KOHIMA SCIENCE COLLEGE, JOTSOMA
(An Autonomous Government P.G College)

DEPARTMENT OF GEOGRAPHY

(Semester Based Course)

B.A/B.Sc. Syllabus

National Education Policy 2020

Effective from

Academic Year 2024-25

Kohima Science College
(An Autonomous Govt. P.G College)
Jotsoma, Nagaland

BOARD OF STUDIES

DEPARTMENT OF GEOGRAPHY

SL.NO		NAME	DESIGNATION	INSTITUTION	REMARKS
1.	Chairman	Ms. Rongdensungla Longkumer	Associate Professor	Kohima Science College (A)	
2.	Board Members (Department of Geography, KSCJ)	Dr. Sakhoveyi Lohe	Associate Professor		
		Mr. Selie Puro	Assistant Professor		
		Mr. Kezhadi Leno	Assistant Professor		
		Mr. Kekhriele Nakhro	Assistant Professor		
		Ms. T. K. Medoweu	Assistant Professor		
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3.	Subject Expert	Dr. Vekhoshehü Thingo	Former Principal		
		Dr. R. Bendangtemjen	Assistant Professor	Dept. of Geography, Fazl Ali College	
4.	Subject Expert from Parent University	Prof. Lanusashi Longkumer	Professor	Nagaland University	
5.	Industry Representative	Dr. Martemjen	Founder Member CICES/Observer Member IPBES	CICES/IPBES	
6.	Alumnus	Dr. Ditho Katiry	Scientist 'C'	Nagaland Science and Technology Council, Dept. of Science and Technology	

MODEL CURRICULUM

Name of the Degree Program: B.A/B.Sc. (Basic/Honours) Degree in Geography

Discipline Core: Geography

Total Credits for the Program: 160

Starting year of implementation: 2024-2025

Program Learning Outcomes (PLO):

- Comprehensive understanding of the basic concepts in Geography.

- Demonstrating the coherent and systematic knowledge in the discipline of Geography to deal with current issues and their solution.
- Display an ability to read and understand maps and topographic sheets to look at the various aspects of the space.
- Cultivate ability to evaluate critically the wider chain of network of spatial aspects from global to local on various time scales.
- Recognise the skill development in Geographical studies programme as part of career avenues in various fields like teaching, research and administration.

PLO 1: Relating to Knowledge

By the end of the program, the students will be able to:

1.1 Elucidate the terms and concepts of Geography including the various definitions relating to the discipline.
1.2 Describe the principles, theories and models in Geography.
1.3 Explain with clarity the processes related to man and his environment.

PLO 2: Understanding and application

By the end of the program, the students will be able to:

2.1 Comprehend the complex phenomena operating in physical environment.

2.2 Able to identify the differences and similarities between various places, people and the environment.

2.3 Implement the processes and theories involved in the discipline to various models of study as in changes in distribution of resources and its impact on the environment.

PLO 3: Skilling of Students

By the end of the program, the students will be able to:

3.1 Translate the geographical data into different outcomes at the same time deduce its limitations.

3.2 Apply the geographical data to study trends of development

3.3 To gather geographical information by the use of analytical methods applicable in the discipline.

3.4 Utilize maps and diagrams to display various geographical aspects.

PLO 4: Students Evaluation

By the end of the program, the students will be able to:

4.1 Appraise the theories and principles involved in the discipline.

4.2 Assess the impact of geographical processes.

4.3 Determine how the changes in processes involved in physical setting has led to conflicts of interest , at the same time led to the management of Physical and Human environment.

4.4 Overall evaluation of the success or failure of the program.

AIMS OF THE SYLLABUS:

1. Inculcate the ability to evaluate and solve geographical problems effectively.
2. Appreciate the relevance of geographical knowledge to everyday life.
3. Demonstrate the ability to communicate geographic information by utilizing both lecture and practical exercises.
4. Explain the cause and effects of change over space and time on physical and human environments.
5. Creating a broad knowledge of space, place and location.
6. Demonstrate the skills in using geographical research tools including spatial statistics, cartography, remote sensing and GIS.
7. Based on field knowledge the students should be able to understand the on-going geographical problems in different physical setting with appropriate pragmatic solutions.

B.A/B.SC. GEOGRAPHY DEGREE (BASIC/HONOURS)
TECHNICAL SKILLS AND POSSIBLE JOBS AFTER EACH EXIT
DURING AND AFTER THE PROGRAM

Year	Objectives	Exit Level	Credits	Technical Skills	Possible Jobs

I	Understanding and exploration	Certificate	40	• Map Interpretation • Geomorphic Analysis • Management of resources • Basics of resource management	●Field Surveyor ●Consultant in Disaster management & Mitigation Program
II	Focus and Immersion	Diploma	80	• Cartography • Statistical Analysis • Climate data analysis and interpretation	●Field Surveyor ●Cartographer ●Weather data analyst
III	Real Time Learning	Degree	120	• Cartography • GIS and Image Analysis • Tourism management	●GIS Field Surveyor ●GIS Analyst ●Nature Conservation Officer ●School Teacher
IV	In-depth Study	Degree with honours	160	• GIS and Image Analysis • Resource Management • Town Planning • Tourism management	●Tourism Officer ●Planning Officer ●Cartographer ●Geography Teacher ●Geography Researcher ●Asst. Urban Development Officer

UG PROGRAM STRUCTURE FOR B.A./B.SC. GEOGRAPHY

Sem	DS Core *Major* (4)	DS Elective *Minor* (4)	Inter./Multi. Course (3)	AEC (3)	SEC (3)	Common VAC (3)	Total Credits
1st	**MJ 1**- Physical Geography	**MN 1** Introduction to Physical Geography	**MC 1** Settlement geography	**AEC 1**- EN, TN	**SEC 1**- Thematic Cartography	**VAC 1**- EVS	20
2nd	**MJ 2**- Human Geography	**MN 2** Introduction to Human Geography	**MC 2** Fundamentals of Natural Disaster	**AEC 2**- EN, TN	**SEC 2**- Cartographic Mapping	**VAC 2**- ITK	20
UG Certificate will be awarded provided a student secure 4 credits in work based vocational courses offered during summer term or internship.							**40**
3rd	**MJ 3**- Development of Geographical Thoughts **MJ 4**- Geomorphology	**MN 3** Earth System Dynamic	**MC 3** Introduction to Geomorphology	**(2)** **AEC 2**- EN, TN	**SEC 3** - Geo-Surveying		20
4th	**MJ 5**- Economic Geography **MJ 6**- Geography Of India **MJ 7**- Climatology **MJ 8**- Field work	**MN 4** Fundamental Climatology					20
UG Diploma							**80**
5th	**MJ 9**- Hydrology **MJ 10**- Population Geog. **MJ 11**- Fundamentals of Remote Sensing.	**MN 5** Geography of India			**(4)** **Internship**		20
6th	**MJ 12**- Geography Of NEI & Nagaland **MJ 13**- Regional Planning & Development **MJ 14**- Research Methodology in Geography **MJ 15**- Fundamentals of GIS	**MN 6** Evolution of Geographical Thought					20
UG Degree							**120**
7th	**MJ 16**- Environmental Geography **MJ 17**- Resource & Applied Geography **MJ 18**- Advanced Geomorphology **MJ 19**- Statistical Geog.	**MN 7** Environmental Geography					20
8th	**MJ 20**- Disaster Management	**MN 8** Resource and Applied Geography			**MJ 21**- Social Geography **MJ 22**-.Field Work **MJ 23**- Geography of Transport **Or** Research Project / Dissertation (12)		20
UG Degree (Honours) w/ Research							**160**

SEMESTER – I
DS CORE 1 (Major-1)
PHYSICAL GEOGRAPHY (Theory + Practical)

Contact Hours:
Credit: 4

Course Objectives:
The course aims to:

1. Study basic principles of the Earth Sciences
2. Understand the landforms, atmospheric elements and structure
3. Understand Composition of the earth's crust with exogenetic and endogenetic forces.
4. Learn basic concepts cartography

Learning Outcomes:

1. Students will be able to understand the fundamental concepts in Earth Sciences
2. Understand basic terminology used to describe physical processes and landscape forms.
3. Describe Composition of the earth's crust, exogenetic and endogenetic forces.
4. Read and prepare maps.
5. Comprehend locational and spatial aspects of the earth surface.

Course Content (Theory + Practical)

Unit 1: Physical geography – nature, scope and Branches of Physical Geography; Origin of Solar System and Earth (Gaseous Theory by Kant, Nebular Hypothesis of Laplace and Big-Bang Theory).

Unit II: Motions of the Earth: Rotation and Revolution; Effects of the movement of the Earth; Major landforms: Types and classification of Mountains, Plateaus and Plains.

Unit III: Rock types and significance; Weathering- Concept, Controlling factors of Weathering; Mass Movement- Concept and factors of Mass Movement, Types and distribution of Volcanoes and Earthquakes.

Unit IV: Concept of map and types of maps; Map Elements (Representation of distance and direction; cardinal points; conventional signs and symbols), Techniques of drawing map boundaries –international, national, state and district; Preparation of base map: State/ Country/World; Concept of time zones: GMT, IST, IDL, Equinoxes, solstices, Meridians and Parallels, Calculation of Time on the basis of longitude

Recommended Readings:

1. Bryant, H. Richard (2001): Physical Geography Made Simple, Rupa and Company, New Delhi.
2. Bunnett, R.B. (2003): Physical Geography in Diagrams, Fourth GCSE edition, Pearson Education (Singapore) Private Ltd.
3. Hugget, R.J. (2003): Fundamentals of Geomorphology, Routledge, London.
4. Monkhouse, F.J. (1979): Physical Geography, Methuen, London.
5. Negi, B.S. (2000): Physical Geography, Kedar Nath Ram Nath, Meerut.
6. Singh, S. (2003): Physical Geography, Prayag Pustak Bhawan, Allahabad. (2007): Physical Geography, Lakshmi Narain Agarwal, Agra.
7. Sharma, Y.K. (2007): Physical Geography, Lakshmi Narain Agarwal, Agra.
8. Strahler, A.N. and Strahler, A.m. (1992): Modern Physical Geography, John Wiley and Sons, New York.
9. Thornbury, W.D. (1960): Principles of Geomorphology, John Willey & Sons, New York.
10. Wooldrige, S.H and Morgan, R.S. (1959): The Physical Basis of Geography –An Outline of Geomorphology

SEMESTER – I
DS Elective (Minor-1)
INTRODUCTION TO PHYSICAL GEOGRAPHY (Theory)

Contact Hours:
Credit: 4

Course Objectives:
This course aims to:

1. Study basic principles of the Earth Sciences
2. Understand the landforms, atmospheric elements and structure and basics of oceanography
3. Learn basic writing techniques for report preparation.

Learning Outcomes:

1. Students will be able to understand the fundamental concepts in Earth Sciences
2. Understand basic terminology used to describe physical processes and landscape forms.
3. Describe elements of the atmosphere and the oceans
4. Develop skill in identifying problems and prepare report based on data collected.

Course Content (Theory + Practical)

Unit I: Nature and scope of Physical Geography; Movement of the Earth- Rotation and Revolution, effects of the movement of the Earth; Coordinates – Latitude, Longitude and time; Internal structure of the Earth.

Unit II: Rocks- types and significance; Weathering- definition and types; Types and distribution of Volcanoes and Earthquakes.

Unit III: Structure and composition of atmosphere; elements of weather and climate; Insolation and heat budget; Atmospheric pressure, winds and precipitation; Relief of the ocean floor; temperature and salinity of sea water; Marine resources – marine zones and classification of marine resources.

Unit IV: Report writing on a relevant topic studied under Unit I, II and III.

