

To,

The Principal Secretary
Rajbhavan, Bihar, Patna.

Sub.- Regarding submission of proposed course structure and uniform syllabus of GEOGRAPHY for 3rd To 8th Semester of 4-Year undergraduate.


Ref- Letter No.-BSU(UGC)-02/2023-1457/GS(I), Dated-14-09-2023.

Sir,


In Compliance with your letter no-BSU(UGC)-02/2023-1457/GS(I), dated 14-09-2023 followed by above mentioned letter no, we are submitting the proposed Course structure and syllabus of GEOGRAPHY for Semester 3rd to 8th semester of the 4 year, under graduate course system as per UGC Regulations.

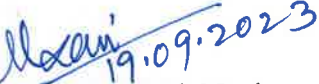
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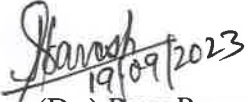
Yours faithfully,



Professor (Dr.) R.B.P Singh
Former Vice-Chancellor
Patna University, Patna

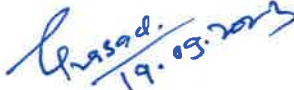

Professor (Dr.) Bibha Singh
Gaya College, Gaya

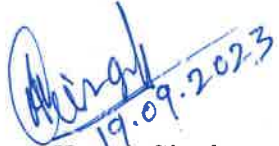

Professor (Dr.) Narendra Singh
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Assistant Professor
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Dr. Vidya Yadav
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Syllabus
For
Bachelor of Arts / Science Programme
In
GEOGRAPHY
Under Choice Based Credit System (CBCS)
(2023-24 onwards)
of
NEW EDUCATION POLICY-2020
(Semester-III To Semester-VIII)

GEOGRAPHY

(A) Major Core Course

Sl. No.	Sem.	Type of Course	Name of Course	Credits	Marks
1.	I	MJC-1 (T)	Geomorphology (T)	4	100
		MJC-1 (P)	Geomorphology (P)	2	100
2.	II	MJC-2 (T)	Climatology and Oceanography (T)	4	100
		MJC-2(P)	Climatology and Oceanography (P)	2	100
3.	III	MJC-3 (T)	Economic Geography (T)	5	100
		MJC-4 (T)	Cartograms, Map Projection and Surveying (T)	3	100
		MJC-4(P)	Cartograms, Map Projection and Surveying (P)	1	100
4.	IV	MJC-5(T)	Human Geography (T)	5	100
		MJC-6(T)	Geography of India and Bihar (T)	5	100
		MJC-7(T)	Statistical Methods in Geography (T)	3	100
		MJC-7(P)	Statistical Methods in Geography (P)	2	100
5.	V	MJC-8(T)	Environmental Geography (T)	5	100
		MJC-9(T)	Cartographic Techniques (T)	3	100
		MJC-9 ()	Cartographic Techniques (P)	2	100
6.	VI	MJC-10(T)	Evolution of Geographical Thought (T)	5	100
		MJC-11(T)	Research Methodology and Field Work	4	100
		MJC-12(T)	Remote sensing and GIS (T)	3	100
		MJC-12(P)	Remote Sensing and GIS (P)	2	100
7.	VII	MJC-13(T)	Regional Planning and Development (T)	5	100
		MJC-14(T)	Research Methodology (T)	5	100
		MJC-15(T)	Disaster Management (T)	4	100
		MJC-15(P)	Disaster Management (P)	2	100
8.	VIII	MJC-16(T)	Social Geography (T)	4	100
		TOTAL			80

(B) Minor Courses to be offered by the Department for students of other Departments of Social Science

Sl.No.	Sem	Type of Course	Name of Course	Credit	Marks
1.	I	MIC-1(T)	Geomorphology(T)	2	100
		MIC-1(P)	Geomorphology(P)	1	100
2.	II	MIC-2(T)	Climatology and Oceanography(T)	2	100
		MIC-2(P)	Climatology and Oceanography(P)	1	100
3.	III	MIC-3(T)	Economic Geography(T)	2	100
		MIC-3(P)	Economic Geography(P)	1	100
4.	IV	MIC-4(T)	Population Geography(T)	2	100
		MIC-4(P)	Population Geography(P)	1	100
5.	V	MIC-5(T)	Human Geography(T)	3	100
		MIC-5(T)	Geography of India and Bihar(T)	2	100
		MIC-6(P)	Geography of India and Bihar(P)	1	100
6.	VI	MIC-7(T)	Regional Planning and Development (T)	4	100
		MIC-8(P)	Statistical Method in Geography (P)	2	100
7.	VII	MIC-9(T)	Environmental Geography (T)	3	100
		MIC-9(P)	Environmental Geography (P)	1	100
8.	VIII	MIC -10(T)	Remote Sensing and GIS (T)	3	100
		MIC-10(P)	Remote Sensing and GIS (P)	1	100
TOTAL				32	

Note: The Department may reduce the syllabus of the Minor Courses as per the credit distribution. The Department concerned may also decide practical courses.

Question Paper Pattern

The Question paper pattern shall consists of three parts-

Part-A-Comulsory- consisting of objective/multiple choice type- each carrying two marks $10 \times 2 = 20$ marks

Part-B- Short Answer Type- Four questions to be answered out of six questions- each carrying five marks $04 \times 5 = 20$ marks

Part-C-Long Answer Type- Three questions to be answered out of five questions- each carrying ten marks $03 \times 10 = 30$ marks

Note- Examinations shall not be held on OMR Sheet strictly.

We are submitting the syllabus of Bachelor of Arts / Science Programme in GEOGRAPHY for Semester-III and Semester-VIII.

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Professor (Dr.) R.B.P Singh
Former Vice-Chancellor
Patna University, Patna

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GEOGRAPHY

SEMESTER –III

TYPE OF COURSE : MJC-4 (T) **Full Marks: 100**
NAME OF COURSE : CARTOGRAMS, MAP PROJECTION
AND SURVEYING **ESE - 70 Marks**
CREDIT : 3 **CIA - 30 Marks**

Course Objectives:

1. Develop an understanding for construction of maps through cartographic conventions.
2. Develop an understanding of the concepts regarding map projections to suit map purposes.
3. Better understanding of survey and surveying.

Course Outcomes:

This is a theory paper, when students complete it, they will be able to:

1. Explain how maps work, conceptually and technically and will be able to understand science and art of cartography
2. Recognize the benefits and limitations of some common map projections and their uses.
3. Develop an understanding and importance of surveying.

UNIT	TOPICS	No. of Lectures
I	Nature and Scope of Cartography, Bar Diagram -Types and Uses,	06
II	Map and its Types, Distribution Maps - Dot, Choropleth and Isopleth.	08
III	Map Projection : Concept, Classification and Properties.	08
IV	Surveying – Concept, Types and its significance.	08
TOTAL		30

Suggested Readings:-

1. Anson R. and Ormelling F. J., (1994) *International Cartographic Association: Basic Cartographic Vol.* Pregmen Press.
 2. Gupta K.K. and Tyagi, V. C., (1992) *Working with Map*, Survey of India, DST, New Delhi.
 3. Maltiyar. K. K & Maltiyar S. R., (2019) *Concept of Cartography, Remote Sensing and GIS*, Rajesh publication, New Delhi.
 4. Mishra R.P. and Ramesh, A., (1989) *Fundamentals of Cartography*, Concept, N Resource & Economic Geography ew Delhi.
 5. Monkhouse F. J. and Wilkinson H. R., (1973) *Maps and Diagrams*, Methuen, London.
 6. Rhind D. W. and Taylor D. R. F., (eds.), (1989) *Cartography: Past, Present and Future*, Elsevier, International Cartographic Association.
- Robinson A. H., (2009) *Elements of Cartography*, John Wiley and Sons, New York.
 Sharma J. P., (2010) *Prayogic Bhugol*, Rastogi Publishers, Meerut.

