INSTITUTE OF DISTANCE EDUCATION (IDE)
UNIVERSITY OF MADRAS

DEPARTMENT OF GEOGRAPHY

Programme:	**B.Sc GEOGRAPHY**
Programme Code:	**SUGE**
Duration:	**3 Years**
Programme Objectives:	1. To provide students with a strong foundation in geographic knowledge. This includes understanding physical geography and the interconnectedness of these elements. 2. To cultivate critical thinking and problem-solving abilities in real-world issues related to geography, such as natural resource management, environmental conservation, and urban development. 3. To develop research skills, including data collection, statistical analysis, and the ability to present findings effectively. 4. To explore how geography intersects with other disciplines, such as economics, sociology, and environmental science etc. 5. To learn how to use Geo-informatic tools and software to collect, prepare thematic layers, analyse geo-spatial data, and visualize geospatial data, which is valuable in various professional fields, including urban planning, environmental management, and business.
Programme Outcomes:	1. Understand the scope and evolution of the diverse discipline of Geography
	2. Develop ethical aptitudes and dispositions necessary to acquire and hold leadership positions in industry, government, and professional organizations.
	3. Recognize, synthesize and evaluate diverse sources of knowledge, arguments and approaches pertinent to exploring human-environment problems.
	4. Development of knowledge, skills and holistic understanding of the discipline among students. Encouragement of scientific mode of thinking and scientific method of enquiry in students.
	5. Ability to undertake research in interdisciplinary studies and problems or issues beyond the realm of what strictly comes under the purview of geography

Programme Specific Outcomes:	1. Understand the major biophysical and social patterns in the world, and the key drivers that give rise to those patterns.
	2. Demonstrate in-depth knowledge of theories, concepts, techniques and technologies in human and physical aspects of geography, as well as geographic information science and technology, through real-world practical applications at the local, regional, and global scales.
	3. Apply systems thinking and critical thinking skills to analyze problems and potential solutions in socio-economic-ecological systems at the human-environment interface.
	4. Practice obtaining, analyzing, and interpreting complex geographic data.
	5. Work effectively in interdisciplinary and multicultural real-world contexts to combine theory and practice in responding to local to global issues for humans and non-humans.

LIST OF COURSES

Part	Course Code	Title of the Course	Core/Elective/ Soft Skill	Credits
FIRST YEAR : SEMESTER-I				
I	Paper - I	Tamil / Other Language	Language	3
II	Paper – I	English	Language	3
III	Core Paper - I	Physical Geography	Core	4
	Core Paper -II	**Practical-I :** General Cartography	Core	4
	Allied Paper - I	General Geology	Elective	3
FIRST YEAR : SEMESTER-II				
I	Paper – II	Tamil / Other Language	Language	3
II	Paper – II	English	Language	3
III	Core Paper – III	Human Geography	Core	4
	Core Paper - IV	**Practical – II :** Thematic Cartography (Physical)	Core	4
	Allied Paper - II	Applied Statistics	Elective	3
SECOND YEAR : SEMESTER-III				
I	Paper – III	Tamil / Other Language	Language	3
II	Paper – III	English	Language	3
III	Core paper – V	Economic Geography	Core	4
	Core Paper – VI	**Practical – III :**Thematic Cartography (Socio-Economic)	Core	4
IV	Non-Major Elective – I	Information Technology	Elective	2
SECOND YEAR : SEMESTER-IV				
I	Paper – IV	Tamil / Other Language	Language	3
II	Paper – IV	English	Language	3
III	Core paper – VII	Fundamental of Geoinformatics	Core	4
	Core paper – VIII	**Practical-IV :** Geoinformatics	Core	4
IV	Non-Major Elective – II	Disaster Management	Elective	2

THIRD YEAR : SEMESTER-V				
III	Core paper – IX	Geography of Resources	Core	4
	Core paper – X	Regional Planning & Development	Core	4
	Core paper – XI	**Practical-V :** Field Work and Research Methods	Core	5
	Core Elective – I	Climate Change Vulnerability and Adaptation	Elective	3
IV	EVS	Environmental Studies	EVS	2
THIRD YEAR : SEMESTER-VI				
III	Core paper – XII	Geography of India	Core	4
	Core Paper – XIII	Geography of Health and Well Being	Core	4
	Core Paper – XIV	Project Work/Dissertation, Viva Voce Examination	Core	5
	Core Elective – II	Hydrology and Oceanography	Elective	3
IV	VE	Value Education	VE	2

Part	Paper	Credit per paper	No. of paper	Total credit
I	Language-I	03	04	12
II	Language-II	03	04	12
III	Core paper	04	12	48
		05	02	10
	Allied paper	03	02	06
	Elective paper	03	02	06
IV	NME	02	02	04
	EVS	02	01	02
	VE	02	01	02
Total			**30**	**102**

SEMESTER - I

Core Paper-I : PHYSICAL GEOGRAPHY

Course Objectives:		
The main objectives of this course are to:		
1	provide students with knowledge about the physical forces and processes that shape the Earth's landforms, climate, and ecosystems.	**K1, K2**
2	foster an appreciation for the natural environment and its vulnerability to human impact, including issues related to climate change, natural disasters, and resource management.	**K2, K3**
3	develop students' ability to analyze spatial patterns, relationships, and distributions, using tools like Geographic Information Systems (GIS) and remote sensing.	**K3, K6**
4	equip students with the practical skills needed to conduct fieldwork, gather data, and apply scientific methods to physical geography research.	**K4, K5**
5	encourage students to recognize the interdisciplinary nature of physical geography, emphasizing its connections with geology, meteorology, ecology, and other scientific fields.	**K4, K6**
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		

Course – 1	**CORE PAPER**
Title of the Course:	**PHYSICAL GEOGRAPHY**
Credits:	04
Pre-requisites, if any:	A strong foundation in basic science and geographical concepts
UNITS	
Unit -I	**PHYSICAL GEOGRAPHY**
Definition, nature and Scope, Components of Earth System	
Unit-II	**ATMOSPHERE**
Heat Balance, Global Circulation Pattern, Tropical Cyclones, Monsoon, Climatic Classification (Koppen).	
Unit-III	**LITHOSPHERE**
Internal Structure of Earth - Seismic Evidence, Plate Tectonics and its associated features.	
Unit-IV	**FLUVIAL CYCLE OF EROSION**
Davis and Penck’s cycle of erosion	
Unit-V	**HYDROSPHERE**
Hydrological Cycle, Ocean Bottom Relief Features, Tides and Ocean Currents.	

