INDIRA GANDHI UNIVERSITY MEERPUR (REWARI)

(Established under State Legislature Act 29 of 2013)

DEPARTMENT OF GEOGRAPHY

Syllabi and Scheme of Examination under Choice Based Credit System
w.e.f. the Academic Session 2019-20 and amended in 2020-2021

Learning Objectives of the whole Course

1. This two-year course aims to provide a conceptually and practical sophisticated understanding of spatial issues and their association with the environment, socio-economic, political, and cultural realm.
2. To develop an understanding about basic concepts, principles, theories, contemporary issues and advance technology inputs to develop a capacity to appraise the geographical phenomena.
3. To develop insight on the issues related to development and inequalities or disparities among regions and achieving the balanced regional development with adopting a sustainable approach.
4. Link theory, hypothesis, methods, data and fieldwork to identify and develop advanced research questions and design dissertation research that is identifiable with a professional research approach. In addition, enhance the potentiality among students to visualize the geographical reality through empirical field-based observations.
5. To make the students well aware of geo-strategies issues and today's emerging political system.
6. To develop an understanding of the transport network, spatial interaction through various transportation mode and location models to investigate economic development.
7. To develop the skills of using geographical instruments, drawing the map and making models with help of advance professional software(s).
8. To enable the students to acquire a knowledge of their existing surrounding, distribution of resource and how physical and climatic factors influenced their way of life and decision making.
9. The course is inter-disciplinary in nature and produces an intellectually exciting environment to the students without previous experience of the subject of geography.
10. The course tries to educate the students to seek placement in various professional and government agencies deals with; environmental issues, weather forecasting, earth sciences, urban and regional planning, transport planning, population studies, agricultural and rural development, physical and social data collection by surveying, and computer based data management and professional map making etc.

INDIRA GANDHI UNIVERSITY, MEERPUR-REWARI
M.Sc. Programme in Geography

General Instructions

M.Sc. Programme in Geography shall be of two years duration spread over four semesters. Each Semester shall consist of Core Courses (compulsory courses) of 4 credits each, Lab Courses (compulsory courses) of 4 credits each and a group of two to three Discipline Centric Elective Courses (DCEC) of 4 credits each, out of which the students have to select any one course. The Discipline Centric Elective Courses/papers shall be provided by the department according to its administrative and academic convenience. Foundation Course (FC) compulsory for all programmes including geography, as decided by the university is Communication Skills and Personality Development, shall be offered to all students of the Department in second semester and shall be of 2 credits. As decided by the university students will have to opt an Open Elective Course (OEC) of 3 credits each during third semesters out of a pool of OECs (except the course offered by department of geography to the students of other disciplines). In addition to this a compulsory course on Computer Applications of four credits (100 Marks with the bifurcation 60 marks theory and 40 marks practical) shall be compulsory in first semester.

The medium of instructions shall be both English and Hindi. The duration of examination for theory and Lab courses shall be of three and four hours respectively. Lab course examination shall be conducted by a Board of Examiners consisting of either both the external examiners or the internal and external examiners, as the case may be. The Chairperson, Department of Geography shall appoint the examiners, with the consent of Vice-Chancellor, out of the penal of examiners recommended by the

P.G. Board of Studies and Research in Geography. The marks for each core course and discipline centric elective course shall be 100 bifurcated in the ratio of 80:20, i.e. 80 marks for Theory Paper and 20 marks for Internal Assessment irrespective of the credits assigned to it. Each Lab course will be of 50 marks (Lab work record 10, Lab work test 30 and viva-voce 10). The Internal Assessment in each course/paper shall be based on two assignments of 05 marks each (10 marks), Assignment/Presentation 5 marks and attendance 5 marks as per the criteria mentioned in the CBCS ordinance. However, the distribution of the weightage of marks in the "internal assessment" and the minimum percentage of marks to pass the end semester examination in each semester shall be as per the laid down norms/relevant ordinance of the University adopted from time to time.

Besides all above two additional courses of compulsory nature on Seminar/Journal Club and Self Study Paper of 1 credit point (25 marks) each in all the four semesters will have to be studied by the students on their own under the guidance and supervision of faculty members. Details of these courses are as under.

1. Seminar/ Journal Club

In each semester there will be a course/paper on seminar presentation of 25 marks with 01 credit. In this course/paper, each student will be required to present a seminar of about 15-20 minutes on the theme/topic such as review of research paper/article published in national/international journals in his/her area of interest. The topic will be selected by the student in consultation with the teacher allotted to him/her by the department.

An internal committee of two teachers constituted by the chairperson of the department for each student will evaluate the seminar presentation. The evaluation (internal evaluation only) will be based on the presentation of the student, depth of the subject matter and answer to the questions. There will be a coordinator to be nominated by the chairperson of the department among the teachers of the department. Suggested break up of marks is as under:

1. Presentation 10 marks
2. Depth of the subject matter 10 marks
3. Answers to the questions 05 marks

For seminar, the topic should be chosen in the following manner:

First Semester	Any topic (not related to the syllabi)
Second Semester	Any basic research paper/article
Third Semester	Any national level research paper/article
Fourth Semester	Any foreign research paper/article

2. Self-Study Paper

In each semester, there will be a self-study paper of 25 marks with 01 credit. The objective of this paper is to create habit of reading books and to develop writing skills in a manner of creativity and originality. The students will select a topic of their own interest in the given area in consultation with their teacher/in-charge/mentors. After selecting a suitable title for the paper, the students will be required to write the paper in about 6-10 pages in his/her own handwriting. The students will hand over the paper to the teacher concerned for correction and after making the required corrections the students will submit it for evaluation before the commencement of examinations of that semester. The structure of the paper will include the following:

(a) Introductions
(b) Main Body
(c) Conclusion

Thoughts presented in the paper must be original work of the students. The paper will be evaluated by the panel (one external and one internal examiner) to be appointed by the chairperson of the department from the prescribed panel of the university.

The evaluation of the self-study paper will be done in following manner:

(a) Evaluation of paper: 15 Marks
(b) Viva-Voce : 10 marks

PROGRAMME STRUCTURE AND SCHEME OF EXAMINATION
M.SC GEOGRAPHY
UNDER CHOICE BASED CREDIT SYSTEM W.E.F. 2019-20 AMENDED IN 2020-21
M. Sc. Geography
Semester – I

Core Courses (CC)

Sr. No.	Course Code	Nomenclature of the course	Credits				Contact Hrs/week	Maximum Marks			
			L	T	P	Total		Theory	IA	P	Total
1	GEOG101	Climatology	4	0	0	4	4	80	20	0	100
2	GEOG102	Geomorphology	4	0	0	4	4	80	20	0	100
3	GEOG103	Advance Geography of India	4	0	0	4	4	80	20	0	100
4	GEOG104	Computer Applications	2	0	2	4	6	60	00	40	100
5	GEOG105	Seminar/Journal Club				1	-	-	-	-	25
6	GEOG106	Self-Study Paper				1	-	-	-	-	25
7	GEOG107	Lab Course-I: Study and Interpretation of Topographical sheets	0	0	4	4	8	-	-	50	50
8	GEOG108	Lab Course-2: Climatology and Geomorphology	0	0	4	4	8	-	-	50	50

Discipline Centric Elective courses (DCEC): One course from each group

Group –A

9	GEOG109	Urban Geography	4	0	0	4	4	80	20	0	100
10	GEOG110	Rural Geography	4	0	0	4	4	80	20	0	100

Group –B

11	GEOG111	Resource Geography	4	0	0	4	4	80	20	0	100
12	GEOG112	Cultural Geography	4	0	0	4	4	80	20	0	100
Total						**34**	**42**				**750**

Total Credits: 34

Total Contact hours per week: 42

M. Sc. Geography
Semester – II

Core Courses (CC)

Sr. No.	Course Code	Nomenclature of the course	Credits				Contact Hrs/week	Maximum Marks			
			L	T	P	Total		Theory	IA	P	Total
1	GEOG201	Geographical Thought	4	0	0	4	4	80	20	0	100
2	GEOG202	Economic Geography	4	0	0	4	4	80	20	0	100
3	GEOG203	Population Geography	4	0	0	4	4	80	20	0	100
4	GEOG204	Statistical Methods in Geography	4	0	0	4	4	80	20	0	100
5	GEOG205	Seminar/Journal Club				1	-	-	-	-	25
6	GEOG206	Self-Study Paper				1	-	-	-	-	25
7	GEOG207	Lab Course-I: (Economic Geography & Population Geography)	0	0	4	4	8	-	-	50	50
8	GEOG208	Lab Course-2: Computer based data management and Cartography.	0	0	4	4	8	-	-	50	50

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Discipline Centric Elective courses (DCEC) Any one of the following two courses

9	GEOG209	Oceanography	4	0	0	4	4	80	20	0	100
10	GEOG210	Soil Geography	4	0	0	4	4	80	20	0	100

Foundation Course (Compulsory)

11	GEOG211	Communication Skills & Personality Development	2	0	0	2	2	40	10	0	50
			Total			**32**	**38**				**700**

Total Credits: 32

Total Contact hours per week: 38

M. Sc. Geography
Semester – III

Core Courses (CC)

Sr. No.	Course Code	Nomenclature of the course	Credits				Contact Hrs/week	Maximum Marks			
			L	T	P	Total		Theory	IA	P	Total
1	GEOG301	Regional development and Planning with special reference to India	4	0	0	4	4	80	20	0	100
2	GEOG302	Environmental Geography	4	0	0	4	4	80	20	0	100
3	GEOG303	Remote Sensing (RS)	4	0	0	4	4	80	20	0	100
4	GEOG304	Geographical Information System (GIS)	4	0	0	4	4	80	20	0	100
5	GEOG305	Seminar/Journal Club				1	-	-	-	-	25
6	GEOG306	Self-Study Paper				1	-	-	-	-	25
7	GEOG307	Lab Course-I : Visual Interpretation of Aerial Photographs	0	0	4	4	8	-	-	50	50
8	GEOG308	Lab Course -2 (Field- Work): Socio- Economic Survey & Report Writing)	0	0	4	4	8	-	-	50	50

Discipline Centric Elective courses (DCEC): Any one of the following three courses

9	GEOG309	Agricultural Geography	4	0	0	4	4	80	20	0	100
10	GEOG310	Biogeography	4	0	0	4	4	80	20	0	100
11	GEOG311	Political Geography	4	0	0	4	4	80	20	0	100

Open Elective Courses (OEC): To be opted out of a pool of OECs.

To be chosen from the pool of Open Elective courses provided by the University (Excluding the OEC offered by the Dept. of Geography)

12	GEOG312	Fundamentals of Geography	3	0	0	3	3	80	20	0	100
	Total					**33**	**39**				**750**

Total Credits: 33

Total Contact hours per week: 39

M. Sc. Geography
Semester – IV

Core Courses (CC)

Sr.No.	Course Code	Nomenclature of the course	Credits				Contact hrs/week	Maximum Marks			
			L	T	P	Total		Theory	IA	P	Total
1	GEOG401	Research Methodology	4	0	0	4	4	80	20	0	100
2	GEOG402	Geography and Disaster Management	4	0	0	4	4	80	20	0	100
3	GEOG403	Application of Remote Sensing and Geographical Information system	4	0	0	4	4	80	20	0	100
4	GEOG404	Hydrology	4	0	0	4	4	80	20	0	100
5	GEOG405	Seminar/Journal Club				1	-	-	-	-	25
6	GEOG406	Self-Study Paper				1	-	-	-	-	25
7	GEOG407	Lab Course-I: Digital Image Processing Techniques	0	0	4	4	8	-	0	50	50
8	GEOG408	LabCourse-2: GIS Exercises	0	0	4	4	8	-	0	50	50

Discipline Centric Elective courses (DCEC): Any one of the following three courses

9	GEOG409	Geography and Water Resource Management	4	0	0	4	4	80	20	0	100
10	GEOG410	Social Geography	4	0	0	4	4	80	20	0	100
11	GEOG411	Geography of Tourism	4	0	0	4	4	80	20	0	100
	Total					**30**	**36**				**650**

Total Credits: 30
Total Contact hours per week: 36
Total Credits for M. Sc. Geography: 34 + 32 + 33 + 30 = 129

DEPARTMENT OF GEOGRAPHY

M.Sc. Programme in Geography (w.e.f. 2020-21)

Total Credit Points

Semester	Core Course	DCEC	Open Elective	Foundation Course	Total
First	26	08	00	00	**34**
Second	26	04	00	02	**32**
Third	26	04	03	00	**33**
Fourth	26	04	00	00	**30**
Total	**104**	**20**	**03**	**02**	**129**

INDIRA GANDHI UNIVERSITY, MEERPUR, REWARI

M. Sc. Geography
Semester- I

GEOG101
Climatology

MaximumMarks:100
Theory Examination: 80
Internal Assessment-20
Time- 3 hrs.

Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

Course Objectives

1. The course is to make the students familiar with the fundamentals of atmospheric phenomena interaction between the atmosphere and the earth's surface, heat budget, global climate systems, climatic classification, greenhouse gases induced global warming and climate change.
2. Focus will also be on making students aware about various theories of climate change.
3. The course aims at developing the capacity of the students to understand the dynamics of the atmosphere, interaction with land & water and the overall climatic system.
4. The course will enable students to analysis and interpret climatic data and their use in climatic classification.

Unit-I

Climatology; Meaning, definition and scope; Definition of Weather and Climate: Climatology and Meteorology. Atmosphere: Origin, composition and structure. Insolation: Solar radiation and terrestrial radiation; latitudinal and seasonal variations, Effects of atmosphere: greenhouse effect, heat budget and latitudinal heat balance. Temperature: Processes of heat energy transfer, heating and cooling of atmosphere, horizontal and vertical distribution, inversion of temperature.

Unit II

Atmospheric pressure: measurement and its distribution pattern – vertical, horizontal and seasonal variations. General circulation: planetary, geostrophic, subtropical, westerlies and polar winds, tricellular meridional circulation, walker circulation-ENSO and La Nina; Circulation pattern in vertical and horizontal planes. Origin of monsoon and jet streams.

Unit III

Atmospheric moisture: sources of atmospheric moisture; types and distribution of humidity and evaporation. Condensation: conditions, forms and types. Precipitation: process, form, types and distribution. Atmospheric equilibrium: stability and instability, adiabatic process of temperature change, lapse rate: dry and wet adiabatic rate.

Unit- IV

Air masses: definition, characteristics, modification and classification. Fronts: frontogenesis, front lysis and classification. Atmospheric disturbances: extra tropical and tropical cyclones, their origin and associated weather, thunderstorms, tornadoes and waterspouts. Climatic classification: Bases of climatic classification by Koppen and Thornthwaite.

Climatic changes – Evidences; Theories of Climate Change- Atmospheric Dust Hypothesis, Carbon Dioxide Theory and Astronomic Theory of Climate Change.

Suggested Readings:

1. Trewartha G. T (1980) An Introduction to Climate, McGraw Hill Company, New York.
2. Critchfield, HJ(Rep.2010) General Climatology, Prentice Hall of India, New Delhi,
3. Barry R. G. and Chorley, R. J, (1968) Atmosphere, Weather and Climate, Marthren.
4. Lal, DS (2012) Climatology, Chetanya Publishing House, Allahabad.
5. Singh Savindra (2014) Climatology, Pravalika Publications, Allahabad.
5. Das, PK (1984) The Monsoons, National Book Trust, New Delhi,
6. Ramasastry, AA, Weather and Weather Forecasting, Publication Division, New Delhi.

Learning Outcomes

1. After the successful completion of the course, students will be able to understand the global atmospheric circulations and disturbances, greenhouse effect, world climate systems, climatic variability and change.
2. The student will be able to find out various human activities that are increasing emissions of the natural greenhouse gases.
3. The student will also acquire skill to demonstrate how climate and geographical environment affect economic activities and business, present and communicate weather analyses and forecasts in a team or individually and what alteration in building design can be made in different climates.
4. The student will have an understanding of climate and climatic hazards at scales ranging from global, regional and local scales.