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9. Singh R. L. and Singh R. P. B., (1999) *Elements of Practical Geography*, Kalyani Publishers, New Delhi.
10. Sinha. M.M. P., (2017) *Ucch Cartography*, Rajesh Publication, New Delhi.
11. Sarkar, A. (2015) *Practical geography: A systematic approach*. Orient Black Swan Private Ltd., New Delhi.
12. Singh R L & Singh Rana P B, (1991) *Prayogtmak Bhugol ke Mool Tatva*, Kalyani Publishers, New Delhi.
13. Sharma, J P (2010) *Prayogtmak Bhugol ki Rooprekha*, Rastogi Publications, Meerut.
14. Singh, R L & Dutta, P K (2012) *Prayogtmak Bhugol*, Central Book Depot, Allahabad.

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GEOGRAPHY

SEMESTER –III

TYPE OF COURSE	: MJC-4 (P)	Full Marks: 100
NAME OF COURSE	: CARTOGRAMS, MAP PROJECTION AND SURVEYING	ESE - 70 Marks CIA - 30 Marks
CREDIT	: 1	

Course Objectives:

1. Learning to construct maps through cartographic conventions.
2. Develop an understanding of the concepts regarding scale, map projections to suit map purposes;
3. Better understanding of the techniques for interpretation of Prismatic Compass Survey.

Course Outcomes:

This is a practical, hands-on course; when students complete it, they will be able to:

1. Construct maps and various Diagrams.
2. Learn the construction and use of some common map projections.
3. Understand and perform Prismatic Compass Survey.

UNIT	TOPICS	No. of Lectures
I	Bar Diagram, Pie Diagram and Choropleth.	03
II	Map Projection : Simpal Conical One Standard Parallel, Cylindrical Equidistant Projection. Zenithal Equidistant Projection.	04
III	Prismatic Compass Survey: Open and Closed Traverse.	03
IV	Record of Practical Work & Viva-voce.	--
	TOTAL	10

Suggested Readings:-

1. Anson R. and Ormelling F. J., (1994) *International Cartographic Association: Basic Cartographic Vol.* Pregmen Press.
2. Gupta K.K. and Tyagi, V. C., (1992) *Working with Map*, Survey of India, DST, New Delhi.
3. Maltiyar. K. K & Maltiyar S. R., (2019) *Concept of Cartography, Remote Sensing and GIS*, Rajesh publication, New Delhi.
4. Mishra R.P. and Ramesh, A., (1989) *Fundamentals of Cartography*, Concept, N Resource & Economic Geography ew Delhi.
5. Monkhouse F. J. and Wilkinson H. R., (1973) *Maps and Diagrams*, Methuen, London.
6. Rhind D. W. and Taylor D. R. F., (eds.), (1989) *Cartography: Past, Present and Future*, Elsevier, International Cartographic Association.
7. Robinson A. H., (2009) *Elements of Cartography*, John Wiley and Sons, New York.
- Sharma J. P., (2010) *Prayogic Bhugol*, Rastogi Publishers, Meerut.

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9. Singh R. L. and Singh R. P. B., (1999) *Elements of Practical Geography*, Kalyani Publishers, New Delhi.
10. Sinha. M.M. P., (2017) *Ucch Cartography*, Rajesh Publication, New Delhi.
11. Sarkar, A. (2015) *Practical geography: A systematic approach*. Orient Black Swan Private Ltd., New Delhi.
12. Singh R L & Singh Rana P B, (1991) *Prayogtmak Bhugol ke Mool Tatva*, Kalyani Publishers, New Delhi.
13. Sharma, J P (2010) *Prayogtmak Bhugol ki Rooprekha*, Rastogi Publications, Meerut.
14. Singh, R L & Dutta, P K (2012) *Prayogtmak Bhugol*, Central Book Depot, Allahabad.

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GEOGRAPHY
SEMESTER -IV

TYPE OF COURSE	: MJC-5 (T)	Full Marks: 100
NAME OF COURSE	: Human Geography	ESE: 70
CREDIT	: 5	CIA: 30

COURSE OBJECTIVES:

1. To understand the concept of human communities, culture and its relationship with environment.
2. To examine the Contemporary relevance of environmental thoughts.
3. To provide an in-depth knowledge of Indian races and tribes.
4. To give a detailed eye-view on migration and settlement pattern

COURSE OUTCOMES:

After completion of the course students will be able to-

1. Get a complete idea of space and place
2. Able to know the types and distribution of tribes in India and Bihar with reference to Census data
3. Conceptualize the trends and pattern of Migration and settlement types

Unit	Topics	No. of Lectures
I	Human Geography: Definition, Nature and Scope; Fundamental Concepts in Human Geography, Contemporary relevance of Determinism, Possibilism and Neo-Determinism	15
II	Population: Population Composition, Growth, Density and Distribution (World); Malthus Population theory, Demographic Transition Theory; Migration: Causes and types	15
III	Races and Tribes: Major Tribal Groups of India and Bihar; Race, Religion and Language	10
IV	Settlements: Types and Pattern of Rural Settlements; Classification of Urban Settlements based on Function and Size; Christaller Central Place Theory; Trends and Pattern of Urbanization (India and World)	10
Total		50

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5. Sharma, T. C. 2003: India - Economic and Commercial Geography. Vikas Publ., New Delhi.
6. Singh R. L., 1971: *India: A Regional Geography*, National Geographical Society of India.
7. Singh, Jagdish 2003: *India - A Comprehensive & Systematic Geography*, GyanodayaPrakashan, Gorakhpur.
8. Spate O. H. K. and Learmonth A. T. A., 1967: *India and Pakistan: A General and Regional, Geography*, Methuen.
9. Sinha, V.N.P et.al., (2013), Bihar: Land, People and Economy, Rajesh Publication, New Delhi
10. Sinha, V.N.P et.al., (2014), Bihar Ka Bhugol, Rajesh Publication, New Delhi
11. Sharma, Nandeshwar (2007), Bihar ki BhaugolikSamisksha, Vasundhara Prakashan, Gorakhpur

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Masir
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GEOGRAPHY
SEMESTER -IV

TYPE OF COURSE : MJC-7 (T) Full Marks: 100
NAME OF COURSE : Statistical Methods in Geography ESE: 70
CREDIT : 3CIA: 30

COURSE OBJECTIVES :

1. Enable the students to differentiate between quantitative and qualitative information
2. To understand the various data sets, its sources and methods of data collection
3. To enhance the study of Geography in quantitative terms with the use of statistical methods

COURSE OUTCOMES :