Expected Course Outcomes:		
On the successful completion of the course, student will be able to:		
1	Understand the Earth's physical processes, including weather and climate, landforms, ecosystems, and geological phenomena.;	**K1, K2**
2	Skilled in using geospatial tools and technologies for analyzing geographic data and understanding spatial patterns.;	**K2, K3**
3	Aware of environmental issues and the impact of human activities on natural systems, including climate change, land degradation, and conservation.;	**K3, K6**
4	Capable of conducting research, collecting field data, and applying scientific methods to investigate physical geography phenomena.;	**K4, K5**
5	Appreciate the interdisciplinary nature of physical geography, understanding its connections with geology, meteorology, ecology, and other scientific fields	**K4, K6**
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		

Reading List (s) :	
1	Conserva H. T., 2004. Illustrated Dictionary of Physical Geography, Author House, USA, 96 Pages
2	Darrel Hess & Dennis Tasa., 2016. McKnight's Physical Geography: A LandscapeAppreciation, Books a la Carte Edition" Pearson Education 2016, 688 pages.
3	Gabler R. E., Petersen J. F. and Trapasso, L. M., 2007. Essentials of Physical Geography (8th Edition), Thompson, Brooks/Cole, USA, 658 Pages.
4	Husain M., 2002. Fundamentals of Physical Geography, Rawat Publications, Jaipur, 638 Pages.

Recommended Text (s) :	
1	Goudie, A., 1984. The Nature of the Environment: An Advanced Physical Geography, 331 Pages.
3	Monkhouse, F. J., 2009. Principles of Physical Geography, Platinum Publishers, Kolkata, 570 Pages.

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.] :	
1	https://www.youtube.com/watch?v=BKWEAy1Z96M&pp=ygUScGh5c2ljYWwgZ2VvZ3JhcGh5
2	https://www.youtube.com/watch?v=MlwBZ2MSNtE&pp=ygUKYXRtb3NwaGVyZQ%3D%3D
3	https://www.youtube.com/watch?v=et0DcFhX8Ig&pp=ygULbGl0aG9zcGhlcmU%3D
4	https://www.youtube.com/watch?v=TDYa1Td_WOk&pp=ygUsZmx1dmlhbCBjeWNsZSBvZiBlcm9zaW9uIGJ5IGRhdmlzIGFuZCBwZW5jayA%3D
5	https://www.youtube.com/watch?v=BRlW2Yhexcw&pp=ygUMaHlkcm9zaHBoZXJl

Method of Evaluation :

Internal Assessment	End Semester Examination	Total	Grade
25	75	100	

Methods of Assessment

Recall (K1) - Simple definitions, MCQ, Recall steps, Concept definitions

Understand/ Comprehend (K2) - MCQ, True/False, Short essays, Concept explanations, Short summary or overview

Application (K3) - Suggest idea/concept with examples, Suggest formulae, Solve problems, Observe, Explain

Analyse (K4) - Problem-solving questions, Finish a procedure in many steps, Differentiate between various ideas, Map knowledge

Evaluate (K5) - Longer essay/ Evaluation essay, Critique or justify with pros and con

Create (K6) - Check knowledge in specific or offbeat situations, Discussion, Debating or Presentations

Mapping with Programme Outcomes:

PCOs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	1	1	2	2	2
CO 2	1	1	2	1	1
CO 3	1	2	1	2	2
CO 4	1	2	1	2	2
CO 5	1	1	1	1	2

Map **Course Outcomes (CO)** for each Course with **Programme Specific Outcomes (PSO)** in the 3-Point scale of **1,2, 3 (Strong, Medium and Low)**

Core Paper-II : Practical-I : GENERAL CARTOGRAPHY

Course Objectives:		
The main objectives of this course are to:		
1	provide a solid foundation in cartographic principles, map design, and spatial representation.	**K1, K2**
2	develop practical skills in creating and interpreting maps using modern cartographic tools and software.	**K2, K3**
3	teach how to gather, process, and integrate various types of geospatial data into map production.	**K3, K4**
4	ensure that comprehend map projections, georeferencing techniques, and their impact on map accuracy and representation.	**K4, K5**
5	enhance the ability to convey complex spatial information through well-designed and informative maps suitable for a variety of applications and audiences.	**K4, K6**
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		

Course – 2	**CORE PAPER**
Title of the Course:	**PRACTICAL-I : GENERAL CARTOGRAPHY**
Credits:	04
Pre-requisites, if any:	Basic understanding of geography and spatial concepts
UNITS	
Unit -I	**MAPS**
Definition of Cartography - Nature and Scope of Cartography - Historical development of Cartography- Earth as a Cartographic problem	
Unit-II	**MAP SCALE AND MAP INTERPRETATION**
Scale: Types and Function, Map Interpretation : Interpretation of Topographic Maps - Interpretation of Weather maps	
Unit-III	**MAP PROJECTIONS**
Map Projection: Criteria for choice projections - Attributes and Properties of Zenithal, Gnomonic Polar Case, Cylindrical, Equal Area, Conical Projection with Two Standard Parallel, UTM projection	
Unit-IV	**SURVEYING**
Traditional Surveying : Instruments - Types of Survey, Modern Surveying : Instruments – Methods of Modern Surveying and Mapping - Significance of Survey in Geographical studies	

Unit-V	MAP DESIGN AND LAYOUT	
Map Design and Layout : Theory of Visual Perception - Constraints in map design – Symbolization - Lettering – Style, Form, Size and Position – Digital Mapping Techniques		
Expected Course Outcomes:		
On the successful completion of the course, student will be able to:		
1	capable of designing visually effective and informative maps, understanding principles like scale, legend, and symbolization.	**K1, K2**
2	Develop skill in interpreting and analyzing spatial data represented in maps, and understanding the relationships between geographic features.	**K2, K5**
3	hands-on experience using cartographic software and tools for map creation and data visualization.	**K4, K5**
4	Understand the map projections and their impact on map accuracy and distortion.	**K3, K5**
5	communicate spatial information through well-designed and accurate maps, suitable for various applications and audiences.	**K3, K6**
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		
Reading List (s) :		
1	Dent B. D., 1999. Cartography: Thematic Map Design, (Vol. 1), McGraw Hill, 368 Pages.	
2	Gupta K. K and Tyagi V. C., 1992. Working with Maps, Survey of India, DST, New Delhi, 232 Pages.	
3	Markoski Blagoja 2018. Basic Principles of Topography" Springer, 219 pages	
4	Menno-Jan Kraak & Ormeling Ferjan., 2013. Cartography, Third Edition: Visualization of Spatial Data" Guilford Press, 09-Jun-2011, 199 pages.	
Recommended Text (s) :		
1	Mishra R. P. and Ramesh A., 1989. Fundamentals of Cartography, Concept Publishing,556 Pages.	
2	Norman J. W., 2008. Maps and Civilization: Cartography in Culture and Society, Third Edition, University of Chicago Press 2008, 362 pages.	
3	Peterson.P, 2017. Advances in Cartography and GIS science: Selections from the International Cartographic Conference "Springer 2017, 542 pages.	
4	Robinson A., 1953. Elements of Cartography, John Wiley, 254 Pages.	
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.] :		
1	https://www.youtube.com/watch?v=ZwXrlx7FT0c&pp=ygUdR2VuZXJhbCBDYXJ0b2dyYXBoeSBwcmFjdGljYWw%3D	
2	https://www.youtube.com/watch?v=iHEMOdRo5u8&pp=ygUadGhlbWF0aWMgbWFwcyBpbiBnZW9ncmFwaHk%3D	