M.Sc. Geography
Semester-I

GEOG102
Geomorphology

MaximumMarks-100
Theory Examination-80
Internal Assessment-20
Time- 3 hrs.

Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

Course Objectives

1. The course provides an overview of fundamental concepts on evolution of landforms. The main objective of
2. The course is to introduce students the various land forming processes and how these depend on climate, tectonic regimes, oceanographic processes and time.
3. The course is to introduce students to basic concepts of Geology & Geographic processes and applied aspects of Geomorphology in various fields.
4. The course is to empower students in better understanding of both internal and external processes that build and shape Earth's surface and how the geomorphic agents (Running water, Winds, Glaciers, Sea waves and Underground water) can mould the landscape.

Unit-I

Geomorphology – Definition, nature and scope. Fundamental concepts – Uniformitarianism, Geological structure and landforms, Monocyclic, multicyclic and polygenetic evolution of landscapes, Climatogenetic geomorphology, concepts of Threshold, Frequency, Thermoluminescence, C-14 and Pollen in geomorphological studies. Introduction to the four spheres of earth and rocktypes.

Unit-II

Continental drift theory and its basic considerations; Plate tectonics- Plate margins and boundaries, movement and distribution of plates, tectonic activities along the boundaries.

Endogenetic processes – Faulting, folding and their geomorphic expressions. Earthquake – causes, classification, intensity and magnitude, geographical distribution. Volcanism – mechanism and causes; classification and geographical distribution.

Unit-III

Exogenetic Processes-Weathering: Causes, type of weathering: mechanical, chemical and biological; rock weathering and soil formation. Mass wasting and hill slopes analysis: causes, classifications and types of mass movement- slow and rapid mass movements; Hill slope analysis: techniques and theories, mode and rate of slope retreat. geomorphic processes and resulting landforms: Fluvial, Glacial, Aeolian and Karst.

Unit-IV

Applied geomorphology: meaning and concept; role of geomorphology in environmental management of the accelerated erosion and sedimentation. Application of geomorphology in groundwater studies, in construction of large dams and in urban development.

Suggested Readings:

1. Ritter D F Kochel, R C and Miller J R (1995) Process Geomorphology. Dubuque, Win C. Brown Publishers(3rdEdn)
2. Sharma, V K (2010) Introduction to process Geomorphology, Tayler and Francs's, London
3. Kale VS and Gupta A (2001) Introduction to Geomorphology, orient –Longman,Hyderabad.
4. Bloom AL (2002) Geomorphology: A systematic Analysis of late Canozic landforms, Prentice –Hall Private Limited, New Delhi
5. Thornbury, W D (Rep.2004) Principles of Geomorphology, John Wiley & Sons, New York.
6. Sparks B W (1960) Geomorphology, Longman, London.
7. Singh, Savinder (2014) Geomorphology, Prayag Publication, Allahabad.
8. Singh, Savinder (2008) Physical Geography, Prayag Pustak Bhawan, Allahabad.
9. Sharma, H S and Kale V S (2009) Geomorphology in India, Prayag Pustak Bhawan, Allahabad.
10. Strahler A H (2013) Introducing Physical Geography, Wiley, 6th Edition.
11. Kale V S (2014) Landscapes and Landforms of India, Springer.

Learning Outcomes

1. On the completion of this course, the student should develop understanding of Earth surface processes & landforms and will be able to describe the exogenous and endogenous processes involved in the development of landscape, and will be able to understand the relationship between underlying geology, the landscapes developed on this geology and the processes involved in shaping the topography.
2. At the conclusion of the course, a successful student will be able to describe the morphology of the landscape and related processes in areas influenced by fluvial, glacial & periglacial, aeolian, coastal, and karst processes at local, regional and global scale.
3. Students will also be able to Relate landforms illustrated on maps and imagery to geologic processes. Students after completion shall have deep knowledge of tectonic hazards.

M. Sc Geography
Semester-I

GEOG103
Advanced Geography of India

Maximum Marks-100
Theory Examination-80
Internal Assessment-20
Time-3 hrs.

Note: There shall be nine questions in all. Question no. 1 shall be compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Student will have to attempt one question from each unit. Each question shall carry equal marks.

Course Objectives

1. The course is to make the students familiar with the resource endowments of our country, regional imbalances & regionalization and regional development & planning.
2. The course is to make familiar the students about the strategies being adopted for various types of regional plans.
3. Focus will also be on contemporary issues like population explosion and food security, linkages of rivers and natural hazards in Indian perspective.

Unit-I

Physical Setting: Space relationship of India with neighboring countries; Physiographic regions; Drainage system and watersheds; Climate: Mechanism of Indian monsoons and rainfall patterns, Climatic regions; Natural vegetation; Soil types and their distributions.

Unit-II

Agriculture and Resources: Major characteristics and problems of agriculture; Agricultural regions; Agro-climatic regions. Green revolution and its impact on Indian agriculture.; Dry farming and its significance; Livestock resources and white revolution. Non-conventional Energy resources, and mineral resources-coal and petroleum.

Unit-III

Industry, Transport, Communication and Trade: Evolution of industries; Locational factors of cotton textile, iron and steel, and automobile industries; Industrial regions of India. Road, railway, and pipeline networks and their complementary roles in regional development;

Unit-IV

Regional Development and Planning: Experience of regional planning in India; Integrated rural development programmes; Planning for backward area, desert, drought prone, hill, tribal area development;

Contemporary Issues: Environmental hazards: earthquakes, Tsunamis, floods and droughts-causes and mitigation measures. Population explosion and food security; Regional disparities in economic development; Linkage of rivers;

Suggested Readings:

1. Centre for Science & Environment (1988), State of India's Environment, New Delhi.
2. Desphande, C.D. (1992), India: A Regional Interpretation, ICSSR & Northern Book Centre, NewDelhi.
3. Dreza, Jean & Amartya Sen (ed.) (1996), India Economic Development and Social Opportunity, Oxford University Press, New Delhi.
4. Dubey, R. N. (1974), Economic Geography of India, Kitab Mahal,Allahabad
5. Gautam, Alka (2014), Advanced Geography of India, 4th Ed., Sharda Pustak Bhawan,Allahabad.
6. Hussain, Majid (2015), Geography of India, Mc Graw HillEducation.
7. Joshi, H. L. (1990), Industrial Geography of India, Rawat Publications,Jaipur
8. Khullar, D.R. (2014), India: A Comprehensive Geography, 3rd Ed., KalyaniPublishers, NewDelhi.
9. Kundu A. and Raza, Moonis (1992), Indian Economy: The Regional DimensionSpeclaum Publishers, New Delhi,1992.
10. Nag, P. and Sengupta, S. (1992), Geography of India, Concept publications. Co., NewDelhi.
11. Rautray, J.K. (1993), Geography of Regional Disparity, Asian Institute ofTechnology,Bankok.
12. Robinson, Francs (1989), The Cambridge Encyclopaedia of India, Pakistan,Bangladesh, Sri Lanka, Nepal, Bhutan & Maldives, Cambridge University Press,London.
13. Sharma, T.C. and Coutinno, O. (1988), Economic and Commercial Geography ofIndia, Vikas Publishing House Pvt. Ltd, NewDelhi.
14. Singh R.L. (ed.) (1971), India - A Regional Geography, National GeographicalSociety, India,Varanasi.
15. Spate OHK & ATA Learnont (1967), India & Pakistan, Methuen,London.
16. Tirtha, R. and Gopal Krishan (1996), Emerging India, Reprinted by Rawat Publications, Jaipur.
17. Tirtha, R. and Krishan G. (1996), Geography of India, Rawat Publications, Jaipur &New Delhi.
18. Tiwari, R. C. (2010), Geography of India, 6th Ed., Prayag Pustak Bhawan,Allahabad.

Learning Outcomes

1. The student should develop understanding about the resource deficit and resource rich regions of the country, role of green revolution in enhancing food security.
2. The student will be able to evolve/modify criteria for delimiting problematic regions and suggest effective strategy for the development of problematic and backward regions.
3. The students after undergoing the course will have a good understanding of natural hazards at local, regional and national level and will be able to give their suggestion in preparedness and mitigation.

M. Sc. Geography

Semester- I

GEOG107

Lab Course – I: Interpretation of Topographical sheets

Maximum Marks-50
Time- 4hrs
Distribution of Marks:
Lab Test-30
Record on Lab Work-10
Viva-Voce-10

Note: The examiner shall set four questions, two from each unit. The candidate shall attempt two questions, selecting one from each unit. Each question will carry fifteen marks.

Course Objectives

1. The broad objective of the course is to make the students familiar with the information available on topographical maps, their use & importance.
2. The other objectives are indexing and nomenclature of topo-sheets published in India, and interpretation of natural and cultural features.

Unit- I

1. Introduction to topographical sheets, Uses & importance of topographical sheets; Development of topographical mapping in India, preliminary information on topographical sheets. Publication, availability and procurement of topographical sheets of India. Restricted and unrestricted topographical sheets in India.
2. Index numbering and nomenclature of topographical sheets of India.

3. Introduction to conventional signs used on topographical sheets in India.

Unit- II

Interpretation of Topographical sheets:

4. Interpretation of natural features (relief, drainage & vegetation).

5. Drawing of serial, superimposed, projected and composite profiles.

6. Interpretation of cultural features (human settlements, land-use, means of irrigation, means of transport. (at least 12Exercises).

Recommended Readings:

1. Misra, R.P. and Ramesh, A. (1999), Fundamentals of Cartography, Concept Publishing Company, New-Delhi.

2. Monkhouse, F.J. and Wilkinson, H.R. (1980), Maps and Diagrams, B. I. Publications, New Delhi.

3. Punmia, B.C. (1981), Surveying, Standard Book House, New Delhi.

4. Sharma, J.P. (1996), Prayogik Bhoogol, Restogi Publications,Meerut.

5. Singh, R.L. (1979), Elements of Practical Geography, Kalyani Publishers, New Delhi.

6. Yadav, H.L., (2000), Prayogik Bhoogol Ke Aadhar (Fundamentals of Practical Geography), Radha Publication, New Delhi.

Learning Outcomes

1. On successful completion of the course the students will be able to study and interpret topographical maps using conventional signs.
2. Students will also exhibit knowledge about index numbers, nomenclature, scale, extent and area covered by various categories of topo-sheets.
3. At the conclusion of the course, a successful student will be able to demarcate a drainage basin/study area, use topo-sheets in their research work and specific courses on city & regional planning, rural planning and regional development.

M. Sc. Geography
Semester- I

GEOG108
Lab Course- II: Climatology and Geomorphology

Maximum Marks-50
Time- 4hrs
Distribution of Marks:
Lab Test-30
Record on Lab Work-10
Viva-Voce-10

Note: The examiner shall set four questions, two from each unit. The candidate shall attempt two questions, selecting one from each unit. Each question will carry fifteen marks.

Course Objectives

1. The course is to make the students familiar with the techniques of graphical presentation, analysis of climatic data and forecasting of weather.
2. The course will also provide opportunity to the students to learn morphometric analysis in general and related to a particular drainage basin.

UNIT – I: Climatology-19GEOG21CC1

1. **Graphical Representation of Climatic Data**
   a. Climograph (Taylor and Foster's)
   b. Rainfall deviation diagrams
   c. Hythergraph
   d. Isopleths
2. **Forecasting of Weather**
   a. Study of Weather instrument
   b. Elements of Weather
   c. Interpretation of Indian Weather maps
3. **Construction of water budget diagram**: using precipitation and potential evapotranspiration data.

UNIT – II: Climatology-19GEOG21CC2

Morphometric Analysis of Drainage basin- its geographical significance, basin morphometry of fluvially originated drainage basin,

1. **Linear and aerial Aspects:** Stream ordering based on Horton and Strahler, Bifurcation ratio. Geometry of basin shape, Basin Perimeter, Length and Area, Stream frequency and Drainage density.
2. **Relief Aspects:** Hypsometric analysis- Hypsometric curve and Integral Hypsometric curve, Clinographic analysis, Altimetric analysis,
3. **Slope Analysis**- Average Slope (Wentworth's method), Relative Relief (Smith'smethod),

Suggested Readings:

1. Singh, L. R. (2013), Fundamentals of Practical Geography, Sharda PustakBhawan.
2. Singh, R. L. (1986), Practical Geography, Kalyani Publications,Ludhiana.
3. Monkhouse, F. J. and Wilkinson (1980), Maps and Diagrams, B.I. Publications, NewDelhi.
4. Singh Gopal (2012), Map Work and Practical Geography, Vikash Publishing House Pvt.Ltd.

Learning Outcomes

1. On successful completion of the course, students would be able to analyses the climate of a place/region by preparing various climatic diagrams and maps.
2. Students will also be able to forecast weather at a place to some extent.
3. On completion of the course students would be able to order streams, find stream frequency & stream density, and make slope analysis in a drainage basin.

M. Sc Geography
Semester – I

GEOG109
Urban Geography

Maximum Marks- 100
Theory Examination-80
Internal Assessment-20
Time-3 hrs

Note: There shall be nine questions in all. Question no. 1 is compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

Course Objectives

1. The course is to build an exposure to define and identify urban settlements, their origin and evolution and historic imprints on them, services & functions being performed by urban centers, layout & internal structure of cities.
2. The main purpose of the course is to study city system within a system of cities and rural-urban interaction.
3. The ultimate objective is to expose students to the latest trend and patterns of urbanization in the world and India as well, problems being faced by metropolitans and urban planning in India.

Unit-I

Urban Places: Defining Urban places, Identification of urban places, criteria for Identification of urban places and Census definition of urban places; Urban Geography: Definition, nature and scope of Urban Geography; approaches and recent trends in Urban Geography. Origin and evolution of towns in Ancient, Medieval and Modern world. Setting of Towns: site and situation of towns.

Unit-II

City and region; Spatial linkages (rural-urban linkages) and interactions; Rural-Urban fringe, Sub- urbanization; Size and spacing of cities - Central Place Theory: Christaller & Losch; Rank Size Rule, Primate City; Basic and non-basic functions, functional classification of cities: contribution of foreign and Indian scholars.

Unit-III

Urban Morphology and land use; Models of city structure: Concentric Zone model by E.W. Burgess, Sector model by Homer Hoyet, Multiple nuclei model by Harris and Ullman; Social area Analysis. Contemporary urban morphology in the wake of globalization-global city.

Unit-IV

Urbanization and Urbanism, Urbanization Cycle, Trends and Patterns of Urbanization in the world with special reference to India; Problems of Metropolitan cities in India, Urban Planning in India: Study of Master Plans of Delhi and Chandigarh; Concept of Smart Cities in India.

Essential Readings:

1. Michal Pacione; Urban Geography: A Global Perspective. Routledge,2013.
2. Carter (1972): The Study of Urban Geography, Edward Arnold, London.
3. Hall P. (1992) Urban and Regional Planning, Routledge,London.
4. Kundu, A. (1992): Urban Development and Urban Research in India, Khanna Publication
5. Verma (2008): Urban Geography, Rawat,Jaipur
6. Bansal, S.C. (2010), Urban Geography, Meenakshi Prakashan,Meerut.