After completion of the course students will be able to-

1. Know the various types of data and its sources
2. Present data in graphical and pictorial form
3. Produce various types of data tabulation

Unit	Topics	No. of Lectures
I	Use of Data in Geography: Significance of Statistical Methods in Geography, Sources and Types of Data, Scale of Measurement,	8
II	Measures of Central Tendency: Mean, Median, Mode - Concept and Properties; Measures of Dispersion	8
III	Sampling Methods: Types of Sampling- Probability & Non-Probability Sampling	6
IV	Correlation: Meaning and Types -Karl Pearson's Coefficient of Correlation, Spearman's Rank Correlation Coefficient and Scatter Diagram; Regression Analysis	8
Total		30

Suggested Readings:

1. Berry B. J. L. and Marble D. F. (eds.): *Spatial Analysis – A Reader in Geography*.
2. Ebdon D., (1977) *Statistics in Geography: A Practical Approach*.
3. Hammond P. and McCullagh P. S., (1978) *Quantitative Techniques in Geography: An Introduction*, Oxford University Press.
4. King L. S., (1969) *Statistical Analysis in Geography*, Prentice-Hall.
5. Mahmood A., (1977) *Statistical Methods in Geographical Studies*, Concept.

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GEOGRAPHY
SEMESTER -IV

TYPE OF COURSE : MJC-7 (P) Full Marks: 100
NAME OF COURSE : Statistical Methods in Geography ESE: 70
CREDIT : 2 CIA: 30

COURSE OBJECTIVES:

1. To enable the students to differentiate between quantitative and qualitative information
2. To enable students with the nature of various data, different sources and methods of data collection
3. To apply the sampling methods for data collection

COURSE OUTCOME:

After completion of the course students will be able to-

1. Present statistical data in diagrammatic and graphical form
2. Distinguish between dependent and independent variable

Unit	Topics	No. of Lectures
I	Measurement of Central Tendency: Mean, Median, Mode and Centro-Graphic Techniques- Histogram and Frequency Polygon	6
II	Measures of dispersion: Range, Mean Deviation, Standard Deviation, Quartile Deviation	6
III	Correlation - Karl Pearson's Coefficient of Correlation, Spearman's Rank Correlation and Scatter Diagram	8
IV	Practical Record and Viva-Voce	-
Total		20

Suggested Readings:

1. Berry B. J. L. and Marble D. F. (eds.): *Spatial Analysis – A Reader in Geography*.
2. Ebdon D., (1977) *Statistics in Geography: A Practical Approach*.
3. Hammond P. and McCullagh P. S., (1978) *Quantitative Techniques in Geography: An Introduction*, Oxford University Press.
4. King L. S., (1969) *Statistical Analysis in Geography*, Prentice-Hall.
5. Mahmood A., (1977) *Statistical Methods in Geographical Studies*, Concept.
6. Pal S. K., (1998) *Statistics for Geoscientists*, Tata McGraw Hill, New Delhi.
7. Sarkar, A. (2013) *Quantitative geography: techniques and presentations*. Orient Black Swan Private Ltd., New Delhi

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8. Silk J., (1979) *Statistical Concepts in Geography*, Allen and Unwin, London.
9. Spiegel M. R.: *Statistics, Schaum's Outline Series*.
10. Yeates M., (1974) *An Introduction to Quantitative Analysis in Human Geography*, McGraw Hill, New York.
11. Shinha, Indira (2007) *Sankhyikibhugol*. Discovery Publishing House, New Delhi

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GEOGRAPHY

SEMESTER –V

TYPE OF THE COURSE : MJC-8 (T) **Full Marks: 100**
NAME OF THE COURSE : ENVIRONMENTAL GEOGRAPHY **ESE: 70**
CREDIT : 5 **CIA: 30**
COURSE OBJECTIVES :

1. To understand the Environmental Geography - Its concepts and Components.
2. To critically examine Environmental degradation and pollution.
3. To provide a theoretical and empirical framework for understanding environmental law.

COURSE OUTCOMES :

After completion of the course, students will be able to-

- 1: Develop an idea about Environment and different fundamental concepts
- 2: Understand its environmental degradation and various types of pollutions.
- 3: Assess the role of anthropogenic activities producing pollution.
- 4: Explain different types of environmental crisis and bio-diversity.
- 5: Understand the processes of natural hazards and disasters.

UNIT	TOPICS	No.of Lectures
I	Environmental Geography: meaning and concept, Environmental degradation, Bio-diversity: Hot Spots, Heat island, Components of environment and their inter-relationship, Concepts and types of Eco-system, Ecological balance, Bio-energy Cycle.	12
II	Environmental pollution : Air pollution, Water pollution, Noise pollution, Sound pollution, and their remedial measures, International standard of Drinking water	12
III	Environmental Degradation: Causes and Impacts, Natural disasters Drought, Flood and Earthquake, Environmental Pollution : Air Pollution, Water Pollution, Environmental management and policies.	14
IV	Sewage disposal, Cleaning of rivers, Natural hazards and disasters, Radiation hazards, Gas leak, Acid rain, Environmental laws.	12
Total		50

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Suggested Readings:-

1. Chandna R. C., (2002)*Environmental Geography*, Kalyani, Ludhiana.
2. Cunningham W. P. and Cunningham M. A., (2004)*Principals of Environmental Science: Inquiry and Applications*, Tata Macgraw Hill, New Delhi.
3. Goudie A., (2001)*The Nature of the Environment*, Blackwell, Oxford.
4. Mal, Suraj., and Singh, R.B. (Eds.) (2009) *Biogeography and Biodiversity*. Rawat Publication, Jaipur.
5. Miller G. T., (2004)*Environmental Science: Working with the Earth*, Thomson BrooksCole, Singapore.
6. MoEF, (2006)*National Environmental Policy-2006*, Ministry of Environment and Forests, Government of India.
7. Singh, R.B. and Hietala, R. (Eds.) (2014) Livelihood security in Northwestern Himalaya: Case studies from changing socio-economic environments in Himachal Pradesh, India. *Advances in Geographical and Environmental Studies*, Springer.
8. Odum, E. P. et al, (2005)*Fundamentals of Ecology*, Ceneage Learning India.
9. Singh S., (1997)*Environmental Geography*, PrayagPustakBhawan. Allahabad.
10. UNEP, (2007)*Global Environment Outlook: GEO4: Environment for Development*, United Nations Environment Programme.
11. Singh, M., Singh, R.B. and Hassan, M.I. (Eds.) (2014) Climate change and biodiversity: Proceedings of IGU Rohtak Conference, Volume 1. *Advances in Geographical and Environmental Studies*, Springer
12. Singh, R.B. (1998) *Ecological Techniques and Approaches to Vulnerable Environment*, New Delhi, Oxford & IBH Pub..
13. Singh, Savindra 2001. *ParyavaranBhugol*, PrayagPustakBhawan, Allahabad. (in Hindi).

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GEOGRAPHY

SEMESTER –V

TYPE OF THE COURSE : MJC-9 (T) **Full Marks: 100**
NAME OF THE COURSE : CARTOGRAPHIC TECHNIQUES **ESE: 70**
CREDIT : 3 **CIA: 30**
COURSE OBJECTIVES :

1. Create professional and aesthetically pleasing maps through thoughtful application of cartographic conventions;
2. Develop an understanding of the concepts regarding scale, map projections to suit map purposes;
3. Better understanding of the techniques for interpretation of topographical and weather maps.