Method of Evaluation :			
Internal Assessment	**End Semester Examination**	**Total**	**Grade**
25	75	100	

Methods of Assessment

Recall (K1) - Simple definitions, MCQ, Recall steps, Concept definitions

Understand/ Comprehend (K2) - MCQ, True/False, Short essays, Concept explanations, Short summary or overview

Application (K3) - Suggest idea/concept with examples, Suggest formulae, Solve problems, Observe, Explain

Analyse (K4) - Problem-solving questions, Finish a procedure in many steps, Differentiate between various ideas, Map knowledge

Evaluate (K5) - Longer essay/ Evaluation essay, Critique or justify with pros and con

Create (K6) - Check knowledge in specific or offbeat situations, Discussion, Debating or Presentations

Mapping with Programme Outcomes:

PCOs	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**
CO 1	1	1	2	1	1
CO 2	1	1	2	1	1
CO 3	1	2	2	2	2
CO 4	1	2	1	2	2
CO 5	1	2	1	1	2

Map **Course Outcomes (CO)** for each Course with **Programme Specific Outcomes (PSO)** in the 3-Point scale of **1,2, 3 (Strong, Medium and Low)**

Allied Paper-I : GENERAL GEOLOGY

Course Objectives:		
The main objectives of this course are to:		
1	provide students with a solid understanding of key geological concepts, including mineralogy, petrology, and structural geology.	**K1, K2**
2	equip the students with practical skills in fieldwork, laboratory techniques, and the use of geological tools for data collection and analysis.	**K2, K3**
3	develop the ability to interpret geological maps, identify rock formations, and conduct geological mapping exercises.	**K3, K6**
4	explore the geological principles to address environmental challenges, such as groundwater management, natural hazards, and land use planning.	**K5, K6**
5	recognize the interdisciplinary nature of allied geology, understanding its connections with environmental science, engineering, and resource management.	**K4, K6**
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		

Course – 3	**ALLIED PAPER - I**
Title of the Course:	**GENERAL GEOLOGY**
Credits:	03
Pre-requisites, if any:	Basic knowledge of basic geology concepts and principles

UNITS

Unit -I	**STUDY OF THE SOLAR SYSTEM**

Study of the Solar system- An outline of Nebular and Planetesimal hypotheses of the origin of Solar system – An outline of the constitution and composition of the interior of the earth- An outline of important methods of determining the age of the earth- Earthquakes and their effects- A simple type of seismograph- Seismograms- Modern scale of intensity of earthquakes – Concepts of continental drift – Wegner's hypothesis.

Unit-II	**DEFINITION OF DIP AND STRIKE**

Definition of Dip and Strike – Distinction between true dip and apparent dip. Folds: Symmetrical and Asymmetrical; Anticline and Syncline. Faults: Normal fault, strike fault, dip fault, oblique fault, horst and graben – Description of simple types of Joints: Strike Joints, Dip Joints, Oblique Joints and Bedding joints – Definition of Unconformity and non- conformity.

Unit-III	FOSSIL PRESERVATION

Definition, Modes of preservation and uses of fossils – Morphological characteristics of the following: Pelecypods, Gasteropods, Cephalopods, Brachiopods and Trilobites. Laws of Stratigraphy – Geological Time Scale - An outline of the following formations in India: Dharwar system of Karnataka, Cuddapah system, Vindhyan system, Triassic of Spiti, Jurassic of Kutch and Cretaceous of Trichinopoly.

Unit-IV	CRYSTALLOGRAPHY

Crystallography: Definition of Crystal - Morphological characters of crystals – Faces – Forms – Edges – Solid angles – Crystal symmetry: Axes of symmetry, plane of symmetry and centre of symmetry – Parameters and Miller's indices - Study of the normal classes of all the systems - Descriptive Mineralogy: Definition, Physical properties and Description of the following: Quartz and its varieties, Orthoclase, Albite, Anorthite, Hornblende, Hypersthene, Olivene, Muscovite, Chlorite, Garnet, Talc, Topaz and Calcite.

Unit-V	IGNEOUS ROCKS

Igneous rocks: Description of the following: Granite, Pegmatite, Syenite, Diorite, Dunite, Anorthosite, Dolerite and Basalt. Sedimentary rocks: Description of the following: Conglomerate, Sandstone, Arkose, Grit, Shales and Limestone. Metamorphic rocks: Description of the following: Slate, Phyllite, Schist, Gneiss, Quartzite, and Marble.

Expected Course Outcomes:

On the successful completion of the course, student will be able to:

1	understand the basic geological principles, including mineralogy, petrology, and structural geology.	**K1, K2**
2	equip students with hands-on skills in fieldwork, laboratory analysis, and the use of geological tools and instruments.	**K2, K5**
3	do geological mapping techniques, including the interpretation of geological maps and the identification of rock formations.	**K4, K5**
4	explore the application of geological knowledge in addressing environmental challenges, such as groundwater management, natural hazards, and land use planning.	**K3, K5**
5	appreciate the interdisciplinary connections of allied geology, recognizing its intersections with environmental science, engineering, and resource management.	**K3, K6**

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Reading List (s) :

1	Henry Woods, 2004. Invertebrate Palaeontology, Cambridge Biological Series,455 pages
2	Mukherjee, P.K, 2013. A text book of Geology. World Press, 346 pages
3	Parbin Singh, 2013. Text book of Engineering and General Geology. Katson Publication Series, 600 pages