Recommended Readings:

1. Bryant, H. Richard (2001): Physical Geography Made Simple, Rupa and Company, New Delhi.
2. Bunnett, R.B. (2003): Physical Geography in Diagrams, Fourth GCSE edition, Pearson Education (Singapore) Private Ltd.
3. Hugget, R.J. (2003): Fundamentals of Geomorphology, Routledge, London.
4. Monkhouse, F.J. (1979): Physical Geography, Methuen, London.
5. Negi, B.S. (2000): Physical Geography, Kedar Nath Ram Nath, Meerut.
6. Singh, S. (2003): Physical Geography, Prayag Pustak Bhawan, Allahabad. (2007): Physical Geography, Lakshmi Narain Agarwal, Agra.
7. Sharma, Y.K. (2007): Physical Geography, Lakshmi Narain Agarwal, Agra.
8. Strahler, A.N. and Strahler, A.m. (1992): Modern Physical Geography, John Wiley and Sons, New York.
9. Thornbury, W.D. (1960): Principles of Geomorphology, John Willey & Sons, New York.

SEMESTER – I

SEC - 1

Mapping Techniques

Contact Hours:45
Credit: 3

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 understand the techniques and uses of Map Projections.

Learning Outcome: After the completion of course, the students will have ability to:

1. Prepare and interpret maps.
2. Comprehend locational and spatial aspects of the earth surface.

Course Content (Theory + Practical)

UNIT I: Meaning, Nature and scope of cartography, Evolution of Cartography: Ancient, Medieval and Modern Cartography, Introduction to scale: Definition and Types of scale, Conversion of scale: Verbal Scale (VS) into RF and RF into VS, Preparation of scale: Simple/Plain/Linear, Comparative and Diagonal.

UNIT II: Enlargement and Reduction of map by graphical method, combination of maps of different scales

UNIT III: Definition, classification and uses of map projection; Map projection- Cylindrical(simple and equal area)with properties and uses; Molleweid's and Sinusoidal Projection.

UNIT IV: Viva voce and Practical Notebook.

Recommended Readings:

1. Binch, T.W. (1968**): Maps: Topographical and Statistica**l, Clarendon Press, Oxford.
2. Khan, Md. Z.A. (1998): **Text Book of Practical Geography**, Concept Publishing, New Delhi.
3. Lownsberg, J.F. and Aldrich, F.T. (1979): **Introduction to Geographical Methods and Techniques**, Charles Marlin, Columbus.
4. Mishra, R.P. and Ramesh A. (1989): **Fundamentals of Cartography**, Concept Publishing Company, New Delhi.
5. Mohammad, N. (2008): **Practical Work in Geography**, Sunflower Publishers, New Delhi.
6. Sarkar, A.K. (1997): **Practical Geography: A Systematic Approach**, Orient Longman, Kolkata.
7. Singh, L.R. (2006): **Fundamentals of Practical Geography**, Sharda Pustak Bhawan, Allahabad.
8. Singh, R.L. and Singh, Rana P.B. (1993): **Elements of Practical Geography**, Kalyani Publishers, New Delhi.

SEMESTER – II
DS CORE 2 (Major-2)
HUMAN GEOGRAPHY (Theory + Practical)

Contact Hours: 60
Credit: 4

Course Objectives - This course aims to:

1. Understand the basics concepts of human geography
2. Study population attributes and dynamic nature of it
3. Introduce economic, cultural, and trade activities and their impact on the development of the region
4. To equip the pupils with map interpretation tools and techniques

Learning Outcomes:

1. Students will learn how human, physical, and environmental components of the world interact.
2. The student will Describe what geography and human geography are.
3. Understand population dynamics and migration.
4. Able to interpret map correctly using proper tools and techniques

Course Content (Theory + Practical)

Unit I: Nature and scope of Human Geography; development and branches of Human geography, approaches to study of human geography**;** Man-environment dynamic relationships: determinism, neo determinism and possibilism.

Unit II: Evolution of man; classification of races; characteristics of races and their broad distribution; Human adaptation to environment (Eskimos, Bushman, Gujjars); Physical, economic and social factors influencing spatial distribution of world population; population growth, distribution and density.

Unit III: Settlement-Geographical factors influencing human settlement; rural and urban settlement; Types and patterns of rural settlement; Urban settlement- morphology and functional classification; Migration – Causes, types and consequences.

Unit IV: Interpretation of Toposheet: Settlement, Transport and Land-use; Representation of statistical Qualitative data using: Chorochromatic, Choro schematic Techniques.

Recommended Readings:

1. Beyman, E.F. (1995): **Human Geography** – Culture,s Connections and Landscape, Prentice Hall, New Jersey.
2. Hazra, Jayati et al., (1977): **Dimensions of Human Geography**, Rawat Publications, Jaipur.
3. Hopkins, I. (1982): **An Introduction to Human Geography**, Widenfield and Nicolson, London.
4. Hussain, M. (1994): **Human Geography,** Rawat Publications, Jaipur.
5. James, R. (2010):**The Cultural Landscape – An Introduction to Human Geography**, Prentice Hall of India, New Delhi.
6. Leong Goh Cheng (2003): **Physical and Human Geography,** Oxford University Press, New Delhi.
7. Norton, W. (1995): **Human Geography,** Oxford University Press, New York.
8. Singh, L.R. (2005): **Fundamentals of Human Geography**, Sharda Pustak Bhawan, Allahabad.
9. Stoddard, R.H., Wishart, D.J. and and Blouet, B.W.: **Human Geography,** Prentice-Hall, Englewood Cliffs, New Jersey

DS Elective (Minor-2)

INTRODUCTION TO HUMAN GEOGRAPHY (Theory)

Contact Hours:
Credit: 4

Course Objectives - This course aims to:

1. Understand the basics concepts of human geography
2. Study population attributes and dynamic nature of it
3. Introduce economic, cultural, and trade activities and their impact on the development of the region

Learning Outcomes: The student will

1. Learn how human, physical, and environmental components of the world interact.
2. Be familiarized with economic processes such as globalization, trade and their impacts on economic, cultural and social activities.
3. Able to describe what geography and human geography are.
4. Understand population dynamics and migration.

Course Content (Theory + Practical)

Unit I: Human Geography-meaning, nature and scope; branches of Human geography; Man-environment dynamic relationships- determinism and possibilism.

Unit II: Physical, economic and social factors influencing spatial distribution of world population; growth distribution and density of population; Concept of over population, under population and optimum population.

Unit III: Settlement: Geographical factors influencing human settlement; rural and urban settlement (Types and patterns); Migration- types and consequences.

Unit IV: Case study on any aspects of the topics studied above (Physical/Social/Economic/Political)

Recommended Readings:

1. Beyman, E.F. (1995): **Human Geography** – Culture, Connections and Landscape, Prentice Hall, New Jersey.
2. Hazra, Jayati et al., (1977): **Dimensions of Human Geography**, Rawat Publications, Jaipur.
3. Hopkins, I. (1982): **An Introduction to Human Geography**, Widenfield and Nicolson, London.
4. Hussain, M. (1994): **Human Geography,** Rawat Publications, Jaipur.
5. James, R. (2010):**The Cultural Landscape – An Introduction to Human Geography**, Prentice Hall of India, New Delhi.
6. Leong Goh Cheng (2003): **Physical and Human Geography,** Oxford University Press, New Delhi.
7. Norton, W. (1995): **Human Geography,** Oxford University Press, New York.
8. Singh, L.R. (2005): **Fundamentals of Human Geography**, Sharda Pustak Bhawan, Allahabad.
9. Stoddard, R.H., Wishart, D.J. and and Blouet, B.W.: **Human Geography,** Prentice-Hall, Englewood Cliffs, New Jersey

SEMESTER – II

SEC 2
Thematic Cartography 2

Contact Hours: 45
Credit: 3

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 understand the techniques of interpretation of topographical and weather maps.

Learning Outcome: After the completion of course, the students will have ability to:
1. Read and prepare maps.
2. Comprehend locational and spatial aspects of the earth surface.
3. Use and importance of maps for regional development and decision making

Course Content (Practical)

Unit I: Concept of thematic/distribution maps; Types of thematic/distribution maps; importance of distribution maps in geography

Unit II: Cartographic representation of economic data in spatial and temporal context: Histogram, Pie-graph, Age-Sex Pyramid; Thematic map using population data (distribution /density/ sex composition/literacy)

Unit III: Map projection: Polar Zenithal (Stereographic, Orthographic); Cylindrical map projection (Gall's and Mercator's) with outline maps.

Recommended Readings:

1. Kanetker, T.P. and Kulkarni, S.V. (1967): **Surveying and Levelling,** Vol I and II V.G. Prakashan, Poona
2. Monkhouse, F.J. and Wilkinson, F.J. (1985): **Maps and Diagrams,** Methuen, London.
3. Pugh, J.C. (1975): **Surveying for Field Scientists**, Methuen and Company Ltd., London.
4. Raiz, E. (1962): **Principles of Cartography,** McGraw Hill, New York.
5. Robinson, Arthur et al., (1978): **Elements of Cartography**, John Wiley and Sons, New York.
6. Sarkar, A.K. (1997): **Practical Geography: A Systematic Approach,** Orient Longman, Kolkata.

SEMESTER – II
VAC 2
Indian Traditional Knowledge

Contact Hours: 45
Credit: 3

Course Objectives: The course aims to:
1. Inculcate indigenous knowledge systems
2. Instil indigenous approaches to sustainable resource management

Learning Outcome: Studying Indian indigenous knowledge systems from a geographic perspective can yield :
1. Understand and recognize place based knowledge of indigenous communities.
2. Examination of traditional indigenous approaches to sustainable resource management.
3. Promotes cross cultural understanding and social dynamics.

Course Content

Unit I The Geographic Backdrop

Locational significance- splendid geographical isolation of India

Physiographic units – the Himalayas, the Sindhu- Ganga plain and the great coastal plains.

Unit II The People

Population – most populous country in the world

Cultural setting – uniqueness of Indian culture

Town Planning – drain/sewage system

Unit III The Economy

Agriculture - Largest cultivable area in the world; significance of agriculture and irrigation as emphasized in the Ramayana and Mahabharata

India as the ancient home of cotton and silk fabrics.

Recommended Readings:

1. Baladev Upadhyaya, Samskrta Śāstrom ka Itihās, Chowkhambha, Varanasi, 2010.

2. D. M. Bose, S. N. Sen and B. V. Subbarayappa, Eds., A Concise History of Science in India, 2nd Ed., Universities Press, Hyderabad, 2010.

3. Astāngahrdaya, Vol. I, Sūtrasthāna and Śarīrasthāna, Translated by K. R. Srikantha Murthy, Vol. I, Krishnadas Academy, Varanasi, 1991.

4. Dharampal, Some Aspects of Earlier Indian Society and Polity and Their Relevance Today, New Quest Publications, Pune, 1987.

5. Dharampal, Indian Science and Technology in the Eighteenth Century: Some Contemporary European Accounts, Dharampal Classics Series, Rashtrotthana Sahitya, Bengaluru, 2021. University Grants Commission 15

6. Dharampal, The Beautiful Tree: Indian Indigenous Education in the Eighteenth Century, Dharampal Classics Series, Rashtrotthana Sahitya, Bengaluru, 2021.

7. J. K. Bajaj and M. D. Srinivas, Indian Economy and Polity in Eighteenth century Chengalpattu, in J. K. Bajaj ed., Indian Economy and Polity, Centre for Policy Studies, Chennai, 1995, pp. 63-84.

8. J. K. Bajaj and M. D. Srinivas, Annam Bahu Kurvita Recollecting the Indian Discipline of Growing and Sharing Food in Plenty, Centre for Policy Studies, Chennai, 1996.

9. J. K. Bajaj and M. D. Srinivas, Timeless India Resurgent India, Centre for Policy Studies, Chennai, 2001.

10. M. D. Srinivas, The methodology of Indian sciences as expounded in the disciplines of Nyāya, Vyākarana, Ganita and Jyotisa, in K. Gopinath and Shailaja D. Sharma (eds.), The Computation Meme: Explorations in Indic Computational Thinking, Indian Institute of Science, Bengaluru, 2022 (in press).