COURSE OUTCOMES :

This is a practical, hands-on course; when students complete it, they will be able to:

1. Explain how maps work, conceptually and technically and will be able to understand science and art of cartography
2. Recognize the benefits and limitations of some common map projections and their use.
3. Understand and perform interpretation of topographical maps and weather maps.

UNIT	TOPICS	No.of Lectures
I	Nature and Scope of Cartography, Scale- Concept and Application, Graphical Construction of Simple, Comparative and Diagonal Scales.	8
II	Weather Map – Difference between Climate and Weather, Significance of weather maps, Study and Interpretation of Weather Maps. Cloud types, Methods of interpretation of daily weather maps, Development of weather forecasting technology	8
III	Map Projections - Concept, Classification and Properties, Graphical Construction of Cylindrical Equidistant and Equal Area Projection, Conical Projection with One and Two Standard Parallels, Zenithal Equi-Distant and Equal Area Projection.	8
IV	Topographical Map – Development of topographical mapping in India, Maps of Survey of India, Methods of study of the Topographical maps, Interpretation of Topographical Maps.	6
Total		30

Amal
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Shash
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Amal
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Shingta
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Suggested Readings:-

1. Anson, R. and Ormelling, F. J., (1994) International Cartographic Association: Basic Cartographic Vol. Pregmen Press.
2. Gupta, K.K. and Tyagi, V. C., (1992) Working with Map, Survey of India, DST, New Delhi.
3. Maltiyar. K. K & Maltiyar S. R., (2019) Concept of Cartography, Remote Sensing and GIS, Rajesh publication, New Delhi.
4. Mishra, R.P. and Ramesh, A., (1989) Fundamentals of Cartography, Concept, NResource & Economic Geographyew Delhi.
5. Monkhouse, F. J. and Wilkinson H. R., (1973) Maps and Diagrams, Methuen, London.
6. Rhind, D. W. and Taylor D. R. F., (eds.), (1989) Cartography: Past, Present and Future, Elsevier, International Cartographic Association.
7. Robinson, A. H., (2009) Elements of Cartography, John Wiley and Sons, New York.
8. Sharma J. P., (2010) Prayogic Bhugol, Rastogi Publishers, Meerut.
9. Singh R. L. and Singh R. P. B., (1999) Elements of Practical Geography, Kalyani Publishers, New Delhi.
10. Sinha. M.M. P., (2017) Uchch Cartography, Rajesh Publication, New Delhi.
11. Sarkar, A. (2015) Practical geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi.
12. Singh R L & Singh Rana P B, (1991) Prayogtmak Bhugolke Mool Tatva, Kalyani Publishers, New Delhi.
13. Sharma, J P (2010) Prayogtmak Bhugolki Roprekha, Rastogi Publications, Meerut.
14. Singh, R L & Datta, P K (2012) Prayogtmak Bhugol, Central Book Depot, Allahabad.

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GEOGRAPHY
SEMESTER - VI

TYPE OF COURSE : MJC- 10 (T)

FULL MARKS: 100

NAME OF COURSE : EVOLUTION OF GEOGRAPHICAL THOUGHT

ESE- 70 MARKS

CREDIT : 5

CIA- 30 MARKS

Course Objectives:

1. Understanding historical evolution of geographic thought;
2. Detailed analysis of different paradigms in geography;
3. Evaluating the contemporary trends in geographical studies

Course Outcomes:

After studying, students will be able to:

1. Understand the evolution of geographical thought and relation of Geography with other Sciences.
2. Detailed knowledge about the paradigms and debates in the geographical studies.
3. Understanding of recent traditions in geography.

UNIT	TOPICS	NUMBER OF LECTURES
I	Meaning and Definition of Geography, Relation of Geography with Other Sciences.	10
II	Contribution of Geographers: Eratosthenes, Ptolemy, Stabo, Al-Idrisi, Al-Masudi, Humbolt, Ritter, Ratzel, Blache and Mackinder.	15
III	Dualism in Geography- Physical Vs Human Geography, Determinism Vs Possiblism, Neo-Determinism, Systematic Vs Regional.	10
IV	Concept and Methodological development in Geography, Quantitative Revolution, Behaviouralism, Applied Geography.	15

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Devi
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GEOGRAPHY SEMESTER – VI

TYPE OF COURSE : MJC- 11 (T)

FULL MARKS: 100

NAME OF COURSE : RESEARCH METHODOLOGY AND FIELD WORK

ESE- 70 MARKS

CREDIT : 4

CIA- 30 MARKS

Course Objectives:

1. To understand concept and various techniques of research methodology in geography;
2. Detailed analysis of different field survey techniques.
3. Understanding of the report writing and field tools.

Course Outcomes:

After learning, students will be able to:

1. Detailed exposure of new geographical landscape as study area.
2. In-depth knowledge of different field techniques.
3. Understanding the field ethics and different tools of field study.

UNIT	TOPICS	NUMBER OF LECTURES
I	Research - Meaning and its Types, Hypothesis, Research Methodology: Merits and demerits of Quantitative and Qualitative techniques.	12
II	Field Techniques: Merits, Demerits and Selection; Observation, Questionnaire, Schedule and Interview Method. Sampling and its Types.	10
III	Case Study Method of Research: Definition, Nature and Field Tools.	8
IV	Field Report: Aims and Objectives, Data Analysis, Interpretation and Report Writing. Bibliography.	10
Total		40

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Suggested Readings:-

1. Anson, R. and Ormelling, F. J., (1994) International Cartographic Association: Basic Cartographic Vol. Pregmen Press.
2. Gupta, K.K. and Tyagi, V. C., (1992) Working with Map, Survey of India, DST, New Delhi.
3. Maltiyar. K. K &Maltiyar S. R., (2019) Concept of Cartography, Remote Sensing and GIS, Rajesh publication, New Delhi.
4. Mishra, R.P. and Ramesh, A., (1989) Fundamentals of Cartography, Concept, NResource & Economic Geographyew Delhi.
5. Monkhouse, F. J. and Wilkinson H. R., (1973) Maps and Diagrams, Methuen, London.
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8. Sharma J. P., (2010) PrayogicBhugol, Rastogi Publishers, Meerut.
9. Singh R. L. and Singh R. P. B., (1999) Elements of Practical Geography, Kalyani Publishers, New Delhi.
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11. Sarkar, A. (2015) Practical geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi.
12. Singh R L & Singh Rana P B, (1991) Prayogtmak Bhugol ke Mooltatva, Kalyani Publishers, New Delhi.
13. Sharma, J P (2010) PrayogtmakBhugulkiRooptekha, Rastogi Publications, Meerut.
14. Singh, R L & Duttu, P K (2012) PrayogtmakBhugol, Central Book Depot, Allahabad.