Recommended Text (s) :	
1	Ghosh S.K. 1993.Structural Geology: Fundamentals and Modern development, Pergamon Press, 411 pages
2	Mahapatra G.B. 2018.Physical Geology and Earth's Interior, Cambridge Biological Series,325 pages.
3	Sengupta S.M. 2018. Sedimentary Petrology, Cambridge Biological Series,329 pages.
4	Winter J.D., 2015.Igneous and Metamorphic Petrology, Pearson Education India, 400 pages
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.] :	
1	https://www.youtube.com/watch?v=qNiOXc6pSBQ&pp=ygUPZ2VuZXJhbCBnZW9sb2d5
2	https://www.youtube.com/watch?v=qhSzpCpI38U&pp=ygUTZmF1bHQgdHlwZXMgZ2VvbG9neQ%3D%3D
3	https://www.youtube.com/watch?v=bRuSmxJo_iA&pp=ygUHZm9zc2lscw%3D%3D
4	https://www.youtube.com/watch?v=7Bxw4kkeHJ8&pp=ygUKcm9jayB0eXBlcw%3D%3D

Method of Evaluation :

Internal Assessment	End Semester Examination	Total	Grade
25	75	100	

Methods of Assessment

Recall (K1) - Simple definitions, MCQ, Recall steps, Concept definitions

Understand/ Comprehend (K2) - MCQ, True/False, Short essays, Concept explanations, Short summary or overview

Application (K3) - Suggest idea/concept with examples, Suggest formulae, Solve problems, Observe, Explain

Analyse (K4) - Problem-solving questions, Finish a procedure in many steps, Differentiate between various ideas, Map knowledge

Evaluate (K5) - Longer essay/ Evaluation essay, Critique or justify with pros and con

Create (K6) - Check knowledge in specific or offbeat situations, Discussion, Debating or Presentations

Mapping with Programme Outcomes:

PCOs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	1	1	2	2	2
CO 2	1	1	2	1	1
CO 3	1	2	2	2	2
CO 4	1	2	1	2	2
CO 5	1	2	1	1	2

Map **Course Outcomes (CO)** for each Course with **Programme Specific Outcomes (PSO)** in the 3-Point scale of **1,2, 3 (Strong, Medium and Low)**

SEMESTER - II

Core Paper-III : HUMAN GEOGRAPHY

Course Objectives:		
The main objectives of this course are to:		
1	explore how human activities and societies interact with and shape the natural environment.	**K2, K1**
2	study the diversity of cultures, societies, and urban areas, and how they influence and are influenced by geographic factors.	**K3, K1**
3	develop skills in analyzing spatial data, using tools like Geographic Information Systems (GIS) and remote sensing.	**K4, K5**
4	examine regional variations and global patterns in human geography, including issues related to population, urbanization, migration, and globalization.	**K4, K3**
5	encourage critical thinking about contemporary global challenges, such as climate change, urban development, and social inequalities, from a geographic perspective.	**K5, K6**
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		

Course – 4	**CORE PAPER**
Title of the Course:	**HUMAN GEOGRAPHY**
Credits:	04
Pre-requisites, if any:	Basic understanding of general Geography concepts and Social Sciences
UNITS	
Unit -I	**HUMAN GEOGRAPHY**
Definition, nature and scope of human geography - Major Subfields - Contemporary Relevance.	
Unit-II	**SPACE AND SOCIETY**
Cultural Regions; Race; Religion and Language	
Unit-III	**POPULATION DEVELOPMENT**
Population Growth and Demographic Transition Theory	
Unit-IV	**WORLD POPULATION DISTRIBUTION**
World Population Distribution and Composition (Age, Gender and Literacy).	
Unit-V	**SETTLEMENTS**
Types and Patterns of Rural Settlements; Classification of Urban Settlements; Trends and Patterns of World Urbanization	

Expected Course Outcomes:		
On the successful completion of the course, student will be able to:		
1	understand the key human geography concepts, including cultural, social, and economic factors that influence human behavior and society.	**K2, K1**
2	proficiency in using geospatial tools and technologies to analyze and interpret spatial data related to human activities and their impact on the environment.	**K5, K4**
3	broad appreciation of cultural diversity, social issues, and urbanization trends across different regions and societies.	**K3, K5**
4	ability to think critically about complex global challenges, such as population growth, urban development, migration, and environmental sustainability, from a geographic perspective	**K4, K5**
5	communicate their findings and insights regarding human geography topics effectively, both in writing and through presentations, to a variety of audiences.	**K3, K6**
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		
Reading List (s) :		
1	Chandna, R.C., 2015. Population Geography, Kalyani Publisher, 641 pages	
2	Cloke Chris Philo David Sadler Paul. J., 1991. Approaching Human Geography: An Introduction to Contemporary Theoretical Debates" SAGE, 1991, 256 pages	
3	Daniel, P.A. and Hopkinson, M.F., 1989. The Geography of Settlement, Oliver & Boyd, London, 336 pages	
4	De Blij Harm J & Nash Catherine J., 1998. Human Geography: Culture, Society, and Space-Edition 6" Wiley 1999, 560 pages.	
Recommended Text (s) :		
1	Ghosh, S., 2015. Introduction to settlement geography. Orient Black Swan Private Ltd., Kolkata, 164 pages	
2	Jones Andrew, 2012. Human Geography: The Basics Routledge 2012,209 pages	
3	Jordan-Bychkov et al., 2006. The Human Mosaic: A Thematic Introduction to Cultural Geography. W. H. Freeman and Company, New York, 564 pages	
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.] :		
1	https://www.youtube.com/watch?v=4y2nndDs8m4&pp=ygUPaHVtYW4gZ2VvZ3JhcGh5	
2	https://www.youtube.com/watch?v=-gf4hakk_WY&pp=ygUdZGVtb2dyYXBoa WMgdHJhbnNpdGlvbiB0aGVvcnk%3D	

3	https://www.youtube.com/watch?v=HkYEbJfxQyI&pp=ygUXcG9wdWxhdGlvbiBkaXN0cmlidXRpb24%3D
4	https://www.youtube.com/watch?v=WGtl9Peyt9Y&pp=ygUKc2V0dGxlbWVudA%3D%3D
5	https://www.youtube.com/watch?v=4y2nndDs8m4&pp=ygUPaHVtYW4gZ2VvZ3JhcGh5

Method of Evaluation :

Internal Assessment	End Semester Examination	Total	Grade
25	75	100	

Methods of Assessment

Recall (K1) - Simple definitions, MCQ, Recall steps, Concept definitions

Understand/ Comprehend (K2) - MCQ, True/False, Short essays, Concept explanations, Short summary or overview

Application (K3) - Suggest idea/concept with examples, Suggest formulae, Solve problems, Observe, Explain

Analyse (K4) - Problem-solving questions, Finish a procedure in many steps, Differentiate between various ideas, Map knowledge

Evaluate (K5) - Longer essay/ Evaluation essay, Critique or justify with pros and con

Create (K6) - Check knowledge in specific or offbeat situations, Discussion, Debating or Presentations

Mapping with programme Outcomes:

PCOs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	1	1	1	2	2
CO 2	2	1	2	1	1
CO 3	2	2	1	2	2
CO 4	1	2	1	2	2
CO 5	2	2	1	1	2