Suggested Readings:

1. Castells, Manuel (1977); The Urban Question: A Marxist Approach. Cambridge: MITPress
2. Bhattacharya, B. (1979): 'Urban Development in India', Shree Publishing House, NewDelhi.
3. Brian.R.K. (1996): Landscape of Settlement Prehistory to the present, Routledge,London.
4. Johnson, James; Urban Geography: An Introductory Analysis, 2ndEdition
5. K. Siddharth and S. Mukherji: Cities, Urbanizations and Urban Systems
6. Singh. K. and Steinberg. F. (eds) (1998): Urban India in Crisis. New Age Interns.
7. Shah Manzooor Alam: Urbanization in Developing Countries

Learning Outcomes

1. On the completion of this course, the students will develop an understanding why cities exist, what services & functions they perform and how the interaction between rural and urban areas takes place?
2. Students will be able to understand the internal structure/ land use in the urban areas and how urban morphology of urban areas vary in different parts of the world.
3. Students will also be clear in their thoughts that the world is heading towards urban world, most cities will grow to problematic metropolitans in the lack of proper urban planning.
4. At the successful conclusion of this course students will be able to pursue Post Graduate degree in Urban Planning / City and regional Planning from various schools of planning in India and abroad.

M. Sc Geography
Semester – I

GEOG110
Rural Geography

Maximum Marks- 100
Theory Examination-80
Internal Assessment-20
Time-3 hrs.

Note: There shall be nine questions in all. Question no. 1 is compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

Course Objectives

1. The course is to build an exposure to define and identify rural settlements, regional pattern of house types, community facilities and sanitation.
2. The course will also be on sustainable rural development in India through block and district level plans and integrated rural development planning.

UNIT-I

Rural Geography: Meaning, Nature and Scope. Types of community facilities and services - water, sanitation, electricity. Provider of community facilities- governmental, non-governmental and philanthropic organizations; Community facilities and services programmes

Unit-II

Rural House Types**:** House Types based on Building Materials, Size and Shape as basis for classification, House Types based on Socio-Economic Status, Regional Patterns of Houses in India.

Unit-III

Rural Development in India**-** Determinants of rural development; Approaches to rural development: Community development approach, sectoral approach, target approach, integrated approach, participatory development approach; Sustainable rural development. Issues of Rural Development in India: Land Reforms, Agricultural land-use, Rural Poverty, Rural Unemployment. Rural education, health and health care delivery systems.

Unit-IV

Rural Planning: District and block level planning; Area specific projects/programmes - Tribal Area Development and Integrated Wasteland Development programme; Agricultural Specific Programmes; High Yielding Variety Programme, Integrated Rural Development Programmes (IRDP).

Suggested Readings:

1. Alam, S.M. et al. (1982), Settlement System of India, Oxford and IBH Publication Co., New Delhi.
2. Armendera (1998), Poverty, Rural Development and Public Policy; Deep and Deep Publishers, New Delhi.

3. Das, K.D. (2007), Dynamics of Rural Development, Deep and Deep Publishers, New Delhi.
4. Garg, A. (1992), Working and Impact of Integrated Rural Development Programme, Deep and Deep Publishers, NewDelhi.
5. Hudson, F.S. (1976), A Geography of Settlements, Mac Donald & Evans, New York.
6. Jha, U.M. (1995), Rural Development in India: Problems and Prospects.
7. Mandal, R.B. (2001), Introduction to Rural Settlements, Concept Publication, New Delhi.
8. Misra, H.N. (1987), Rural Geography, Vol. IX, Contributions to Indian Geography, Heritage Publishers, New Delhi.
9. Nath,V. (2010), Rural Development and Planning in India, Concept Publication, NewDelhi
10. Nikkiran,S. and Ramesh, G. (2010), Research Methods in Rural Development, Deep and Deep Publications, New Delhi
11. Sahu, B.K. (2003), Rural Development in India; Anmol Publishers, Delhi.
12. Shah, G. Thorat S. et al. (2006), Untouchability in Rural India, Sage Publication, New Delhi.
13. Singh, R.L. (1976), Geographic Dimensions of Rural Settlements, NGSI,Varanasi.
14. Singh, R.L. and K.N. Singh eds. (1975), Readings in Rural Settlements Geography, NGSI, Varanasi.
15. Singh, R.Y. (2005), Adhiwas Bhugol, (in Hindi) Rawat Publication, New Delhi.
16. Sinha, R.N.P., Geography and Rural Development; Manohar Publishers and Distributors, New Delhi.
17. Sinha, S.P. & Singh, S. (2007), Strategies for Sustainable Rural Development, Deep and Deep Publishers, New Delhi.

Learning Outcomes

1. On successful completion of the course the students will have the knowledge about the historical development, patterns, types and functional systems of rural settlements.
2. Students will also be able to conduct research on rural development and give their suggestions on improvement of house structure, essential facilities and sanitary conditions.
3. On completion of the course students will also be able to identify the strengths and weaknesses of various rural development programs.

M. Sc Geography
Semester – I

GEOG111
Resource Geography

Maximum Marks- 100
Theory Examination-80
Internal Assessment-20
Time-3 hrs

Note: There shall be nine questions in all. Question no. 1 is compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks

Course Objectives

1. The course is to make the students familiar with the concepts of resources, classification, resource endowments of various countries of the world,models of natural resource process, poverty and resource degradation and economic development and conservation and management of resources for sustainable development.
2. The course also focuses on community based natural resource management.

Unit-I

Concept and Scope of Resource Geography; Resource and ecosystem services: concept and types in relation to related concepts- environment, ecosystem, nature as nurture; World resources: classification of resources- changing profile and concerns; understanding relationship between natural resources and development process, and livelihoods with special reference to poor in the developing world. Sustainable development and some concerns from the past- from dooms day, zero growth to Rio and subsequent Earth summits.

Unit-II

Natural resource based development processes in history: the agricultural transition, the era of Malthusian stagnation, Emergence of world economy, rise of the Western Europe with special reference to golden era of resource based development (1870-1913), colonial origins and resource exploitation, centre-periphery trade-resource dependency and unequal development.

Unit-III

Models of Natural Resources Process**:** Zimmermann‘s Primitive and Advance Models of natural resource process- population, resources and carrying capacity, Kirk‘s Decision Model, Brookfield System Model; The resource curse hypothesis; open access exploitation hypothesis; factor endowment hypothesis; resources and common property/ entitlement-opportunity hypothesis; Resource exploitation and internal colonization, accumulation by dispossession; poverty and resource degradation.

Unit-IV

Management of Natural Resources: Meaning and Concept of conservation of Natural Resources, Resources and governance- State, civil society and state- resource tenure and property rights-access and ownership; decentralization, participation and Justice- fundamentals of community based natural resources management (C-BNRM); political economy and C-BNRM; reconciling biodiversity with development. Conservation and Management Methods of Natural resources: Soil Resource, Water Resource, Forest Resource and Mineral Resources, Problems of Natural Resource Management in India. Policies for sustainable resource-based development.

Suggested Readings:

1. Barbier, Edward B (2005) Natural Resources and Economic Development, Cambridge University Press.
2. Fabricius, C & Eddie Koch Eds. (2004) Rights, Resources and Rural Development: Community-based Natural Resource Management in Southern Africa, Earth scan, London Sterling.
3. UNDP & World Resource Institute (2005) The Wealth of the Poor—Managing Ecosystems to Fight Poverty, World Resources Institute, Washington, DC20002
4. 4. Das Gupta, Biplab (1979) the Environmental Debate, Economic and Political Weekly, Vol. 13, No. 6/7, Annual Number (Feb., 1978), pp. 385- 387+389+391+393+395+397-400
5. Borton, I and R W Kates (1984) Readings in Resource Management and Conservation, University of Chicago Press, Chicago.
6. Bruce, Mitchell (1989) Geography and Resource Analysis, John Wiley and Son, New York.
7. Eliot Hurst, M E (1972) A Geography of Economic Behavior: An Introduction, Duxbury Press, California.
8. Guha, J L and P R Chattroj (1994) Economic Geography- A Study of Resources,The World Press Pvt. Ltd. Calcutta
9. Martino, R L (1969) Resource Management. Mc Graw Hill Book Co.,London.
10. Negi, B S (2000) Geography of Resources, Kedar Nath and Ram Nath,Meerut
11. Owen, Oliver, S (1971) Natural Resource Conservation: A EcologicalApproach, McMillion, NewDelhi.
12. Raja, M (1989) Renewable Resources, Development, Concept Pub. NewDelhi.
13. Ramesh, A (1984) Resource Geography (Ed.) R P Misra, Contribution to Indian Geography, Heritage Publishers, NewDelhi.
14. Zimmermann, E W (1951) World Resources and Industries, Harper and Brothers, NewDelhi.

Learning Outcomes

1. On successful completion of the course, students will have a sound knowledge of resource rich and resource poor countries of the world and inequality in economic development.
2. Students will be well aware about the use and misuse of resources, methods of resource conservation and management.
3. Students will exhibit a sense of judicious use and conservation of resources and will be able to give their suggestions on framing of policies for resource conservation and sustainable development.

M. Sc Geography
Semester – I

GEOG112
Cultural Geography

Maximum Marks- 100
Theory Examination-80
Internal Assessment-20
Time-3 hr

Note: There shall be nine questions in all. Question no. 1 is compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

Course Objectives

1. To build an exposure about various themes in cultural geography, bases of cultural diversity and role of man-environment interaction in development and diversification of folk culture in India and world over.
2. The course also focuses on human races and racial elements in Indian population, human adaptation in extreme physical environments, evolution and revival of tribal cultures.
3. In broad term, cultural geography examines the cultural values, practices discursive and material expressions and artifacts of people.

Unit-I

Cultural Geography: Meaning, Nature & Scope; The evolutionary approach in Cultural Geography. The evolution of Cultural Geography-contribution of Otto Schluter and Carl Sauer and others. Themes in Cultural Geography-The Cultural Region, Culture Areas & Cultural Realm Determinism and Possibilism.

Unit-II

Cultural Diversity: Bases of cultural diversity-race, religion and language; Cultural diversity in world; cultural diversity and regionalization in India.

Unit-III

Role of Environment in the Development of Folk Culture and its Diversity; Revival of Folk Culture. Cultural Adaptation and Environmental perception; Man as modifier of the earth spatial structure.

Unit-IV

Human races- habitat and economy. Racial Elements in India's Population.

Tribes of India (Bhil, Gond, Toda, Naga); Tribes of World (Eskimo, Pigmy, Bushman).

Suggested Readings:

1. Ahmad, Aijazuddin, Social Geography, Rawat Publication, New Delhi,1999.
2. De Blij. B.d. Human Geography. John Wiley and Son, New York.
3. Dreze Jean, Amartya Sen, Economic Development and Social Opportunity, Oxford University press, NewDelhi,1996
4. Dubey, S.C.: Indian Society, National Book Trust, New Delhi, 1991.
5. Gregory, D. and UJ. Larry. (eds.) Social relations and Spatial Structures, McMillan,1985.
6. Haq, Mahbubul: Reflection on Human Development. Oxford University Press. New Delhi

7. Maloney, Clarence: People of South Asia, Winston, New York, 1974.
8. Planning Commission, Government of India: Report on Development of Tribal areas.1981
9. Rao, M.S.A.: Urban Sociology in India. Orient Longman, 1970.
10. Schwartzberg Joseph: An Historical Atlas of South Asia. University of Chicago Press, Chicago, 1978.
11. Sen, Amartya and Dreze Jean, Indian Development Selected Regional Perspectives. Oxford University Press,1996.
12. Smith, David: Geography: A Welfare Approach. Edward Arnold, London, 1977. Sopher, David: An Exploration of India. Cornell University Press. 1980.
13. Subba Rao (1958), Personality of India: Pre and Proto Historic Foundation of India and Pakistan, M.S. University, Baroda,Vadodara.

Learning Outcomes

1. On the completion of this course, the students will develop an understanding about the role of physical environment in the evolution of diverse culture in the world.
2. Students will have a general insight of how the folk culture, physical environment, and local & global economic systems are integral to the principles of sustainable development.
3. After the successful completion of the course the students will be able to conduct social research on various tribes.

M.Sc. Geography
Semester – II

GEOG201
Geographical Thought

Maximum Marks- 100
Theory Eamination-80
Internal Assessment-20
Time- 3 hrs

Note: There shall be nine questions in all. Question no. 1 is compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

Course objectives

1. The course is to make the students familiar with the development of the discipline of Geography with emphasis on both the historical and recent developments in the field including critical analysis of writing of representative geographers.
2. The course will help of the students to introduce the students to philosophical and methodological issues in the development of the discipline of geography and to assess the nature and trend of ancient, modern and post-modern trends in the field of geography.

Unit-I

Classification of knowledge and place of Geography in the realm of knowledge, Geography as a science and its relationship with other science, Significance of space, place and location in geography, Explanations in Geography: Methodological and philosophical settings.

Unit-II

Development of Geographical knowledge during ancient (Greek and Roman) and medieval (Arab) periods, Foundation of Modern Geography- Varenius, Kant, Humboldt and Ritter

Concepts of Modern Geography- chorology, landscapes, areal differentiation, environmental determinism and possibilism, Dichotomy and dualism in Geography: Physical vs Human Geography, and Systematic Vs Regional Geography

Unit-III

Quantitative Revolution and Emergence of theoretical geography, Positivist Explanations in Geography- Laws, theories, models, Inductive & deductive logic.

Unit-IV

Behavioral and Humanistic Perspectives in Geography, Social Relevance in Geography- Welfare, Radical and Feminist Perspectives, Postmodernism and geography.

Suggested Readings:

1. Dickinson, R E (1959), The Makers of Modern Geography, London.
2. Dikshit, RD (1997), Geographical Thought- A Contextual History of Ideas, Prentice Hall of India, New Delhi.
3. Harvey David (1989), Explanation in Geography, Edward Arnold, London.
4. Hartshorne, R (1959), Perspectives on the Nature of Geography, Rand MacNelly, Chicago.
5. James PE and Martin J Geoffrey (1972) All possible Worlds, John Wiley and Sons, New York.
6. Johnston, RJ (1983) Geography and Geographers, Edward Heinemann, London
7. Peet, Richard (1998) Modern Geographical Thought, Oxford, Blackwell Publishers.
8. Hebert and Matthew (2012), Re-unifying geography: Common Heritage and shared future, Routledge

Learning Outcomes

1. After successful completion of the course a student will demonstrate in-depth knowledge of the historical evolution of geographic thought and disciplinary trends in Germany, France, Britain, and United States of America.
2. The students will exhibit clarity in their perspectives on current themes & research frontiers in the discipline, dualism and dichotomies in the discipline, historical development and contemporary trends in geography.

M.Sc. Geography
Semester- II

GEOG202

Economic Geography

MaximumMarks-100
Theory Examination-80
Internal Assessment-20
Time- 3 hrs

Note: There shall be nine questions in all. Question no. 1 is compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

Course Objectives

1. The students to the principles of economic geography and to develop new insights among students on the relevance of economy and geography.
2. The broad objective of the course is to enable the students to understand how primary, secondary and tertiary sectors work together and evolve the economies in developed and developing countries.
3. The course focuses on impact of transport networks on economic activities, production & distribution of energy and mineral resources, spatial interaction & location models, economic growth & pattern of economic development and globalization.

Unit-I

Definition, nature, scope and approaches of Economic Geography, Relationship of economic geography with economics and other branches of social sciences, World Economies: bases of classification, patterns and characteristics of developed and developing economies of the world.

Unit-II

Functional Classification of Economic Activities, World production and distribution of energy resources: coal and petroleum. World production and distribution of mineral resources: iron-ore and bauxite.

Unit-III

Network structure and economic activities, impact of transport on economic activities, Edward Ullman‘s spatial interaction model, Location models: Weber, Christaller and Loschmodels

Unit-IV

Concept of economic growth and development, globalization and pattern of economic development, Theories of economic development: Modernizing theories; Dependency theories; Expert based model and Basic need theory, Theories of New Economic geography (Krugman).