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Suggested Readings:

1. Campbell J. B., (2007) *Introduction to Remote Sensing*, Guildford Press.
2. Jensen J. R., (2004) *Introductory Digital Image Processing: A Remote Sensing Perspective*, Prentice Hall.
3. Joseph, G. (2005) *Fundamentals of Remote Sensing*, United Press India.
4. Lillesand T. M., Kiefer R. W. and Chipman J. W., (2004) *Remote Sensing and Image Interpretation*, Wiley. (Wiley Student Edition).
5. Maltiyar. K. K & Maltiyar S. R., (2019) *Concept of Cartography, Remote Sensing and GIS*, Rajesh publication, New Delhi.
6. Nag P. and Kudra, M., (1998) *Digital Remote Sensing*, Concept, New Delhi.
7. Rees W. G., (2001) *Physical Principles of Remote Sensing*, Cambridge University Press.
8. Singh R. B. and Murai S., (1998) *Space-informatics for Sustainable Development*, Oxford and IBH Pub.
9. Wolf P. R. and Dewitt B. A., (2000) *Elements of Photogrammetry: With Applications in GIS*, McGraw-Hill.
10. Sarkar, A. (2015) *Practical geography: A systematic approach*. Orient Black Swan Private Ltd., New Delhi.
11. Chauniyal, D.D. (2010) *Sudur Samvedanevam Bhogolik Suchana Pranali*, Sharda Pustak Bhawan, Allahabad.

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Interpretation, Wiley. (Wiley Student Edition).

5. Maltiyar. K. K & Maltiyar S. R., (2019) *Concept of Cartography, Remote Sensing and GIS*, Rajesh publication, New Delhi.
6. Nag P. and Kudra, M., (1998) *Digital Remote Sensing*, Concept, New Delhi.
7. Rees W. G., (2001) *Physical Principles of Remote Sensing*, Cambridge University Press.
8. Singh R. B. and Murai S., (1998) *Space-informatics for Sustainable Development*, Oxford and IBH Pub.
9. Wolf P. R. and Dewitt B. A., (2000) *Elements of Photogrammetry: With Applications in GIS*, McGraw-Hill.
10. Sarkar, A. (2015) *Practical geography: A systematic approach*. Orient Black Swan Private Ltd., New Delhi.
11. Chauniyal, D.D. (2010) *Sudur Samvedan evam Bhogolik Suchana Pranali*, Sharda Pustak Bhawan, Allahabad.

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Massachusetts.

3. Friedmann J. and Alonso W. (1975) *Regional Policy - Readings in Theory and Applications*, MIT Press, Massachusetts.
4. Gore C. G., (1984) *Regions in Question: Space, Development Theory and Regional Policy*, Methuen, London.
5. Gore C. G., Köhler G., Reich U-P. and Ziesemer T., (1996) *Questioning Development: Essays on the Theory, Policies and Practice of Development Intervention*, Metropolis- Verlag, Marburg.
6. Haynes J., (2008) *Development Studies*, Polity Short Introduction Series.
7. Johnson E. A. J., (1970) *The Organization of Space in Developing Countries*, MIT Press, Massachusetts.
8. Peet R., (1999) *Theories of Development*, The Guilford Press, New York.
9. UNDP (2001-04) *Human Development Report*, Oxford University Press, New York.
10. World Bank (2001-05) *World Development Report*, Oxford University Press, New York.

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Ja Bohi
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SUGGESTED READING:

1. Government of India. (1997) Vulnerability Atlas of India. New Delhi, Building Materials & Technology Promotion Council, Ministry of Urban Development, Government of India.
2. Kapur, A. (2010) Vulnerable India: A Geographical Study of Disasters, Sage Publication, New Delhi.
3. Modh, S. (2010) Managing Natural Disaster: Hydrological, Marine and Geological Disasters, Macmillan, Delhi.
4. Singh, R.B. (2005) Risk Assessment and Vulnerability Analysis, IGNOU, New Delhi. Chapter 1, 2 and 3
5. Singh, R. B. (ed.), (2006) Natural Hazards and Disaster Management: Vulnerability and Mitigation, Rawat Publications, New Delhi.
6. Sinha, A. (2001). Disaster Management: Lessons Drawn and Strategies for Future, New United Press, New Delhi.
7. Stoltman, J.P. et al. (2004) International Perspectives on Natural Disasters, Kluwer Academic Publications. Dordrecht.
8. Singh Jagbir (2007) "Disaster Management Future Challenges and Opportunities", 2007. Publisher- I.K. International Pvt. Ltd. S-25, Green Park Extension, Uphaar Cinema Market, New Delhi, India (www.ikbooks.com).

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GEOGRAPHY

SEMESTER –VII

TYPE OF THE COURSE : MJC-15 (P) **Full Marks: 100**
NAME OF THE COURSE : DISASTER MANAGEMENT **ESE: 70**
CREDIT : 2 **CIA: 30**
COURSE OBJECTIVES :

1. Understanding the basic concepts of disaster management;
2. Detailed analysis about the different types of disasters in India;
3. Evaluating the role of institutional frameworks to mitigate the disasters in the country.

COURSE OUTCOMES :

After completion of the course, students will be able to–

1. Understanding about the various disasters in the country.
2. Providing thorough understanding about the human responses to the disasters.
3. Human responses and mitigating measures to both natural and manmade disasters.
4. Understanding the processes of natural hazards and disasters.
5. Explaining different types of environmental crisis.

ESE will consists of 70 marks out of which 40 marks will be on written test and 30 marks for Viva-voce on Project Report.

UNIT	TOPICS	No.of Lectures
I	Field Work and Preparation of Project Report on any one of the following: Flood, Drought, Earthquake, Erosion by rivers, Human Induced Disasters: Fire Hazards, Electric shorts, Bursting of domestic Gas Cylinder, Chemical disasters, Industrial accidents, Road – Rail accidents, Problem of solid Waste.	10
II	Natural Disasters in India: Causes, Impact and Distribution; Flood, Drought, Earthquake and Cyclone.	10
III	Project Report and Viva -voce	
Total		20

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Vidya
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Sanjay
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Pradip
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Arjun
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Ujjwal
19.09.23

Bishu
19.09.23

Shrinika
19/09/23

Vidya
19/09/23

Suggested Reading :

1. Government of India. (1997) *Vulnerability Atlas of India*. New Delhi, Building Materials & Technology Promotion Council, Ministry of Urban Development, Government of India.
2. Kapur, A. (2010) *Vulnerable India: A Geographical Study of Disasters*, Sage Publication, New Delhi.
3. Modh, S. (2010) *Managing Natural Disaster: Hydrological, Marine and Geological Disasters*, Macmillan, Delhi.
4. Singh, R.B. (2005) *Risk Assessment and Vulnerability Analysis*, IGNOU, New Delhi. Chapter 1, 2 and 3
5. Singh, R. B. (ed.), (2006) *Natural Hazards and Disaster Management: Vulnerability and Mitigation*, Rawat Publications, New Delhi.
6. Sinha, A. (2001). *Disaster Management: Lessons Drawn and Strategies for Future*, New United Press, New Delhi.
7. Stoltman, J.P. et al. (2004) *International Perspectives on Natural Disasters*, Kluwer Academic Publications. Dordrecht.
8. Singh Jagbir (2007) *Disaster Management Future Challenges and Opportunities*. Publisher- I.K. International Pvt. Ltd. S-25, Green Park Extension, Uphaar Cinema Market, New Delhi, India (www.ikbooks.com).
9. Singh, R. B. (ed.), (2006) *Natural Hazards and Disaster Management: Vulnerability and Mitigation*, Rawat Publications, New Delhi.
10. Sinha, A. (2001). *Disaster Management: Lessons Drawn and Strategies for Future*, New United Press, New Delhi.