SEMESTER– III
DS CORE3 (Major-3)
DEVELOPMENT OF GEOGRAPHICAL THOUGHTS (Theory + Practical)

Contact Hours:60
Credit:4

Course Objectives:
3. To understand the historical evolution of geographic thought
4. To explore different paradigms and contemporary trends in geography.

Learning Outcome: After the completion of course, the students will have ability to:
1. Understand the geographical thinking in different regions of world
2. Distinguish paradigms and post modern concepts in geography

Course Content (Theory + Practical)

Unit I: Paradigms in Geography; Pre-Modern period – Early Origins of Geographical Thinking with reference to the Classical and Medieval Philosophies. Impact of Darwinian Theory on Geographical Thought.

Unit II: Modern period – Evolution of Geographical Thinking and Disciplinary Trends in Germany, France, Britain, United States of America; Dualisms in Geography – Environmental Determinism and Possibilism, Systematic and Regional, Ideographic and Nomothetic.

Unit III: Trends – Quantitative Revolution and its Impact, Major Geographic Traditions (Earth Science, man-environment relationship, area studies and spatial analysis), Paradigm Shift; Perspectives in Geography (Positivism, Behaviouralism, Humanism and Post modernism).

Unit IV: Mapping of routes of exploration and discoveries (Marco Polo, Christopher Columbus, Vasco da Gama, and James Cook); Conical Projection with one and two standard parallel; Polyconic & Bonne's Projection with outline maps.

Recommended Readings:

1. Arentsen M., Stam R. and Thuijis R., 2000: Post-modern Approaches to Space, ebook.
2. Bhat, L.S. (2009) Geography in India (Selected Themes). Pearson
3. Bonnett A., 2008: What is Geography? Sage.
4. Dikshit R. D., 1997: Geographical Thought: A Contextual History of Ideas, Prentice– Hall India.
5. Hartshone R., 1959: Perspectives of Nature of Geography, Rand MacNally and Co.
6. Holt-Jensen A., 2011: Geography: History and Its Concepts: A Students Guide, SAGE.
7. Johnston R. J., (Ed.): Dictionary of Human Geography, Routledge.
8. Johnston R. J., 1997: Geography and Geographers, Anglo-American Human Geography since 1945, Arnold, London.
9. Kapur A., 2001: Indian Geography Voice of Concern, Concept Publications.
10. Martin Geoffrey J., 2005: All Possible Worlds: A History of Geographical Ideas, Oxford.
11. Soja, Edward 1989. Post-modern Geographies, Verso, London. Reprinted 1997: Rawat Publ., Jaipur and New Delhi.

SEMESTER– III
DS CORE 4 (Major-4)
GEOMORPHOLOGY (Theory + Practical)

Contact Hours:60
Credit:4

Course Objectives: This course aims to:
1. To define the concepts in Geomorphology and Physical Geography
2. To introduce various concept to understand cycles of the solid Earth surface
3. To understand the dynamic nature of the Earth's surface, various processes, and landforms.
4. To study the impact human on geomorphic system.

Learning Outcomes: After the completion of this course, students should be able to:
1. Define the field of Geomorphology and to explain the essential principles of it.
2. To outline the mechanism of dynamic nature of the Earth's surface and interior of the Earth.
3. To illustrate and explain the forces affecting the crust of the earth and its effect on it.
4. To understand the conceptual and dynamic aspects of landform development

Course Content (Theory + Practical)

UNIT I Geomorphology (Nature and scope); relief features of the earth surface, Constitution of the earth's interior - Internal structure of Earth (seismological evidence and recent views); Weathering and mass wasting

UNIT II Earth movements – Mountain building process; Theories regarding origin of mountains- continental drift theory, Isostasy and plate-tectonics

UNIT III Faults and Folds, Volcano (definition, classification, landforms produced), Earthquakes (definition, causes, landforms produced); Processes and resultant Land forms: Works of river, wind, glacial, under-ground water.

UNIT IV: Representation by contour and their profile – Plateau, Cliff, Cirque, Ria coast, Fjord coast, River terrace, Relief and Slope Analysis- Serial, Superimposed, Projected and Composite profiles; contouring by dumpy level

Recommended Readings:

1. Bryant, H. Richard (2001): **Physical Geography Made Simple,** Rupa and Company, New Delhi.
2. Hugget, R.J. (2003): **Fundamentals of Geomorphology**, Routledge, London.
3. Monkhouse, F.J. (1979): **Physical Geography**, Methuen, London.
4. Singh, S. (2003): **Physical Geography,** Prayag Pustak Bhawan, Allahabad. (2007): Physical Geography, Lakshmi Narain Agarwal, Agra.
5. Sharma, Y.K. (2007): **Physical Geography**, Lakshmi Narain Agarwal, Agra.
6. Strahler, A.N. and Strahler, A.m. (1992): **Modern Physical Geography**, John Wiley and Sons, New York.
7. Thornbury, W.D. (1960): **Principles of Geomorphology**, John Willey & Sons, New York.
8. Wooldrige, S.H and Morgan, R.S. (1959): **The Physical Basis of Geography** –An Outline of Geomorphology, Longman Green & Co., London

SEMESTER– III
DSE 3.1 (MN-3)
EARTH SYSTEM DYNAMICS (Theory + Practical)

Contact Hours:60
Credit:4

Course Objectives: This course aims to:

1. Understand the concepts in Earth Sciences
2. To study the global issues in the Earth system
3. To study application of geoinformatics to solve the disaster and hazards

Learning Outcomes:

1. This course is to make understand the basic concepts of earth and to impart necessary skills of earth system, and dynamics to the students. So that, students acquire basic understanding of the mother earth
2. To articulate the synergies and trade-offs of earth system and interconnected sub-systems to the students of interdisciplinary students.

Course Content (Theory + Practical)

UNIT I Origin of Earth and its forms plate tectonics, layers of earth and composition, geological epochs, evolution of species, extinctions, ice ages, continental drift theory, Process of atmosphere, hydrosphere, biosphere, lithosphere, and their interaction

Unit II Issues in Earth System: Global warming, greenhouse effect, carbon cycle, nitrogen cycle, water cycle, ozone depletion, floods, droughts, weather variations, sea level rise, changing ecosystems, snow / glaciers melting and impact of pollution.

Unit III Climate Change: The physical science of climate system and change, concepts, causes, effects, measures, climate change; Land – Climate interactions and climatic zones of world and India; Climate change and linkages with energy, emerging diseases, community response. Geoinformatics Applications; weather variations, energy studies, health and diseases studies and other case studies.

Unit IV Presentation based on the theory topics

Recommended Readings:

1. The Dynamic Earth System (2012), Prentice Hall India Learning Private Limited; Third edition (2012) A.M. Patwardhan
2. Earth's Dynamic Systems (2003), Pearson; 10th edition (2003), W. Kenneth Hamblin & Eric H. Christiansen
3. Planet Earth: Cosmology, Geology, and the Evolution of Life and Environment (1992) Cesare Emiliani
4. Earth: Evolution of a Habitable World, 2nd edn., Cambridge, UK: Cambridge University Press (2013) Jonathan I. Lunine.
5. Evolution of the Earth, McGraw-Hill Education; 8th edition (2009) Donald Prothero, Robert Dott, Jr.
6. A Textbook of Climatology, Wisdom Press (2015) Tapas Bhattacharya

SEMESTER– III
SEC 3
GEO-SURVEYING

Contact Hours:45
Credit:3

Course Objectives:

1. Develop an understanding of the concept of survey and its purposes.
2. Perform professional survey through application of different surveying techniques.
3. Better understand the techniques of measuring the area and height of a particular area using survey instruments and methods.

Learning Outcome:

1. Learn the usages of survey instruments.
2. Brings direct interaction of different types of surveying instruments like Dumpy level and Theodolite with environment.
3. Develop an idea about different types of surveying techniques.

Course Content (Practical)

UNITI Surveying: definition**,** types, Importance of surveying in geography, instruments–handling and care of survey instruments.

UNITII Survey-Chain or Tape survey (to plot an area within the college premises) (Close and open traverse), Plane Table (Radiation and Intersection)

UNITIII Height determination using theodolite (Accessible and inaccessible object), road profile using dumpy level

Recommended Readings:

1. Talukdar, S. (2008): **Introduction to Map Projection**, EBH Publishers, Guwahati
2. Sarkar, A. K. (1997): **Practical Geography: A Systematic Approach,** Orient Longman, Kolkata
3. Singh, L.R. (2006): **Fundamentals of Practical Geography**, Sharda Pustak Bhawan, Allahabad.
4. Steers, J. A. (1965): **An Introduction to the Study of Map Projection**, University of London Press, London
5. Mishra, R.P. and Ramesh A. (1989): **Fundamentals of Cartography**, Concept Publishing Company, New Delhi

SEMESTER– IV
DS core (MJ-5)
ECONOMIC GEOGRAPHY (Theory + Practical)

Contact Hours:60
Credit:4

Course Objectives:

1. To convey an understanding of the fundamental concepts of economic Geography
2. To understand the dynamics of economic activities, man's resources use, population pressure on resource base,
3. To understand the rationale for the location of industries and agricultural activities in its geographical perspectives and human land use by locational theories

Learning Outcome: After successful completion of this course students will be able to understand:

1. The concept of economic geography
2. Expresses human and economic activities taking place in the world and India.
3. Classifies the types of geography that could affect economic development. 4. Explains the effect of geography of India to economic development

Course Content (Theory + Practical)

UNIT I Meaning, Scope and Approaches to the study of economic geography; Concept and classification of economic activity; Factors affecting location of Economic activity – Agriculture (Von Thunen Theory) and Industry (Weber's theory)

UNIT II Primary Activities: Subsistence and Commercial Agriculture, forestry, fishing and mining, Secondary activities: Factors influencing industrial location, distribution and production of iron and steel (USA and China) and Cotton Textiles (U.K. and India)

UNIT III Tertiary Activities – Modes of Transportation, Patterns of International Trade, Quaternary Activities – Information and Communication Technology Industry.

Unit IV Construction and interpretation of gender-wise bar showing work participation rate, Construction and interpretation of ergograph; Time series analysis of industrial production of India using moving average

Recommended Readings:

1. Boesch, H. (1964): **Geography of World Economy**, D. Van Nost nand Co., New York.
2. Bryson, J., Henry, N., Keeble, D. And Martin, R. (eds) (1999): **The Economic Geography Reader: Producing and Consuming Global Capitalism,** John Wiley and sons, Inc, New York.
3. Coe, N. (2007): **Economic Geography: A Contemporary Introduction,** Blackwell Publishers, Inc., Massachusetts.
4. Guha, J.S. and Chattoraj, P.R. (2002): **A new Approach to Economic Geography: A Study of Resources,** The World Press Private Limited, Kolkata.
5. Hannk, D.M. (1997): **Principles and Applications of Economic Geography: Economy, Policy, Environment**, John Wiley and Sons, Inc, New York.
6. Leong G.C. and Morgan, G. C.(1982): **Human and Economic Geography,** Oxford University Press, Singapore.
7. Miller, E. (1962): **Geography of Manufacturing Industries**, Prentice Hall, New York.
8. Pounds, N.J.G. (1970): **Introduction to Economic Geography**, John Murray, London.
9. Smith, D.M. (1971): **Industrial Location – An Economic Geographical Approach**, John Willey, New York.
10. Roy, P. K. (2005): **Economic Geography, A Study of Resources**, New Central Book Agency

SEMESTER– IV
DSC (MJ-6)
GEOGRAPHY OF INDIA (theory + practical)

Contact Hours:60
Credit:4

Course Objectives

1. Understanding the physical profile of the country.
2. To study the resource endowment, its spatial distribution

Learning Outcome: After the completion of course, the students will have ability to:

1. Understand the physical and social dimensions of the country.
2. To utilise resources for sustainable development.
3. It will also be useful for students preparing for various competitive examinations including civil services.

Course Content (Theory + Practical)

UNIT I: Locational significance; unity and diversity.; Physical environment – physiographic division (general characteristics) climate, soil and natural vegetation.