Map **Course Outcomes (CO)** for each Course with **Programme Specific Outcomes (PSO)** in the 3-Point scale of **1,2, 3 (Strong, Medium and Low)**

CORE PAPER IV :
PRACTICAL - II: THEMATIC CARTOGRAPHY (PHYSICAL)

Course Objectives:		
The main objectives of this course are to:		
1	equip students with the practical skills needed to create thematic maps for various purposes, focusing on clear and effective map design.	**K1, K2**
2	teach students how to select, process, and prepare relevant thematic data, ensuring accuracy and relevance for map production.	**K2, K3**
3	enable students to apply appropriate visualization techniques, including choropleth maps, dot density maps, and cartograms, to represent and convey thematic information effectively.	**K3, K5**
4	familiarize students with cartographic software and tools commonly used in thematic cartography, allowing them to create digital maps and visualizations.	**K4, K3**
5	develop students' ability to convey thematic information through well-designed maps, suitable for specific audiences and applications, and to understand the importance of cartographic choices in data presentation.	**K4, K6**
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		

Course – 5	**CORE PAPER**
Title of the Course:	**PRACTICAL- II THEMATIC CARTOGRAPHY (PHYSICAL)**
Credits:	04
Pre-requisites, if any:	Prior knowledge in basic cartography and a foundational understanding of geography concepts
UNITS	
Unit -I	**MAPPING THE LANDFORM**
Landforms from contour features: Hill, Cliff, Knoll, Spur, U shaped Valley, Plateau, Profiles: Simple, Superimposed, Projected and Composite	
Unit-II	**SLOPE ANALYSIS**
Slope: Wentworth's Regional Slope Method – Smiths Relative Relief Method - Perspective Block Diagram.	
Unit-III	**RIVER MORPHOMETRIC ANALYSIS**
Watershed : Watershed delineation and codification, Stream Ordering: Horton and Strahler Methods – River Morphometry: Stream Length Ratio (RI), Bifurcation Ratio(Rb), Drainage Density (Dd), Stream Frequency (Fs), Elongation Ratio (Re),	

Unit-IV	REPRESENTATION OF CLIMATIC DATA	
Climograph (Taylor and Foster) – Climograph – Hythergraph – Ergograph - Wind Rose Diagram		
Unit-V	**INDIAN WEATHER CHART INTERPRETATION**	
Weather Station Model – Interpretation of Indian Weather Chart (rainfall pattern and seasonal variation of temperature) – Cyclone Tracking – Weather Forecasting		
Expected Course Outcomes:		
On the successful completion of the course, student will be able to:		
1	create effective physical thematic maps that represent various environmental phenomena, such as climate, landforms, and natural resources.	**K2, K1**
2	skills to collect, process, and manipulate geospatial data related to physical geography, ensuring data accuracy and relevance for thematic mapping.	**K2, K5**
3	capable of applying appropriate visualization methods, like contour maps, isopleth maps, and spatial interpolations, to portray physical data clearly and accurately.	**K4, K5**
4	gain hands-on experience using cartographic software and tools for the creation of thematic maps and data visualizations.	**K6, K5**
5	able to communicate physical geographic information through well-designed and accurate maps, suitable for various applications and audiences, and understand the significance of cartographic choices in conveying physical data effectively.	**K4, K6**
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		
Reading List (s) :		
1	Author Terry Slocum A., 1999. Thematic Cartography and Visualization Prentice Hall, 293 pages.	
2	Colette Cauvin & Francisco Escobar et.al., 2010. New Approaches in Thematic Cartography, Publisher Wiley, 320 pages.	
3	Colette Cauvin & Escobar Francisco Et.al., 2013. Thematic Cartography, Cartography and the Impact of the Quantitative Revolution" John Wiley & Sons, 448 pages.	
4	Dent B. D., Torguson J. S., and Holder T. W., 2008. Cartography: Thematic Map Design (6^{th} Edition), McGraw-Hill Higher Education, 336 pages	
Recommended Text (s) :		
1	Gupta K. K. and Tyagi V. C., 1992. Working with Maps, Survey of India, DST, New Delhi, 17 pages	
2	Kraak M.-J. and Ormeling F., 2003. Cartography: Visualization of Geo-Spatial Data, Prentice-Hall, 261 pages	
3	Mishra R. P. and Ramesh A., 1989. Fundamentals of Cartography, Concept Publication, New Delhi, 527 pages.	

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.] :	
1	https://www.youtube.com/watch?v=iHEMOdRo5u8&pp=ygUUdGhlbWF0aWMgY2FydG9ncmFwaHk%3D
2	https://www.youtube.com/watch?v=9cdvotT5INU&pp=ygUeZGlhZ3JhbW1hdGljIGRhdGEgcHJlc2VudGF0aW9u
3	https://www.youtube.com/watch?v=AGgHlXi9iQE&pp=ygUbdGhlbWF0aWMgbWFwcGluZyB0ZWNobmlxdWVz

Method of Evaluation :			
Internal Assessment	**End Semester Examination**	**Total**	**Grade**
25	75	100	

Methods of Assessment

Recall (K1) - Simple definitions, MCQ, Recall steps, Concept definitions

Understand/ Comprehend (K2) - MCQ, True/False, Short essays, Concept explanations, Short summary or overview

Application (K3) - Suggest idea/concept with examples, Suggest formulae, Solve problems, Observe, Explain

Analyse (K4) - Problem-solving questions, Finish a procedure in many steps, Differentiate between various ideas, Map knowledge

Evaluate (K5) - Longer essay/ Evaluation essay, Critique or justify with pros and con

Create (K6) - Check knowledge in specific or offbeat situations, Discussion, Debating or Presentations

Mapping with programme Outcomes:

PCOs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	1	1	2	2	2
CO 2	1	1	3	1	1
CO 3	1	2	1	2	2
CO 4	1	2	1	2	2
CO 5	1	1	1	1	2

Map **Course Outcomes (CO)** for each Course with **Programme Specific Outcomes (PSO)** in the 3-Point scale of **1,2, 3 (Strong, Medium and Low)**

Allied Paper – II APPLIED STATISTICS

Course Objectives:		
The main objectives of this course are to:		
1	develop students' understanding of fundamental statistical concepts, including data analysis, probability, and inferential statistics	**K1, K2**
2	equip students with practical skills in collecting, organizing, and analyzing data using statistical methods and software.	**K2, K3**
3	enable students to make informed decisions and draw valid conclusions based on statistical analysis.	**K6, K4**
4	teach students how to apply statistical techniques to solve real-world problems in fields such as research, business, and social sciences.	**K5, K6**
5	foster critical thinking and the ability to evaluate the appropriateness of statistical methods for specific scenarios and to interpret results effectively.	**K6, K2**
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		