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GEOGRAPHY

SEMESTER –VII

TYPE OF COURSE	:	MJC-16 (T)	Full Marks: 100
NAME OF COURSE	:	SOCIAL GEOGRAPHY	ESE - 70 Marks
CREDIT	:	4	CIA - 30 Marks

COURSE OBJECTIVES:

1. To familiarise the student with the theoretical foundations and conceptual grounding of unique of social geography.
2. To appreciate the roles of geographic factors in socio-cultural diversity in terms of caste, class, religion etc.
3. To analyse in details the social wellbeing, problems and welfare programmes and policies.

COURSE OUTCOMES:

After studying, students will be able to:

1. Get Knowledge of the social geography and social diversity.
2. Appraise the key concepts of social geography in regional context; geographic factors underlying patterns of social well-being and inclusive development.
3. Explain the social problems and the welfare programs and policies.

UNIT	TOPICS	No. of Lectures
I	Social Geography: Concept, Nature and Scope, Migration: Causes and Consequences.	10
II	Social Categories: Caste, Religion, Race - their Spatial distribution.	10
III	Geography of Welfare and Social Wellbeing: Concept and Components, Healthcare, Housing and Education –Concept and Problems.	10
IV	Geography of Social Inclusion and Exclusion, Slums & Social Conflicts, Social Planning in India.	10
	TOTAL	40

Suggested Readings:-

1. Ahmed A., (1999) *Social Geography*, Rawat Publications.
2. Casino V. J. D. Jr., (2009) *Social Geography: A Critical Introduction*, Wiley Blackwell.
3. Cater J. and Jones T., (2000) *Social Geography: An Introduction to Contemporary Issues*, Hodder Arnold.
4. Holt L., (2011) *Geographies of Children, Youth and Families: An International Perspective*, Taylor & Francis.
5. Panelli R., (2004) *Social Geographies: From Difference to Action*, Sage.
6. Rachel P., Burke M., Fuller D., Gough J., Macfarlane R. and Mowl G., (2001) *Introducing*

Roshni
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GEOGRAPHY

SEMESTER –III

TYPE OF COURSE	:	MIC-3 (T)	Full Marks: 100
NAME OF COURSE	:	ECONOMIC GEOGRAPHY	ESE - 70 Marks
CREDIT	:	2	CIA - 30 Marks

COURSE OBJECTIVES:

1. To understand the concept and spatial distribution of economic activities in the world.
2. To analyse the factors affecting the economics activities.
3. To describe in details the spatial pattern of economic activities.

COURSE OUTCOMES:

After learning, students should be able to:

1. Distinguish to different types of economic activities and their utilities.
2. Examine the significance and relevance of economic activities for the progress of Mankind.

UNIT	TOPICS	No. of Lectures
I	Meaning and Scope of Economic Geography: Concept and Classification of Economic Activities- Primary, Secondary and Tertiary.	08
II	Intensive Subsistence Farming and Commercial Grain Farming, Major Industries - Iron and Steel, Cotton Textile Industry.	06
III	International Trade and WTO; Special Economic Zone (SEZ)	06
	TOTAL	20

Suggested Readings:-

1. Alexander J. W., (1963) *Economic Geography*, Prentice-Hall Inc., Englewood Cliffs, New Jersey.
2. Combes P., Mayer T. and Thisse J. F., (2008) *Economic Geography: The Integration of Regions and Nations*, Princeton University Press.
3. Wheeler J. O., (1998) *Economic Geography*, Wiley..
4. Bagchi-Sen S. and Smith H. L., (2006) *Economic Geography: Past, Present and Future*, Taylor and Francis.
5. Singh K.N.& Jagdish Singh (2020)., *Aarthik Bhugol ke Mool Tatva*, Prayag Publication.
6. Jatt B.C., (2020) *Aathik Bhugol*.. Mallik Book Company Jaypur.
7. Gautam Alka., (2022) *Aarthik bhugol ke mool tatv*, Sharda Pustak Bhawan, Prayagraj.
8. Maurya S.D., *Aarthik Bhugol*., Pravalika Publication.

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GEOGRAPHY

SEMESTER -III

TYPE OF COURSE	:	MIC-3 (P)	Full Marks: 100
NAME OF COURSE	:	ECONOMIC GEOGRAPHY	ESE - 70 Marks
CREDIT	:	1	CIA - 30 Marks

Course Objectives:

1. Create professional and aesthetically pleasing maps through thoughtful application of cartographic conventions;
2. Develop an understanding of the concepts regarding scale, map projections to suit map purposes;
3. Better understanding of the techniques for interpretation of topographical and weather maps.

Course Outcomes:

This is a practical, hands-on course; when students complete it, they will be able to:

1. Explain how diagram works.
2. Recognize the benefits and limitations of some common map projections.
3. To Understand how prismatic compass survey work.

UNIT	TOPICS	No. of Lectures
I	Scale, R.F and Maps.	05
II	Diagrams – Bar diagram and Pie diagram, Map Projection – Simpal Conical.	05
III	Record of Practical Work & Viva-voce.	--
	TOTAL	10

Suggested Readings:-

1. Anson R. and Ormelling F. J., (1994) *International Cartographic Association: Basic Cartographic Vol.* Pregmen Press.
2. Gupta K.K. and Tyagi, V. C., (1992) *Working with Map*, Survey of India, DST, New Delhi.
3. Maltiyar. K. K & Maltiyar S. R., (2019) *Concept of Cartography, Remote Sensing and GIS*, Rajesh publication, New Delhi.
4. Mishra R.P. and Ramesh, A., (1989) *Fundamentals of Cartography*, Concept, N Resource & Economic Geography ew Delhi.
5. Monkhouse F. J. and Wilkinson H. R., (1973) *Maps and Diagrams*, Methuen, London.
6. Rhind D. W. and Taylor D. R. F., (eds.), (1989) *Cartography: Past, Present and Future*, Elsevier, International Cartographic Association.
7. Robinson A. H., (2009) *Elements of Cartography*, John Wiley and Sons, New York.
8. Sharma J. P., (2010) *Prayogic Bhugol*, Rastogi Publishers, Meerut.
- Singh R. L. and Singh R. P. B., (1999) *Elements of Practical Geography*, Kalyani Publishers, New Delhi.

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12. Singh R L & Singh Rana P B, (1991) *Prayogtmak Bhugol ke Mool Tatva*, Kalyani Publishers, New Delhi.
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14. Singh, R L & Dutta, P K (2012) *Prayogtmak Bhugol*, Central Book Depot, Allahabad.