UNIT II: Population characteristics: population growth, distribution and density, Agriculture: Characteristics of Indian agriculture, Major Agricultural Crops (Wheat, Rice and Cotton).

UNIT III: Transport: Roads and railways, air transport and water transport, Industry: distribution of major industries (iron and steel, petrochemicals and cement industries)

Unit IV: Monthly temperature and rainfall graphs of five selected stations from different physiographic regions of India, Representation of population data using age sex pyramid; Prismatic Compass survey (Closed and Open)

Recommended Readings:

4. Gautam, A. (2006): **Advanced Geography of India,** Sharda Pustak Bhawan, Allahabad.
5. Gopal Singh (1992): A Geography of India, Atma Ram & Sons, Lucknow.
6. Khullar, D.R. (2007): **A Comprehensive Geography,** Kalyani Publishers, New Delhi.
7. Kundee, A. (1992): **Urban Development Urban Research in India**, Khanna Pub.l, New Delhi.
8. Nag, P. and Gupta, S.S. (1992): **Geography of India**, Concept Publishing Company, New Delhi.
9. Premi, M.K. (2007**): Population of India**, NBT, New Delhi.
10. Singh, J. (2003): **India: A Comprehensive Systematic Geography**, GyanodayaPrakashan, Gorakhpur.
11. Singh, R.L. (ed.) (1971): **India: A Regional Geography**, National Geographical Society of India, Varanasi.
12. Srinivasan, K. and Vlassoff, M. (2001): **Population and Development Nexus in India, Challenges for the new Millenium**, Tata Mc Graw Hill, New Delhi.
13. Tiwari, R.C. (2007): **Geography of India**, Prayag Pustak Bhawan, Allahabad

SEMESTER– IV
DSC (MJ-7)
CLIMATOLOGY (THEORY + PRACTICAL)

Contact Hours: 60
Credit:4

Course Objectives - This course aims to:

1. To define the field of climatology and components of the climate system
2. To introduce various dimensions of climatology like structure and composition.
3. To understand the global atmospheric pressure, temperature, and wind system.
4. To study the concept of atmospheric moisture and its types

Learning Outcomes: After the completion of this course, students should be able to

1. Define the field of climatology and to understand the atmospheric composition and structure.
2. To outline the mechanism and process of solar radiation transfer to earth surface and to ex- plain the temperature distribution and variation according to time and space.
3. To illustrate and explain the air pressure system, wind regulating forces and the formation of the Atmospheric Disturbance.
4. To understand and compute the air humidity as well as to explain the process of Condensation and formation of precipitation and its types.

Course Content (Theory + Practical)

UNIT I Definition and significance of climatology; elements of weather and climate; Composition and structure of atmosphere, Insolation and heat budget, distribution of Temperature - Vertical and Horizontal.

UNIT II Pressure Belt; Wind system - planetary, periodic and local winds, Jet streams; Air masses; fronts; Cyclones and Anti-cyclones.

UNIT III Humidity and Precipitation**,** Major climatic types (Koppen's and Thornthwaite's classification of world climate); Global Climate change with special reference to role and response of man in climatic changes.

Unit IV Study of weather symbols; uses of weather instruments (Max-Min Thermometer, Hygrometer, Barometer, Rain Gauge, and Anemometer); Interpretation of weather maps published by Indian Meteorological Department; Representation of climatic data: (a) Preparation of Climograph, Hythergraph and Ergograph and their interpretation (b) Preparation of rainfall variability map of India

Recommended Readings:

1. Chorley, R.J. (2001): Atmosphere, Weather and Climate. Methuen, London.
2. Critchfield, H.J. (2002): General Climatology. Prentice-Hall of India, New Delhi.
3. Finch, J.C. and Trewartha, G.T.: Elements of Weather and Climate. Prentice-Hall, London.
4. Lal, D.S. (1986): Climatology. Chaitanya Publications, Allahabad.
5. Oliver, J.E. and Hidore, J.J. (2003): Climatology: An Atmospheric Science, Pearson Education Private Ltd, Delhi.
6. Singh, S. (2005): Climatology. Prayag Pustak Bhawan, Allahabad.

SEMESTER– IV
DSC – MJ 8
FIELDWORK (PRACTICAL)

Contact Hours: 60
Credit: 4

Course Objectives: The aim is to develop skills in reality situations and provide opportunities for applying the knowledge and the information gained in the classroom to reality situation. This learning experience should provide an opportunity of working with communities, groups, individuals/ families and managing organization tasks.

Learning outcome: Developing skills of problem solving process, and practice based research and imbibe as a professional person. Using instruction to learn and practice.

Course Content (Practical)

FIELD WORK

The students are to prepare a project as assigned by the concerned teacher. Students are to conduct independent research (study) of a small areal unit in nearby areas.

Each student is required to choose a topic based on the theory paper or the topic of the fieldwork can be allotted by the designated teacher under whose guidance the fieldwork shall be carried out. On completion of the field work, the student shall prepare a field report. The report shall be evaluated by the designated teacher appointed by the Head of the Department. Viva of the fieldwork shall be conducted during the End Semester practical exam. The marks shall be awarded on predetermined criteria.

Recommended Readings:

1. Jones, P.A. (1968): **Field Work in Geography**, Longman, Green and Company Ltd., London.
2. Kumar, R. (2011): **Research Metodology (Third Edition)**, SAGE, New Delhi.
3. Lousenbury, J.F. and Aldrich, F.T. (1986): **Introduction to geographic Field Methods and Techniques**, Charles E. MerillPubl, Colombus.
4. Misra, H.N. and Singh, V.P. (2002): **Research Methodology in Geography**, Rawat, New Delhi.
5. Raina, R.M. (2011): **Research in Geography: Trends and Techniques**, Summit Enterprises, New Delhi.
6. Trivedi, R.N. and Shukla, D.P. (1996): **Research Methodology**, Radha Publ., New Delhi.

SEMESTER – IV
DSE (MN-4)
MN 4.1 - FUNDAMENTAL CLIMATOLOGY

Contact Hours:60
Credit: 4

Course Objectives - This course aims to:

1. To define the field of climatology and components of the climate system
2. To introduce various dimensions of climatology like structure and composition.
3. To understand the global atmospheric pressure, temperature, and wind system.
4. To study the concept of atmospheric moisture and its types

Learning Outcomes: After the completion of this course, students should be able to

1. Define the field of climatology and to understand the atmospheric composition and structure.
2. To outline the mechanism and process of solar radiation transfer to earth surface and to ex- plain the temperature distribution and variation according to time and space.
3. To illustrate and explain the air pressure system, wind regulating forces and the formation of the Atmospheric Disturbance.
4. To understand and compute the air humidity as well as to explain the process of Condensation and formation of precipitation and its types.

Course Content (Theory + Practical)

UNIT I Nature and scope of climatology; elements of weather and climate; Composition and structure of atmosphere, Insolation and heat budget, distribution of Temperature - Vertical and Horizontal.

UNIT II Pressure Belts, Wind system - planetary, periodic and local winds, Jet streams, Air masses ; fronts; Cyclones and Anti-cyclones.

UNIT III Humidity and Precipitation; Global Climate change with special reference to role and response of man in climatic changes.

Unit IV Study of weather symbols; uses of weather instruments (Max-Min Thermometer, Hygrometer, Barometer, Rain Gauge, and Anemometer); Interpretation of weather maps published by Indian Meteorological Department; Representation of climatic data: (a) Preparation of Climograph, Hythergraph and their interpretation (b) Preparation of rainfall variability map of India

Recommended Readings:

1. Chorley, R.J. (2001): Atmosphere, Weather and Climate. Methuen, London.
2. Crithfield, H.J. (2002): General Climatology. Prentice-Hall of India, New Delhi.
3. Finch, J.C. and Trewartha, G.T.: Elements of Weather and Climate. Prentice-Hall, London.
4. Lal, D.S. (1986): Climatology. Chaitanya Publications, Allahabad.
5. Oliver, J.E. and Hidore, J.J. (2003): Climatology: An Atmospheric Science, Pearson Education Private Ltd, Delhi.Singh, S. (2005): Climatology. Prayag Pustak Bhawan, Allaha

SEMESTER – V
DSC (MJ 9)
HYDROLOGY (THEORY + PRACTICAL)

Contact Hours: 60
Credit: 4

Course Objective:

1. To understand the basic concept of hydrology and its relationship with other allied science
2. To understand role of hydrology in addressing the issues on water scarcity

Learning Outcome: After the completion of course, the students will have ability to:

1. Understand and appreciate the nature of hydrology and its importance in the day to day activities
2. Solve many of the water issues in the light of water conservation strategies.

COURSE CONTENT

UNIT I Concepts and scope of hydrology, Hydrological cycle, Hydrology in relation to water resources development

UNIT II Surface water hydrology: Hydrological cycle in drainage basin, Runoff and Basin Yield, Surface water resources of India, Problems and Conservation of Water Resources

UNIT III Ground water hydrology: Lithology and its hydrological properties, Type of aquifers, Recharge and discharge of groundwater, Ground water resources of India, Conjunctive use of ground water.

UNIT IV Stream ordering, Drainage frequency and Drainage density with isopleths maps, Cross – Transverse

Suggested Readings:

1. Addison, H. Land Water and Flood, Chapman and Hall, London 1961.

2. Chorley, R.J. (ed) : Introduction to Physical Hydrology, Methuen, London.1969 Chorley,R.J.: Water, Earth and Man,methuen,London,1967.

3. Dakshinamurthy, C .et al., Water Resources of India and Their utilisation in Agriculture, Indian Agriculture Research Institute, New Delhi,1973.

4. Jones, J.A.A : Global Hydrology: Processes, Resources and Environmental Management, Longman,London,1997

5. Matter , J.R., Water Resources. Distribution, Use and Management, John Wiley, Marylane,1984.

6. Singh, R.A. and Singh, S.R.: Water Management: Principles and Practices. Tara Publication, Varanasi, 1972.

7. Todd, D.K.: Ground Water Hydrology, John Wiley, New York, 1959

SEMESTER – V

DSC - MJ 10
POPULATION GEOGRAPHY(THEORY + PRACTICAL)

Contact Hours: 60

Credit: 4

Course Objectives:

1. It introduces the basic concepts of population Geography to the students.
2. An understanding of the importance and need of Demographic data in understanding of population dynamics.

Learning Outcome: After the completion of course, the students will have ability to:

1. Learn the role of demography and population studies as distinct fields of human geography
2. Have sound knowledge of key concept, different components of population along with its drivers and examine population dynamics and characteristic with contemporary issues

Course Content (Theory + Practical)

UNIT I: Nature and Scope of Population Geography, Sources of Population Data with special reference of Indian Census, Population Dynamics: Fertility and Mortality – Measures and Determinants, Migration – Determinants and Implications.

UNIT II: Population Size, Distribution and Growth – Determinants and Patterns; Theories of Growth – Malthusian Theory and Demographic Transition Theory.

UNIT III: Contemporary Issues - Ageing of Population, Demographic Dividends, Global Refugee Crisis.

Unit IV : Presentation on topic related to any aspect of population

Recommended Readings:

1. Bhende A. and Kanitkar T. (2019). Principles of Population Studies. Himalaya Publishing House, New Delhi, India.

2. Chandna, R.C. (2017). Geography of Population. Kalyani Publishers, Ludhiana, India.

3. Clarks, John, I. (1972). Population Geography. Pergamon Press, New York.

4. Hassan M.I. (2020). Population Geography, A Systematic Exposition. Routledge Taylor and Francis Group, New York.

5. Lutz, W., Warren, C. S. and Scherbov, S. (2004). The End of the World Population Growth in the 21st Century. UK: Earthscan.

