. Map symbolization.

-13

Unit 2

Shape of the Earth: Spheroid, Ellipsoid and Geoid. Geographic Coordinates: Latitude and Longitude. Datum, Map projections: Properties, Distance, Direction and Angle, Selection of appropriate map projection and types.

-13

Unit 3

Scope and objectives of map design, controls of map design and constraints in map design. Map Scale: Statement, Representative Fraction and Geographical Scales, Determining and scale. Ground Survey and Positioning: Measuring distance, and direction, Traditional Survey methods, Automated Survey System.

-13

Unit 4

Types of Maps – Perception and Designing, Color and Pattern Creation, Typography and Lettering the map, Map compilation and map layout, Future Cartography. Mapping organization and services in India: SOI, NATMO and NRSC.

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References:

1. Meena-JaKraak&FerjanOrmeling (2003) —Cartography Visualization of Geospatial Data', 2nd Edn., Pearson Edn., Pvt. Ltd., (Singapore) New Delhi.
2. Robinson & Morrison (1995) Elements of Cartography, Library of Congress Catalog, USA.
3. Monkhouse F. J & H. R Wilkinson (1952) Maps and Diagrams, their complication and Concentration, Methuen & Co., London.
4. Harwell J. D. & M. D. Newson (1973). Techniques in Physical Geography, Macmillan Edn, Ltd., London.
5. Mishra R.P & Ramesh A. (1968) Fundamentals of Cartography, Prasaranga, University of Mysore.

II SEMESTER
Paper 2.1: Advanced Climatology

Teaching Hour: 52

Unit 1

Fundamental principles of Climatology; Earth-Sun relationship. Elements of Weather and Climate. Origin, Composition and Structure of Atmosphere. Temperature: Temperature belts of the World; Solar Radiation principles, Heat Budget of the World; Atmospheric circulation; Atmospheric stability and instability; Greenhouse effects, Horizontal and Vertical Distribution of temperature & Inversion of Temperature. Global warming and Global Cooling. – 13

Unit 2

Atmospheric Pressure: Pressure belts of the World; Pressure Gradient, Coriolis Effect, Horizontal and vertical distribution of Air Pressure and Pressure Belts. Winds: Planetary, Monsoons, Local Winds, Jet Streams. Mechanism of monsoon. Types and distribution of precipitation; Weather and climate; Hydrological cycle and water balance and Humidity. El-Nino and La Nina phenomena, El-Nino-Southern Oscillation (ENSO). – 13

Unit 3

Air-Masses: Definition, Nature, Source Region, Classification. Fronts – Frontogenesis and Frontolysis, Classification of Fronts, Frontal Zones. Cyclones: Types, Tropical Cyclones - Origin, Types and Structure of Tropical Cyclone. Distribution of Tropical and Temperate Cyclones. Features of Temperate Cyclone, Source Region, Origin of Temperate Cyclone. Polar Front, tornadoes. Study of weather disturbances through Satellites. -13

Unit 4

Classification of World Climates: Koppen's & Thornthwaite & Trewartha's Classification. Changes in World Climate: Global Warming, Depletion of Ozone layer & Green House Effect. Weather Forecasting, Problems and Prospects of Weather Forecasting in India. Global Climate change and role and response of man in climate changes; Applied climatology and urban climate. Climate changes; Natural and human induced factors. Paleoclimatology. – 13

References

1. Savindra Singh (2005): climatology, PrayagPustakBhawan, 20-A, University Road, Allahabad- 02. UP.
2. Critchfield H.J. (2005): General climatology, prentice Hall of India, Pvt. Ltd. New Delhi-01
3. Lal D.S (2009) : Physical Geography, sharadaPustakBhawan, II, University Road, Allahabad – UP.
4. Siddhartha K (2005): Atmosphere, weather and climate, Kisalaya Publications Pvt.ltd., C—2, Padma apartment, MehruLi, New Delhi-30.
5. Lal D.S. (2005): climatology: SharaduPustakBhawan, 11, University Road, Allahabad - 02, UP.
6. Dasagupta A and Kapoor A.N. (1978): Principles of Physical Geography, chand S & Co. Ltd. New Delhi.
7. Strahler A.N. (1976): The earth sciences, Harpu& Row, Intl. Ed. New York.
8. AlkaGoutam (2012): Climatology, PrayagPustakBhawan, 20 A, University Road, Allahabad – 02, UP
9. <http://apollo.lsc.vsc.edu/classes/met430/viberts/pres2/India.html>
10. <http://library.thinkquest.org/5818/maps.html>

II SEMESTER
Paper 2.2: Advanced Oceanography

Teaching Hour: 52

Unit 1

Scope and Content of Oceanography, Importance of the Oceans, Origin of the ocean basins; The Morphology of Ocean Bottoms - Continental Shelf, Slope, Submarine canyons and its related theories, Ocean Plains and Ocean Deeps, Heat and salt budget. - 13

Unit 2

Bottom relief of the Ocean: Relief of the Atlantic, the Pacific and the Indian Ocean. Physical and Chemical Properties of Ocean waters: Composition, Temperature, Density and Salinity of Ocean water, Ice in the Sea, effects of polar Ice on the Atmospheric circulations. -13

Unit 3

Movements and Circulation of Ocean Water: Waves, Tides, Currents and their Effects, Deep circulation. Currents in Pacific, Atlantic and Indian Ocean, Coastal Ecology-Coastal Dunes and Mangroves. Marine resources: Biotic, mineral and energy resource and their utilization. -13

Unit 4

Ocean Deposits: Types and Distribution, Coral Reefs: Origin, Types and Theories of Origin of Coral Reefs (Darwin, Dally and Murray), Coastal Bleaching. Impact of Humans on the Marine Environment. Recent Trends in Oceanography. Sea-level changes, Law of the sea and marine pollution. - 13

References:

1. Lal. D.S. (2003) Oceanography, SharadaPustakBhavan, Allahabad 02.
2. King Cuchalaine A.M. (2000) Oceanography for geographers, Edward Arnold publications, London.
3. Savindra Singh (2004): physical geography, PrayogPustakBhavan, Allahabad -02
4. Siddharth (2005) Oceanography: A brief introduction, Rawat Publishers. New Delhi.
5. Sharma RC (2000) Oceanography for Geographers, Chaitanya Publishers, Allahabad -02
6. Vattal and Sharma (2003), Oceanography for Geographers, Chaitanya Publishers, Allahabad -02
7. Yadav A.S. (2002): Geography of Minerals of Oceans, concept Publishers, New Delhi,
8. Basu S.K. (2003): Hand book of oceanography, Global vision, Delhi.
9. Garisson Tom (1999): Oceanography, Cole, Wadsworth, New York.
10. Sharma and Vattal (1962) Oceanography for Geographers, Chaitanya Publication House, Allahabad.
11. Turman Harold (1985); Introductory Oceanography, Bell & Howell Co. London.
12. <http://drs.nio.org/drs/index.jsp>

II SEMESTER
Paper: 2.3 Basics of Remote Sensing

Teaching Hour: 52

Unit 1

Remote Sensing: Development of Remote Sensing: Definition – types – chronological development; international remote sensing centres; Indian remote sensing centres and their activities – new satellite programs of India. Electro Magnetic Radiation (EMR) and Electro Magnetic Spectrum, Interaction of EMR with the atmosphere & with the surface feature. Atmospheric window; spectral signature of common land covers (minerals, rocks, water, vegetation and urban area) . -13

Unit 2

Introduction to aerial photography; purpose of photography, scale of photography, types of aerial photography, time and season of photography. Basic geometric characteristics of aerial photographs; types of aerial photographs, scale, ground coverage and resolution of aerial photos, tilt and relief displacement. Components of the Camera, Film, Aerial Platforms Binocular observation of stereoscopic photographs, accommodation and convergence and stereoscopes. Elements of Aerial photo interpretation: Formats of Imageries: Digital and Analog data. -13

Unit 3

Sensor & Platforms: Sensors: Active and passive Sensors, Electro mechanical and optical sensors. Platforms: Types, Characteristics, Payload of launch vehicles, -SLV, PSLV, GSLV, AGSLV, Orbit positioning issues. Scanning methods; FOV and IFOV; hyper-spectral sensors and imaging. Resolution: spatial, spectral, radiometric and temporal. -13