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6. Lutz W., Warren C. S. and Scherbov S., (2004) *The End of the World Population Growth in the 21st Century*, Earthscan
7. Newbold, K. B., (2009) *Population Geography: Tools and Issues*, Rowman and Littlefield Publishers.
8. Pacione, M., (1986) *Population Geography: Progress and Prospect*, Taylor and Francis.
9. Wilson, M. G. A., (1968) *Population Geography*, Nelson.
10. Panda, B. P., (1988) *JanasankyaBhugol*, M P Hindi Granth Academy, Bhopal.
11. Maurya, S. D., (2009) *JansankyaBhugol*, Sharda Putak Bhawan, Allahabad.
12. Chandna, R. C., (2006) *JansankhyaBhugol*, Kalyani Publishers, Delhi.

Homesh
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Utsav
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4. Dorrel, D., Henderson, P. 2018. Introduction to Human Geography. University of Georgia Press.
5. Hassan, M. I. (2005) Population Geography, Rawat Publication, Jaipur.
6. Fouberg, E.H., Nash, A.B., Murphy, A.B., de Blij, H., 2015. Human Geography: People, Place, and Culture, 11th ed, Wiley.
7. Ghosh S. 1998. An Introduction to Settlement Geography, Sangam Books Ltd.
8. Gregory, D., Johnston, R., Pratt, G., Watts, K., Whatmore, S. (Eds) 2009. The Dictionary of Human Geography, 5th ed, Wiley-Blackwell.
9. Knox, P.L., Marston, S.A. 2014. Human Geography, Places and Regions in Global Context, 6th ed, Pearson Education.
10. Majumdar, P.K. 2013. India's Demography: Changing Demographic Scenario in India, Rawat Publications
11. Mercier, M., Norton, W. 2019. Human Geography, 10th ed, Oxford University Press.
12. Paul, C., Crang, P., Goodwine, M.G. 2014, Introducing Human Geographies, 3rd ed, Routledge.
13. Rubenstein J.M., 2018, Contemporary Human Geography, 4th ed, Pearson.
14. Rubenstein, J.H. and Bacon, R.S., The Cultural Landscape -A Introduction to Human geography, Prentice Hall, India, New Delhi, 1990
15. Short, R.J. 2017. Human Geography: A Short Introduction, 2nd ed, Oxford University Press.
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8. Spate O. H. K. and Learmonth A. T. A., 1967: *India and Pakistan: A General and Regional Geography*, Methuen.
9. Sinha, V.N.P et.al., (2013), Bihar: Land, People and Economy, Rajesh Publication, New Delhi
10. Sinha, V.N.P et.al., (2014), Bihar Ka Bhugol, Rajesh Publication, New Delhi
11. Sharma, Nandeshwar (2007), Bihar ki BhaugolikSamisksha, Vasundhara Prakashan, Gorakhpur

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GEOGRAPHY
SEMESTER –IV

TYPE OF COURSE : MIC-6 (P) **Full Marks: 100**
NAME OF COURSE : Geography of India and Bihar **ESE: 70**
CREDIT : 1 **CIA: 30**

COURSE OBJECTIVES :

1. Introduce the basic graphical diagrams associated with the use of population data.
2. Use of Toposheet maps

COURSE OUTCOME:

After completion of the course students will be able to–

1. Learn different graphical diagrams associated with population data
2. Identify and Interpret the physical and cultural features on toposheet map

Unit	Topics	No. of Lectures
I	Bar Diagrams: Simple, Multiple and Compound; Pie Diagram and Band Graph	4
II	Graphical Presentation of Statistical Data: Age-Sex Pyramid, Dot Method, Proportionate Circle Diagram	4
III	Toposheet: Interpretation of Physical and Cultural Features	2
IV	Practical Record and Viva-Voce	-
Total		10

Suggested Readings:

1. Gupta K. K. and Tyagi V. C., (1992) *Working with Maps*, Survey of India, DST, New Delhi.
2. Kraak M.-J. and Ormeling F., (2003) *Cartography: Visualization of Geo-Spatial Data*, Prentice-Hall New Delhi.
3. Sharma J. P., (2010) *Prayogic Bhugol*, Rastogi Publishers, Meerut.
4. Singh R. L. and Singh R. P. B., (1999) *Elements of Practical Geography*, Kalyani Publishers, New Delhi.
5. Tyner J. A., (2010) *Principles of Map Design*, The Guilford Press.
6. Sarkar, A. (2015) *Practical geography: A Systematic Approach*. Orient Black Swan Private Ltd., New Delhi.

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8. Bhopal Singh R L and Duttta P K (2012) *Prayogatama Bhugol*, Central Book Depot, Allahabad.

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GEOGRAPHY SEMESTER – VI

TYPE OF COURSE : MIC- 07 (T)

FULL MARKS: 100

NAME OF COURSE : REGIONAL PLANNING AND DEVELOPMENT

ESE- 70 MARKS

CREDIT : 04

CIA- 30 MARKS

Course Objectives:

1. To understand the concept of Region and Regional Planning;
2. To familiarize the students with Theories and Models for Regional Planning;
3. To develop understanding about concept of development and different programmes and policies of development and planning.

Course Outcomes:

After studying, students will be able to:

1. Conceptualize the Regional Planning and its theories.
2. Get the overview of Sustainable Regional Development.
3. Have sound knowledge for Development Policies and Programmes.

UNIT	TOPICS	NUMBER OF LECTURES
I	Concept of Region, Types of Regions, Need for Regional Planning.	11
II	Indicators of Development and Regional Disparity in India.	09
III	Growth Pole Model of Perroux; Concept of PURA; Planning Regions: Hilly Regions and Flood Prone Regions.	12
IV	Multilevel Planning; Panchayati Raj Institutions. Prime Ministers Gramin Sadak Yojna.	08
Total		40

Suggested Reading:

1. Blij H. J. De, (1971) *Geography: Regions and Concepts*, John Wiley and Sons.
2. Claval P.I, (1998) *An Introduction to Regional Geography*, Blackwell Publishers, Oxford and Massachusetts.
3. Friedmann J. and Alonso W. (1975) *Regional Policy - Readings in Theory and Applications*, MIT Press, Massachusetts.

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4. Gore C. G., (1984) *Regions in Question: Space, Development Theory and Regional Policy*, Methuen, London.
5. Gore C. G., Köhler G., Reich U-P. and Ziesemer T., (1996) *Questioning Development; Essays on the Theory, Policies and Practice of Development Intervention*, Metropolis- Verlag, Marburg.
6. Haynes J., (2008) *Development Studies*, Polity Short Introduction Series.
7. Johnson E. A. J., (1970) *The Organization of Space in Developing Countries*, MIT Press, Massachusetts.
8. Peet R., (1999) *Theories of Development*, The Guilford Press, New York.
9. UNDP (2001-04) *Human Development Report*, Oxford University Press, New York.
10. World Bank (2001-05) *World Development Report*, Oxford University Press, New York.

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9. Spiegel M. R.: *Statistics, Schaum's Outline Series*.
10. Yeates M., (1974) *An Introduction to Quantitative Analysis in Human Geography*, McGraw Hill, New York.
11. Shinha, Indira (2007) *Sankhyiki bhugol*. Discovery Publishing House, New Delhi

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GEOGRAPHY

SEMESTER - VII

TYPE OF THE COURSE : MIC-9 (T)

Full Marks: 100

NAME OF THE COURSE : ENVIRONMENTAL GEOGRAPHY

ESE: 70

CREDIT : 3

CIA: 30

COURSE OBJECTIVES :

1. To understand the Environmental Geography, its concepts and Components.
2. To critically examine Environmental pollution.
3. To provide a theoretical and empirical framework for understanding environmental law.