6. Majumdar, P.K. (2010). Fundamentals of Demography. Rawat publications, Jaipur.

7. Maurya, S. D. (2021). Jansankya Bhugol. Sharda Pustak Bhawan, Allahabad.

8. Newbold, K. B. (2017). Population Geography: Tools and Issues. Rowman and Littlefield Publishers,NY, USA.

9. Saroha, J. (2021). JansankhyaBhugol, Janankikievam JansankhyaAdhayan. M.K. Books, New Delhi.

10. Weeks, John R. (2020) Population: An Introduction to Concepts and Issues. Cengage Learning, Boston.

SEMESTER – V

DSC - MJ 11
FUNDAMENTALS OF REMOTE SENSING (THEORY + PRACTICAL)

Contact Hours: 60

Credit: 4

Course objectives: This course introduces one to

1. fundamental concepts, methods, and applications of remote sensing
2. The general principles of remote sensing and image analysis and interpretation

Learning outcomes: After the completion of course, the students will have ability to:

1. Explain basic remote sensing concepts and methods.
2. Analyze and interpret the spectral signatures of different landscape elements.
3. Assess remotely sensed data using basic image processing techniques to solve the real world problems in the field of Geography.

Course Content (Theory + Practical)

Unit I : Concept and Scope of Remote Sensing: Process and Characteristics of Remote Sensing System (Lillesand and Kiefer 1979), Advantages and limitations. Concept of Electromagnetic Radiation (EMR): Wavelength-frequency-energy relationship of EMR, EMR Spectrum and its properties, EMR wavelength regions and their applications, Interaction of Radiation with Atmosphere, Interaction of EMR with matter, Spectral signatures.

Unit II: Satellites and Sensors: platforms – geostationary satellites and sun synchronous satellites; Sensor Parameters: Spatial resolution and IFOV, Spectral resolution, Radiometric resolution, temporal resolution and imaging sensor systems; Indian Remote Sensing Satellite (IRS) Program

Unit III: Photogrammetry; Aerial Photography: Principles, Types and Geometry; Aerial Imagery: Digital Image Processing, Image Classification Methods – Supervised and unsupervised classification, Image Interpretation, Elements of image interpretation, Application of Remote Sensing.

Unit IV: Aerial Image and Satellite Image Interpretation, Land use land Cover Map, Georeferencing, Band Combination/ Layer Stack, Image to Image Georeferencing, Image classification(supervised), Image classification (unsupervised)

Recommended Readings:

1. Jensen, J.R., 1996. Introductory Digital Image Processing: A Remote Sensing Perspective, Springer- Verlag.
2. Lillesand, T. M. & Kiefer, R.W., 2007. Remote Sensing and Image Interpretation, Wiley.
3. Richards, J.A. and Jia, X., 1999. Remote Sensing Digital Image Analysis, Springer-Verlag.
4. Sahu, Kali Charan, 2018. Text Book of Remote Sensing and Geographical Information System, Atlantic Publishers and Distributors (P) Ltd
5. Bhatta, B. (2008) Remote Sensing and GIS, Oxford University Press, New Delhi.
6. Campbell J. B., 2007: *Introduction to Remote Sensing*, Guildford Press
7. Chauniyal, D. (2010) Sudur Samvedana Avam Bhaugolik Suchna Pranali, Sharda Pustak Bhawan, Allahabad.
8. Jensen, J. R. (2005) Introductory Digital Image Processing: A Remote Sensing Perspective, Pearson Prentice-Hall.

Joseph, G. 2005: *Fundamentals of Remote Sensing*, United Press India.

SEMESTER – V

DSE - MN 5

GEOGRAPHY OF INDIA (THEORY + PRACTICAL)

Contact Hours:60
Credit: 4

Course Objectives

1. Understanding the physical profile of the country.
2. To study the resource endowment, its spatial distribution

Learning Outcome: After the completion of course, the students will have ability to:

1. Understand the physical and social dimensions of the country.
2. Utilise resources for sustainable development.
3. Useful for students preparing for UGC NET/SLET exams and other competitive exams including the civil services.

Course Content (Theory + Practical)

UNIT I: Locational significance; unity and diversity.; Physical environment-physiographic division(general characteristics) climate and natural vegetation.

UNIT II Population characteristics: population growth, distribution and density, Agriculture: Characteristics of Indian agriculture, Major Agricultural Crops (Rice and Cotton).

UNIT III Transport: Roads and railways, air transport and water transport, Industry: distribution of major industries (iron and steel and cement industries)

Unit IV Report writing based on the theory paper

Recommended Readings:

1. Gautam, A. (2006): **Advanced Geography of India,** Sharda Pustak Bhawan, Allahabad.
2. Gopal Singh (1992): A Geography of India, Atma Ram & Sons, Lucknow.
3. Khullar, D.R. (2007): **A Comprehensive Geography,** Kalyani Publishers, New Delhi.
4. Kundee, A. (1992): **Urban Development Urban Research in India**, Khanna Pub.l, New Delhi.
5. Nag, P. and Gupta, S.S. (1992): **Geography of India**, Concept Publishing Company, New Delhi.
6. Premi, M.K. (2007**): Population of India**, NBT, New Delhi.
7. Singh, J. (2003): **India: A Comprehensive Systematic Geography**, Gyanodaya Prakashan, Gorakhpur.
8. Singh, R.L. (ed.) (1971): **India: A Regional Geography**, National Geographical Society of India, Varanasi.
9. Srinivasan, K. and Vlassoff, M. (2001): **Population and Development Nexus in India, Challenges for the new Millenium**, Tata Mc Graw Hill, New Delhi.
10. Tiwari, R.C. (2007): **Geography of India**, Prayag Pustak Bhawan, Allahabad

SEMESTER - VI
DSC - MJ 12
GEOGRAPHY OF N.E-INDIA & NAGALAND (THEORY + PRACTICAL)

Contact Hours: 60
Credit: 4

Course Objectives

1. Understanding the physical profile of North-eastern region and Nagaland.
2. To study the resource endowment, its spatial distribution

Learning Outcome: After the completion of course, the students will have ability to:

1. Understand the physical and social dimensions of North-eastern region and Nagaland
2. To utilise resources for sustainable development.
3. Useful for students preparing for UGC NET/SLET exams and other competitive exams including the civil services.

Course Content (Theory + Practical)

UNIT I Northeast India: Locational significance; Physical characteristics- Physiography, climate, soil and natural vegetation, Population of NE India: Growth, Distribution and Density, Rural-Urban composition

UNIT II Economic basis of NE India: Agriculture, Industries and Transport system.

UNIT III Nagaland: Locational significance, physiography, Population growth and distribution, Economic Attributes of Nagaland: Tourism and its potential, Problems and prospects of agriculture and allied activities

Unit IV Cartographic Representation of NE Population Data – Distribution and Density using: dot, proportionate circle and sphere methods

Recommended Readings:

1. Bhagabati, A.K.(ed): **Biodiversity of Assam**, Eastern Book House, Guwahati.
2. Bhattacharyya,N.N.(2005): .**North East India: A systematic Geography,** Rajesh Pub. New Delhi.
3. Gopal Krishnan,R. : **Geography of North East India**
4. **Gopal Krishnan R. (1991): North-East India: Land, People and Economy, Vikash Publishing House, NewDelhi.**
5. Sebu, Sonyhulo (2013): **Geography of Nagaland**, Spectrum Publications Guwahati, Delhi.
6. Singh, S. (1994): **Agricultural Development in India : A Regional Analysis**, Kaushal Publ., Shillong.
7. Taher,M. and Ahmed,P.(1988): **Geography of North East India**, Mani Manik Prakash, Guwahati.

SEMESTER - VI
DSC - MJ 13
REGIONAL PLANNING & DEVELOPMENT (THEORY + PRACTICAL)

Contact Hours: 60
Credit: 4

Course Objectives:
1. To understand the concept of region and planning process involve in it.
2. To examine factor responsible for development disparities and sustainable development

Learning Outcome: After the completion of course, the students will have ability to:
1. Understand the techniques involve in regional planning and development.
2. Understand the key component of the sustainable development

Course Content (Theory + Practical)

UNIT I: Geographical concept of regional planning, Application of regional concept in planning and development.

UNIT II: Regional Hierarchy (Micro, Meso and Macro region), types of regions and methods of delineation, Integrated area planning.

UNIT III: Concept of development, measurement of levels of regional development, planning for sustainable development, Regional development in India: Disparity and diversity, Theories and models for regional development: Cumulative causation (Myrdal) and Stages of development (Rostow).

UNIT IV: GPS: Principles, uses and data handling, Layout Preparation of Location/Study area map using GIS Software.

Recommended Readings:

1. De Blij, H. J., Muller, P.O., Winkler Prine, A and Nijman, J. (2010): **The World Today: Concepts and Regions in Geography (5th Edition)**, John Wiley and Sons, U.S.A.
2. Alden J and R. Morgan (1974), **Regional Planning: A Comprehensive View**, Leonard Hill Books, Bath, U.K.
3. Dewer, D. et. al. (eds), (1986), **Regional Development and Settlement Policy**, Allen and Unwin, Boston
4. Friedmann, J. and William, A (1967), **Regional Development and Planning**, Rotterdam Univ. Press
5. Hilhorat, J.G.M., (1975): **Regional Planning**, Rotterdam Univ. Press.
6. Kuklinski, A. R. (ed) 1972: **Growth Poles and Growth Centres in Regional Planning**, Monton, The Hague
7. Misra, R. P., 1969**: Regional Planning, Concepts, Techniques, Policies**, University of Mysore.

SEMESTER - VI
DSC - MJ 14
RESEARCH METHODOLOGY IN GEOGRAPHY(THEORY + PRACTICAL)

Contact Hours: 60
Credit: 4

Course Objectives:

1. Understand how to approach a research problem
2. To instil skills and methodology in researches
3. Understand how to collect data, review literature and analyse data

Learning Outcome: the students will be able to:

1. Understand basic concepts in research
2. Proceed with tackling a research problem and the steps one should adopt and the tools and craft a geographer usually employs.

Course Content

UNIT I Meaning of research and geographic research; types of research; Introduction to research methodology in geography, Formulation of a research problem.

UNIT II Research design: statement of the problem, objectives, and hypothesis/ research questions, methodology, significance, review of research works and referencing.

Unit III Field techniques and tools, processing and analysis of data, interpretation and report writing, Ethics in fieldwork, Plagiarism: Classification and prevention.

Unit IV Literature review/ Research write-up/Questionnaire design

Recommended Readings:

1. Clifford, N., Cope, M., Gillespie, T.W., French, S. (Eds) 2016.
2. Key Methods in Geography, 3rd ed, Sage. Gomes, B., Jones III, J.P. (Eds) 2010.
3. Research Methods in Geography: A Critical Introduction, WileyBlackwell. Lenon, B., Cleves, P. 2015.
4. Geography Fieldwork and Skills, Harper-Collins. Montello , D.R, Sutton, P. 2012.
5. An Introduction to Scientific Research Methods in Geography and Environmental Studies, 2nd ed, Sage. Murthy , K.LN. 2004.
6. Research Methodology in Geography: A Text Book, Concept Publishing Co. Northey, N., Draper, D., Knight, D.B. 2015.
7. Making Sense in Geography and Environmental Sciences: A Student's Guide to Research and Writing, 6th ed, Oxford University Press. Parsons, T., Knight, P.G. 2015.
8. How To Do Your Dissertation in Geography and Related Disciplines, 3rd ed, Routledge. Riordan, D. 2013.
9. Technical Report Writing Today, 10th ed, Wadsworth Publishing. Phillips, R., Johns, J. 2012.

10. Fieldwork for Human Geography, Sage. Thornbush, M.J., Allen, C.D., Fitzpatrick, F.A. (Eds) 2014. Geomorphological Fieldwork, Elsevier.

SEMESTER - VI
DSE - MN 6
EVOLUTION OF GEOGRAPHICAL THOUGHT (Theory + Practical)

Contact Hours:60
Credit:4

Course Objectives:
5. To understand the historical evolution of geographic thought
6. To explore different paradigms and contemporary trends in geography.