Unit 4

Applications Satellites: GOES, NOAA, METEOSAT & INSAT. Land observation Satellites: LANDSAT, SPOT, IRS, IKONOS, GEOEYE & WORLDVIEW. Marine Observation Satellites: Sea-Sat, Nimbus, CZCS, MOS, SeaStar, SeaWiFS & Oceansat. -13

References:

1. Lillisand T.M and Keifer R.W, (1994), Remote Sensing and Image Interpretation, Jhon Willey & sons, New York.
2. Rampall, K.K. (1999), hand book of Aerial Photography and Interpretation, Concept Publishing Co., New Delhi.
3. Sabins, F.F. Jr, (1987), Remote Sensing; Principles and Interpretation, W.h. Freeman & Co., New York.
4. Jenson R. Jhon, (2003), Remote Sensing of the Environment-An Earth Resource Perspective, Pearson Education Pvt. Ltd., Indian Branch, Patparganj, Delhi, India.
5. LRA Narayanan, Remote sensing and its Applications, (1999), Universities Press (India) Ltd., Hyderabad.
6. <http://rst.gsfc.nasa.gov/Front/tofc.html>.
7. <http://earthobsevatory.nasa.gov/Library/RemoteSensing>

II SEMESTER
Paper: 2.4 (A) Geography of Settlements

Teaching Hour: 52

Unit 1

Concept of rural and urban settlements; Nature, Scope, Significance and Recent Trends in Settlement Geography. **Evolution of Settlements in India:** Emergence of Village Settlements; rural settlement patterns, Origin and Growth of Towns; Basic and Non-Basic Concepts in Settlement formation. Distribution of Settlements, Spacing of Settlements - Application of Models of Christaller and Losch. -13

Unit 2

Rural Settlements – Types & patterns of Rural Settlements, House Types, Morphology and Functions of Rural Settlements; Rural Service Centers and their Role in Urbanization Process. Indian Rural Settlements in Different Micro-Environmental Conditions: (a) Mountains (b) Desert Region (c) In the vicinity of Urban Centers. -13

Unit 3

Urban Settlements: Urban morphology, sphere of urban influence, Classification of Urban Places, Non-Functional and Functional. Morphology of Indian Cities and Its Comparison with Western Cities; Functional Relations between Urban Settlements and their umlands. Settlement systems; primate city, rank-size rule, settlement hierarchy. -13

Unit 4

Theories in Settlement Geography – CBD, Centrifugal and centripetal forces theory, Urban Fringe, Urban structures theories. Rank size relationship. **Settlement Geography of selected Indian Cities:** Mumbai, Kolkata, Bangalore, Delhi, Chennai, Hyderabad, Pune, Laknow, Patna, Jaipur and Chandigarh. Urban development in India. -13

References:

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

II SEMESTER
Paper: 2.4 (B) Geography of Karnataka

Teaching Hour: 52

Unit – I

Introduction, Geographical Location, size and Administrative divisions. **Land Forms:** Divisions of Land Forms in Karnataka, Coastal Regions, Malanadu Regions and Maidana Regions. **Weather and Climate:** Seasons, Distribution of Rainfall and Temperature, Climatic regions, Drought prone areas in Karnataka. **Drainage Systems:** East flowing rivers and west flowing rivers. Major Drainage Systems in Karnataka. -13

Unit – II

Soils: Introduction, Types, Soil Conservation and Preservation. **Natural Vegetation:** Types of vegetation, Distribution of forest in Karnataka, Protection and Conservations. Reserve Forest and Protected Forest in Karnataka, National Parks and Bird Sanctuaries in Karnataka. **Water Resources:** Importance, Distribution of water resources, Irrigations – sources of irrigations, multipurpose river valley projects. Water Disputes in Karnataka. -13

Unit – III

Agriculture: Introduction, Agriculture regions of Karnataka. **Major Food Crops** – Paddy, Ragi, Maize, Wheat, Pulses. **Commercial Corps** – Cotton, Sugarcane, Tobacco, Coffee, Species, Mulberry crop. Fishing and Nomading Herding. **Energy Resources:** Types, Importance and their distributions. -13

Unit – IV

Minerals: Introduction, Gold, Iron, Manganese, Lime Stone. **Industries:** Sugar Industries, Silk Industries, Iron and Steel Industries, Cotton Industries, IT and BT Industries. Industrial Policies in Karnataka. **Transportation:** Types of Transportation, Distribution of Transportation. Population: Distribution of Population, Sex ratio, Literacy. -13

References:

1. Geography Of Karnataka, Ranganath, **ISBN-13:** 9788190972116, **Publishing Date:** 2015, **Publisher:** Mysore Book House
2. Geography of Karnataka by S.S.Nanjannavar
3. Physical Geography: R. N. Tikka
4. Misra R.P Geography of Mysore State
5. NBK Reddy and Murthy G.S Regional Geography of Mysore State
6. Director, Census Reports Published by Govt. of Karnataka
7. Karnataka State Gazetteer Volume- I & II
8. Karnataka Hand Book.

II SEMETER
Practical: 2.5 Geo-Surveying

Teaching Hour: 52

Exercise No	Title of the Exercise(Total 52 Hrs)
1	Surveying – Introduction, Importance and Types
2	Chain Surveying
3	Plane Table Survey
4	Compass Surveying
5	Theodolite Surveying
6	Traverse Surveying
7	Contouring
8	Total Station – Surveying line patterns
9	Total Station – Surveying Area patterns
10	GPS – Introduction, Segments and Applications
11	Handling GPS Instruments – Handle GPS
12	Extracting Point, Line and Polygon Features
13	DGPS – Base point extraction
14	DGPS – High accuracy point extractions
15	Plotting GPS points into graphs sheets

Reference:

1. Davis, Peter, (1974): Science in Geography Data Description & Presentation, Vol.3, Oxford University Press, London.
2. Hanwell, J.D. & Newson, M.D. (1973): Macmillan Education Ltd., London.
3. Mishra, R.P. (1973): Elements of Cartography. Prasaranga, University of Mysore.
4. Monkhouse, F.JR & Wilkinson, H.R: Maps and Diagrams, Mathwn& Company, London.
5. Robinson, A.H & Sale R.D.: Elements of Cartography. Johns House & Sons, London.
6. Sing R. L. (1996) : Map Work & Practical Geography, Central Book Dept. Allahabad.
7. Singh & Kanaujia (1973) : Map Work & Practical Geography, Central Book Dept. Allahabad.
8. N. N. Basak (1994): Surveying and Leveling, Tata McGraw Hill Publishing Company LTD., New Delhi.

II SEMESTER
Practical: 2.6 Statistical Methods in Geography

Teaching Hour: 52

Exercise No	Title of the Exercise(Total 52 Hrs)
1	Processing of Data: Data, Preparation of Frequency Table,
2	Graphical Presentation of Frequency - Histograms,
3	Frequency Polygon and O-give Curves.
4	Measurement of Central Tendency – Meaning, Uses
5	Mean, Median and Mode – ungrouped data
6	Mean, Median and Mode – grouped data
7	Measures of Dispersion: Mean Deviation – grouped and ungrouped
8	Standard Deviation – grouped and ungrouped
9	Quartile Deviation – grouped and ungrouped
10	Coefficient Variation, Quartiles, Deciles and Percentiles – ungrouped data
11	Coefficient Variation, Quartiles, Deciles and Percentiles – grouped data
12	Measures of Association: Correlation- Meaning and Methods
13	Rank Order Correlation
14	Product Moment Correlation
15	Regression Coefficients.