Suggested Readings:

1. Hartshorne, T. A. and Alexander, J. W., Economic Geography (fourth Edition) 2001,New Delhi, Prentice Hall ofIndia.
2. Jones, C. F., and Darkenwarld , G. G., Economic Geography New York, TheMacmillan andCo.
3. James. D., Wheeler and Peter O., Muller, Economic Geography, New York, JohnWiley andSons.
4. Knox, P. 2003. The Geography of World Economy. Arnold,London.
5. Hudson, R. 2005. Economic Geography. Sage Publication, NewDelhi.
6. Gautam, A.2010. Advanced Economic Geography.ShardaPustakBhawan,Allhabad

Learning Outcomes

1. After successful completion of the course students will be able to demonstrate their knowledge how primary, secondary and tertiary economic sectors are growing in developed & developing countries and how manufacturing in the core region has changed and shifted to periphery.

2. Students will exhibit clear understanding about the role of transport in the choice of economic activities and the suitability of various modes of transport for various products and how containerization has accelerated globalization.

3. Students will also be capable of applying various theories & models in economic development.

M. Sc Geography

Semester- II

GEOG203
Population Geography

MaximumMarks-100
Theory Examination-80
Internal Assessment-20
Time- 3 hrs

Note: There shall be nine questions in all. Question no. 1 is compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

Course Objectives

1. The course is to make the students aware about sources of demographic data, determinants of population distribution; density; fertility & mortality, composition of population, migration and various theories of population growth.
2. The course also focuses on making students aware about the concept of population as resource and its role in economic development, population growth and environment quality and population policies in India.

Unit- I

Population Geography: Definition, nature and scope, Conceptual framework and historical development, Sources of population data with particular reference to India – census, vital or civil registration system, Sample Registration System.

Unit-II

Population Distribution and Density, Factors and Determinants, Population growth - trends and determinants; Theories of population growth – pre-Malthusian views, Malthus's Theory, views of socialist writers, optimum population theory, demographic transition model.

Unit- III

Components of population change: determinants of fertility and mortality, trends and patterns in fertility and mortality levels in India, Migration: major international migrations, features of internal migration in India, theories of migration, Population composition and characteristics - age and sex composition, literacy, marital status and economic characteristics of population.

Unit- IV

Population and development: population growth and economic development, population growth and environmental quality, Population Policies of India and China, Post-independence development – Reproductive and Child Health Programme.

Suggested Readings:

1. Beaujeu, Garnier, J. (1966) Geography of Population, Longman, London.
2. Brooks, S. (1977): The World Population Today (Ethnodemographic Process), USSR Academy of Sciences, Moscow.
3. Cassen, Robert & Bates, Lisa M. (1994): Population Policy: A New Consensus Overseas Development Council, Washington, D.C.
4. Chandna, R. C. (1998): A Geography of Population: Concepts, Determinants and Patterns, Publishers, New Delhi.
5. Clarks, John, I. (1971): Population Geography and the Developing Countries, Pergamon Press, NewYork.
6. Demko, G. J. and others (Eds.) (1971): Population Geography, Reader, McGraw-Hill Books Co., NewYork
7. Jones, Huw, R. (1981): A Population Geography, Harper and Row Publishers, London.

Learning Outcomes

1. After successful completion of the course students will be able to demonstrate their knowledge about distribution of population world over, demarcate areas of high population concentration and correlate it with economic development and environmental degradation.
2. Students will also be able to apply various theories and models to explain how the population of a country changes as it develops.
3. Students will also be able to collect/download population data from Census of India and other sites/sources to conduct research on population geography.

M.Sc. Geography
Semester II

GEOG204

Statistical Methods in Geography

MaximumMarks-100
Theory Examination-80
Internal Assessment-20
Time- 3 hrs

Note: There shall be nine questions in all. Question no. 1 is compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

Course Objectives

1. The course is to make the students familiar with the statistical techniques for summarization of data, measuring dispersion, inequality and concentration in distribution with specific focus on centrographic techniques.
2. Focus will also be on Computing and interpreting the results of Correlation and Bivariate and Multivariate Regression Analysis, for prediction.
3. Stress will also be given on making students familiar with certain tests for hypothesis testing.

Unit- I

Geography and statistics, significance of statistics in geographical studies. Nature and characteristic. Descriptive statistics: tabulation and graphical representation of data. Measures of central tendency: mean, median and mode. Partitioned values: Quartiles and deciles. Centrographic techniques- Mean center and Median center.

Unit- II

Measure of dispersion: Absolute measure; Range, quartile deviation, mean deviation, standard deviation and Standard Distance. Relative measure of dispersion: coefficient of variation. Measures of inequality: location quotient and Lorenz curve and Gini's coefficient.

Unit- III

Bivariate analysis: scatter diagram, correlation analysis, Spearman's rank correlation and Karl Pearson's correlation coefficient. Test of significance: Chi-square test, student's t-test, F-test.

Unit- IV

Simple linear regression model: regression equations, construction of regression line, computation of residuals and mapping. Basis of multivariate analysis: correlation matrix partial and multiple correlations.

Suggested Readings:

1. Mahmood A (2008) Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi.
2. Paul S K (1998) Statistics for Geoscientists: Techniques and Applications, Concept Publishing Company, New Delhi.
3. Gupta C B and Gupta V (2009) An Introduction to Statistical Methods, Vikas Publishing

House,Delhi.
4. Gregory S (1978) Statistical Methods and the Geographers, Longman, London.
5. Hoshmand A R (1998) Statistical Methods for Environmental and Agricultural Sciences, CRC Press, New York, 2nd Edition.
6. Johnston R J (1989) Multivariate Statistical Analysis in Geography, John Wiley & Sons,4th edition
7. Smith D M (1977) Patterns in Human Geography, Penguin Books

Learning Outcomes

1. On completion of the course students would be able to summarizing data and locating mean centre and median centre of distribution on the maps.
2. Students will also be able to measure and present dispersion on maps.
3. Moreover, students will be able to measure inequality and concentration using location Quotient, Lorenz curve and Gini's coefficient.
4. After successful completion of the course students will be capable of applying these statistical methods in conducting research and testing hypothesis.

M. Sc. Geography
Semester- II

GEOG207
Lab Course- I: Economic Geography & Population Geography

Maximum Marks – 50
Time – 4 hrs
Distribution of Marks
Lab Test: 30
Record on lab work -10
Viva voce- 10

Note: Note: The examiner shall set four questions, two from each unit. The candidate shall attempt two questions, selecting one from each unit. Each question will carry fifteen marks.

Course Objectives

1. The course is to make the students familiar with the techniques of representing economic and population data.
2. The course focuses on to develop among students, the skill of preparing qualitative & quantitative distribution maps and other diagrams to represent economic and population data.

Unit-I

1. **Representation of Economic Data**
    a. Distribution of Coal and Petroleum in India
    b. Distribution of Iron-ore and Bauxite in India
    c. Construction of isodapane using suitable data
    d. Analysis of sectoral contribution in Haryana/India
    e. Distribution of cultivators, agricultural labours and other workers.

Unit-II

1. **Representation of Population Data**
    a. Population distribution map
    b. Population density map
    c. Age –sex structure of population
    d. Fertility, mortality and natural growth of population by polygraph
    e. Calculation of life Table

Suggested Readings:

1. Mahmood A (2008) Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi.
2. Paul S K (1998) Statistics for Geoscientists: Techniques and Applications, Concept Publishing Company, New Delhi.
3. Gupta C B and Gupta V (2009) An Introduction to Statistical Methods, Vikas Publishing

House, Delhi.
4. Gregory S (1978) Statistical Methods and the Geographers, Longman, London.
5. Hoshmand A R (1998) Statistical Methods for Environmental and Agricultural Sciences, CRC Press, New York, 2nd Edition.
6. Johnston R J (1989) Multivariate Statistical Analysis in Geography, John Wiley & Sons,4th edition
7. Smith D M (1977) Patterns in Human Geography, Penguin Books

Learning Outcomes

1. On successful completion of the course the students will demonstrate skills of preparing qualitative & quantitative distribution maps and other diagrams to represent economic and population data.
2. The students will be able to prepare dot maps, choropleth maps, polygraphs, life tables and age & sex pyramids in their reports/research & seminar papers and even in writing books.

M. Sc. Geography

Semester- II

GEOG208

Lab Course- 2: Computer based data management and Cartography

MaximumMarks-50
Time- 4 hrs
Distribution of Marks:
Lab Test: 30
Record on Lab work:
10 Viva Voce: 10

Note: The examiner shall set four questions, two from each unit. The candidate shall attempt two questions, selecting one from each unit. Each question will carry fifteen marks.

Course Objectives

1. To make the students familiar with the computer system and entering & managing data using spreadsheets & data analysis program.
2. Focus will be on analyzing and representing spatial data using different statistical methods in Program.

Unit-I

1. Introduction to Computer System and MS Office
2. Entering and Managing data using Spreadsheets
3. Representation of Geospatial Data
    a. Line graph (Single and Polygraph)
    b. Bar graph (Simple, Compound and Multiple)
    c. Pie Charts
    e. X, Y scatterplots
    f. Trend Line

Unit-II

1. Introduction to Data Analysis Program.
2. Entering and Managing data in Program.
3. Analysis of data using different statistical methods in Program.
4. Preparation and interpretation of Simple and multiple correlation regression matrix in SPSS
5. Preparation of Distribution Maps
    a. Choropleth maps- mono variate and bivariate.
    b. Dot method
6. Miscellaneous diagrams and graphs
    a. Cartograms
    b. Accessibility maps

Suggested Readings:

1. Monkhouse, F.J., and Wikinson, H.R. (1972), Maps and diagrams, B. I Publications put. Ltd.
2. Singh,R.L (1979)Practical Geography, Sharda PustakBhawan
3. Mahmood A (2008) Statistical Methods in Geographical Studies, Rajesh Publications,New Delhi.
4. Paul S K (1998) Statistics for Geoscientists: Techniques and Applications, Concept Publishing Company, New Delhi.
5. Gupta C B and Gupta V (2009) An Introduction to Statistical Methods, VikasPublishing House,Delhi.
6. Gregory S (1978) Statistical Methods and the Geographers, Longman,London.
7. Hoshmand A R (1998) Statistical Methods for Environmental and AgriculturalSciences, CRC Press, New York, 2nd Edition.
8. Johnston R J (1989) Multivariate Statistical Analysis in Geography, John Wiley & Sons,4th edition
9. Smith D M (1977) Patterns in Human Geography, Penguin Books

Learning Outcomes

1. After successful completion of the course the students will demonstrate full knowledge about entering, managing, analyzing and representing data.
2. Students will be able to prepare various line graph, trend line, scatter diagram, bar diagrams, pie diagram and maps using point, time series and spatial data.

M.Sc. Geography

Semester- II

GEOG209

Oceanography

MaximumMarks-100
Theory Examination-80
Internal Assessment-20
Time- 3 hrs

Note: There shall be nine questions in all. Question no. 1 is compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

Course Objectives

1. The course is to make the students familiar with the distribution of land & water on the earth, origin of ocean basins and configuration of ocean floor.
2. The course also aims at making students aware about oceanic circulation, physical properties of sea water, oceans as storehouse of minerals, oceanic deposits and United Nations Law of sea.

Unit-I

Definition, Nature and Scope of Oceanography; Oceanography and other branches of knowledge; Distribution Pattern of Land and Water; Origin of Ocean Basins: Wegner's Drift Hypothesis, Sea Floor Spreading and Plate tectonics.

Unit-II

Features of Ocean Basins; Continental Margins and Deep Oceanic Basins; Oceanic Floor Profile: Continental self, Slope, Ridge and Deeps, Abyssal Plains; Submarine Canyons; Coral reefs: Types, Origin and Distribution; Configuration of Ocean Floor of Indian, Atlantic and Pacific Ocean.

Unit-III

Ocean Currents: origin, types and dynamics; Currents of Pacific, Atlantic, and Indian ocean; Impact of ocean currents; Physical properties of sea water: Temperature and Density; Chemical properties: Salinity and Dissolved Gases; Waves, Tides and Tsunami.

Unit-IV

Ocean as storehouse of food, minerals and energy sources, Oceanic deposits, Sea-level changes – Evidences and impacts, Territorial waters and Exclusive Economic Zones (EEZ), United Nations Convention on Law of Sea (UNCLOS).

Suggested Readings:

1. Davis, Richard J.A.(1986), Oceanography – An Introduction to the MarineEnvironment, Wm. C. Brown,lowa.

2. .Denny, M. (2008), How the Ocean Works: An Introduction to Oceanography, Princeton University Press, NewJersey.
3. .Duxbury, C.A and Duxbury, B. (1996), An Introduction to the world‘s Oceans, 2ndEdition,
4. C. Brown, Iowa.
5. .Garrison, T. (1995), Essentials of Oceanography, Wards worth Pub. Co., London.
6. Garrison, T. (2001), Oceanography-An Introduction to Marine Science, Books/Cole, Pacific Grove, USA.
7. Gross, M. Grant (1987), Oceanography: A View of the Earth, Prentice - Hall Inc. New Jersey.
8. Kennel, J.P. (1982), Marine Geology, Prentice Hall, Englewood Cliff, New Jersey.
9. Kerhsaw, S. (2004), Oceanography: An Earth Science Perspective, Routledge, UK. 9.King, C.A.M. (1962), Oceanography for Geographers.
10. 10.Sharma, R.C. (1985), The Oceans, Rajesh Publications, New Delhi. 11.Shepart, F. (1969), The Earth Beneath the Sea, Rev. ed., Athneum, New York.
11. Sieboldt, E. and W.H. Berger (1994), The Sea Floor, 2nd ed., Freeman, New York.
12. Von Arx, W.S. (1962), An Introduction to Physical Oceanography, Addison, Wesley, New York

Learning Outcomes

1. On successful completion of the course students will demonstrate in depth knowledge about origin of ocean basins and configuration of Indian, Atlantic and Pacific oceans.
2. Students will also well verse with atmospheric-oceanic interaction and impact of oceanic circulation on climate, marine life and international trade.
3. The students will also exhibit knowledge about the importance & values of the ocean resources and various terms of UNCLOS & overlapping claims of neighboring States on certain waters.

M. Sc Geography
Semester- II

GEOG210

Soil Geography

MaximumMarks-100
Theory Examination-80
Internal Assessment-20
Time- 3 hrs.

Note: There shall be nine questions in all. Question no. 1 is compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

Course Objectives

1. The course is to make the students familiar with the spatial variability of soil processes and better appreciation of the distribution and variation of soils and their properties across the landscape.
2. The course also focuses on Soil Taxonomy, Soil Components, Alteration processes, soil forming factors.
3. The students will also be given exposure to soil erosion & degradation, soil conservation & sustainable development of soil resources, integrated soil and water management with reference to India

Unit-I

Nature, scope and significance of Soil Geography; its relationship with Pedology.
Soil forming factors: parent material, organic, climatic, topographic; and Processes of soil formation and soil development (physical, biotic and chemical). Soil Profile and its development.

Unit - II

Pedogenic regimes: podzolization, laterisation, calcification and gleezation and salinization.
Physical properties of soils: morphology, texture, structure, water, air, temperature and other properties of soil,Chemical properties of soil and soil reaction; methods to improve the physical qualities of soils.

Unit - III

Genetic classification of soils; Taxonomic classification of soils: zonal, azonal and intra-zonal soils, their characteristics and world patterns; classification and spatial distribution of Indian soils.

Unit - IV

Soil conservation in India; Conservation methods to improve the physical qualities of soils; Soil erosion, and degradation; Soil Survey - methods and mechanism. Integrated soil and water management; Sustainable development of soil resources with reference to India.

Suggested Readings:

1. Backman, H.O and Brady, N.C. (1960), The Nature and Properties of Soils, McMillan, NewYork.
2. Basile, R.M. (1971), A Geography of Soils, William C. Brown, Dubuque, Ia.