COURSE OUTCOMES :

After completion of the course students will be able to-

- 1: Develop an idea about Environment and different fundamental concepts
- 2: Understand different process of pollution.
- 3: Assess the role of anthropogenic activities producing pollution.
- 4: Explain different types of environmental crisis.
- 5: Understand the processes of natural hazards and disasters.

UNIT	TOPICS	No. of Lectures
I	Environmental Geography : Meaning and Scope, Ecology and Eco-system, Terrestrial and Aquatic Eco-system	8
II	Environmental pollution : Air pollution, Water pollution, Noise pollution, Soil pollution, and their remedial measures, International standard of Drinking water	8
III	Environmental crisis: causes and mitigation, Major global Environmental issues with special reference to India: Ozone layer Depletion, Natural disasters: Drought, Flood.	8
IV	Cleaning of rivers, Contamination of water: Arsenic and Fluorides, Natural hazards and disasters, Radiation Hazards, Acid rain.	6
Total		30

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Suggested Readings:-

1. Chandna R. C., (2002)*Environmental Geography*, Kalyani, Ludhiana.
2. Cunningham W. P. and Cunningham M. A., (2004)*Principals of Environmental Science: Inquiry and Applications*, Tata Macgraw Hill, New Delhi.
3. Goudie A., (2001)*The Nature of the Environment*, Blackwell, Oxford.
4. Mal, Suraj., and Singh, R.B. (Eds.) (2009) *Biogeography and Biodiversity*. Rawat Publication, Jaipur.
5. Miller G. T., (2004)*Environmental Science: Working with the Earth*, Thomson BrooksCole, Singapore.
6. MoEF, (2006)*National Environmental Policy-2006*, Ministry of Environment and Forests, Government of India.
7. Singh, R.B. and Hietala, R. (Eds.) (2014) Livelihood security in Northwestern Himalaya: Case studies from changing socio-economic environments in Himachal Pradesh, India. *Advances in Geographical and Environmental Studies*, Springer.
8. Odum, E. P. et al, (2005)*Fundamentals of Ecology*, Ceneage Learning India.
9. Singh S., (1997)*Environmental Geography*, PrayagPustakBhawan. Allahabad.
10. UNEP, (2007)*Global Environment Outlook: GEO4: Environment for Development*, United Nations Environment Programme.
11. Singh, M., Singh, R.B. and Hassan, M.I. (Eds.) (2014) Climate change and biodiversity: Proceedings of IGU Rohtak Conference, Volume 1. *Advances in Geographical and Environmental Studies*, Springer
12. Singh, R.B. (1998) *Ecological Techniques and Approaches to Vulnerable Environment*, New Delhi, Oxford & IBH Pub..
13. Singh, Savindra 2001. *Paryavaran Bhugol*, PrayagPustakBhawan, Allahabad. (in Hindi).

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Suggested Readings:-

1. Chandna R. C., (2002)*Environmental Geography*, Kalyani, Ludhiana.
2. Cunningham W. P. and Cunningham M. A., (2004)*Principals of Environmental Science: Inquiry and Applications*, Tata Macgraw Hill, New Delhi.
3. Goudie A., (2001)*The Nature of the Environment*, Blackwell, Oxford.
4. Mal, Suraj., and Singh, R.B. (Eds.) (2009) *Biogeography and Biodiversity*. Rawat Publication, Jaipur.
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6. MoEF, (2006)*National Environmental Policy-2006*, Ministry of Environment and Forests, Government of India.
7. Singh, R.B. and Hietala, R. (Eds.) (2014) Livelihood security in Northwestern Himalaya: Case studies from changing socio-econoinic environments in Himachal Pradesh, India. Advances in Geographical and Environmental Studies, Springer.
8. Odum, E. P. et al, (2005)*Fundamentals of Ecology*, Ceneage Learning India.
9. Singh S., (1997)*Environmental Geography*, PrayagPustakBhawan. Allahabad.
10. UNEP, (2007)*Global Environment Outlook: GEO4: Environment for Development*, United Nations Environment Programme.
11. Singh, M., Singh, R.B. and Hassan, M.I. (Eds.) (2014) Climate change and biodiversity: Proceedings of IGU Rohtak Conference, Volume 1. Advances in Geographical and Environmental Studies, Springer
12. Singh, R.B. (1998). *Ecological Techniques and Approaches to Vulnerable Environment*, New Delhi, Oxford & IBH Pub..
13. Singh, Savindra 2001. *Paryavaran Bhugol*, PrayagPustakBhawan, Allahabad. (in Hindi).

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1. Campbell J. B., (2007) *Introduction to Remote Sensing*, Guildford Press.
2. Jensen J. R., (2004) *Introductory Digital Image Processing: A Remote Sensing Perspective*, Prentice Hall.
3. Joseph, G. (2005) *Fundamentals of Remote Sensing*, United Press India.
4. Lillesand T. M., Kiefer R. W. and Chipman J. W., (2004) *Remote Sensing and Image Interpretation*, Wiley. (Wiley Student Edition).
5. Maltiyar. K. K & Maltiyar S. R., (2019) *Concept of Cartography, Remote Sensing and GIS*, Rajesh publication, New Delhi.
6. Nag P. and Kudra, M., (1998) *Digital Remote Sensing*, Concept, New Delhi.
7. Rees W. G., (2001) *Physical Principles of Remote Sensing*, Cambridge University Press.
8. Singh R. B. and Murai S., (1998) *Space-informatics for Sustainable Development*, Oxford and IBH Pub.
9. Wolf P. R. and Dewitt B. A., (2000) *Elements of Photogrammetry: With Applications in GIS*, McGraw-Hill.
10. Sarkar, A. (2015) *Practical geography: A systematic approach*. Orient Black Swan Private Ltd., New Delhi.
11. Chauniyal, D.D. (2010) *Sudur Samvedan evam Bhogolik Suchana Pranali*, Sharda Pustak Bhawan, Allahabad.

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3. Joseph, G. (2005) *Fundamentals of Remote Sensing*, United Press India.
4. Lillesand T. M., Kiefer R. W. and Chipman J. W., (2004) *Remote Sensing and Image Interpretation*, Wiley. (Wiley Student Edition).
5. Maltiyar. K. K & Maltiyar S. R., (2019) *Concept of Cartography, Remote Sensing and GIS*, Rajesh publication, New Delhi.
6. Nag P. and Kudra, M., (1998) *Digital Remote Sensing*, Concept, New Delhi.
7. Rees W. G., (2001) *Physical Principles of Remote Sensing*, Cambridge University Press.
8. Singh R. B. and Murai S., (1998) *Space-informatics for Sustainable Development*, Oxford and IBH Pub.
9. Wolf P. R. and Dewitt B. A., (2000) *Elements of Photogrammetry: With Applications in GIS*, McGraw-Hill.
10. Sarkar, A. (2015) *Practical geography: A systematic approach*. Orient Black Swan Private Ltd., New Delhi.
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