References:

1. Haymond and Mccullah (1974), Quantitative techniques in geography, An introduction, Oxford London.
2. Aslam Mohamed (1977), Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi.
3. Gupta CB. (1979), An introduction to statistical methods, Vika publishing house pvt. Ltd. New Delhi.
4. Murray R. Spiegel (1972): Theory and problems of statistics, Mc. Grawhill Book co. New York.
5. Singh RL. (1979) elements of Practical Geography, Kalyani Publishers, New Delhi

II SEMESTER
Practical: 2.7 Map Projections

Teaching Hour: 52

Exercise No	Title of the Exercise(Total 52 Hrs)
1	Map Projection Meaning, Classification
2	Calculation for Map Projection
3	Choice of Projection
4	Methods of Construction
5	Simple Conical Projection with one and two Standard parallels
6	Bonne's Conical Projection
7	Polyconic Projection
8	Conical Equal Area Projection with Standard Parallel
9	Zenithal Projection
10	Gnomic Polar Zenithal Projections – equal area and equidistant
11	Natural and Simple Cylindrical Projection
12	Sinusoidal or Sanson – Flamsteed Projection
13	Mpllweide's Projection
14	Gall's Projection and Globular Projection
15	International Map Projection

1. Elements of Practical Geography; R.L. Singh and P.K. Dutt; 1979; Student's Friend Publication; Allahabad.
2. Practical Geography - A systematic Approach; AshisSarkar; 2012; Orient BlackswamPvt Ltd; Kolkata.
3. Understanding Maps; J.S. Keats; 1982; Halsted Press; USA.
4. Advanced Practical Geography; Arthur Guest; 5th Edition; 1980; Morrison & Gibb ltd London and Edinburg.
5. Advanced Practical Geography; PiyushkantiSaha, ParthaBasu; 2015; ArunabhaSen, Kolkata.

II SEMESTER
Practical: 2.8 Mapping through Bhuvan

Teaching Hour: 52

Exercise No	Title of the Exercise(Total 52 Hrs)
1	Introduction Bhuvan ISRO Software
2	Bhuvan 2D and 3D
3	Downloading free data from the server
4	Creating GIS Maps
5	Creating Point, Line and Polygon Layers
6	Creating attributes
7	Labeling the attributes
8	Online line shape file creations
9	Map output
10	Special Applications in Bhuvan
11	Smart Tracking
12	Thematic Services
13	Disasters Services
14	Ocean Services
15	Bhuvan Panchayath Portal

1. *"Welcome to Bhuvan | ISRO's Geoportal | Gateway to Indian Earth Observation". Bhuvan.nrsc.gov.in. 2013-04-25. Retrieved 2013-05-20.*
2. *"India to launch Bhuvan in March 2009". Silicon India. 2008-11-23. Archived from the original on 25 December 2008. Retrieved 2008-11-23.*
3. *"Bhuvan, Indian Earth Observation Visualisation". ISRO. 2009-08-12. Retrieved 2009-08-12.*
4. *"Bhuvan: India's answer to Google Earth". Jai Bihar. 2009-08-12. Archived from the original on August 15, 2009. Retrieved 2009-08-12.*
5. <http://www.medianama.com/2013/01/223-bhuvan-new-datasets/>
6. bhuvan.nrsc.gov.in/disaster
7. <http://www.medianama.com/2014/02/223-bhuvan-upgraded-mapping-tool-2-5d-city-models-better-high-res-imagery-others/>
8. bhuvan.nrsc.gov.in/data
9. <http://bhuvan3.nrsc.gov.in/applications/bhuvanstore.php>
10. *"ISRO's Bhuvan stands up to Google Earth". Merinews.com. 2009-08-13. Retrieved 2013-05-20.*

II SEMESTER
Paper 2.9 Research Methodology

Teaching Hour: 52

Unit I

Research: Meaning, definitions, objectives, characteristics, types, steps involved in Research, Research ethics, approaches, significance, research and scientific methods, research process, criteria of good research, research problems faced by the researchers in India. Review of literature, need for review of literature. -13

Unit II

Forms of Research: what is research problem, selecting the research problem, necessity of defining the problem, Research paper, article, workshop, Seminars, Conference and Symposia. Research design: Meaning, need important concepts relating to research design, different research design, developing a research plan. -13

Unit III

Research methods versus methodology, research and scientific methods. Sampling methods: Need for sampling some fundamental definitions, sampling theory. Methods of data collection: Collection of Primary data, observation method, interview method, questionnaire methods, collection of secondary data, selection of appropriate method for collection of data, case study method. -13

Unit IV

Hypothesis, Basic concepts concerning testing of hypothesis, limitations of the tests of hypothesis. Interpretation and report writing: Meaning of interpretation, why interpretation, techniques of interpretation, precaution in interpretation, significance of report writing, different steps in report writing, layout of the research report, types of reports, oral presentation, conclusion, findings and suggestions. Bibliography and reference, field photographs. -13

References:

Text Books

1. Gilbert, N. 2001: **Researching Social Life**, Sage, London.
2. Flowerdew, R. and D. Martin 2005: **Methods in Human Geography: A Guide for students doing a research project**, Prentice Hall, New York.
3. Clifford, N.J. and G. Valentine 2003: **Key methods in Geography**, Sage, London.
4. Leedy, P. D. and J.E. Ormrod 2001: **Practical Research: Planning and Design**,

Web resources:

- <http://computer.org> - <http://www.acm.org>
- <http://www.intute.ac.uk/socialsciences/>

III SEMESTER
Paper 3.1(A). Geography of Resources

Teaching Hour: 52

Unit 1

Consciousness and Definition of Resources: The Concept of Resource- Wealth- Resistance and Neutral Stuff. Land as a resource, resource creating Factors, Classification of Resources. -13

Unit 2

Soil: Soil Formation, Factors Influencing Soil Formation, Soil Characteristics and Soil Profile, Classification of Soil (zonal types) Soil erosion, Soil Conservation. **Forest Resources:** Types & distribution, Forest Products-Timber and Paper, Forest Decay, Forest Conservation. -13

Unit 3

Water and Forest Resources: Water Resources and its Development in India, Ground and surface water, water cycle and water budget; Conservation of water. **Livestock:** Livestock Rearing in the World and Live Stock Regions, Livestock Products: Milk, Meat and Wool. Marine resources; Major fishing Grounds of the world. - 13

Unit 4

Mineral Resources: Classification of Major Minerals, their Distribution and Production, Petroleum, Coal, Iron Ore, Bauxite and Copper. Mineral conservation and Mineral Policy. Energy sources and alternate energies. -13

References:

1. Guha J.L. and Chattoraj (2004), A New approach to economic geography, A study of resources, the world Press pvt. Ltd. Calcutta.
2. Zimmerwan- World resources and industries
3. Khanna K.K. and Gupta V.K (1993) Economic and Commercial Geography, Sultan Chand, New Delhi.
4. Mallappa P. (2004) UdyamSaupahmagalu, Chetan Book House, Mysore
5. Roy. PR. (2001) Economic Geography- A study of Resources, New Central Book Agency, (p) ltd. Calcutta.
6. P. Hagget (1997), Geography, A Modern Synthesis, Haper and Roo publications, New York.
7. Dubey RN. And Negi BS (2002)- Economic Geography of India, Kitabmahal, Allahabad.
8. http://www.nationmaster.com/graph/geo_nat_res-geography-natural-resources

III SEMESTER
Paper: 3.1 (B) World Geography

Teaching Hour: 52

Unit – 1

Eurasia - Physiography: Mountains, Plateaus, Plain, Coastal Areas, Deserts, Rivers. Issues and Challenges: Drinking Water and Water Sharing; Malnutrition; Outbreak of Viral Diseases; Antisocial Activities – Terrorism; Population Issues – Gender Discrimination, Age-related Population Pyramid.

Unit – 2:

America – Physiography: Mountains, Plateaus, Plain, Coastal Areas, Deserts, Rivers. Issues and Challenges: Drinking Water and Water Sharing; Malnutrition; Outbreak of Viral Diseases; Antisocial Activities – Terrorism; Population Issues – Gender Discrimination, Age-related Population Pyramid.

Unit – 3

Africa – Physiography: Mountains, Plateaus, Plain, Coastal Areas, Deserts, Rivers. Issues and Challenges: Drinking Water and Water Sharing; Malnutrition; Outbreak of Viral Diseases; Antisocial Activities – Terrorism; Population Issues – Gender Discrimination, Age-related Population Pyramid.

Unit – 4

Oceania – Physiography: Mountains, Plateaus, Plain, Coastal Areas, Deserts, Rivers. Issues and Challenges: Drinking Water and Water Sharing; Malnutrition; Outbreak of Viral Diseases; Antisocial Activities – Terrorism; Population Issues – Gender Discrimination, Age-related Population Pyramid.