3. Bennet, Hugh H.: Soil Conservation, McGraw Hill, NewYork.
4. Birkland P.W. (1999), Soils and Geomorphology, Oxford University Press, Inc.,New York.
5. BradyNyle,C. and Weil Raymond, C. (2012), The Nature and Properties of Soils, Pearson publishing, Prentice hall of India, Pvt. Ltd. , NewDelhi.
6. Bunting, B.T. (1973), The Geography of Soils, Hutchinson, London.
7. Clarke, G.R. (1957), Study of the Soil in the Field, Oxford University Press,Oxford.
8. Daji, J.A.(1970), A Text Book of Soil Science, Asia Publishing House, NewDelhi.
9. De N.K. and Ghos, P. (1993), India: A Study in Soil Geography, Sribhumi PublishingCo., Calcutta.
10. Foth H.D. and Turk, L.M. (1972), Fundamentals of Soil Science, John Wiley, NewYork.
11. Govinda Rajan, S.V. and Gopala Rao, H.G. (1978), Studies on Soils of India, Vikas, New Delhi.
12. Govinda Rajan, S.V. and Gopala Rao, H.G.(1978), Studies on Soils of India, Vikas Publications, New Delhi.
13. James S. Gardiner (1977), Physical Geography, Harper's College Press, NewYork.
14. Mc. Bride, M.B.: Environmental Chemistry of Soils, Oxford University Press,New York1999.
15. McBride, M.B. (1999), Environmental Chemistry of Soils, Oxford University Press, New York.
16. Mcknight, Tom L. (1987), Physical Geography: A Landscape Appreciation (2^{nd}Ed.), Prentice Hall, inc., Englewood Cliffs, N.J.
17. Pitty, A.F. (1978), Geography and Soil Properties. University Press,London.
18. Raychoudhuri, S.P. (1958), Soils of India, ICAR, NewDelhi.
19. Sehgal, J. (2000), Pedology-Concepts and Applications. Kalyani Publications, NewDelhi.
20. Steila, D. (1976), The Geography of Soils, Prentice Hall, inc., Englewood Cliffs,N.J.

Learning Outcomes

1. After completion of the course students will demonstrate in depth knowledge about the physical, chemical & biological properties, their suitability for various crops and distribution of major soil types at various levels.
2. The students will also exhibit their knowledge about the areas prone to soil erosion & degradation in Indian context and will be able to suggest measures to conserve soil for sustainable development in Indian context

M. Sc. Geography

Semester- II

GEOG211

Communication Skills and Personality Development

Note: The common syllabus for this course will be followed.

M. Sc. Geography
Semester- III

GEOG301
Regional Development Planning with special reference to India

MaximumMarks-100
Theory Examination-80
Internal Assessment-20
Time- 3 hrs

Note: There shall be nine questions in all. Question no. 1 is compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

Course Objectives

1. The course is to develop insight among students on the issue of development and disparities among geographical regions and achieving balanced regional development by adopting suitable development theory.
2. The course focuses on making students clear in their minds that development is a process of change and it occurs at different rates and times in different regions of the country, need to delineate planning regions in Indian context and prepare suitable plans for backward/problematic regions.

Unit-I

Concept in development and regional studies; regional and spatial disparities, methods of regional delineation, types of planning region, balanced regional development.

Unit-II

Development Theories: Trickle-down Theory (Hirschman), Growth Pole Model (Parroux), Cumulative causation model (Myrdal), Core-Periphery Theory (Friedman); Recent Divergence and convergence theories: Kuznets curve, Dependency theory, bio-regionalism, Eco-feminism, Deep ecology, sustainable development.

Unit-III

Need for Planning Region; Characteristics of Planning Regions; Planning Process- Sectoral, Temporal and Spatial dimensions; Short-term and Long-term Perspective of Planning; Planning for a Region‘s development and Multi-regional planning in National Context; sectoral-spatial development with special reference to agricultural and industrial development in India; decentralization and development; State, civil society and market in the Neo-liberal economic framework; Globalization

Unit-IV

Regional Planning in India: Regional Imbalances/Disparities- Causes and Consequences; Measurements of Regional Disparities; Planning Policies for Regional Development; National Capital Region, study of regional development planning and programmes: Backward area development, Tribal area development, Hilly area development, Arid/Desert area development, flood and drought prone areas development and coastal area development.

Suggested Readings:

1. Bhatt, L.S. (1972) Regional Planning in India, Statistical Publishing Society, Calcutta.
2. Bhatt, L.S. et. al. (ends) (1982) Regional Inequalities in India, Society for the study Regional Disparities, New Delhi.
3. Blunder. J. et. al. (1973) Regional Analysis and Development, Harper & Row, London.
4. Chand, M and V.K. Puri (1985) Regional Planning in India, Allied Pub. Pvt.Ltd. New Delhi.
5. Coates, B.R. and R.J. Johnston (1977) Geography and Inequality, Oxford University Press, Oxford.
6. Friedmann, J and William Alonso (1967) Regional Development and Planning: A Reader, MIT Press, Cambridge Massachusetts.
7. Kuklinski, A.R. (ed) (1972) Growth Poles and Growth Centres in Regional Planning , Monton, The Hague.
8. Misra R.P. et. al. (eds.) (1974) Regional Development Planning in India, Vikas, New Delhi.
9. Raza, Moonis (1988) Regional Development, Heritage, NewDelhi.
10. Sundram, K. V. (1977) Urban and Regional Planning in India, Vikas Publishig House Pvt Ltd, New Delhi

Learning Outcomes

1. On successful completion of the course students will demonstrate an understanding about the process of regional planning & development and its variations across time and space.
2. Students will be able to understand where and why inequality occurs at various scales in India, to evolve criteria for delineating a region and suggest which model of development/plan will be suitable for the development of different types of regions.
3. After undergoing this course, student will be capable of pursuing master's degree in regional planning.

M. Sc- Geography
Semester- III

GEOG302
Environmental Geography

MaximumMarks-100
Theory Examination-80
Internal Assessment-20
Time- 3 hrs

Note: There shall be nine questions in all. Question no. 1 is compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

Course Objectives

1. To familiarize the students with concepts, issues, and approaches about physical environment.
2. The Course focuses on introducing geological & climatological hazards present in the environment, impact assessment, environmental degradation & conservation and addressing complex environmental issues from a problem-oriented, interdisciplinary perspective.
3. The course intends to introduce students to environment education and legislation for better environmental protection & conservation and tend to develop new insights among students on the relevance of environmental studies from a spatial perspective.

Unit-I

Environmental Geography: meaning, and scope; Principles of Ecology; Human ecological adaptations; Influence of man on ecology and environment; Global and regional ecological changes and imbalances, Concept of Environment; Components of environment – abiotic & biotic types of environment; Biodiversity and Biosphere Reserve.

Unit-II

Ecosystem: concept, types, components, and functions; Energy flow in ecosystem: food chain, food web, trophic levels, ecological production and ecological pyramids. Biogeochemical cycles: hydrological, carbon, oxygen and nitrogen cycles. Ecosystems- their management and conservation; Ecological regions of India.

Unit-III

Environmental Degradation–meaning, types, causes, management and conservation; Environmental Pollution- meaning, types, sources, causes and effects of environmental pollution with special reference to air pollution and water pollution.

Environmental Hazards: earthquakes, volcanoes, tsunamis, floods, droughts, famines - distribution, causes, consequences and measures; Global warming and climate change - Greenhouse effect; Ozone depletion; Acid Rain; Urbansmog.

Unit-IV

Environmental education and legislation; Environment Impact Assessment (EIA); Global Summits and Agencies of Environmental Conservation, Environmental issues and policies in India; National

Environmental Policy-2006 of India.

Suggested Readings:

1. Anderson J.M. (1981), Ecology for Environmental Science: Biosphere, Ecosystemsand Man, Arnold,London.
2. Awasthi, N.M. and Tiwari, R.P.L. (1995), Paryavaran Bhugool (Environmental Geography), Madhya Pradesh Hindi Granth Academy,Bhopal.
3. Botkin, D.B., Keller, E.A. (2007), Environmental Science: Earth as a Living Planet, John Wiley and Sons, NewYork.
4. Chandna, R.C. (1988), Environmental Awareness, Kalyani Publishers, NewDelhi.
5. Chandna, R. C. (2002), Environmental Geography, Kalyani,Ludhiana.
6. Cunningham, W. Cunningham, Mary (2010), Environmental Science: A GlobalConcern, MacGraw-Hill, London.
7. Goudie, Andrew (1984), The Nature of the Environment, Oxford Katerpring Co.Ltd.
8. Government of India (2010), Status of Environment Report, New Delhi.
9. McKinney, M.L., Schoch, R.M. (2003), Environmental Science: Systems and Solutions, Jones & Bartlett Learning.
10. Marsh, W.M., Grossa, J. (2005), Environmental Geography: Science, Land Use, and Earth Systems. John Wiley, NewYork.
11. Miller, G.T, Spoolman, Scott (2011), Environmental Science. Brooks Cloe,London.
12. MoEF (2006), National Environmental Policy-2006, Ministry of Environmentand Forests, Government of India, New Delhi.
13. Nobel and Wright (1996), Environmental Science, Prentice Hall, NewYork.
14. Odum, E.P. (1971), Fundamental of Ecology, W.B. Sanders,Philadelphia.
15. Saxena, H.M. (1994), Prayavaranevn Paristhitiki Bhugool (Geography of Environment and Ecology), Rajasthan Hindi Granth Academy,Jaipur.
16. Saxena, H.M. (1999), Environmental Geography, Rawat Publications, Jaipur.Singh, Savindra (1991), Environmental Geography, Prayag Pustak Bhawan,Allahabad.
17. Singh, R.B. (ed.) (1989), Environmental Geography, Heritage, NewDelhi.
18. Strahler, A.N. and Strahler, A.H. (1973), Environmental Geosciences:Interaction between Natural Systems and Man, John Wiley and Sons, NewYork.
19. Strahler, A.H. and Strahler A.N. (1977), Geography and Mans Environment, JohnWiley, NewYork.
20. UNEP (2007), Global Environment Outlook: GEO4: Environment For Development, United Nations Environment Programme.
21. William, M.M. and John, G. (1996), Environmental Geography - Science, Landuse and Earth System, John Wiley and Sons, NewYork.
22. Wright, R.T., Nebel, B.J. (2005), Environmental Science: Toward a SustainableFuture, Pearson/Prentice Hall, New Jersey.

Learning Outcomes

1. On successful completion of the course the students will demonstrate knowledge about various aspects of environmental degradation and their enthusiasm for protection, preservation and sustainable management of environment.

2. Students will have a sound knowledge of environmental hazards, risk assessment, mitigation and preparedness.
3. **St**udents will be able to develop ideas on environmental issues that geographers usually address.
4. On other hand some of the students may get motivated to educate the masses and to run NGOs to protect environment.

M. Sc Geography
Semester- III

GEOG303
Remote Sensing

MaximumMarks-100
Theory Examination-80
Internal Assessment-20
Time- 3 hrs

Note: There shall be nine questions in all. Question no. 1 is compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

Course Objectives

1. The course is to make the students familiar with the technology of earth observation using aerial photography & remote sensing and acquaint the basic principles and methods of photogrammetry.
2. The course focuses on introducing the students the basic concepts, principles & components and application of aerial photography & remote sensing system in geographical studies.

Unit-I

Aerial photography: History, Definition, advantages and limitations; Elements of photographic systems- aerial camera and films; Aerial photographs: Types, scale and resolution; Geometric properties of single vertical aerial photograph, Mirror Stereoscope and Stereoscopic vision; Stereoscopic parallax and relief displacement; Image Interpretation: types of images- Panchromatic, False and True colour combination and elements of image interpretation.

Unit-II

Remote sensing- definition, scope and development; Electromagnetic radiation and spectrum; Black body radiation and Kirchhoff‘s Law; Interaction of EMR with atmosphere and Earth‘s surface features, Atmospheric windows; Orbits: Geo-stationary and sun synchronous; Remote Platforms and sensors; Resolution: Spatial, Radiometric and temporal.

Unit-III

Active and Passive remote sensing; Concept and principal of microwave remote sensing: platforms and sensor, Synthetic Aperture Radar (SAR), Hyper Spectral Remote sensing; Indian Space Programmes and remote sensing missions.

Unit-IV

Introduction to digital image processing: digital images and data formats; Image restoration: radiometric and geometric corrections; Introduction to contrast stretching techniques; Methods of classification:

supervised and unsupervised classifications, accuracy of classified maps and recent trends in digital image processing.

Essential Readings

1. Campbell, J.B. (2002) Introduction to Remote Sensing, 3rd ed., Taylor & Francis, New York, USA.
2. George Joseph: Fundamentals of Remote Sensing, 2nd ed., Universities Press
3. Paul R. Wolf, Bon A. Dewitt: Elements of Photogrammetry with Applications in GIS, 3rd ed., Mc GrawHill
4. Basudeb Bhatta: Remote Sensing and GIS, 2nd ed. OUP, India,2011

Suggested Readings

1. Avery T.E., and G.L. Berlin (1992): Fundamentals of Remote Sensing and AirPhoto Interpretation, 514 Ed. Macmillan, New York,USA.
2. Lillesand, Thomas M. and R. Kiffer (1994), Remote sensing and image Interpretation, 3rdedition, john Willy & sones, Inc New York, USA.
3. Sabins, F (1982): Remote sensing principles and Application, Freemass and Compare, New York.
4. Jensen, J.R. (2000), Remote sensing of the Environment: An earth Resource Perspectives, pearson Education Inc. India.
5. Aggarwal C.S. and P.K. Garg (2000). Remote Sensing, A.H. Wheeler & Co. Ltd, New Delhi.
6. Nag and Kudrat (2002), Remote sensing and Image Interpretation, Concept publishers, Delhi.

Learning Outcomes:

1. After successful completion of the course students will demonstrate an understanding about the process of capturing, interpreting and application of air photos and satellite imageries in geographical investigations and solving real world problems.
2. Students will also develop a capacity to pursue M. Tech. in Remote Sensing and Geographical Information System

M. Sc Geography
Semester- III

GEOG304
Geographical Information System

MaximumMarks-100
Theory Examination-80
Internal Assessment-20
Time- 3 hrs

Note: There shall be nine questions in all. Question no. 1 is compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

Course Objectives

1. The course is to make the students familiar with the spatial & non spatial data and input, editing & managing spatial data in Raster/Vector formats.
2. The course also focuses on spatial analysis operations in GIS, integration of remote sensing, geographical positioning system & geographical information system and its application in geographical studies.
3. This course will develop a proficiency in basic GIS skills for those new to GIS.

Unit-I

GIS: Definition and scope; Components and Elements; Geographic framework: Geoid and Spheroid. Coordinate projection system: Definition and need; Implications of spherical and planar coordinate systems and their transformations in GIS;

Unit-II

Geographic Entities: Point, line and Polygon; Data Types: Raster and Vector; Data formats: Spatial and non-spatial; Sources of data input; Generation of Geo-data bases; Data base management system; Spatial topology.

Unit-III

Spatial Analysis: Overlay, Neighborhood and Proximity; Integration of raster and vector data; GIS and Map Production; GIS and Cartography; Bertin‘s visual variables

Unit-IV

Fundamentals of Global Positioning System (GPS): Concept and Principles; GPS Segment: Space, Control and User; GPS devices: handle and differential GPS; GPS system: NAVSTAR, GALILIO and GAGAN. Applications of GPS

Essential Readings:

1. Burrough, P.A. and McDonnell, R. (1998): Principles of Geographic Information Systems. Oxford University Press, Oxford.
2. Chang, K.T. (2003): Introduction to Geographic Information Systems. Tata Mc Graw Hill Publications Company, New Delhi.
3. Ahmed El-Rabbany: Introduction to GPS, 2nd ed., Artech House,Boston
4. Chauniyal, D. D. (2004): Remote Sensing and Geographic Information Systems. (inHindi). Sharda Pustak

Bhawan,Allahabad.