Course – 6	**ALLIED PAPER -II**
Title of the Course:	**APPLIED STATISTICS**
Credits:	03
Pre-requisites, if any:	A strong foundation in basic mathematics and familiarity with probability concepts

UNITS

Unit -I	**INTRODUCTION TO SPATIAL STATISTICS**
Nature and scope of statistical methods and their limitations and their application in Geography –Spatial data and statistical methods – Classification, tabulation and diagrammatic representation of various types of statistical data	
Unit-II	**DESCRIPTIVE STATISTICS**
Graphical determination of percentiles, quartiles and their uses - Measures of location and dispersion (relative and absolute) - Skewness and Kurtosis. Probability of an event - Finitely additive probability space	
Unit-III	**RANDOM VARIABLES**
Concept of Random Variables – Mathematical expectation – Moments of Random variables – Simple Problems.	
Unit-IV	**DISCRETE RANDOM VARIABLES**
Bivariate frequency table and its uses – Scatter diagram – Regression lines – Linear prediction –Rank correlation coefficient – Standard distributions –Binomial, Poisson and normal distributions.	

Unit-V	SAMPLING TECHNIQUES	
Concept of Sampling distributions – Sampling from finite population – Simple Random sampling – Stratified and Systematic Random sampling – Procedures – Sampling and Non-Sampling errors.		
Expected Course Outcomes:		
On the successful completion of the course, student will be able to:		
1	gain a strong grasp of various statistical methods, including descriptive statistics, hypothesis testing, regression analysis, and multivariate analysis.	**K1, K2**
2	capable of collecting, cleaning, and analysing data using statistical software, making data-driven decisions.	**K2, K5**
3	foster critical thinking skills, enabling students to select appropriate statistical techniques, interpret results, and assess the validity of statistical conclusions.	**K4, K5**
4	prepared to apply statistical techniques to solve practical problems in research, business, healthcare, and various other fields.	**K3, K5**
5	able to communicate statistical findings and insights clearly and concisely, both in writing and through presentations, to a variety of audiences.	**K3, K6**
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		
Reading List (s) :		
1	Arunkumar and alkachaudry., 2006. Applied Statistics - Krishna Prakashan Media, 236 pages	
2	Aslam Mahmood and Moonis Raza., 1977. Statistical Methods in Geographical Studies, Rajesh Publication New Delhi, 176 pages	
3	Cox, D. R., Christl A. Donnelly., 2011. Principles of Applied Statistics – Cambridge University Press, 214 pages.	
4	David, Ebdon, 1977. Statistics in Geography –A Practical Approach, Basil Blackwell, Oxford, 195 pages.	
Recommended Text (s) :		
1	Gegory, S., 1964. Statistics Methods and Geographer, Longman, London, 256 pages.	
2	Hammond, R. and McCullah, P., 1974. Quantitative Techniques in Geography –An Introduction Clarendon press Oxford, 334 pages.	
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.] :		
1	https://www.youtube.com/watch?v=IngKIlvpg3s&pp=ygUSYXBwbGllZCBzdGF0aXN0aWNz	
2	https://www.youtube.com/watch?v=mOD7DiJwxf8&pp=ygUbcHJvYmFiaWxpdHkgb2YgZGlzdHJpYnV0aW9u	
3	https://www.youtube.com/watch?v=3v9w79NhsfI&pp=ygUxcmFuZG9tIHZhcmlhYmxlIGRpc2NyZXRlIHByb2JhYmlsaXR5IGRpc3RyaWJ1dGlvbg%3D%3D	

4	https://www.youtube.com/watch?v=lyRbCwDDnJo&pp=ygUPZnJlcXVlbmN5IHRhYmxl
5	https://www.youtube.com/watch?v=z0Ry_3_qhDw&pp=ygUVc2FtcGxpbmcgZGlzdHJpYnV0aW9u

Method of Evaluation:

Internal Assessment	End Semester Examination	Total	Grade
25	75	100	

Methods of Assessment

Recall (K1) - Simple definitions, MCQ, Recall steps, Concept definitions

Understand/ Comprehend (K2) - MCQ, True/False, Short essays, Concept explanations, Short summary or overview

Application (K3) - Suggest idea/concept with examples, Suggest formulae, Solve problems, Observe, Explain

Analyse (K4) - Problem-solving questions, Finish a procedure in many steps, Differentiate between various ideas, Map knowledge

Evaluate (K5) - Longer essay/ Evaluation essay, Critique or justify with pros and con

Create (K6) - Check knowledge in specific or offbeat situations, Discussion, Debating or Presentations

Mapping with programme Outcomes:

PCOs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	1	2	1	1	2
CO 2	2	1	2	2	1
CO 3	2	1	3	1	1
CO 4	1	2	1	2	3
CO 5	1	1	2	3	1

Map **Course Outcomes (CO)** for each Course with **Programme Specific Outcomes (PSO)** in the 3-Point scale of **1,2, 3 (Strong, Medium and Low)**

SEMESTER -III

Core Paper-V : ECONOMIC GEOGRAPHY

Course Objectives:		
The main objectives of this course are to:		
1	provide the students with contextual information of the spatial distribution and spatial interaction of economic activities	**K1, K2**
2	understand the concept of space and economic principles with reference to geography	**K2, K1**
3	understand and analyse the industrial locational models and their relevance to present scenario	**K3, K4**
4	critically analyse the economies of scale and agglomeration in heterogeneous landscape	**K6, K5**
5	apply Geospatial technology in economic geography and regional planning for solving the spatial problems	**K4, K5**
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		

Course – 7	**CORE PAPER**
Title of the Course:	**ECONOMIC GEOGRAPHY**
Credits:	04
Pre-requisites, if any:	A foundational knowledge of geography and economics concepts
UNITS	
Unit -I	**INTRODUCTION TO ECONOMIC GEOGRAPHY**
Definition, approaches and fundamental concepts of Economic Geography; patterns of development of Economic Geography.	
Unit-II	**AGRICULTURAL GEOGRAPHY**
Locational Theories : Agriculture (Von Thunen) and Industrial (Weber)	
Unit-III	**PRIMARY ACTIVITIES**
Primary activities: Intensive Subsistence Farming, Commercial Grain Farming, Plantation, Commercial Dairy Farming, Commercial Fishing, and Mining (Iron Ore, Coal and Petroleum).	
Unit-IV	**SECONDARY ACTIVITIES**
Secondary activities : Cotton Textile Industry, Petro-Chemical Industry, Major Manufacturing Regions	