References:

1. Majid Husain., 2004.,World Geography.,RawatPublications.,Jaipur., India.
2. Qazi S.A., NavaidShabirQazi., 2007., Geography of the World., APH Publishing Corporation., New Delhi., India.
3. Prajapathi R.V., 2008.,Encyclopedia of World Geography., Cybertech Publications., New Delhi., India.

III SEMESTER
Paper:3.2(A) Urban Geography

Teaching Hour: 52

Unit 1

Nature of Urban Geography-Definition of Urban Settlements (Towns, Cities and Metropolitan.); Census concept of urban areas, Urbanization through times; Current Factors, Trends of Urbanization in the World and India.Growth of the World and Indian lading cities.Problems of urbanization & remedies.National urbanization policy. -13

Unit 2

Urban fringe; city region; primate city; Urban Population Density and Land Value Curves-Urban Land Use – Vertical and Horizontal Growth of Cities, Concentric, Zonal and Multiple Nuclei Theories of Urban Structure.smart cities and satellite towns. - 13

Unit 3

Urban Functions- Basic and Non-Basic; Hierarchical patterns of Indian cities; - Rank-Size Rule; Central Place Theory; Functional Classification of Towns by C.D. Harris and H.J. Nelson. Urban Issues & Challenges: Water supply, traffic congestion, solid waste, smog, sewage and drainage system. Ecological process of urban growth. - 13

Unit 4

Concept of City, Region and Urban Hinterland – Urban Sprawl- Urban Slums & urban housing – Urban Crimes and their Trend s with reference to India; Concept and Issues of Peri-Urbanization. Elements of Urban Planning – Urban Renewal – Policies of Urban Development in India – Master Plans CDP of Bangalore 2015.Sustainable development of cities. -13

References:

1. Beanjen-Garnier J&G. Chabot (1967) Urban Geography, Jhonwiley, New York.
2. Northham Ray M. (1975) Urban Geography, Jhon Wiley & Sons, Inc. New York
3. RananPaddison (2001) Hand Book or Urban Studies, University of Glasgow, U.K., Sage Publications, New Delhi.
4. Peter Roberts (2000) Urban Regeneration, University of Dundee, U.K., Sage Publication, New Delhi.
5. SaskiaSassen (2000) Cities in a World Economy, University of Chicago, USA, Sage Publications, New Delhi.
6. Stephen Ward (2004) Planning and Urban Change, Sage Publications, New Delhi
7. Karen Stromme Christensen (1999) Cities and Complexity, University of California, Berkely USA, Sage Publication, New Delhi.
8. Mayer H.M. & Kohn CF (1967) Urban Geography, Central Depot, Allahabad, India
9. King Leslie J. &Regionald G. Golledge (1978) Cities, Space and Behaviour 0 The Elements of Urban Geography, Pentice-Hall, Inc. Englewood Cliffs, New Jersey, USA.
10. Mandal R.B. (2002) Urban Geography – A Text Book, Concept Publishing Company, New Delhi.
11. Siddartha K & S. Mukarjee (1996). Cities, Urbanization and Urban Systems, Transworld Media and Communication Pvt. Ltd. New Delhi
12. Johnson James H (1966) Urban Geography – An Introductory Analysis, Pergamon Press Oxford, London
13. www.geography.about.com/cs/cities/urbanl/geo/
14. www.brixworth.demon.co.uk/leeds/

III SEMESTER
Paper: 3.2 (B) Political Geography

Teaching Hour: 52

Unit 1

Definition, scope and nature of Political Geography; Approaches to the study of Political Geography: Whittlesey's law-landscape Approach, Hartshorne's Functional Approach, Gottmann's Political partitioning model, Jone's Unified field theory: Idea-area chain; Political Systems Model: Contemporary relevance to these approaches, Soja's Analysis of Political systems, Wallerstein's World-Systems Approach; Recent trends in Political Geography; Concept of nation and state; geopolitics; politics of world resources. -13

Unit 2

Geography and Federalism; political regions of the world; nature and administrative area and geography of public policy and finance; resource development and international politics; Geographical basis of Indian federalism. Frontiers & Boundaries: Concept of Frontiers, Boundaries, Distinction between Boundaries & Frontiers. The International Boundary of India & related issues. -13

Unit 3

Global strategic views: Heartland Theory, Rimland theory & Mahan's Sea Power concept. State reorganization; regional consciousness and national integration. The international boundary of India and related issues; India and geopolitics of the Indian Ocean. -13

Unit 4

India's Political Aspects: State reorganization; Emergence of new states; Regional consciousness and interstate issues; Cross border terrorism; India's role in world affairs; Geopolitics of South Asia and Indian Ocean Realm. Electoral Geography: Trends in Electoral Geography, Geography of Voter participation, Regional Stability, Regional Realignment, Contextual Effect, A Systems model for electoral geography, A revised model of electoral Geography. -13

References:

1. Adhikari; Political Geography; Rawat Publications
2. Alexander L.M. 1963; The World Political Pattern (2nd Edition), Chicago, Rand McNally.
3. Bergman E. 1975; Modern Political Geography, Iowa.W.M.C. Brown Co-publisher.
4. Carlson. I 1971; Geography and World Politics (India Edition), Dehradun, Patil&Datt.
5. deBlij. H.J. 1972; Systematic Political Geography, NewYork, Wiley
6. Dikshit, R.D. 1982; Political Geography A contemporary Perspective, New Delhi. Tata McGraw Hill Publishing company.
7. Dwivedi R.L. 1990; Fundamentals of Political Geography. Allahabad, Chaitanya Publishing House.
8. Norris. R.E and Harring L.L. 1980; Political Geography, London Charles E Merrill Publishing Company.
9. Taylor P.J. 1985; Political Geography. World Economy, Nation-State and Locality, London, Longman.

III SEMESTER
Paper: 3.3 (A) Population Geography

Teaching Hour: 52

Unit 1

Nature and Scope of Population Geography, Population Geography and Demography, Sources of Population Data. Density and Distribution of Population, Distribution and its Pattern in the World, Factors Influencing Distribution of Population in the world. - 13

Unit 2

Population Change: Concept of over, under & optimum population; Growth of Population in the World and India, Components of Population Change, Fertility, Mortality and Migration. Determinants of Fertility and Mortality, Demographic Transition Theory. -13

Unit 3

Migration- Meaning & Types, Causes & Consequences, Theories of Migration Ravenstein & Lee. Population composition of world with special reference to India, Age, Sex composition; Population dividend. -13

Unit 4

Population and Resources, Population Resource Regions, Malthus Population Theory, Population Policy of India. Policy issues; Social well-being and quality of life; population as a social capital. Contemporary Issues – Ageing of Population; Declining Sex Ratio; HIV/AIDS. -13

References:

1. Chandna R.C. (2009), Geography of Population, KalyaniPublicishers, Aneari Road, Daryaganj, New Delhi-2.
2. MajidHussain (1999), Human Geography, Rawat publications, Jaipur.
3. Trewartha GT. (1959) A Geography of Population, world Patterns, John Wiley and Sons Inc. New York.
4. Ghosh BN. (1987) Fundamentals of population Geography s, sterling publishing company, New Delhi
5. Jingham ML. B.K. Bhat, JN Deasi (2003) Demography, Urinda Publishers Pvt. Ltd. Delhi.
6. R.K. Tripathi ((2000) Population geography, commonwealth publishers, New Delhi.
7. Kayastha SL. (1998) Geography of Population, Rawat publications, jaipur.
8. Clerk I (1984) Geography of populations, approaches and applications, pergamon press, Oxford, UK.