5. Demers, M. N. (2000): Fundamentals of Geographic Information Systems. John Wiley andSons, Singapore.

Suggested Readings:

1. Albrecht, J.: _Key Concepts and Techniques in GIS‘, Sage Publications Ltd., London2007.
2. Bonham, Carter, G.F. (1995): Information Systems for Geoscientists – Modelling withGIS. Pergamon,Oxford.
3. Bradford W. Parkinson & James Spilker., Global Positioning System: Theory andApplications, VolI,1996
6. ESRI: Understanding GIS, Environmental Systems Research Institute, U.S.A.,1993.
7. Gunter Seeber., Satellite Geodesy Foundations-Methods andApplications,2003.
8. Heywood, I. et al. (2004): An Introduction to Geographic Information Systems, PearsonEducation.
9. Hofmann W.B & Lichtenegger, H. Collins., Global Positioning System – Theory andPractice, Springer-Verlag Wein, NewYork,2001.
10. Elliot Kaplan, Christopher Hegarty; Understanding GPS: Principles and Apllications, 2nd ed., Artech House, Boston
11. Gunter Seeber., Satellite Geodesy Foundations-Methods andApplications,2003.
12. N.K.Agarwal (2004), Essentials of GPS, Spatial Network Pvt.Ltd

Learning Outcomes

1. After successful completion of the course the students will demonstrate their basic understanding to input, edit and manage spatial and non-spatial data in Raster and Vector data formats.

2. Students will also exhibit their knowledge about creating a buffer zone, overlay of various thematic maps, reclassification of spatial variables and facilities & merits of integration of RS, GPS and GIS.

3. Students will also develop a capacity to pursue M. Tech. in Remote Sensing and Geographical Information System.

M. Sc. Geography
Semester- III

GEOG307
Lab Course- I: Visual Interpretation of Aerial photographs

MaximumMarks-50
Time: 4 hrs
Distribution of Marks:
Lab Test: 30
Record on Lab work: 10
Viva Voce: 10

Note: The examiner shall set four questions, two from each unit. The candidate shall attempt two questions, selecting one from each unit. Each question will carry fifteen marks.

Course Objectives

1. The course is to impart practical training to the students on photogrammetry and identification, mapping & interpretation of natural & cultural features on aerial photographs and satellite imageries.
2. The course also focuses on preparation of interpretation keys, comparison of features on panchromatic, true color & false color imageries and preparing land-cover maps.

Unit – I: Interpretation of Arial photographs

1. Basic information on aerial photographs (annotation and markings)
2. Identification of Principal Points, Fiducial Points, Conjugate point and Calculation of scale of aerial photographs
3. Determination of flight line and flight direction;
4. Determination of height of objects from single vertical aerial photographs;
5. Test of 3d vision using stereoscope, Identification of objects and features on Aerial Photographs with stereoscope (pocket and mirror) and preparation of thematic maps.
6. Parallax bar measurement and height determination from stereopairs

Unit-II: Interpretation of satellite images

1. Identification, mapping and Interpretation of different natural and cultural features.
2. Comparison of features on panchromatic, true colour and false composite images
3. Preparation of interpretation keys.
4. Preparation of thematic maps i.e. land use and land cover map

Suggested Readings:

1. Wolf, Paul.R.,Elements of Photogrammetry, 2nd ed., McGraw-Hill, NewYork,1983
2. Lillesand, T.M. and Kiefer, R.W. (2002), Remote Sensing and Image Interpretation, John Wiley and Sons, New York.
3. Nag. P. and Kudrat M. (1998) Digital Remote Sensing, Concept Publishing Co., New Delhi.
4. Rampal, K.K. (1999) Handbook of Aerial Photography and Interpretation, Concept Publishing Co., New delhi.
5. Robbert, G. Reavesa et. al. (1981) Manual of Remote Sensing (eds.), Fourth Edition, Vol. I & II, American Society of Photogrammetry, Falls Church, U.S.A.
6. Sabins, F.F. (1986) Remote Sensing-Principles and Interpretation, Second Edition, WH Freeman and Co., New York.

Learning Outcomes

1. The course the students will be able to locate PP, CPP & flight line on aerial photographs.
2. Students will also be able to find the scale of aerial photos, measure height of objects on a single vertical photo & stereo pair of vertical aerial photos and prepare stereogram to generate 3D vision.
3. Students will also exhibit their skills in identification of features, interpretation of imageries and preparing maps showing physical & cultural features.

M. Sc. Geography

Semester- III

GEOG308

Lab Course- 2: Field- Work: Socio-Economic Survey & Report Writing

MaximumMarks-50 Time- 4 hrs
Distribution of Marks:
Lab Test: 30
Record on Lab work: 10
Viva Voce: 10

The question paper of Lab work test shall contain three questions in all. Candidate(s) are required to attempt two questions in all. All questions carry equal marks.

Course Objectives

1. The course is to impart practical training to students on the field.
2. The course aims at developing among the students the skill of observing socio-economic phenomena in the field, collecting and analyzing data and presenting in the form of a field report.
3. The course focuses on enhancing the potential of students to visualize the geographical reality through empirical field based observation.

Unit-I

Significance of Field work in Geographical studies: Identification of Research Problem and Formulation of Research Design in Geography.

Sources of data – primary and secondary; Collection of primary data: methods of primary data collection -Observation method, Interview method, Questionnaires, Schedules, and Case Study method; Processing and analysis of data.

Unit-II

Field Work and Report writing: Sample Design for collection of socio-economic data; Collection of demographic and socio-economic data through field visit; Preparing research design- aims and objectives, methodology, analysis, interpretation and writing of report.

Note:

1. The students shall conduct demographic/ socio-economic survey in different parts of the country as decided by the department under the supervision of faculty member(s) of the department with full financial support by the university.
2. Duration of the field study shall not exceed 10 days in normal circumstances.
3. The faculty member(s) of the department and the accompanying staff like Lab Attendant, etc. If any, shall be paid TA/ DA as per university rules.
4. A group of 15 students will prepare a report based on primary and secondary data collected during fieldwork.
5. Text of the report should not exceed 6,000 words and should ideally be divided into the following sections:
   (a) introduction, (*b)* statement of the problem (c) objectives, (d*)* materials and methods, *(e)* results and discussion, *(f)* conclusions and suggestions (*g)* references and bibliography and *(h)* appendices (if Any).

6. The report is to be produced individually by the students. Photocopying is not allowed in any form.
7. One copy of the report on A-4 size paper should be submitted in hard binding.

Recommended Readings:

1. Ahuja, Ram (2003), Social Survey and Research (Hindi version), Rawat Publications, Jaipur.
2. Basotia, G. R. and Sharma, K. K. (2002), Research Methodology, Manga lDeep Publications, Jaipur.
3. Creswell J. (1994), Research Design: Qualitative and Quantitative Approaches, Sage Publications.
4. Evans,M.(1988),"ParticipantObservation:TheResearcherasResearchTool"inEyles,
5. J. and Smith, D. (eds.), Qualitative Methods in Human Geography.
6. Gideon Sjoberg and Roger Nett (1992), A Methodology for Social Research, Rawat Publications,Jaipur.
7. Gregory, S. (1980), Statistical Methods and the Geographer, Longman, London.
8. Ibrahim, R. (1992), Socio-Economic Profile of Mewat, Radha Publishers, NewDelhi.
9. Kundu A, Measurement of Urban Processes: A Study of Regionalization, Popular Prakashan,Mombay.
10. Mahmood, A. (1986), Statistical Methods in Geographical Studies, Rajesh Publications, NewDelhi.
11. Mukherjee, Neela (1993), Participatory Rural Appraisal: Methodology and Application, Concept Publishing Co. Pvt. Ltd, NewDelhi.
12. Mukherjee, Neela (2002), Participatory Learning and Action: with 100 Field Methods, Concept Publishing Co. Pvt. Ltd, NewDelhi.
13. Raisz, E. (1962), Principles of Cartography, Mc Graw Hill, NewYork.
14. Robinson A. (1998), "Thinking Straight and Writing That Way", in by F. Pryczak and R. Bruce (eds.), Writing Empirical Research Reports: A Basic Guide for Students of the Social and Behavioural Sciences, Pryczak, Publishing, Los Angeles.
15. Robinson, A.H. (1978), Elements of Cartography, John Wiley, NewYork.
16. Stoddard, R. H. (1982), Field Techniques and Research Methods in Geography, Kendall/Hunt.
17. Wolcott, H. (1995), The Art of Fieldwork, Alta Mira Press, Walnut Creek,CA

Learning Outcomes

1. On successful completion of the course the students will demonstrate their skill of preparing a questionnaire for collecting socio-economic data.
2. Students will also exhibit their ability of conducting socio-economic surveys in the field.
3. Students will also be able to summarize, analyze and represent data. Students will also become capable of writing a good field report.

M. Sc. Geography
Semester- III

GEOG309
Agricultural Geography

MaximumMarks-100
Theory Examination-80
InternalAssessment-20
Time- 3 hrs

Note: There shall be nine questions in all. Question no. 1 is compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

Course Objectives

1. The course is to make the students familiar with the determents of agricultural patterns, agricultural regionalization and regional imbalances in the levels of agricultural development in India.
2. The course also focuses on making students aware about linkages between local and global agricultural change in the world's food security situation, to investigate new perspectives in agriculture and impact of climate change on agriculture.

Unit-I

Nature, scope and significance of agricultural geography; Approaches: commodity, systematic, regional; Origin and dispersal of agriculture; gene-centres of agriculture; Determinants of agricultural patterns: physical, technological and cultural factors.

Unit-II

Concepts of land capability classification (U.S. and Britain), Land use survey and Classification (British and Indian), land use and cropping pattern; Agricultural concept and their measurement- (a) intensity of cropping, (b) degree of commercialization, (c) diversification and specialization, (d) agricultural efficiency and productivity, (e) crop combination and concentration; Von Thunen Model of agricultural land use.

Unit-III

Agricultural Regionalisation: Concept and criteria, Whittlesey's agricultural systems; and agricultural typology by Kostrowiki; Agro-climatic Zonation: Concept and agro-climatic regions of India. agricultural regions of India; Regional imbalances in agricultural productivity in India. Green revolution: Its impact and consequences in India.

Unit-IV

Neo-liberalization and Indian agriculture; Food Security: Concept and components, Food Security in India; New Perspectives in Agriculture: Urban agriculture, Contract Farming, Agri-business, Sustainable Agricultural Development; Agriculture and climate change: Impacts and adaptation.

Suggested Readings:

1. Geoffrey, H.F.: (1970) Geography of Agriculture: Themes in Research, Practice Hall,N.J.
2. Morgon, W.B. and Munton, R.J.C.: (1971) Agricultural Geography Methuen,London.
3. Singh Jasbir and Dhillon S.S. (1994) Agricultural Geography, Tata Mc Graw Hill, NewDelhi.
4. Husain, Majid (1996), Systemic Agricultural Geography; Rawat Publications,Jaipur.
5. Tarrant, J.R. (1974) Agricultural Geography, Willey, NewYork.
6. Safi, Mohammad (2007) Agricultural Geography.
7. Singh Jasbir (1989) AgriculturalGeography.
8. Bowler TR (1992), The Geography of Agriculture in Developed Market Economics,Longman.
9. Grigg D (1995) Introduction to Agricultural Geography, Routkdge, London.

Learning Outcomes

1. On the successful completion of this course students will be able to evaluate the agricultural dynamics including agricultural determinants, concepts and major agricultural systems of the world.
2. Students will have the knowledge about food situation in different regions of the world, new perspectives in agriculture and sustainable agricultural development.
3. Students will also become familiar with the threats posed by climate change before the farmers and agriculture scientists.

M. Sc. Geography
Semester- III

GEOG310
Biogeography

MaximumMarks-100
Theory Examination-80
Internal Assessment-20
Time- 3 hrs

Note: There shall be nine questions in all. Question no. 1 is compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

Course Objectives

1. The course is to make the students familiar with the environment, habitat and plant & animal association.
2. The course also focuses on distribution and diversity of wild life in relation to vegetation types.
3. Focus in this course is also on bio-reserves and forest & wildlife policy in India.

Unit-I

Biogeography – Development and scope; Biosphere - definition, nature and composition; Environment, Habitat and Plant-animal association.

Origin of fauna and flora: Major gene centers; domestication of plants and animals and their disposal agents and roots.

Unit-II

Distribution of plant life on the earth and its relation to soil, climate and human activities.

Geographical distribution of animal life on the earth and its relation to vegetation types, climate and human activities.

Unit-III

Ecosystem - Meaning, types, components and functioning of ecosystem; Evolution of living organism and factors influencing their distribution on the earth. Biomes- Meaning and types.

Unit-IV

Bio-geographical realms: Zoogeography and Zoogeographical realms. Zoogeography and its Environmental Relationship

Environmental hazards: Ecological consequences, human perception and adjustment with respect to flood, drought and earthquake.

Bio-Reserves in India; National forest and wild life policy of India.

Recommended Readings:

1. Agarwal, D.P. (1992), *Man and Environment in India Through Ages*, Book &Books.
2. Bradshaw, M.J. (1979), Earth and Living Planet, ELBS, London.
3. Cox. C.D. and Moore, P.D. (1993), Biogeography: An Ecological and Evolutionary Approach (Fifth Edition), Blackwell.
4. Gaur, R. (1987), *Environment and Ecology of Early Man in Northern India*, R.B. Publication Corporation.
5. Hoyt, J.B. (1992), *Man and the Earth*, Prentice Hall,U.S.A.
6. Huggett, R.J. (1998), Fundamentals of Biogeography, Routledge,U.S.A.
7. Illics, J. (1974), Introduction to Zoogeography, Mcmillian, London.
8. Khoshoo, T.N. and Sharma, M. (eds.) (1991), *Indian Geosphere-Biosphere,*Har-Anand Publication, Delhi.
9. Lapedes, D.N. (ed.) (1974), Encyclopedia of Environmental Science, McGrawHill.
10. Lllies, J. (1974), *Introduction of Zoogeography*, McMillan, London.
11. Mathur, H.S. (1998), Essentials of Biogeography, Anuj Printers,Jaipur.
12. Pears, N. (1985), *Basic Biogeography*. 2nd Ed. Longman, London.
13. Simmon. I.G. (1974), *Biogeography, Natural and Cultural*, Longman,London.
14. Tivy, J. (1992), *Biogeography: A Study of Plants in Ecosphere*, 3rd Edition. Oliver an Boyd,U.S.A.

Learning Outcomes

1. On successful completion of the course the students will demonstrate their knowledge about the association of climate, soil, vegetation and plants & animals.
2. Students will also exhibit their knowledge about domestication of plants and animals.
3. Students will be able to explain the functioning of various ecosystems.
4. On completion of the course students will be able to evaluate the Indian forest and wildlife policy.

M. Sc. Geography
Semester- III

GEOG311
Political Geography

Maximum Marks-100
Theory Examination-80
Internal Assessment-20
Time- 3 hrs

Note: There shall be nine questions in all Question no. 1 is compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

Course Objectives

1. The course is to make the students familiar with the concept of Nation; State & Nation-State, boundary & frontier, major issues of the emerging political economy and globalization through "World Systems Theory".
2. The course focuses on making students well aware about the global strategic view, emergence of India as regional power and geopolitical issues in India.

Unit-I

Nature and scope of Political Geography; its approaches and recent trends. Schools of thought: Political Economy, World Systems, Place, and Globalisation.

Unit-II

Concepts of Nation, State, Nation- State, Nationalism and Nation- Building; Emergence and Growth of territorial state; Globalisation and the Crisis of the Territorial State; Forms of Governance: Unitary and Federal.
Concept of frontiers and boundaries, demarcation of boundaries, classification and functions of boundaries.

Unit-III

Rise and Demise of German Geopolitics; Global strategic views: Mahan and Sea power; Mackinder and Heartland; Spykman and Rimland; Servasky and Air power.
Geopolitics in the post-Cold War World - S.B. Cohen's model of Geo-politics.