Unit-V	TERTIARY AND QUATERNARY ACTIVITIES	
Modes of Transportation, Patterns of International Trade, and Information and Communication Technology Industry.		
Expected Course Outcomes:		
On the successful completion of the course, student will be able to:		
1	comprehend the various economic systems, structures, and theories, as well as their geographic dimensions and implications.	**K6, K2**
2	skilled in analysing regional economic disparities, industry clusters, trade patterns, and urbanization trends, using spatial data and geographic tools.	**K2, K3**
3	develop an understanding of the impacts of globalization on the spatial distribution of economic activities, trade networks, and regional development.	**K6, K4**
4	able to critically assess economic issues, propose solutions, and evaluate policy implications within a geographical context.	**K4, K5**
5	convey complex economic geographical concepts and research findings to various audiences through well-structured reports and presentations.	**K4, K6**
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		
Reading List (s) :		
1	Andrew Wood, Susan Roberts., 2012. Economic Geography: Places – Routledge publication Networks and Flows, 192 pages.	
2	Bagchi-Sen S. and Smith H. L., 2006. Economic Geography: Past, Present and Future, Taylor and Francis, 125 pages.	
3	Coe N. M., Kelly P. F. and Yeung H. W., 2007. Economic Geography: A Contemporary Introduction, Wiley-Blackwell, 453 pages.	
Recommended Text (s) :		
1	Combes P., Mayer T. and Thisse J. F., 2008. Economic Geography: The Integration of Regions and Nations, Princeton University Press. 125 pages.	
2	Neil Coe, Philip Kelly, Henry W. C. Yeung., 2013. Economic Geography: A Contemporary Introduction, Publisher Wiley, second Edition, 576 pages.	
3	Trevor J. Barnes, Brett Christophers., 2017. Economic Geography: A Critical Introduction to Geography - John Wiley & Sons, 336 pages.	

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.] :	
1	https://www.youtube.com/watch?v=W9FV0ZXQcCg&pp=ygUSZWNvbm9taWMgZ2VvZ3JhcGh5
2	https://www.youtube.com/watch?v=KRrTgUEe1Lk&pp=ygURbG9jYXRpb24gdGhlb3JpZXM%3D
3	https://www.youtube.com/watch?v=02muth5Cw7s&pp=ygUQZWNvbm9taWMgc2VjdG9ycw%3D%3D

Method of Evaluation :

Internal Assessment	End Semester Examination	Total	Grade
25	75	100	

Methods of Assessment

Recall (K1) - Simple definitions, MCQ, Recall steps, Concept definitions

Understand/ Comprehend (K2) - MCQ, True/False, Short essays, Concept explanations, Short summary or overview

Application (K3) - Suggest idea/concept with examples, Suggest formulae, Solve problems, Observe, Explain

Analyse (K4) - Problem-solving questions, Finish a procedure in many steps, Differentiate between various ideas, Map knowledge

Evaluate (K5) - Longer essay/ Evaluation essay, Critique or justify with pros and con

Create (K6) - Check knowledge in specific or offbeat situations, Discussion, Debating or Presentations

Mapping with programme Outcomes:

PCOs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	1	2	2	2
CO 2	1	2	3	1	1
CO 3	2	1	2	2	2
CO 4	1	2	1	2	1
CO 5	1	1	2	1	1

Map **Course Outcomes (CO)** for each Course with **Programme Specific Outcomes (PSO)** in the 3-Point scale of **1,2, 3 (Strong, Medium and Low)**

CORE PAPER VI : PRACTICAL-III
THEMATIC CARTOGRAPHY (SOCIO-ECONOMIC)

Course Objectives:		
The main objectives of this course are to:		
1	develop practical skills in creating clear and effective maps, including thematic maps, topographic maps, and map layouts.	**K1, K2**
2	familiarize students with GIS software and tools, enabling them to manipulate geospatial data, create digital maps, and perform spatial analysis.	**K2, K3**
3	teach techniques for visualizing geographic data through symbolization, color use, and appropriate cartographic techniques.	**K5, K6**
4	enable students to collect, process, and analyse spatial data, making informed decisions based on geospatial information.	**K4, K5**
5	provide hands-on experience using cartographic software and tools, ensuring that students can produce accurate and visually appealing maps suitable for various applications.	**K4, K3**
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		

Course – 8	**CORE PAPER – PRACTICAL - III**
Title of the Course:	**THEMATIC CARTOGRAPHY (SOCIO-ECONOMIC)**
Credits:	04
Pre-requisites, if any:	A foundational knowledge of geography and basic cartography concepts
UNITS	
Unit -I	**SOCIO-ECONOMIC DATA**
Classification and Types of Socio-economic data and data analysis	
Unit-II	**DIAGRAMMATIC DATA PRESENTATION**
Diagrammatic Presentation Socio-economic data : Line, Bar and Circle diagram	
Unit-III	**THEMATIC MAPPING TECHNIQUES**
Distribution maps : Properties, Uses and Limitations; Areal Data : Choropleth, Isopleth, Dot, Proportional Circles and Flow maps	
Unit-IV	**CARTOGRAPHIC OVERLAYS**
Cartographic Overlays – Point, Line and Areal Data.	

Unit-V	THEMATIC MAP INTERPRETATION	
Thematic Maps : Preparation and Interpretation of Socio-economic themes – Population, economic activities, cropping pattern etc.		
Expected Course Outcomes:		
On the successful completion of the course, student will be able to:		
1	develop practical skills in creating a variety of maps, mastering the use of symbols, scales, and layout design.	**K1, K2**
2	use GIS software to manipulate spatial data, perform geospatial analysis, and create digital maps.	**K2, K4**
3	effectively visualize geographic data, using appropriate color schemes, symbols, and graphical techniques.	**K3, K5**
4	skilled in collecting, processing, and analyzing spatial data, enabling them to make informed decisions based on geographic information.	**K4, K6**
5	produce accurate, visually appealing maps suitable for various real-world applications, including urban planning, environmental management, and business.	**K1, K3**
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		
Reading List (s) :		
1	Anson R. and Ormelling F. J., 1994. International Cartographic Association" Basic Cartographic Vol. Pregmen Press, 125 pages.	
2	Gupta K.K. and Tyagi, V. C., 1992. Working with Map, Survey of India" DST, New Delhi, 124 pages.	
3	Mishra R.P. and Ramesh, A., 1989. Fundamentals of Cartography, Concept, New Delhi, 556 pages.	
4	Monkhouse F. J. and Wilkinson H. R., 1973. Maps and Diagrams, Methuen, London, 625 pages.	
Recommended Text (s) :		
1	Eduard Imhof., 2007. Cartographic Relief Presentation, Esri Press Classics Series, 433 pages.	
2	Robinson A. H., 2009. Elements of Cartography, John Wiley and Sons, New York.620 pages.	
3	Sharma J. P., 2010.Prayogic Bhugol, Rastogi Publishers, Meerut, 495 pages.	
4	Singh R. L. and Singh R. P. B., 1999. Elements of Practical Geography, Kalyani Publishers, 407 pages.	