III SEMESTER
Paper: 3.3 (B) Industrial Geography

Teaching Hour: 52

Unit 1

Nature, Scope and content of Manufacturing Geography, Factors of Localization of Industries, Centralization and Decentralization of Industries. History of industrial development, study of mineral-based, agro-based and forest-based industries. -13

Unit 2

Factors of localization, Location of Industries with special reference to Cost Structure of Land, Labour, Capital and Transportation; Resource based and footloose industries; Scale of External Economies and Historical Accidents. -13

Unit 3

Classification of Industries; Theories and Models of Industrial Location: Weber, Losch, Isard and Hoover. Methods of Delineating Manufacturing Regions: Industrial Regions of the World; Industrial policy. World industries and their patterns; industrial decentralization and industrial policy; industrial complexes and industrial regionalization of backward areas and rural industries. Information Technology industries and development. -13

Unit 4

Industry: Evolution of industries; Revolution of industries; Industrial houses and complexes including public sector undertakings; Industrial regionalization; Multi-nationals and liberalization, Special economic zones; Tourism including eco-tourism Industrial Hazards: Air, Water, Land and its Impact on Health & Occupation. Role of Globalization on Industrial Sector, Application of Remote Sensing in Industrial Geography. -13

References:

1. Alexanderson & Gunnar (2000) Geography of Manufacturing, prentice Hall, Englewood Cliffs, N.J.
2. Jarett H.R. (1983) Manufacturing Geography, Mac Donald Xemolds, London.
3. Riley R.C. (1983), Industrial Geography, Chatto&Windus Publications, London.
4. Miller E. (1979) A Geography of Manufacturing, Prentice Hall, Englewood Cliffs, N,J.
5. Smith (1978) Industrial Location, Prentice Hall, Englewood Cliffs, N.J.
6. www.countrystudies.us/united-states/geography-11.html
7. www.homepages.wmich.edu/~jyin/ch7ptl.pdf
8. www.utexas.edu/depts/grg/sanders/GRG305/industrial_geography.hrml

III SEMESTER

Practical: 3.4 Interpretation of Aerial Photography and Satellite Images

Teaching Hour: 52

Exercise No	Title of the Exercise(Total 52 Hrs)
1	Comparison of features in Toposheets and Aerial Photographs
2	Comparison of features in Aerial Photographs and Satellite imageries.
3	Comparison of features in Toposheets and Satellite imageries
4	Determination of Aerial Photo scale
5	Procedures of acquiring Aerial Photographs
6	Types of Aerial Photographs
7	Medium of Aerial Photographic Interpretation
8	Test for Stereographic View
9	Elements of Aerial Photographs
10	Stereographic Interpretation of Aerial Photographs
11	Manual Preparation of Land Use Maps
12	Interpretation of Satellite Imagery
13	Identification of features through signatures, color identifications
14	Preparation of Thematic maps using the satellite imagery
15	Interpretation Methods

References:

1. Paul R. Wolf (1999) Elements of photogrammetry, Mc. Grawhill, International Book Company, New Delhi.
2. Averte and GL. Berrin (2001) Fundamentals of Remote Sensing and Aerial Photo interpretation McMillan, New York.
3. Singh and Sharma (2004) Introduction of Remote Sensing, Rawath Publications, New Delhi
4. George Joseph (2002) Fundamentals of Remote Sensing, University press Pvt. Ltd. Hyderabad-29
5. A Verte and GL. Berrin (2001); Fundamentals of Remote Sensing and Aerial Photo Interpretation, Mc. Millan, New York.

**III SEMESTER
Practical 3.5 GIS**

Teaching Hour: 52

Exercise No	Title of the Exercise(Total 52 Hrs)
1	GIS Interpretation Procedure
2	Measurement of Scales Nominal, Ordinal and Ratio
3	Extraction of Geographical features through toposheets
4	Vector Data Model
5	Raster Data Model
6	Cartesian Coordinates System
7	Spagathi Model
8	TIN
9	Buffering
10	Overlay analysis
11	Rainfall Variability and Intensity Map
12	Tourism Interest Maps
13	Model Creation
14	Identification of Rocks
15	Identification of Minerals

References:

1. Agarwal, C.S. and Garg, P.K. 2000. Textbook of Remote Sensing in Natural Resources Monitoring and Management. New Delhi: Wheeler Publishing.
2. Avery, T.E. 1985. Interpretation of aerial Photographs. Minneapolis, Minnesota: Burgess Publishing Company.
3. Bakker, Wim H., et al. 2001. Principles of Remote Sensing – An Introductory Textbook. Enschede, The Netherlands: ITC.
4. Banerjee, R.K. and Banerjee, B. 2000. Remote Sensing for Regional Development. New Delhi: Concept Publishing Company.
5. Campbell, James B. 1996. Introduction to Remote Sensing (Second Edition). London: Taylor & Francis.
6. Colwell, Robert N. (ed.) 1983. Manual of Remote Sensing, Second Edition, Volume 1 and 2. Falls Church, Virginia: American Society of Photogrammetry.
7. Gibson, Paul J. (2000). Introductory Remote Sensing – Principles and Concepts. Routledge.
8. Jensen, John R. 2000. Remote Sensing of the Environment – An Earth Resource Perspective. Pearson Education (First Indian Edition, 2003).
9. Hord, R. Michae I. 1986. Remote Sensing – Methods and Applications. (A Wiley-Interscience Publication). New York: John Wiley & Sons.
10. Lillesand, T.M., Kiefer, R.W., and Chipman, J.W. 2004. Remote Sensing and Image

III SEMESTER
Practical 3.6 Open Source GIS

Teaching Hour: 52

Exercise No	Title of the Exercise(Total 52 Hrs)
1	Introduction to Spatial Analysis and Working with Software
2	Geo-referencing and Projecting Raster Data
3	Crating Vector Data Model and Projecting
4	Digitizing – Point, Line and Polygon
5	Special Digitizing features adjoining polygon, split and joining
6	Creating Attributes – Character, Numbers and Float
7	Labeling Special features
8	Symbology and Typography
9	Map Layout and Exporting Map in Different Format
10	Unique Symbol Maps – Dot, Classified, Unique Value
11	Cartographic Maps – Choropleth, Bar, Pie and Stacked
12	Query Building and Executing
13	Buffer Analysis
14	Overlay Analysis
15	Interpreting Spatial Analysis Maps

References:

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

III SEMESTER
Practical: 3.7 Techniques in Human Geography

Teaching Hour: 52

Exercise No	Title of the Exercise(Total 52 Hrs)
1	Network Analysis: Alfa, Beta and Gama indices
2	Accessibility Matrices: 'C' Matrix
3	Accessibility Matrices: Shortest Path Matrix.
4	Nearest Neighbour Analysis
5	Location Quotient
6	Rank Size Relationship
7	Functional Classification of Towns
8	Analysis of Crop combination and Mapping – J.C. Weaver's Method
9	Analysis of Crop combination and Mapping - Doi's Method
10	Analysis of Crop combination and Mapping - Rafiuallah's methods
11	Crop Diversification
12	Crop Intensity
13	Index of Diversification,
14	Population Potential
15	Centrographic Analysis

References:

1. AslamMohamood (1977) Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi
2. Gupta C.B. (1979) An Introduction to Statistical Methods, Vikas Publishing House Pvt. Ltd. New Delhi.
3. Toffe R. Transportation Geography, Prentice Hall Publication, New York

III SEMESTER
Paper 3.8: Geography for All

Teaching Hour: 52

Unit 1

Physical Setting of India: Location, Physiographic Divisions, Natural Drainage Systems and their Distribution. Climate: seasons & climatic regions. Soils: Types, Distribution, Erosion and Conservation. Natural Vegetation: Types & Distribution, Degradation and Conservation. – 13

Unit 2

Agriculture: Major Agricultural Crops: Rice, Wheat, Cotton, Sugarcane, Maize, Jowar, Tea, Coffee, Rubber, Mulberry Crops. Green Revolution in India, and Food Security in India. Irrigation: Major River Projects. -13

Unit 3

Distribution, production and trade of important Minerals & Power resources: Iron Ore, Manganese, Mica, Copper, Bauxite, Coal, Petroleum, Natural Gas, Atomic Energy, **Hydal** and Thermal Power. Growth, Development and Distribution of Major Industries: Iron & Steel, Engineering, Cement, Paper, Fertilizers, Cotton Textiles, Silk, Knowledge-based Industries: Industrial Regions of India. -13

Unit 4

Growth & Development of Transportation. **Transport System:** Roads, Railways, Airways and Inland Water. Population: Growth and Distribution, Composition and Density, Literacy, Sex Ratio, Fertility & Mortality & Health Services. - 13

References:

1. Khullar DR. (2009): India: A Comprehensive Geography, Kalyani Publishes, New Delhi, Hyderabad, Kolkata.
2. AlkaGautam (2009) Geography of India, Sharadapustakbhawan, University Road, Allahabad – UP.
3. Sharma TC & Coutinho O (2005) : Economic and Commercial geography of India, Vikas Publishing House Ltd., New Delhi-14
4. Tiwari RC. (2008) Geography of India, PrayagpustakBhavan, 20-A, University Road, Allahabad- UP
5. Pritivish Nag & Smitasengupta (1992) Geography of India, Concept Publishing Company, New Delhi – 59.
6. Ranganath (2007) Geography of India, VidhyanidhiPrakashan, Station Road, Gadag-01.
7. PhaniDeka & AbaniBhagabati (1992) Geography: Economic and Regional, Wiley Eastern Limited, Ansari Raod, Daryaganj, N. Delhi-01.
8. Majid Husain (2008): Geography of India, Tata Mc. Graw hill publishing co. ltd. N. Delhi.
9. Singh R.L. (1971); India A Regional Geography, National Geographical Society of India, Varanasi, UP.
10. Jadish Sing (2003): India: A comprehensive systematic geography, GyanodayaPrakashanGorakhpur- UP.
11. India: Year Books- 2005-2010.
12. <http://www.mapsofindia.com/geography/>

IV SEMESTER
Paper: 4.1 Regional Planning and Development

Teaching Hour: 52

Unit 1

Regional concept in Geography: Types, hierarchy and characteristics of regions, Delineation methods of regions – Formal, Functional and Nodal. Geography and regional planning. Concept and scope of Regional Planning. Regional Approaches. Principles, methods, techniques of regional planning, need for planning. -13

Unit 2

Conceptual and theoretical frame work of regional planning: Growth pole and growth foci. Planning Processes: Sectoral, Multilevel, decentralized planning. Integrated Area Development Planning (IADP). Planning for tribal and hilly areas, drought prone areas, command areas and watershed. Planning for metropolitan region: CDP, satellite towns, urban green belt. - 13

Unit 3

Concept of Development, Indicators of development. Regional imbalance. Regional development strategies. Problems and issues in regional planning. Planning for sustainable development. Regionalization of India: Based on natural, economic and administration (macro and meso levels only). Regional policies in Indian five-year plans, experience of regional planning in India; Evolution, nature and scope of town planning with special reference to india; fundamentals of town and country planning. - 13

Unit 4

Theories of regional development: Central Place Theory, Diffusion theory (Hegerstand's). The role of locational theories in regional planning process. An evaluation of regional disparities / imbalances – backward regions of India. Identification of backward areas, Planning backward area. Causes and consequences regional of disparities. Measures of disparities. Harnessing the information through GIS, Remote Sensing, GPS for regional planning and development. - 13

References:

1. Tiwari R. C. (2005) Geography of India, PrayougPustakBhavan, Allahabad
2. Singh Jagadish (2003) India – A Comprehensive Systematic Geography, GyanodayaPrakashan, Gorakhpur, U.P.
3. Mishra RP (1969) Regional Planning Concepts Techniques Policies and case studies, Prasaranga, The Mysore University, Mysore.
4. V.K.R.V. Rao (1978). Planning in Perspective, Allied Publishers Private Limited, Bombay.
5. Mahesh Chand and Viney K. Puri (1985)n Regional Planning in India, Allied Publishers Pvt. Ltd., Bombay
6. Mishra R.P. (1979) Regional Planning and National Development, Vikas Publishing House Pvt. Ltd., New Delhi.
7. Laxmidevi (1997) Planning Development and Regional Deisparities, Anmol Publication Pvt. Ltd., New Delhi.

IV SEMESTER
Paper: 4.2 (A) Agriculture & Food Security

Teaching Hour: 52

Unit 1

Origin & Evolution of Agriculture; Determinants of Agriculture: Physical, Socio-Economic, Cultural, Institutional, Technological and Political. Agriculture system of the world Bio-fuel cultivation and extraction; recent trends in organic farming and foam mechanization; farming systems and sustainability. - 13

Unit 2

Land Holding and Land tenure Systems, Land Use Policy and Planning, Irrigation and Dry-farming; social forestry; agro-forestry; post-harvest technology and value addition; importance of horticulture and floriculture; high-tech horticulture (green / poly house cultivation). - 13

Unit 3

Measures of Agriculture: Cropping Pattern, Crop Combinations, Crop Diversification, Intensity of Cropping, Degree of Commercialization, Measurement of Agricultural Efficiency and Productivity, HYV seeds. Classification of Agriculture: Whittlesey's Classification of world Agriculture, Von-Thunen's Theory of Agriculture and its relevant modifications, Game Theory & Decision Making. Role of WTO in Agriculture. Food quality standards; food laws and regulations; National Agricultural Research System (NARS); Commercialization and globalization of agriculture. - 13

Unit 4

Agriculture regionalization; agro-ecological regions; Phases of Green revolution, White revolution, Blue revolution, Yellow revolution; Remote Sensing & Agriculture. Emerging Impact on Agriculture: Food Security, salinization and land degradation. Employment in Agricultural Sector, Use of Modern Technologies. Population explosion and food security; problems of agrarian and industrial unrest. - 13

References:

1. Mohammad Shafi (2006): Agricultural Geography, Dorling Kindessley (India) Pv. Ltd. New Delhi.
2. Negi. B.S. (2003) Indian Agriculture: problems, Progress & Prospects, Vikas publishing house Pvt. Ltd. S. Ansari Road, Daryagani, New -Delhi-2.
3. MajidHussain (2000): Agricultural Geography, Ed Anmol Publishing Pvt. Ltd. Ansari Road, Daryagani, New Delhi-2.
4. Shafi M. (1999): Agricultural Geography, Kedarnath Ram Nath, 132, RG College road, Meetat UP-1.
5. Singh &Dhillion (2000): Agricultureal geography, PrayogPustakBhavan, 20 A, University road, Allahabad-211002, UP.
6. Jasbirsingh (2001): Agricultureal geography, PrayogPustakBhavan, 20 A, University road, Allahabad-211002, UP
7. Memonia CB (1998): Aricultural Problems in India: PrayogPustakBhavan, 20 A, University road, Allahabad-211002, UP.
8. Majid Husain (2007): Systematic Agricultural Geography, Rawat publications, Jawahar Nagar, Jaipur, New Delhi – 92.
9. Goh Cheng Leong & Gillian C. Morgan (2009): Human and Economic Geography, Oxford University Press, New Delhi, New York.
10. The Hindu Publications: 2005 to 2010; Survey of Indian Agriculture.

IV SEMESTER
Paper: 4.2 (B) Economic Geography

Teaching Hour: 52

Unit 1

Nature, Scope and importance of Economic Geography, Location of economic activities and spatial organization of economies; Sectors of economy: Primary, secondary, tertiary and quaternary. Economy and economic Geography. - 13

Unit 2

Primary Economic Activities: Hunting, Fishing, Food gathering, Herding, Timbering, Agriculture and Mining. Commercial Economic Activities: Dairying, Mixed Farming, Poultry, and Plantations. Fishing and Forestry: Law of the sea, fishing grounds and aquaculture. Issues and challenges for the development of fishing and forestry. -13

Unit 3

Knowledge-based Technologies: Electronic age, Spatial Information Technology, Telecommunication, High tech-transport, Effects of Liberalization, Privatization and Globalization (LPG) on Economic activities in the World and India. -13

Unit 4

Economic Development: Growth and Development, Definition, Concept, Contents of Development and Sustainable Development. Human Resource Development: Concept, Measurement, Indicators and Components. Energy crisis; the limits of the growth. Human Development Index (HDI) at global, National and regional level. - 13

References:

1. Alexander (1975): Economic Geography.
2. Guha J.L. and Chattoraj (2004), A New approach to economic geography, A study of resources, the world Press pvt. Ltd. Calcutta.
3. Zimmerwan- World resources and industries
4. Khanna K.K. and Gupta V.K (1993) Economic and Commercial Geography, Sultan Chand, New Delhi.
5. Mallappa P. (2004) UdyamSaupahmagalu, Chetan Book House, Mysore.
6. Roy. PR. (2001) Economic Geography- A study of Resources, New Central Book Agency, (p) ltd. Calcutta.
7. P. Hagget (1997), Geography, A Modern Synthesis, Haper and Roo publications, New York.
8. Dubey RN. And Negi BS (2002)- Economic Geography of India, Kitabmahal, Allahabad.
9. http://www.nationmaster.com/graph/geo_nat_res-geography-natural-resources