Learning Outcome: After the completion of course, the students will have ability to:
3. Understand the geographical thinking in different regions of world
4. Distinguish paradigms and post modern concepts in geography

Course Content (Theory + Practical)

Unit I: Ancient Period - Geographical thought of Greek and Roman; Dark Age; Arab Geographical Thought; Impact of Darwinian Theory on Geographical Thought.

Unit II: Modern period – Evolution of Geographical Thinking and Disciplinary Trends in Germany, France, Britain, United States of America; Dualisms in Geography – Environmental Determinism and Possibilism, Ideographic and Nomothetic.

Unit III: Trends – Dichotomies between Human and Physical; Systematic vs Regional Geography; Modern Indian Geography; Indian Geography: Problems and prospects.

Unit IV: Mapping of routes of exploration and discoveries (Marco Polo, Christopher Columbus, Vasco da Gama, and James Cook); Conical Projection with one and two Standard parallel; Polyconic & Bonne's Projection.

Recommended Readings:

1. Arentsen M., Stam R. and Thuijis R., 2000: Post-modern Approaches to Space, ebook.
2. Bhat, L.S. (2009) Geography in India (Selected Themes). Pearson
3. Bonnett A., 2008: What is Geography? Sage.
4. Dikshit R. D., 1997: Geographical Thought: A Contextual History of Ideas, Prentice– Hall India.
5. Hartshone R., 1959: Perspectives of Nature of Geography, Rand MacNally and Co.
6. Holt-Jensen A., 2011: Geography: History and Its Concepts: A Students Guide, SAGE.
7. Johnston R. J., (Ed.): Dictionary of Human Geography, Routledge.
8. Johnston R. J., 1997: Geography and Geographers, Anglo-American Human Geography since 1945, Arnold, London.
9. Kapur A., 2001: Indian Geography Voice of Concern, Concept Publications.
10. Martin Geoffrey J., 2005: All Possible Worlds: A History of Geographical Ideas, Oxford.
11. Soja, Edward 1989. Post-modern Geographies, Verso, London. Reprinted 1997: Rawat Publ., Jaipur and New Delhi.

SEMESTER - VI
DSC - MJ 15
FUNDAMENTALS OF GEOGRAPHIC INFORMATION SYSTEM
(THEORY + PRACTICAL)

Contact Hours: 60
Credit: 4

Course Objectives:
1. To acquaint knowledge about Geographic Information System (GIS) software.
2. To develop the skill of geo-referencing and creation of different data files.
3. To improve the practical knowledge on attribute data and linkage.
4. To develop the skill on analysis methods of GIS.

Course Outcomes: After the completion of the course, Students will be able to:
1. Acquaint knowledge the about especially Geographic Information System (GIS) software
2. Develop the skill of geo-referencing and creation of different data files.
3. Improve the practical knowledge on attribute data and linkage.
4. Develop the skill on analysis methods of GIS.

Course Content (Theory + Practical)

Unit I: Geographical Information System (GIS): Definition, development and GIS soft-wares, Components of GIS, GIS Data Sources

Unit II: GIS Data types; Data Structures Vector, Raster and TIN data structures; GCS and PCS; UTM Zone System

Unit III: Interpolation tools in GIS; Geo-processing tools; Application of GIS, Advantages and Disadvantages

Unit IV: Geo-referencing, Clip and Mosaic, Digitization tools and Map Digitization; Thematic mapping; Cadastral mapping; Location/ Study area map; DEM Generation; Band Combination; Image Classification – Supervised & Unsupervised

Recommended Readings:

1. Bhatta, B. (2010) Analysis of Urban Growth and Sprawl from Remote Sensing, Springer, Berlin Heidelberg.41
2. Burrough, P.A., and McDonnell, R.A. (2000) Principles of Geographical Information System- Spatial
3. Information System and Geo-statistics. Oxford University Press
4. Chauniyal, D.D. (2010) Sudur Samvedanevam Bhogolik Suchana Pranali, Sharda Pustak Bhawan, Allahabad
5. Heywoods, I., Cornelius, S and Carver, S. (2006) An Introduction to Geographical Information system. Prentice Hall.
6. Jha, M.M. and Singh, R.B. (2008) Land Use: Reflection on Spatial Informatics Agriculture and Development, New Delhi: Concept.
7. Nag, P. (2008) Introduction to GIS, Concept India, New Delhi.
8. Sarkar, A. (2015) Practical geography: A systematic approach. Orient Black Swan Private Ltd., New Delhi
9. Singh, R.B. and Murai, S. (1998) Space Informatics for Sustainable Development, Oxford and IBH, New Delhi.

SEMESTER - VII

DSC - MJ 16
ENVIRONMENTAL GEOGRAPHY (THEORY + PRACTICAL)

Contact Hours: 60
Credit: 4

Course Objectives: The course triggers to
1. Understand the concept, nature and scope, concepts and developments of environmental geography; 2. Learn concept of ecosystem, its structure and function, ecology, types and components of ecology;
3. Understand the Human-Environment relationship in different biomes and human adaptations;
4. Learn about environmental degradation and restoration

Course Outcome: After the completion of this course, students should be able to:
1. Define the field of Environmental Geography and to explain the essential principles of it.
2. Illustrate and explain the ecosystem, types and components.
3. Explain the symbiotic relation between Human-Environment and adaptations in different biomes.
4. Understand the components of environmental degradation and restoration.

Course Content (Theory + Practical)

UNIT I Definition, concept and scope of Environmental Geography; Approaches and methods in Environmental Geography; Ecology - meaning, scope and concepts

UNIT II Environmental pollution- meaning, types, sources, causes and impacts; Environmental Degradation – process, types and causes; Greenhouse effect, Global warming, Ozone depletion and Desertification, Emerging environmental problems: population growth, agriculture, deforestation, science and technology,

UNIT III Conservation and Management of natural resources: soil, water, forest and mineral resources; Disaster Management; Emerging environmental problems and issues in India, Environmental policies and programmes in India.

UNIT IV Report writing on any aspects of environment in India.

Recommended Readings:

1. Cantledge, B.(ed). (1992): **Monitoring the Environment,** Oxford University Press. Oxford.
2. Frank W.L., (1986): **The Violent Earth**, Croom Helm, London.
3. Kapur, A., (2010): **Vulnerable India: A Geographical Study of Disasters**, Safe Publication, New Delhi.
4. Newson, M.(1992): **Land, Water and Development,** Routledge, London.
5. Saxena, H.M. (2003): **Environmental Geography**, Rawat Publications, Jaipur and New Delhi.
6. Singh, R.B. (ed.) (2006): **Natural Hazards and Disaster Management Vulnerability and Mitigation**, Rawat Publications, New Delhi.
7. Singh, S.(1991): **Environmental Geography.** Prayag Pustak Bhawan, Allahabad.
8. Strahler, A.N. & A.H. Strahler, 1976: **Geography and Man's Environment**, John Willey, New York.
9. UN and WMO, (2002): **Living with Risk: A Global Review of Disaster Reduction Initiatives, International Strategy for Disaster Reduction (ISDR)**, WMO and UN Publication.

SEMESTER - VII

DSC - MJ 17
RESOURCE & APPLIED GEOGRAPHY (THEORY + PRACTICAL)

Contact Hours:60
Credit: 4

Course Objective:

1. To understand the concept of resources, prevalent issues related to environment, geographical pattern of resource utilization and the concept of sustainable development.
2. Awareness about resource availability, accessibility, utilization, its use and misuse
3. To know about spatial distribution of natural resources.
4. To understand resource management and governance.

Course Outcome:

1. Understand the concept and classification of resources and approaches to resource utilization
2. Appreciate the significance of resources and pressure on resources
3. Analyze the problems of resource depletion with special reference to forests, soil, water and fossil fuels
4. Understand the distribution, utilization, problems and management of metallic and non-metallic mineral resources
5. Analyze the contemporary energy crisis and assess the future scenario

Course Content(Theory + Practical)

UNIT I Concept Of Resources; Scope of Resource Geography; Classification of Resources, Principles of conservation; Conservation of natural resources; Sustainable resource development and management.

UNIT II Human Resources: Policy, Population Pressure, Resource Utilization and Management; Natural resources: Distribution and management of Forest, Water, mineral and Soil resources

UNIT III Energy and Mineral resources: Conventional (Coal and Petroleum – distribution and utilization), Non-conventional (Wind and Solar energy – potential and utilization).

UNIT IV Interpretation of toposheet- a) Physiography b) Drainage c) Natural Vegetation, Decadal changes in state-wise production of coal and iron ore (Comparative analysis)

Recommended Readings:

1. Bryson, J., Henry, N., Keeble, D. and Martin, R. (eds.) (1999): **The Economic Geography Reader: Producing and Consuming Global Capitalism,** John Wiley and Sons, Inc, New York.
2. Coe, N. (2007): **Economic Geography: A Contemporary Introduction,** Blackwell Publishers, Inc., Massachusetts.
3. Guha, J.S. and Chattorji, P.R. (2002): **A New Approach to Economic Geography: A Study of Resources**, The World Press Private Limited, Kolkata.
4. Hanink, D.M. (1997): **Principles and Applications of Economic Geography: Economy, Policy, Environment,** John Wiley and Sons, Inc, New York.
5. Leong, G. C. and Morgan, G.C. (1982): **Human and Economic Geography**, Oxford University Press, Singapore.
6. Mackinnon, D.and Cumbers, A.(2007): **An Introduction to Economic Geography: Globalization, Uneven Development and Place**, Prentice Hall, New Jersey.
7. Parman, S.S. (2002): **Geography, Economics and Economic Geography**, ASD Publ., Pune.
8. Simmons, I.G. (1980): **The Ecology of Natural Resources**, Edward Arnold, London.
9. Simmons, I.G. (1991): **Earth, Air and Water: Resources and Environment in the 20th Century**, Edward Arnold, London.
10. Roy, P.K. (2005): **Economic Geography: A Study of Resources**, New Central Book Agency (P) Ltd, Kolkata

SEMESTER - VII

DSC- MJ 18
ADVANCED GEOMORPHOLOGY (THEORY + PRACTICAL)

Contact Hours: 60
Credit: 4

Course Objective:

1. To provide a general idea about the topographic and surficial characteristics of the earth's surface to the students.
2. To make students aware of the forms and patterns of diverse landforms in different physical settings of the earth.
3. To make students skilled for applying geomorphic knowledge and techniques for investigating geomorphic processes and the resultant landforms.

Course outcome:

1. This course will help students to understand the evolution and development of various land- forms and the associated geomorphic processes in different geo-environmental settings.
2. It enables students to apply geomorphic knowledge and techniques to investigate different land features and the causes of their changes in spatiotemporal contexts.
3. It will help students to get exposure to the theories and concepts related to the development of the earth and its relief features.

Course Content(Theory + Practical)

UNIT I Development of geomorphology: Contributions by American school & European school, Indian contribution to geomorphology; Method and approaches to the study of landforms.

UNIT II Fundamental concepts in geomorphology: Concept related to principle of uniformitarianism – James Hutton; Geologic structure and Geomorphological processes - W. D. Thornbury.

UNIT III Theories of landform development: Geomorphic theories of W. M. Davis, C.L King, J. T. Hack; Geosynclinal theory of Kober. Application of geomorphology to settlements, transport, mining.

UNIT IV Average slope map and block diagram (from same area), Average slope determination (Wentworth's); Hypsographic and Bathymetric curve.