Unit-IV

Emergence of India as regional power: Geo-political significance of Indian and Pacific Ocean; Geo-political issues in India with special reference to water disputes and riparian claims; Gerrymandering and electoral abuse in India; Kashmir problem and Indo-Pak relations; Inter-State water disputes in India (special reference to SYL canal).

Recommended Readings:

1. Adhikari, Sudeepto (2008), Political Geography of India, Sharda Pustak Bhandar, Allahabad.
2. Agnew, J.A. (1987), Place and Politics, Allen and Unwin, Boston.
3. Alexander, L.M. (1963), World Political Patterns, Ran Mc Nally,Chicago.
4. Blacksell, Mark (2003), Political Geography, London Routledge.
5. Cox, Kevin R. (2008), The Sage Handbook of Political Geography, Sage, New Delhi.
6. De Blij, H.J. and Glassner, Martin (1968), Systematic Political Geography, JohnWiley, NewYork.
7. Dicken, Peter (2003), Global Shift, Sage, New Delhi.
8. Dikshit, R.D. (1996), Political Geography: A Contemporary Perspective, Tata McGraw Hill, NewDelhi.
9. Dikshit, R.D. (2000), Political Geography: The Spatiality of Politics, New Delhi: Tata McGraw Hill
10. Dikshit, R.D. (1999), Political Geography: A Century of Progress, Sage, NewDelhi.
11. Fisher, Charles A. (1968), Essays in Political Geography, Methuen,London.
12. John R. Short (1982), An Introduction to Political Geography, Routledge, London.
13. Jones, Martin Rhys Jones and Michael Woods (2003), An Introduction to Political Geography, Routledge,London.
14. Khor, Martin (2001), Rethinking in Globalization, London: ZedBooks.
15. Painter J. (1995), Politics, Geography and Political Geography, London: Arnold.
16. Pounds N.J.G. (1972), Political Geography. McGraw Hill, NewYork.
17. Prescott. J.R.V.: The Geography of Frontiers and Boundaries, Aldine,Chicago.
18. Sukhwal, B.L. (1968), Modern Political Geography of India, Sterling publishers,New Delhi.
19. Taylor, P.J. and Colin Flint (2001), Political Geography, New Delhi: Pearson.
20. Taylor, P.J. and Johnston, R.J. (1979), Geography of Elections Hammondsworth : Penguin.
21. Taylor, Peter (1985), Political Geography, Longman,London.

Learning Outcomes

1. On successful completion of the course the students will be able to differentiate between Nation, State & Nation-State and boundary & frontier.
2. Students will be able to critically examine the geographical bases of political studies.
3. Students will be able to critically evaluate different geo-strategic views. Students will become very clear in their ideas about India's role in Indian ocean as a regional power and geo-political issues in the country.

M. Sc. Geography
Semester- III

Course Code: GEOG312
Fundamentals of Geography
(Open Elective Course)

Maximum Marks-100
Theory Examination-80
Internal Assessment-20
Time- 3 hrs.

Note: Question no. 1 shall be compulsory and will contain eight objective type questions covering entire syllabus. In addition, the question paper will have four units consisting of two questions each. Candidates are required to attempt one question from each unit. All questions carry equal marks.

Course Objectives

1. This paper is an important for other disciplines/courses to get a basic knowledge of geography.
2. The course provides an overview of fundamental concepts on the evolution of landforms.
3. The course is to introduce students the various land forming processes and how these depend on climate, tectonic regimes and oceanographic processes and solar system.
4. The course is to empower students in better understanding of both internal and external processes that build and shape earth's surface and how the geomorphic agents (winds, sea waves, circulation of oceanic water and currents) can mould the landscape.

Unit-I

Solar System, Solar and Lunar Eclipses; Earth-shape, movements, formation of day/nights and seasons; Location-Latitude-longitude, longitude and time zones, International Date Line.

Unit-II

Interior of earth; volcanism and earthquakes; plate tectonics; weathering and erosion; Relief, Introduction

Unit-III

Weather and Climate: factors affecting and distribution; composition and structure of atmosphere; Atmospheric pressure and global winds; introduction to Monsoon.

Unit-IV

Relief of oceans; oceanic salinity; circulation of oceanic water, currents of Atlantic, Pacific and Indian Oceans.

Recommended Readings:

1. Leong, Goh Cheng., 2015, Certificate Physical and Human Geography, Oxford University Press, New Delhi.
2. Getis, Arthur and Blij and Mark and Getis Victoria., 2014, Introduction to Geography, McGraw Hill Education.
3. Singh, Savinder., 2006, Physical Geography, Pravalika Publication Allahabad.

4. Strahler, Alan and Strahler, Aurthur., 2005, Introducing Physical Geography, John Wiley & Sons, Inc.

Learning Outcomes

1. On the completion of the course, the students should develop an understanding of earth surface processes & landforms and will be able to describe the exogenous and endogenous processes involved in the development of landscape, and will be able to understand the relationship between underline Geology the landscape developed on the Geology and the processes involved in shaping the Topography.
2. To develop in them an understanding of basic concepts principles and theories related to geographical Phenomena.
3. To develop the skills of reading maps and globe to develop drawing and measuring skills and to develop the skills of using and manipulating geographical instruments.
4. After course, students are able to understand all the three aspects of earth, viz, lithosphere, hydrosphere and atmosphere. Geography is related to other social sciences and we can study them better with a background of geography. Geographical factors influence agriculture, industry, trade, commerce and other aspects of economic development. Knowledge of Geography is essential for business, trade, commerce, agriculture, industry, navigation, military operation and spacecraft and even for balancing and administration.
5. Students will also be able to relate landforms illustrated on map and imagery to geologic processes.

M. Sc. Geography
Semester- IV

GEOG401
Research Methodology

MaximumMarks-100
Theory Examination-80
Internal Assessment-20
Time- 3 hrs

Note: There shall be nine questions in all. Question no. 1 is compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

Course Objectives

1. The course is to make the students familiar with the process and types of research, defining research problem, hypothesis formulation, formulating research objectives, research design, sources of data & methods of collection and adoption of suitable sampling technique.
2. Focus will also be on both qualitative and quantitative techniques of data collection and designing of questionnaire.

Unit-I

Introduction to Research in Geography: Meaning, Objectives, Types, and Significance of Research; Characteristics of research. The Research Process- a detailed description of steps involved; problems encountered by researchers in India.

Unit-Il

Defining the Research Problem: Meaning of research problem; Selection of research problem; Need for defining a research problem; Techniques involved in defining a problem; Limitations of the research problem.
Formulation of Hypotheses: Definition, characteristics and types of Hypothesis.

Unit-III

Research Design: meaning, need, and features of research design; Important concepts relating to research design; Types of research design-exploratory, descriptive and experimental.
Sampling Design: Random sampling designs and Non-random sampling designs - merits and limitations.

Unit-IV

Data Sources and Data Collection: Types of Data-Primary and Secondary; Sources of data; Methods of collecting Primary Data - Observation method, Interview method, Questionnaire and Schedule; Difference between Questionnaire and Schedule.

Recommended Readings:

1. Dey, Ian (1993), Quantitative Data Analysis, Routledge, London.
2. Eyles, John and David M. Smith (1988), Qualitative Methods in Human Geography, Polity Press, Oxford.
3. Harvey, David (1969), Explanation in Geography, Edward Arnold, London.
4. Hubbard, Keith et.al. (2002), Thinking Geographically, Continuum, London.
5. Hoggart, Keith et.al. (2002), Researching Human Geography, Arnold, London.
6. Johnston, R.J. and J.D. Sidaway (2004), Geography and Geographers, Arnold, London.
7. Kitchin, Rob and Nicholas J. Tate (2002), Conducting Research in Human Geography, Prentice Hall, London.
8. Kothari, C.R. (2004), Research Methodology: Methods and Techniques, 2nd Ed., New Age International Publishers, New Delhi.
9. Kumar, Ranjit (2005), Research Methodology: Step by Step Guide for Beginners, 2nd Ed., Pearson, Australia. Chapter-1,p.7.
10. Limb, Melanie and Claire Dwyer (2001), Qualitative Methodologies for Geographers, Arnold, London.
11. Misra, H.N. and Singh, Vijai P. (eds.) (2002), Research Methodology in Geography: Social,Spatial and Policy Dimensions, Rawat Publications, Jaipur and New Delhi.
12. Robinson, Guy M. (1998), Methods and Techniques in Human Geography, John Wiley, New York.
13. Scale, Clive (ed.) (2008), Social Research Methods, (Indian Edition), Routledge, London.
14. Somekh, Bridget and Cathy Lewin (eds.) (2005), Research Methods in the Social Sciences, Vistaar Publications, New Delhi.

Learning Outcomes

1. On successful completion of the course the students will demonstrate their skill in framing research problem, research questions and formulation of hypothesis.
2. The students will be able to set objectives of their research and select a suitable research design.
3. They will also become capable of designing questionnaire and adopting sampling technique which suits best for their research.
4. Above all the students will get motivated to conduct research for solving a real world problem.

M. Sc. Geography
Semester- IV

GEOG402
Geography and Disaster Management

MaximumMarks-100
Theory Examination-80
Internal Assessment-20
Time- 3 hrs

Note: There shall be nine questions in all. Question no. 1 is compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

Course Objectives

1. The course is to make the students familiar with the natural & human induced hazards present in our environment, classification of hazards and disasters, risk assessment, mitigation and preparedness.
2. The paper will also be focus on evacuation, shelter, food, livelihood, public health & medical issues after the occurrence of the event, disaster management policies & mechanism in India and role of GIS in disaster management.

Unit-I

Definition and nature of disasters; Basic concepts: Hazards and Disaster; Classification/Types of Hazards/Disasters; Disaster management: meaning, concept, principal, scope, objectives and approaches; elements of disaster management; Geography and Disaster: Major disaster of world and India.

Unit-II

Tectonic Disasters: Volcano, Earthquake, Tsunami and Landslides; Hydrological Disaster: Floods and Droughts; Climatic Disasters: Cyclones and Heavy precipitation; Human induced Disasters: Industrial and Transport Disaster; Wars and Terrorism induced Disaster.

Unit-III

Disaster Mitigation: Hazard assessment, Vulnerability assessment and affecting factors, risk assessment and affecting factors, protective measures and public information.
Disaster Preparedness: Disaster plan, Damage inspection, repair and recovery procedures, communication and control centers, disaster forecasting, warning and prediction.

Unit-IV

Disaster relief: rapid damage assessment, search and rescue operations, Evacuation and shelter, food and medical supply, mass media coverage, relief aid; significance of reconstruction planning; Economic and social rehabilitation; Impact of disaster on society and economic; Disaster Management Policies and mechanism in India; Remote sensing and GIS in disaster management planning.

Suggested Readings:

1. Carter, NW (1991), Disaster Management: A Disaster Manager‘s Handbook, ADB,Manila.
2. Cuny, FC (1983) Disasters and Development, Oxford University Press.
3. Hewitt, K (1977) Regions of Risk: A Geographical Introduction to Disasters, Longman, Harlow.
4. Kates RW and I Burton (1986) Geography, Resources and Environment, Vol. I &II, Themes from the work of Gilbert F White, The University of Chicago Press, Chicago
5. Nlaikie, P and other (1994) At Risk: Natural Hazards, People‘s Vulnerability andDisasters, Routledge, London
6. Smith K (1996) Environmental Hazards: Assessing Risks and Reducing Disasters, Routledge, London.
7. Varley, A, Disaster, Development and Environment, John Wiley and Sons,Chichester.

Learning Outcomes

1. On successful completion of the course the students will demonstrate their capabilities about the role of geography in understanding hazards & disasters, hazards mapping and mitigation & preparedness.
2. Students will be able to understand basic concepts and issues related to disaster risk reduction.
3. The students will also be able to comprehend about causes, impact, distribution and mapping of disasters in Indian context and disaster management setup of India.

M. Sc. Geography
Semester- IV

Application of Remote Sensing and Geographical Information system
GEOG403

MaximumMarks-100
Theory Examination-80
Internal Assessment-20
Time- 3 hrs

Note: There shall be nine questions in all. Question no. 1 is compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

Course Objectives

1. The course is to make the students familiar about the application of Remote Sensing and GIS techniques in the field of Agriculture, Urban planning, Disaster Management, Hydrology & Water Resources Management.

Unit- I

Urban planning: Land use change, urban land use planning, growth monitoring, urban sprawl, Municipal application: Cadastral mapping, ward level mapping, utilities and services etc. solid waste management, urban information system.

Unit- II

Disaster Management: Hazard risk mapping, disaster damage assessment, flood risk extent mapping, drought monitoring, forest and agriculture residue burning, landslide vulnerability assessment.

Unit- III

Agriculture: Importance of remote sensing in agriculture, double and triple crop mapping, agriculture production forecasting, crop damage assessment, watershed characterization, prioritization and management for development.

Unit- IV

Hydrology & Water Resources Management: Digital Elevation Models, sources of data for DEM, morphometric drainage network analysis, interpolation methods, run off estimation, methods of estimating evapotranspiration and soil moisture, water balance computation.

Suggested Readings:

1. Avery T.E., and G.L. Berlin (1992): Fundamentals of Remote Sensing and Air Photo Interpretation, 514 Ed. Macmilan, New York, USA.
2. Aggarwal C.S and P.K. Garg (2000). Remote Sensing, A.H. Wheeler & Co. Ltd. NewDelhi.

3. Campbell, J.B. (2002) Introduction to Remote Sensing 3rd ed, Taylor & Francis, NewYork, USA.
4. Estes, J. E. and LW Senger, 1994, Remote Sensing Techniques for Environmental Analysis, Hamilton, Santa Barbara,California
5. Elangovan,K (2006)―GIS: Fundamentals, Applications and Implementations‖, NewIndia Publishing Agency, NewDelhi‖208pp.
6. Joseph George (2003 Fundamentals of Remote Sensing, University Press.Hyderabad
7. Jensen, J.R. (2000), Remote Sensing of the Environment: An earth Resources Perspectives, Pearson Education Inc.India.
8. Lo, C.P.and Yeung AKW. (2004) Concepts and Techniques of GIS, Prentice - Hall of India, NewDelhi.
9. Lillesand, Thomas M. and R. Kiffer (1994), Remote Sensing and Image Interpretation,3rd edition, John Willy & Sons, Inc New York,USA.
10. Sabins, F (1982); Remote Sensing Principles and Application, Freemass and Compare, New York.
11. Sokhi,B.S. and SM Rashid, 1999, Remote Sensing of Urban Environment, ManakPublishers, NewDelhi.
12. Patra K.C. 2010. Hydrology and Water Resource Engineering, Norsa Publishing House,New Delhi.
13. Reddi, P.J. 1992. A Text Book of Hydrology, Laxmi Publications, NewDelhi.

Learning Outcomes

1. On successful completion of the course students will have a clarity in their minds about mapping utilities and services at ward level, urban information system, hazard risk mapping, disaster damage assessment and flood risk extent mapping.
2. Students will have the sound theoretical knowledge about the mapping of forest and agriculture residue burning, agriculture production forecasting, crop damage assessment, morphometric drainage network analysis, methods of estimating evapotranspiration and soil moisture, water balance computation.

M. Sc- Geography
Semester- IV

Course: Hydrology
GEOG404

MaximumMarks-100
Theory Examination-80
Internal Assessment-20
Time- 3 hrs

Note: There shall be nine questions in all. Question no. 1 is compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

Course Objectives

1. The course is to make the students familiar about the surface and ground water cycle on the earth, estimation of global water budget, human impacts on hydrological cycles, and diverse methods of collecting the hydrological information with special reference to hydrological data sets in India.
2. The course focuses on Runoff measurement & factors affecting runoff, Groundwater occurrence, recharge & discharge, and depletion & quality. Focus is also on Water Resources of India and associated problems.