IV SEMESTER
Paper: 4.3 (A) Geography of Tourism

Teaching Hour: 52

Unit 1

Geography of Tourism: Definition, Nature, Scope and Extent. Concept of Tourism, Importance of Tourism. Relationship between Geography and Tourism, Tourism Promotion– Ecotourism, Agro-tourism, Heritage tourism and Adventure tourism. Factors affecting **Tourism** – Physical and Cultural factors. Tourism motivation, tourism as an industry. -13

Unit 2

The Classification of Tourism and Tourists: Types of Tourism – Domestic and International Tourism - Adventure, Wildlife, Medical, Pilgrimage, Business, Leisure, Pleasure, Eco and Cultural Tourisms. Comparison between Mass and Alternative Tourism. **Tourists types** – Local, National and International. Impact of Tourism– Economic Impact, Physical and Environmental Impact, Socio-Cultural Impact. - 13

Unit 3

Infrastructural Approach for the development of Tourism – Mode of transportation, Agencies, Guides, License, Hotels, Resorts, Youth Hostels, Home stays, Govt. TB,. Role of Foreign Capital and Impact of Globalization on Tourism, Environmental Law and Tourism Government Policies for Planning and Promotion of Tourism in India. State level tourism planning in India with special reference to Karnataka. - 13

Unit 4

Case Studies – Major Tourist Centers. **Hill Station** – Mount Abu, Shimla, Kudhuremukha. **Beach Points** – Mangalore, Vizag, Pangim, Marino Beach. **Historical centers** – Badami, Bijapur, Mysore, Ellora and Tajmahal. **Religious Centers** – Shiradi, Kanyakumari, Tirupathi and Dhamastala. **Dams** - T B Dam, Bhakranagal, DVP. **National Parks** – Dachigam National Park, Gir National Park, Nanda Devi National park, Periyar National park. -13

References:

1. Bhatia A.K (1996): Tourism Development: Principles and Practices. Sterling Publishers, New Delhi.
2. Inskip. E (1991): Tourism Planning: An Integrated and Sustainable Development Approach Van.
3. Kaul R.K (1985): Dynamics of Tourism and Recreation, Inter- India, New Delhi.
4. Kaur, J. (1985): Himalyan Pilgrimages and New Tourism, Himalyan Books, New Delhi
5. Lea, J. (1988): Tourism and development in the third world
6. Milton, D. (1993): Geography of World Tourism, Prentice Hall, New York
7. Peace, D. G. (1987): Tourism To-Day: A geographical Analysis, Harlwo, Longman
8. Robinson, H. A.(1996): A geography of tourism, McDonald and Evans, London
9. Sharma, J. K. (ed.)(2000) : Tourism, Planning and Development- A new perspective, Kanishka
10. Singh, R. L. and KashiNath Singh (Ed.) 1975: Readings in Rural Settlement Geography, National Geographical Society of India, Varanasi.

IV SEMESTER
Paper: 4.3 (B) Environmental Geography

Teaching Hour: 52

Unit 1

Nature and Interdisciplinary Aspect of Environmental Geography. Ecological Approaches. Definition and Meaning of environment. Habitat. Ecological Niche. Bio-sphere and Biodiversity; bio-diversity and sustainable development. Biomes – Equatorial to Tundra i.e 11 types. Man and Environmental Relationships. -13

Unit 2

Ecosystem: Structure and Functioning of Ecosystem, Pond as an Ecosystem, ecosystem management and conservation; Principle of ecology; human ecological adaptation; influence of man on ecology and environment; global and regional ecological change & imbalance. Food Chains, Food Webs, Food Pyramid. Resource Use and Ecological Imbalance with reference to Soil, Forests and Energy Resources. - 13

Unit 3

Man Induced Changes in Environment: Environmental Pollution, i.e. Air, Water, Noise, Solid Waste with special reference to India. Environmental Hazards, i.e. earth as Warehouses, Flood, Famines, Land Slides, Avalanches, Forest Fires, Impact of Green revolution and Extinction of Species. Man Made Ecosystem - Urban, Ecotourism, National Parks and Sanctuaries. Depletion of Ozone, Green House Effect and Acid Rain. - 13

Unit 4

Principles of Environmental Management- Environmental Policy of India, (post 2000 AD). Environment Impact Assessment (EIA). Global Summits & Agencies of Environment Conservation. Environmental degradation, management and conservation; Problems of deforestation and conservation measures; major gene pool centres. Environmental policy; environmental hazards and remedial measures; Environmental education and legislation. - 13

References:

1. Strahler A.N. (1968) The Earth Sciences, Harper International Education, New York.
2. Richard H.B. (2004) Physical Geography, Heinmann Simple Services, Rupa & company, New Delhi
3. Robinson H. (1982) Bio Geography, ELBS, New York.
4. Healey I.N. and Moore P.D. (1973) Bio-Geography, Backwell Oxford, U.K.
5. Strahler A.N. and Strahler A.H. (1973) Environmental Geo Science, Hamilton, California, USA.
6. Savindra Singh (2004) Environmental Geography, PrayogPustakBhawan, Allahabad, India.
7. Paul Selman (2000) Environmental Planning, Sage Publications, New Delhi
8. Cheryl Simon Silve and Ruth S. De Fries (1991) One Earth One Future-Our changing Global Environment, National Academy of Sciences, Affiliated to East West Press Pvt. Ltd. New Delhi.
9. Strahler A.N. and Strahler A.H. (1977) Geography and Man's Environment, John Wiley & Sons, New York
10. Goldsmith Edward et al. (1988) The Earth Report – The Essential Guide to Global Issues, Price Stern Solan Inc. California, USA

IV SEMESTER
Paper: 4.4 (A) Cultural Geography

Teaching Hour: 52

Unit 1

Nature and scope of Cultural Geography; Concept of Culture and cultural areas; Elements of Culture, Convergence and Divergence of Culture; Cultural Change. Cultural Diversity: emergence of man and races of mankind; cultural revolution of man. - 13

Unit 2

Human Races; Caucasoid, Mongoloids and Negroids; World's Major Regions; Major Languages of the World; India's Cultural Regions. Major cultural realms of the world; Dwelling place as cultural expressions. Ethnic Groups, Case Study, Bushman, Pygmies and Eskimos; Theories of tribal groups; Tribal areas and their problems; Tribals of India; Economy and society of tribal groups. - 13

Unit 3

Concept of Social Well-Being: Cultural Indicators; historical perspectives on unity and diversity; religion and secularization. Industrialization and its Impact on Culture and Modernization Broad Features and Impact on Culture. - 13

Unit 4

India's Cultural Setting: Historical perspective of of Indian Society; Racial, linguistic and ethnic diversities; religious minorities; Major tribes, tribal areas and their problems; Cultural Regions; Growth, distribution and density of population; Demographic attributes; Sex ratio, age structure, literacy rate, work-force, dependency ratio, longevity; Inter-regional, intra-regional and international migration and associated problems; Population problems and policy; Health indicators. - 13

References:

1. Robestein J.H. & Robert S. Barren (1990) the cultural Landscape An Introduction to Human Geography, Prentice Hall of India Pvt. Ltd. New Delhi – 1
2. Singh R.Y. (2003) Geography of Settlements. Rawat Publications, Jaipur.
3. Hussain M. (1999) Human Geography, 2nd Edition, Rawat Publication, Jaipur
4. TirthaRanjit (2002) Geography of India 2nd Edition, Rawat Publication, Jaipur
5. www.fortunecity.com/victorian/updike/188.culture.html
6. www.utexas.edu/depts/grg/sanders/GRG305/industrialgeography.html

IV SEMESTER
Paper 4.4 (B) Natural Disaster Management

Teaching Hour: 52

Unit 1

Environment hazards & disasters: Meaning & approaches, Causes and consequences of disaster: Physical, economic and cultural, National and International organizations into disaster management. **Types of environmental hazards and disaster:** Natural disaster- Earthquake, tsunamis, landslides, volcanic eruption, cyclones, tornados, floods, droughts, heat waves and cold waves. Man induced hazards- Soil erosion, release of toxic chemicals, nuclear explosion, population explosion and resultant environmental disasters. -13