Recommended Readings:

1. Ahmed, E. (2004): **Geomorphology (reprint)**, Kalyani Publ., Ludhiana.
2. Bloom, A.L. (1992): **Geomorphology – A Systematic Analysis**, Prentice-Hall India, New Delhi.
3. Dayal, P. (1996): **A Text Book in Geomorphology**, shukla Book Depot, Patna.
4. Kale, V. And Gupta, A. (2001): **Elements of Geomorphology,** Oxford University Press, Delhi.
5. Kale, S.Vishwas and Gupta, Avijit (1996): **Introduction to Geomorphology**, Orient Longman, Calcutta.
6. Stoddard, D. R. (ed) (1996): **Process and Form in Geomorphology**, Routledge, London.
7. Thornbury, W. D. (1990): **Principles of Geomorphology,** Wiley Eastern Edition, New York.
8. Singh, S. (2004): **Geomorphology,** Prayag Pustak Bhawan, Allahabad.
9. Skinner, B. J. And Poter, S.C. (1996): **The Dynamic Earth,** John Wileyand sons, New York.
10. Sparks, B.W. (1960**): Geomorphology**, Longman, London

SEMESTER - VII

DSC - MJ 19
STATISTICAL GEOGRAPHY (THEORY +PRACTICAL)

Contact Hours: 60
Credit: 4

Course Objective: The paper Advanced Spatial Statistical Techniques throws light on the importance of data in geography. It deals with the methods and techniques of data collection, data tabulation, data interpretation and analysis through the application of some basic statistical measures. This paper provides an understanding of the pure and applied nature of geography along with the key elements in the discipline.

Course outcome:

1. Thorough understanding of the statistical methods and techniques used in geographical studies
2. Understanding of tabulation, analysis and interpretation of geographical data.

Course Content (Theory + Practical)

Unit I Collection of data – primary and secondary. Construction of statistical table. Statistical series (individual and frequency distribution)

Unit II Sampling: types, and methods of sampling; Measurement of central tendencies – mean, median, mode

Unit III Partition values. Measures of dispersion – mean deviation, standard deviation, coefficient of variation.

Unit IV Association and correlation: Rank correlation, Karl Pearson. Time series analysis (Moving average); Hypothesis testing: Chi-squared test and t-test

Note: Any Statistical Software Package (SPSS, MS Excel, R, etc.) may be used for practical.

Recommended Readings:

1. Bart James E and Gerald M. Barber, 1996: Elementary Statistics for Geographers, The Guieford Press, London.
2. Eldon, D., 1983: Statistics in Geography: A Practical Approach, Blackwell, London.
3. Cressie, N.A.C., 1991: Statistics for Spatial Analysis, Wiley, New York.
4. Gregory, S., 1978: Statistical Methods and the Geographer (4th Edition), Longman, London.
5. Haining, R.P., 1990: Spatial Data Analysis in the Social and Environmental Science, Cambridge University Press, Cambridge.
6. Mc Grew, Jr. and Cahrles, B. M., 1993: An Introduction to Statistical Problem Solving in Geography, W.C. Brocan Publishers, New Jersey.
7. Mathews, J.A., 1987: Quantitative and Statistical Approaches to Geography: A Practical Manual Pergamon, Oxford.
8. S.K., 1998: Statistics for Geoscientists: Techniques and Applications, Concept Publishing Company, New Delhi.
9. Wei, W.S.,1990: Time Series Analysis: Variate and Multivariate Methods, Addison Wesley Publishing.

SEMESTER - VII

DSE - MN 7
ENVIRONMENTAL GEOGRAPHY

Contact Hours: 60

Credit: 4

Course Objectives: The course aims to
1. Understand the concept, nature and scope, concepts and developments of environmental geography; 2. Learn concept of ecosystem, its structure and function, ecology, types and components of ecology;
3. Understand the Human-Environment relationship in different biomes and human adaptations;
4. Learn about environmental degradation and restoration

Course Outcome: After the completion of this course, students should be able to:
1. Define the field of Environmental Geography and to explain the essential principles of it.
2. Illustrate and explain the ecosystem, types and components.
3. Explain the symbiotic relation between Human-Environment and adaptations in different biomes.
4. Understand the components of environmental degradation and restoration.

Course Content (Theory + Practical)

UNIT I: Definition, concept and scope of Environmental Geography; fundamental concepts of environmental geography; Environment and ecology: Meaning, structure and type of environment; Ecology – meaning, scope and concepts

UNIT II: Environmental pollution- meaning, types, sources, causes and impacts; Air, Water and Land pollutions; Environmental Degradation – Nature, process, types and causes of environmental degradation; Greenhouse effect, global warming, ozone depletion and desertification,

UNIT III: Emerging environmental problems: population growth, agriculture, deforestation, science and technology; Environmental management – concept, methods and approaches; Management of soil, forest and mineral resources;

UNIT IV: Presentation based on theory

Recommended Readings:

1. Cantledge, B.(ed). (1992): **Monitoring the Environment,** Oxford University Press. Oxford.
2. Frank W.L., (1986): **The Violent Earth**, Croom Helm, London.
3. Kapur, A., (2010): **Vulnerable India: A Geographical Study of Disasters**, Safe Publication, New Delhi.
4. Newson, M.(1992): **Land, Water and Development,** Routledge, London.
5. Saxena, H.M. (2003): **Environmental Geography**, Rawat Publications, Jaipur and New Delhi.
6. Singh, R.B. (ed.) (2006): **Natural Hazards and Disaster Management Vulnerability and Mitigation**, Rawat Publications, New Delhi.
7. Singh, S.(1991): **Environmental Geography.** Prayag Pustak Bhawan, Allahabad.
8. Strahler, A.N. & A.H. Strahler, 1976: **Geography and Man's Environment**, John Willey, New York.
9. UN and WMO, (2002): **Living with Risk: A Global Review of Disaster Reduction Initiatives, International Strategy for Disaster Reduction (ISDR)**, WMO and UN Publication.

SEMESTER VIII
DSC - MJ 20
DISASTER MANAGEMENT (THEORY + PRACTICAL)

Contact Hours: 60
Credit: 4

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 Outcome: After the completion of course, the students will have ability to:
1. Gain a perspective of disasters and various dimensions of disaster management
2. Have comprehensive knowledge of various natural and manmade disasters in India
3. Examine the response and mitigation measures of disasters

Course Content (Theory + Practical)

UNIT I: Concept of Hazards and Disaster; Concept and typology of Disaster - drought, flood, forest fires, landslides earthquake and cyclones

UNIT II: Earthquake prone areas; Earthquake zoning in India; Cyclone prone areas, flood prone areas, drought prone areas and landslide prone areas

UNIT III: Disaster management and environmental laws – Institutional organizations and policies, national policy on disaster management; earthquake risk mitigation, cyclone disaster management

UNIT IV: A project report on any one of the following:

1. Deforestation
2. Waste Management
3. Flood
4. Drought
5. Cyclone and Hailstorms
6. Earthquake
7. Landslide
8. Human induced disaster: Fire hazards, chemical, industrial acciden

Recommended Readings:

1. Allan, S., Adam, B. and Carter, C., (eds.), (2000): Environmental Risks and the Media, Routledge, London.
2. Ambala-Bertrand, J.M., (1993): Political Economy of Large Natural Disasters: With Special Reference to Developing Countries, Claredon Press, Oxford.
3. Blaikie, P., Cannon, T., Davis, I., (et al.), (1994): At Risk: Natural Hazards, People's Vulnerability, and Disasters, Routledge, London.
4. Burton, I., Kates, R.W. and White, G.F., (1993): Environment as Hazards, 2nd edition, Guilford Press, New York.
5. Hewitt, K., (1997): Regions of Risk" A Geographical Introduction toDisasters, Longman, London.
6. Hood, C. and Jones, D.K.C. (eds.), (1996): Accident and Design:Contemporary debates in Risk Management, UCL Press, London.
7. Kasperson, J.X., Kasperson, R.E. and turner, B.L., (1995): Regions at Risk: Comparisons of Threatened Environments, United Nation University Press, Tokyo.
8. Mitchell, J.K., (ed.) (1999): Crucibles of Hazard: Mega-Cities and Disasters in Transition, United Nations University Press, New York.
9. Schneider, S.K., (1995): Flirting with Disaster: Public Management in Crisis Situations, M.E.Sharpe, New York.
10. Quarantelli, E.L. (ed.) (1998): What is a Disaster? Perspective on the Question, Routledge, London.
11. Schneid, T. and Collins, L. (1998): Disaster Management and Preparedness, Lewis Publishers, Washington, D.C.
12. Godschalk, D.R. (et.al.) (1999): Natural Hazard Mitigation Recasting Disaster Policy and Planning, Island Press, Washington, D.C.
13. Smith, Keith (1996): Environmental Hazards; Assessing Risk and Reducing Disaster, Routledge, London and New York.
14. Paraswamam, S. and Umikrishnan, P.V. (2000): India Disaster Report, Oxford University Press, New Delhi

SEMESTER VIII

DSE - MN 8
RESOURCE AND APPLIED GEOGRAPHY(THEORY + PRACTICAL)

Contact Hours: 60
Credit: 4

Course Objective:

1. To understand the concept of resources, prevalent issues related to environment; geographical pattern of resource utilization and the concept of sustainable development.
2. Awareness about resource availability, accessibility, utilization, its use and misuse
3. To know about spatial distribution of natural resources and their usage.
4. To understand resource management and governance.

Learning Outcome:

1. At the end the course student should learn importance of natural resources.
2. Conservation methods and awareness about community participation.
3. Assessment of role of national and international efforts to mitigate resource problems.
4. To understand the sustainable development and conservation, planning, strategies of resources.
5. To understand the community participation and governance in development of resources.

Course Content (Theory + Practical)

UNIT I	Concept of Resources; Scope Of Resource Geography; Classification Of Resources, Principles of conservation; Conservation of natural resources; Sustainable resource development and management.
UNIT II	Human Resources: Policy, Population Pressure, Resource Utilization and Management, Natural resources: Distribution and management of Forest, Water resources
UNIT III	Energy and Mineral resources: Conventional (Coal and Petroleum – distribution and utilization), Non-conventional (Wind and Solar energy – potential and utilization).
UNIT IV	Interpretation of toposheet- a) Physiography b) Drainage c) Natural Vegetation, Decadal changes in state-wise production of coal and iron ore (Comparative analysis)

Recommended Readings:

1. Bryson, J., Henry, N., Keeble, D. and Martin, R. (eds.) (1999): **The Economic Geography Reader: Producing and Consuming Global Capitalism,** John Wiley and Sons, Inc, New York.
2. Coe, N. (2007): **Economic Geography: A Contemporary Introduction,** Blackwell Publishers, Inc., Massachusetts.
3. Guha, J.S. and Chattorji, P.R. (2002): **A New Approach to Economic Geography: A Study of Resources**, The World Press Private Limited, Kolkata.
4. Hanink, D.M. (1997): **Principles and Applications of Economic Geography: Economy, Policy, Environment,** John Wiley and Sons, Inc, New York.
5. Leong, G. C. and Morgan, G.C. (1982): **Human and Economic Geography**, Oxford University Press, Singapore.
6. Mackinnon, D.and Cumbers, A.(2007): **An Introduction to Economic Geography: Globalization, Uneven Development and Place**, Prentice Hall, New Jersey.
7. Parman, S.S. (2002): **Geography, Economics and Economic Geography**, ASD Publ., Pune.
8. Simmons, I.G. (1980): **The Ecology of Natural Resources**, Edward Arnold, London.
9. Simmons, I.G. (1991): **Earth, Air and Water: Resources and Environment in the 20th Century**, Edward Arnold, London.
10. Roy, P.K. (2005): **Economic Geography: A Study of Resources**, New Central Book Agency

SEMESTER– VIII

DSC MJ 21
SOCIAL GEOGRAPHY (THEORY + PRACTICAL)

Contact Hours: 60
Credit: 4

Course Objectives: The course triggers to
1. To have a basic introduction of social geography, meaning and scope,
2. To understand concept of caste and tribes of India in geographical prospective,
3. To learn about geography of religion of India,
4. To learn about language and its geographical importance.

Course Outcome: After the completion of this course, students should be able to:
1. Define social geography, its nature, scope and development,
2. Evaluate caste and tribe of India and its distributions,
3. Identify social status and issues due to religion in India,
4. Illustrate language as identity and its relevance.

Course Content (Theory + Practical)

UNIT I Social Geography: Concept, Origin, Nature and Scope, Social structure: caste and class. Social process: Urbanisation, industrialisation, and migration; Social differentiation and region formation

UNIT II Geographies of Welfare and Well-being; Concept and Components – Housing, Education, Health; Social Geographies of Inclusion and Exclusion, Slums, Gated Communities, Communal Conflicts and Crime.