Unit-I

Definition, nature, scope and historical development of hydrology, Hydrological cycle, estimation of global water budget and human impacts on hydrological cycles, Sources of hydrological data sets in India

Unit-II

Rainfall: frequency, intensity, measurement and trends, determination of average rainfall (Arithmetic mean, Theiesson polygon, isohytel methods), rainfall variability, patterns and distribution.

Unit-III

Runoff: its sources and components, methods of stream flow measurement, factors affecting runoff. Hydrograph and its component, analysis of hydrograph, factors affecting shape of hydrograph shape, Rainfall-runoff relationship.

Unit-IV

Groundwater: occurrence, storage, recharge and discharge, problems of ground water utilization, depletion and quality, Water Resources of India and associated problems.

Suggested Readings:

1. Reddy, J. P. 1992.A Textbook of Hydrology.Laxmi Publication., New Delhi. 4thedition.
2. Singh, M. B. 1999.Climatology and Hydrology.Tara Book Agency, Varanasi. (InHindi).
3. Ward, R.C. and Robinson, M. 2000. Principles of Hydrology. McGraw Hill, NewYork.
4. Subramanya K. 1994. Engineering Hydrology, Tata McGraw-Hill Publishing Company Limited, New Delhi.
5. Patra K.C. 2010. Hydrology and Water Resource Engineering, Norsa Publishing House, New Delhi.
6. Manning, J.C. 1997. Applied Principals of Hydrology, Prentice Hall, New Jersey.
7. Digman, L.S. 2002. Physical Hydrology, Prentice Hall, New Jersey.
8. Raghunath, H.M. 1990. Hydrology, Wiley Eastern Limited, New Delhi.

9. Garg, S.K. 1988.Hydrology and Water Resources Engineering, Khanna Publishers, Delhi.

Learning Outcomes

1. On successful completion of the course the students will know basic terminology used in hydrology, the principle of water flow in the nature, importance of water sources and how to protect them.
2. Students will also have a systematic understanding of the nature of hydrological stores and fluxes and a critical awareness of the methods used to measure, analyze and forecast their variability.
3. Students will have the ability to measure stream flow & rainfall and compute average rainfall and variability.
4. Students will have sound knowledge of water resources of India and associated problems.

M. Sc. Geography
Semester- IV

Lab Course-I: Digital Image Processing Techniques
GEOG407

Maximum Marks-50
Time- 4 hrs
Distribution of Marks:
Lab Test: 30
Record on Lab work: 10
Viva Voce: 10

Note: The examiner shall set four questions, two from each unit. The candidate shall attempt two questions, selecting one from each unit. Each question will carry fifteen marks.

Course Objectives:

1. The course is to make students understand digital image, digital number, reflectance & variance and basic principles of digital image enhancement techniques.
2. The course also focuses on making students aware about normalized difference vegetation index and supervised & unsupervised classification of pixels in to groups/classes.

Unit-I

1. Understand digital image (DN, Reflectance and variance).
2. Generate reflectance spectrum for different land uses/ surface characteristics.
3. Image enhancement techniques.

Unit-II

1. Band Rationing (i.e.NDVI)
2. Supervised and Unsupervised classification
3. Accuracy assessment

Suggested Reading:

1. ERDAS IMAGINE 2013 user manuals

Learning Outcomes

1. On successful completion of the course the students will be familiar with the terminology of digital image processing, will be capable of reviewing the fundamental concepts of a digital image processing system and evaluate the techniques for image enhancement and image restoration.
2. The students will have the basic knowledge of different causes for image degradation and different techniques to be employed for the enhancement of digital images.

M. Sc. Geography
Semester- IV

Lab Course-2: **GIS Exercises**
GEOG408

MaximumMarks-50
Time- 4 hrs
Distribution of Marks:
Lab Test: 30
Record on Lab work: 10
Viva Voce: 10

Note: The examiner shall set four questions, two from each unit. The candidate shall attempt two questions, selecting one from each unit. Each question will carry fifteen marks.

Course Objectives:

1. The course is to impart practical knowledge to students about the application of Geographic Information System in various fields of geography using GIS software like ArcGIS or QGIS.
2. The course Focuses on projections, geo-referencing, editing/digitization, generation of geo-data base and analysis and symbolization.

Unit-I

1. **Generation of geographic framework**: Topographic maps, Projection, Spheroids (local & spheroids), Georeferencing, and Geocoding

2. **Generation of geo-database/ spatial data base** - Vectorisation (point, line and polygon) Join non-spatial, Editing

Unit-II

3. **Analysis**
   Query, Proximity, Overlay, Network (morphometric drainage network and road network)
4. **Symbolization:** Chorochromatic, Choropleth and Point proportional.

Suggested Readings:

1. ArcGIS 10.1 user manuals,2013.
2. QGIS user manuals

Learning Outcomes

1. On successful completion of the course the students will be able to work with ArcGIS/ QGIS/ or any other GIS software. Students will have the skill to create shape file, add data (raster image), geo-reference it and digitize it.
2. Students will be able to prepare point, line & polygon exercises and will also be able to perform query, proximity, overlay and network exercises and they will develop the skill of creating maps for their research work.

M. Sc Geography

Semester- IV

GEOG409

Geography and Water Resource Management

MaximumMarks-100
Theory Examination-80
Internal Assessment-20
Time- 3 hrs

Note: There shall be nine questions in all. Question no. 1 is compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

Course Objectives

1. The course is to make the students aware about the distribution, uses, demand estimation, factor affecting water resource development and crisis of water in the world as well as in India.
2. The course also focuses on planning and policies of conservation & development of water resources, socio-economic impacts of multipurpose river valley projects & dams, interlinking & inter basin transfer of water and water dispute in India.

Unit- I

Definition, nature and scope of the geography of water resources; distribution of water (surface and subsurface); changing trends in use of water, water crisis in world; Basic hydrological cycle and its components: precipitation, potential evapotranspiration, interception loss, runoff.

Unit- II

Water demand and use: methods of estimation, agricultural, industrial and municipal, navigational, power generation, recreational and domestic use of water; Factor affecting water resource development: climatic, physiographic, geologic and technological factors.

Unit- III

Problems of water resource management in India: waterlogging, floods, droughts, pollution and water quality parameters; multipurpose river valley projects, dams and their environmental impacts, case study of environmental and socio-economic impacts of Indira Gandhi Canal project and Damodar Valley Corporation

Unit- IV

Water Justice: International and interstate river water disputes and treaties with reference to India; Planning and policies of conservation and development of water resources, integrated basin planning and watershed management; water management in urban areas; River interlinking and inter basin transfer of water.

Suggested Readings:

1. Aggarwal, Anil and Sunita Narain: Dying Wisdom: Rise, Fall and Potential of India's Traditional Water Harvesting System, Centre of Science and Environment, New Delhi, 1997.8.
2. Chorley, R.J. (1979) Water, earth and man, Methuen,London.
3. Gurjar RK and Jat B.C. 2008, Geography of water resources, Rawat Publications, Jaipur related to water andsanitation
4. Jones, J.A.: Global Hydrology, Processes, Resources and Environmental management,Longman, 1997.
5. Michael. A.M. : Irrigation: Theory and Practices, Vikas Publishing House Pvt. Ltd. , NewDelhi, 1978.
6. Mather, J.R. Water Resources Distribution, Use and Management, John, Wiley, Marylane1984.
7. Newson, M. Land Water and Development River Basin Systems and their SustainableManagement, Routledge, London,1992.
8. Tideman, E.M. Watershed Management, Guidelines for Indian Conditions, Omega, New Delhi1996.

Learning Outcomes

1. On successful completion of the course students will demonstrate their knowledge about the distribution of available water resources, development and management of water resources and need for conservation of water.
2. The students will be able to assess the water demand for various sectors, explore the possibilities of linkages of rivers and evaluate the policies on development and conservation of water.
3. The students will be motivated to conduct research on socio-economic impacts of river valley projects in the country.

M. Sc. Geography
Semester- IV

Social Geography
GEOG410

MaximumMarks-100
Theory Examination-80
Internal Assessment-20
Time- 3 hrs

Note: There shall be nine questions in all. Question no. 1 is compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

Course Objectives

1. The course is to make the students aware about the emergence of concepts in social geography, elements of socio-cultural regionalization, social differentiation, regional dimensions of sociological changes and unique social geography of India.
2. The course focuses on national unity & integrity of India besides social, ethnic, linguistic & religious diversity.
3. The course also aims at imparting knowledge about regional studies of tribes in geographical isolation, and social transformation that took place in India.

Unit- I

Nature and Scope of Social Geography; Developments in the field of social geography; Concepts in social geography: social differentiation, region formation, social evolution, social change & transformation, social space, social and spatial justice, ethnicity, social wellbeing.

Unit- II

Elements of socio-cultural regionalism in India; Geography and caste: regional/spatial framework of dominant caste and land inequality, social and spatial segregation/exclusion, regional/cultural forms of untouchability in India- continuity and change; tribes and geographical isolation, tribe as a social formation: scheduled tribes and scheduled areas; regional studies of the major and minor tribes in India.

Unit- III

Language and dialect, language families, India as a linguistic area, linguistic diversity in India, Greenberg‘s linguistic diversity index, Mother tongue, Bi-lingualism, multi-lingualism, language shifts and retention, linguistic regionalism and minority languages;, space and religion: religious diversity in India, religious minorities, communalism and space

Unit- IV

Social Change and transformation in India: Modernization and sanskritization, role of rural urban interaction, problems of social transformation, social wellbeing- overview of concept; social and ethnic diversity of India and national integration: cultural pluralism and development.

Suggested Readings:

1. Ahmad, Aijazuddin, Social Geography, Rawat Publication, New Delhi, 1999.
2. Ahmad A (1993) (ed) Social Structure and Regional Development: A Social Geography Perspective, Rawat Publications, Jaipur.
3. Dreze Jean, Amartya Sen, Economic Development and Social opportunity, Oxford University Press, New Delhi,1996.
4. Dubey, S.C.: Indian Society, National Book Trust, New Delhi, 1991.
5. Pain R, M. Barke, D Fuller, J Gough, R MacFarlane, G Mowl, (2001), Introducing Social Geographies, Arnold Publishers, London.
6. Registrar General of India, (1972), Economic and Socio cultural Dimensions of Regionalization of India, Census Centenary Monograph No 7, New Delhi
7. Schwartzberg Joseph; An Historical Atlas of South Asia, University of Chicago Press, Chicago,1978.
8. Sen, Amartya & Dreze Jean, Indian Development: Selected Regional Perspectives, Oxford University Press,1996.
9. Smith, David: Geography: A Welfare Approach, Edward Arnold, London,1977.
10. Sopher, David. An Exploration of India, Cornell University Press,1980.
11. Subba Roa. Personality of India; Pre and Proto Historic foundation of India and Pakistan.M.S. University Baroda, Vadodara,1958.

Learning Outcomes

1. On successful completion of the course students will be able to assess the deterministic role of Geographical environment in production of different social groups and shaping of their unique features.
2. Students will be efficient and able to evaluate the emerging social spaces, stratification, social well being, and issues of social justice through spatial perspective.
3. Students will demonstrate knowledge of the geographic basis of socio-cultural regionalization, religious & lingual diversity and unity with in diversity.

M.Sc. Geography
Semester- IV

GEOG411
Geography of Tourism

MaximumMarks-100
Theory Examination-80
Internal Assessment-20
Time- 3 hrs

Note: There shall be nine questions in all. Question no. 1 is compulsory, consisting of eight short answer type questions covering the entire syllabus. Two questions will be asked from each unit. Students will have to attempt one question from each unit. Each question shall carry equal marks.

Course Objectives

1. The course is to make the students familiar about the influence of geographical environment in the development of tourism, different dimensions of tourism and their interrelationships in developing tourism as a global industry, factors influencing tourism and regional dimensions in global and Indian perspective.
2. The course also focuses on infrastructure and support system – accommodation, transportation, facilities & amenities and environmental, economic & social impact of tourism.
3. The course also aims at developing professional skill among students through writing a project report on relevant topics of a tourist place of India.

Unit- I

Basics of tourism: Definition of tourism; Factors influencing tourism: historical, natural, socio-cultural and economic; motivating factors for pilgrimages: leisure, recreation; elements of tourism, tourism as an industry.

Unit- II

Geography of tourism: - its spatial affinity; areal and locational dimensions comprising physical, cultural, historical and economic; Tourism types: cultural, eco –ethno, coastal and adventure tourism, national and international tourism; globalization and tourism.

Unit- III

Indian Tourism: regional dimensions of tourist attraction; evolution of tourism, promotion of tourism. Impact of Tourism: Physical, economic and social, perceptional, positive and negative impacts. Tourism Paradigms: Ethnic Tourism, Sustainable Tourism and Ecotourism.

Unit- IV

Infrastructure and support system - accommodation and supplementary accommodation; other facilities and amenities; Tourism circuits-short and longer detraction - Agencies and intermediacies - Indian hotel industry. Impacts of tourism: physical, economic and social and perceptional positive and negative impacts; Environmental laws and tourism - Current trends, spatial patterns and recent changes; Role of foreign capital & impact of globalization on tourism. Project report on relevant topics such as impact of tourism on Garhwal Himalaya, Dal Lake, Goa and North East India, impact on a historic city.

Recommended Readings:

1. Bhatia A.K. (1996), Tourism Development: Principles and Practices, Setrling Publishers, New Delhi,1996.
2. Bhatiya, A.K. (1991), International Tourism - Fundamentals and Practices, Sterling,New Delhi.
3. Carter, E and G. Lowman (1994), Ecotourism, John Wiley and Sons, NewYork.
4. Chandra R.H. (1998), Hill Tourism: Planning and Development,Kanishka Publishers,New Delhi,1998.
5. Hunter, C. and Green, H. (1995), Tourism and the Environment: A Sustainable Relationship, outledge, London.
6. Inskeep, E (1991), Tourism Planning: An Integrated and Sustainable Development Approach,Van Nostrand and Reinhold, New York.
7. Kamra K.K. and Mohinder Chand (2007), Basics of Tourism: Theory, Operation and Practice, Kanishaka Publishers, New Delhi.
8. Kaul R.K. (1985), Dynamics of Tourism & Recreation.Inter-India, NewDelhi.
9. Kaur J. (1985), Himalayan Pilgrimages & New Tourism, Himalayan Books, NewDelhi.
10. Lea J. (1988), Tourism and Development in the Third World, Routledge, London.
11. Milton D. (1993), Geography of World Tourism, Prentice. Hall, NewYork.
12. Pearce D.G. (1987), Tourism To-day: A Geographical Analysis, Harlow, Longman, 1987.
13. Robinson, H. (1996), A Geography of Tourism, Macdonald and Evans, London.
14. Sharma J.K. (ed.) (2000), Tourism Planning and Development - A New Perspective, Kanishka Publishers, New Delhi.
15. Shaw G. and Williams A.M. (1994), Critical Issues in Tourism-A Geographical Perspective,Oxford: Blackwell.
16. Sinha, P. C. (ed.) (1998), Tourism Impact Assessment, Anmol Publishers, NewDelhi.
17. Theobald W. (ed.) (1994), Global Tourism: The Next Decade, Oxford, Butterworth, Heinemann, Oxford.
18. Voase, R. (1995), Tourism: The Human Perspective, Hodder& Stoughton, London.
19. Williams A.M. and Shaw G. (eds.): Tourism and Economic Development – Western European Experiences, Belhaven,London.
20. Williams Stephen (1998), Tourism Geography, Routledge, contemporary Human Geography, London.
21. Williams, Stephen (1998), Tourism Geography, Routledge, Contemporary Human Geography, London.

Learning Outcomes

1. On successful completion of the course the students will demonstrate their understanding about the interrelationships of tourism with environmental processes that interact at local, regional and global scale.
2. Students will be able to find out the social, economic and environmental impacts of tourism.
3. Students will be capable to identify and describe the attractions of a tourist place. Some of the students may develop competence and skills to operate tour and travel agencies.