Unit 2

Emerging approaches to Disaster management: (1) Pre-disaster stage (Preparedness)- hazard zonation maps-predictability and forecasting warning, land use zoning, Information, Education & Communication (IEC) Disaster resistance house construction, Population reduction in vulnerable area and awareness. (2) Emergency Stage- Rescue training for search and operation at national and regional level, ground management plan preparation, immediate relief, Assessment surveys. (3) Post disaster stage rehabilitation – Political administrative aspects, social aspect, economic aspect, cultural aspect and environmental aspects. -13

Unit 3

Natural Disaster mitigation: Relief measure, role of GIS in Relief measures, role of GPS in search and rescue, role of Remote sensing in prediction of hazards and disasters, measures of adjustment of natural hazards. -13

Unit 4

Disaster in Indian context: A regional survey of Land Subsidence, Coastal Disaster, Cyclonic Disaster & Disaster in Hills, terror attacks, communal clashes, Remedial measures. National and international policies for disaster management. - 13

References:

1. R.B.Singh (Ed) ,1990, Environmental Geography, Heritage Publishers New Delhi
2. Savinder Singh,1997, Environmental Geography, PrayagPustakBhawan.
3. Kates,B.I& White,1978, G.F The Environment as Hazards, oxford, New York.
4. R.B. Singh (Ed), 2000,Disaster Management, Rawat Publication, New Delhi.
5. H.K. Gupta (Ed), (2003),Disaster Management, Universiters Press, India.
6. R.B. Singh,(1994),Space Technology for Disaster Mitigation in India (INCED), University of Tokyo.
7. Dr. Satender, (2003), Disaster Management t in Hills, Concept Publishing Co., New Delhi.
8. A.S. Arya Action Plan For Earthquake, Disaster, Mitigation in V.K. Sharma (Ed) (1994),Disaster Management IIPA Publication New Delhi.
9. R.K. Bhandani An overview on Natural &Man made Disaster & their Reduction ,CSIR, New Delhi
10. M.C. Gupta, (2001),Manuals on Natural Disaster management in India, National Centre for Disaster Management,IIPA, New Delhi.

IV SEMESTER
Practical: 4.5 Analysis of Climatic Data

Teaching Hour: 52

Exercise No	Title of the Exercise (Total 52 Hrs)
1	Climate and Weather – Measurements units
2	Diagram of Weather and climate instruments
3	Climatic graphs: Introduction, Types
4	Hyther-graphs
5	Climo-graphs
6	Ergo-graph.
7	Thermo-isopleths
8	Rainfall distribution and Dispersion
9	Rainfall variability
10	Classification of climate :a) Application of Koppen's method of climatic classification
11	Classification of climate :b) Application of Thornthwaite's scheme of classification of climates -- water budget, moisture index.
12	Construction of water budget diagram using Precipitation & potential evapotranspiration data
13	Monsoon Map – Distribution of Rainfall
14	World Climatic Zones
15	Indian Climatic Zones

References:

1. Ashishsarakar: Practical Geography A systematic approach. Orient Longman Limited, Kolkatta.
2. Critchfield: Principles of Climatology.
3. Lawrence,G.R.P.: Cartographic methods.Mathur co., London
4. Mather J.R. (1974) Climatology, Fundamentals and applications. Mc Grew Hill Book co., New York
5. Monkhouse, F.J.R and: Maps and Diagrams, Wilkinson, H.R. Methuen and Co. London.
6. R.L.singh&Ranap.B.Singh: Element of Practical Geography. Kalyani Pub. New Delhi (1999).
7. Trewartha G.T.: An Introduction to climate McGraw – Hill Book Co. New York.

IV SEMESTER
Practical: 4.6 Analysis of Socio - Economic Data

Teaching Hour: 52

Exercise No	Title of the Exercise (Total 52 Hrs)
1	Graphs and Diagrams of socio-economic data
2	Types of Graphs and its importance
3	Simple Line and Bar Graphs
4	Compound Bar Graph
5	Graphs-Triangular Graphs,
6	Semi-log Graphs
7	Log-log graphs
8	Population Pyramid or Age sex Pyramid
9	Rank Size Rule
10	Industrial Diversification - Hierarchy of Industrial centers
11	Gravity model
12	Cumulative graph
13	Deviational graph
14	Scatter diagram
15	Logarithmic & Semi-logarithmic graphs

References:

1. Lawrence, G.R.P. (1973): Cartographic methods, Methuen & Co. London.
2. Mishra, R.P. (1982): Fundamentals of cartography, Prasaranga, University of Mysore.
3. Monkhouse, F.J.R & Wilkinson, H.R: Maps & diagrams, Methuen & company, London.
4. Raisz, Erwin: Principles of cartography, McGraw – hill Book Co., New York.
5. Robinson A.H. & Sale R.D. Element of Cartography, John House & Sons Ltd., London.
6. Singh R. L.: Elements of Practical Geography.

IV SEMESTER

Practical: 4.7 Field Study Tour & Viva-voce

Field Study Tour is a part of curricula in M.Sc. IV Semester. Study tour is compulsory and to be conducted between end of the III Semester and in the beginning of the IV Semester for a duration of two weeks. Study tour report submission is compulsory. Students are required to go to the Field Study Tour which is an exploratory topic of geographical importance based on empirical evidences.

At least five places of geographical importance in India like **Western Ghats, Aravali Range, Coastal Area, Northwestern Desert, Northern Plain and Himalayan Region and cities located in these regions** have to be selected and visited. The detailed geographical, geological, environmental factors for these regions have to be explained. Students need to study environmental impacts of major cities located in these regions. The tour report has to be done with the consultation of the staff-in-charge and has to be submitted to the department at the time of 4th semester examination. Viva-Voice based on study tour report would be conducted at the end.

References:

1. Ahuja (2004) Research Methods, R.K. Books, New Delhi
2. Kothari (1990) Research Methodology – Wiley Eastern Ltd. New Delhi.
3. Gopal M.H. (1970) Introduction to Research Procedure in Social Science, Asia Publishing House, Bombay.
4. Young Pauline V. (1980) Scientific Survey and Research, Prentice Hall, New Delhi.
5. Limb (2001) Quantitative Methodologies for Geographer R.K. Books, New Delhi.
6. Mishra R.P. (2001) Research Methods in Geography, R.K. Books, New Delhi.
7. Pal (2005). Computing Techniques in Geography, R.K. Books, New Delhi.

IV SEMESTER
Practical: 4.8 Project & Viva-voce

Teaching Hour: 52

1. The students of M.Sc Geography 4th Semester may have to be selected a specific theme / topic for a Project Work. The students may select some of the following themes for their project.
 - a. Land Evaluation
 - b. Land-use / Land cover Analysis
 - c. Water Sources
 - d. Slope Studies
 - e. Climatic Change
 - f. Settlement Studies
 - g. Agriculture Studies
 - h. Health Studies
 - i. Infrastructure Studies
 - j. Vegetation Studies
2. GIS, GPS & RS methods have to be used with appropriate primary and secondary data.
3. The students should follow the research guidelines by reading Research Methodology before taking up the Project Work.
4. The Project should not cross 50 pages including photos, references and tables.
5. Project work must include quality maps, diagrams and flowcharts.
6. The project report should include followings:
 - a) Title of the project
 - b) Introduction
 - c) Review of literature
 - d) Study Area
 - e) Data sources
 - f) Main Objective
 - g) Materials and Method
 - h) Results & Discussion
 - i) Conclusion
 - j) Photos
 - k) References

Above work has to be done with the consultation of the staff-in-charge. Viva-Voice would be conducted at the end..

References:

1. Archer J.E. & Dalton T.H. (1968): The field work in Geography, E.t. Batsford Ltd., London.
2. Haring, Lloyed (1975): Scientific Geographic Research W C. Brow Company USA.
3. Johnes, P.A. (2008): Field Work in Geography, Longman.
4. Kothari C.R.(1996): Research Methodology, Vishwas Prakashan, New Delhi
5. Misra R.P. (1991): Research Methodology in Geography, concept pub. New Delhi.