Unit III Concepts of social justice and social security with examples from India. Contemporary social issues: Gender related problems; Social problems in urban areas: Poverty and crime; Social problems in rural areas: Marginalisation and deprivation, social welfare schemes for tribes, women, and children

Unit IV Report writing and presentation on any of the above.

Recommended 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 Social Geographies*, Oxford University Press.
7. Smith D. M., 1977: *Human geography: A Welfare Approach*, Edward Arnold, London.
8. Smith D. M., 1994: *Geography and Social Justice*, Blackwell, Oxford.
9. Smith S. J., Pain R., Marston S. A., Jones J. P., 2009: *The SAGE Handbook of Social Geographies*, Sage Publications.

Sopher, David (1980): *An Exploration of India*, Cornell University Press, Ithasa

SEMESTER– VIII
DSC - MJ 22
FIELD WORK

Contact Hours: 60
Credit: 4

Course Objective:

1. To enhance understanding and practical knowledge of geographical concepts by directly observing and collecting data in real world settings.
2. To allow students to develop analytical skills and gain insights into the physical and human aspects of the environment.

Course Outcome:

1. It would enable the student to have a deeper connection to the subject and promotes critical thinking through hands-on experience in geographical research and analysis.
2. Develop skills in data collection, observation and analysis, fostering the ability to conduct independent geographical research.
3. Improve communication skills through the presentation of findings, both verbally and in written reports, enabling effective sharing of geographical insights.
4. Enhance spatial awareness by navigating and mapping physical environments.

General Guidelines to be followed

Each student will prepare an individual/ group report based on primary level and secondary data collected during field work.

- Report Writing – 40
- Oral Presentation – 20
- Viva Voce – 20
- Internal Assessment - 20

SEMESTER– VIII

DSC - MJ 23

GEOGRAPHY OF TRANSPORT (THEORY + PRACTICAL)

Contact Hours: 60

Credit: 4

Course Objective:

1. This paper introduces the students to the field of Transport geography and its major aspects.
2. It seeks to develop new insights among students on the relevance of Transport geography and associated problems in a rapidly urbanizing world.

Course outcome:

1. The paper will be useful for students in developing ideas on how geographical factors determine transport system and how geographers seek to address various transport problems and issues.
2. It will help build skills among students seeking advanced studies on transport development and planning.
3. The paper will be useful for students preparing for various competitive examinations including civil services.

Course Content (Theory + Practical)

Unit I: Nature, scope, significance and development of transport geography; Factors associated with development of transport system: physical, economic, social cultural and institutional.

Unit II: Regional variations in transport density; traffic flow and regional interaction; Bases of spatial interaction. Transport and locational activities; Impact of different aspects of transport on spatial equilibrium of location; problems of location and regional development.

Unit III: Transportation network: Function, pattern and geometry; Models of network change, Development of Road Transport in Nagaland: Growth and Development of Roads in Nagaland, Levels of Road Transport in Nagaland, Levels of Road Connectivity in Nagaland, Problems of Road Transport in Nagaland

Unit-IV: Use of cartographic symbols and their uses: Iso-chronic cartograms, traffic flow diagrams and choropleth mapping, Flow Chart of types of road transport in Nagaland; Road profile by Dumpy Level.

Recommended Readings:

1. Bamford, C.G. and Robinson, H. (1978), Geography of Transport, Macdonald and Evans, London.

2. Bhaduri S. (1992), Transport and Regional Development, Concept Publishing Company, New Delhi.

3. Eliot Hurst, M.E. (1972), A Geography of Economic Behaviour: An Introduction, Duxbury Press, California.

4. Hammond, R. and Mc Cullagh, P.S. (1989), Quantitative Techniques in Geography; An Introduction, Clarendon Press, Oxford.

5. Hoyle, Band and Knowles, R. (2000), Modern Transport Geography, John Wiley and Sons, New York.

6. Mangat, H.S. and Gill, Lakhvir Singh. (2015), Haryana: Levels of Road Transportation, Punjab Geographer, Vol. 11, October, Punchkula, pp.87-102.

7. Raza, M. and Aggarwal, Y.P. (1985), Transport Geography of India, Concept Publishing Company, New Delhi.

8. Saxena, H.M. (2010), Transport Geography, Rawat Publications, New Delhi.

9. Subodh Rani and Chamar, K.V. (2016), Levels of Road Connectivity in Haryana, Punjab Geographer, Vol. 12, October, Punchkula.

SEMESTER– VIII

DSC

RESEARCH PROJECT/DISSERTATION

Contact Hours: 180
Credit: 12

Course Objective:

1. To generates new insights, theories or methodologies that contribute to the existing body of knowledge in geography.
2. To get acquainted with dissertation writing methods and processes.
3. To perform a comprehensive review of relevant literature and critically analyze previous research to identify gaps and areas for further exploration.
4. Provide insights that can inform policy making or practical applications in geography.

Learning Outcome:

1. Students will contribute new knowledge in the field of geography by filling gaps in existing literature.
2. Introduce innovative research methods or techniques that can be applied to similar geographical studies.
3. Provide an opportunity for personal and professional development by honing research, analytical and communication skills essential for a career in academia or related fields.
4. Facilitate the transfer of knowledge from academic research to practical applications.

General guidelines

1. Each student will have to prepare a dissertation under the guidance of respective teacher as per specialization following appropriate methodology, data base and literature review.
2. The dissertation duly signed by the guide concerned has to be submitted to the department at least one week before the scheduled date of examination.
3. The marks distribution of dissertation in the final semester examination is as follows:

- Field Work: 80
- Evaluation of Content: 120
- Presentation: 60
- Viva-Voce : 40

SEMESTER – I
Multidisciplinary Course 1
SETTLEMENT GEOGRAPHY (Theory)

Contact Hours:45
Credit: 3

Course Objectives:

1. To acquaint the students about the rural and urban settlement.
2. To understand theories, models and approaches

Learning Outcomes: After the completion of course, the students will have ability to:

1. Appreciate the types and patterns of rural and urban settlement.
2. Apply various concepts and theories in rural and urban development

Course Content

UNIT I Definition, nature, and scope of settlement geography; **O**rigin of settlements, factors affecting growth of settlement

UNIT II Rural Settlement: site, location, types and patterns; Urban settlement: origin and functional classification of urban centres; features and trend of urbanization.

UNIT III Social areas of the city; urban Sprawl; conurbation and metropolitan regions; Central Place theory (Christaller's).

Suggested Readings:

1. Hazra, Jayati et al., (1977): **Dimensions of Human Geography**, Rawat Publications, Jaipur.
2. Hopkins, I. (1982): **An Introduction to Human Geography**, Widenfield and Nicolson, London.
3. Hussain, M. (1994): **Human Geography,** Rawat Publications, Jaipur.
4. James, R. (2010): **The Cultural Landscape – An Introduction to Human Geography**, Prentice Hall of India, New Delhi.
5. Leong Goh Cheng (2003): **Physical and Human Geography,** Oxford University Press, New Delhi.
6. Norton, W. (1995): **Human Geography,** Oxford University Press, New York.
7. Singh, L.R. (2005): **Fundamentals of Human Geography**, Sharda Pustak Bhawan, Allahabad.
8. Stoddard, R.H., Wishart, D.J. and and Blouet, B.W.: **Human Geography,** Prentice-Hall, Englewood Cliffs, New Jersey.
9. Knox P. L. and Pinch S., 2006: **Urban Social Geography:** ***An Introduction***, Prentice Hall.
10. Ramachandran, R., 1992: **The Study of Urbanisation**, Oxford University Press, Delhi

SEMESTER – II

Multidisciplinary Course 2

FUNDAMENTALS OF NATURAL DISASTERS (Theory)

Contact Hours: 45
Credit: 3

Course Objectives – This course aims to:

1. The paper is intended to provide a general concept in the dimensions of disasters caused by nature beyond the human control.
2. Introduce a holistic classification of natural disasters considering the Earth Sciences
3. Demonstrate the devastating effect of natural disasters to society.

Learning Outcomes:

1. Understand the basics concepts in natural disasters
2. Study types of natural disasters and their effects

Course Content (Theory)

Unit I: Natural disasters - Meaning, definition and scope, Lithosphere and natural disaster, Earthquakes and Volcanoes, Landslides and Avalanches.

Unit II: Heat wave and Wildfire, Cloud burst and Hailstorm, Drought and famines, Tsunami its effect and preparedness, Hurricanes and cyclones, Floods and flash floods.

Unit III: Epidemics and Pandemics, COVID-19 and its effect, Response to disasters- Community, NGOs, National and International

Recommended Readings:

1. Cantledge, B.(ed). (1992): **Monitoring the Environment,** Oxford University Press. Oxford.
2. Frank W.L., (1986): **The Violent Earth**, Croom Helm, London.
3. Kapur, A., (2010): **Vulnerable India: A Geographical Study of Disasters**, Safe Publication, New Delhi.
4. Newson, M.(1992): **Land, Water and Development,** Routledge, London.
5. Saxena, H.M. (2003): **Environmental Geography**, Rawat Publications, Jaipur and New Delhi.
6. Singh, R.B. (ed.) (2006): **Natural Hazards and Disaster Management Vulnerability and Mitigation**, Rawat Publications, New Delhi.
7. Singh, S.(1991): **Environmental Geography.** Prayag Pustak Bhawan, Allahabad.
8. Strahler, A.N. & A.H. Strahler, 1976: **Geography and Man's Environment**, John Willey, New York.
9. UN and WMO, (2002): **Living with Risk: A Global Review of Disaster Reduction Initiatives, International Strategy for Disaster Reduction (ISDR)**, WMO and UN Publication.

SEMESTER– III
Multidisciplinary Course 3
INTRODUCTION TO GEOMORPHOLOGY (Theory)

Contact Hours:45
Credit:3

Course Objectives: This course aims to
1. To define the concepts in Geomorphology and Physical Geography
2. To introduce various concept to understand cycles of the solid Earth surface
3. To understand the dynamic nature of the Earth's surface, various processes, and landforms.
4. To study the impact human on geomorphic system.

Learning Outcomes: After the completion of this course, students should be able to:
1. Define the field of Geomorphology and to explain the essential principles of it.
2. To outline the mechanism of dynamic nature of the Earth's surface and interior of the Earth.
3. To illustrate and explain the forces affecting the crust of the earth and its effect on it.
4. To understand the conceptual and dynamic aspects of landform development

Course Content (Theory)

UNIT I Geomorphology (Nature and scope); relief features of the earth surface, Constitution of the earth's interior -Internal structure of Earth (seismological evidence and recent views)

UNIT II Earth movements- Mountain building process, Faults and Folds, Volcano (definition, classification, landforms produced), Earthquakes (definition, causes, landforms produced),

UNIT III Processes and resultant Land forms: Works of river, wind, glacial, under- ground water.

Suggested Readings:

1. Bryant, H. Richard (2001): **Physical Geography Made Simple,** Rupa and Company, New Delhi.
2. Hugget, R.J. (2003): **Fundamentals of Geomorphology**, Routledge, London.
3. Monkhouse, F.J. (1979): **Physical Geography**, Methuen, London.
4. Singh, S. (2003): **Physical Geography,** Prayag Pustak Bhawan, Allahabad. (2007): Physical Geography, Lakshmi Narain Agarwal, Agra.
5. Sharma, Y.K. (2007): **Physical Geography**, Lakshmi Narain Agarwal, Agra.
6. Strahler, A.N. and Strahler, A.m. (1992): **Modern Physical Geography**, John Wiley and Sons, New York.
7. Thornbury, W.D. (1960): **Principles of Geomorphology**, John Willey & Sons, New York.

Wooldrige, S.H and Morgan, R.S. (1959): **The Physical Basis of Geography** –An Outline of Geomorphology, Longman Green & Co., London