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.] :	
1	https://www.youtube.com/watch?v=AGgHlXi9iQE&list=PLW9kB_HKs3_P1IwrsHJcBCn1D2jjGI_QN&index=17&pp=iAQB
2	https://www.youtube.com/watch?v=KIBZUk39ncI&pp=ygUGc2NhbGVz
3	https://www.youtube.com/watch?v=VD28oi2uaVw&pp=ygUOc2xvcGUgYW5hbHlzaXM%3D

Method of Evaluation :

Internal Assessment	End Semester Examination	Total	Grade
25	75	100	

Methods of Assessment

Recall (K1) - Simple definitions, MCQ, Recall steps, Concept definitions

Understand/ Comprehend (K2) - MCQ, True/False, Short essays, Concept explanations, Short summary or overview

Application (K3) - Suggest idea/concept with examples, Suggest formulae, Solve problems, Observe, Explain

Analyse (K4) - Problem-solving questions, Finish a procedure in many steps, Differentiate between various ideas, Map knowledge

Evaluate (K5) - Longer essay/ Evaluation essay, Critique or justify with pros and con

Create (K6) - Check knowledge in specific or offbeat situations, Discussion, Debating or Presentations

Mapping with programme Outcomes:

PCOs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	1	1	2	3	2
CO 2	2	1	3	1	1
CO 3	2	1	2	2	1
CO 4	1	2	1	2	1
CO 5	1	1	1	1	1

Map **Course Outcomes (CO)** for each Course with **Programme Specific Outcomes (PSO)** in the 3-Point scale of **1,2, 3 (Strong, Medium and Low)**

NME – I : INFORMATION TECHNOLOGY

Course Objectives:		
The main objectives of this course are to:		
1	provide students with a solid understanding of fundamental IT concepts, hardware, software, and networking.	**K1, K2**
2	equip students with practical skills in using common software applications, programming languages, and IT tools.	**K2, K3**
3	educate students about cybersecurity best practices and the protection of data and information systems.	**K3, K6**
4	develop problem-solving skills in the context of IT, enabling students to address technical issues and challenges effectively.	**K4, K5**
5	foster digital literacy and an awareness of the ethical and social implications of IT in today's society and business environments.	**K4, K6**
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		

Course – 9	**NON-MAJOR ELECTIVE - I**
Title of the Course:	**INFORMATION TECHNOLOGY**
Credits:	02
Pre-requisites, if any:	A basic understanding of computer operations and familiarity with common software applications.
UNITS	
Unit -I	**INTRODUCTION**
Introduction to Computers- Generation of Modern Computers-Classification of Digital Computer Systems Anatomy of a Digital Computer Input and output Devices	
Unit-II	**MEMORY UNITS & PROGRAMMING LANGUAGES**
RAM, ROM, PROM, EPROM, and EEPROM Auxiliary Storage Devices Programming Languages: Machine Language, Assembly Language, High Level Language, Types of High Level Language, Compiler and Interpreter	
Unit-III	**NETWORKING**
Number Systems, Networking, Communication Media, Internet and Intranet, email, Cloud computing	
Unit-IV	**SOFTWARE**
Introduction to Software, MS-Word, MS-Excel, Power Point and MS Access	

Unit-V	WEB MAPPING	
Web mapping applications and mobile applications		
Expected Course Outcomes:		
On the successful completion of the course, student will be able to:		
1	gain proficiency in using computer hardware, software applications, and basic programming skills.	**K1, K2**
2	analyse and solve technical issues, demonstrating problem-solving abilities in an IT context.	**K2, K6**
3	understand the principles of information security and be aware of best practices for protecting data and computer systems.	**K4, K1**
4	develop digital literacy and an understanding of how information technology impacts various aspects of society and business.	**K2, K5**
5	convey technical information and concepts clearly and professionally, both in writing and verbally.	**K6, K2**
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		
Reading List (s) :		
1	Alexis Leon and Mathews Leon., 1999. Fundamentals of Information Technology", Leon TECH World, 454 pages.	
2	Pelin Aksoy, Laura DeNardis., 2007. Information Technology in Theory - Cengage Learning publishing, 482 pages.	
3	Peter Norton., 1998. Introduction to Computers, TMH 6th Edition (for Units IV, V Chapters 13,14), 537 pages.	
Recommended Text (s) :		
1	Rajaraman, V., 2018. Introduction to Information technology Publisher phi learning Pvt. Ltd publication, 400 pages.	
2	Stephen Doyle., 2000. Understanding Information Technology - Nelson Thrones publication, 344 pages.	
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.] :		
1	https://www.youtube.com/watch?v=XZrckLYqdys&pp=ygUWSW5mb3JtYXRpb24gdGVjaG5vbG9neQ%3D%3D	
2	https://www.youtube.com/watch?v=Qy064xFEW64&pp=ygUWSW5mb3JtYXRpb24gdGVjaG5vbG9neQ%3D%3D	
3	https://www.youtube.com/watch?v=KSKF2x3c2k&pp=ygUWSW5mb3JtYXRpb24gdGVjaG5vbG9neQ%3D%3D	

Method of Evaluation :			
Internal Assessment	**End Semester Examination**	**Total**	**Grade**
25	75	100	

Methods of Assessment

Recall (K1) - Simple definitions, MCQ, Recall steps, Concept definitions

Understand/ Comprehend (K2) - MCQ, True/False, Short essays, Concept explanations, Short summary or overview

Application (K3) - Suggest idea/concept with examples, Suggest formulae, Solve problems, Observe, Explain

Analyse (K4) - Problem-solving questions, Finish a procedure in many steps, Differentiate between various ideas, Map knowledge

Evaluate (K5) - Longer essay/ Evaluation essay, Critique or justify with pros and con

Create (K6) - Check knowledge in specific or offbeat situations, Discussion, Debating or Presentations

Mapping with programme Outcomes:

PCOs	**PSO 1**	**PSO 2**	**PSO 3**	**PSO 4**	**PSO 5**
CO 1	1	1	2	2	2
CO 2	1	1	3	1	1
CO 3	1	2	1	2	2
CO 4	1	2	1	2	2
CO 5	1	1	1	1	2

Map **Course Outcomes (CO)** for each Course with **Programme Specific Outcomes (PSO)** in the 3-Point scale of **1,2, 3 (Strong, Medium and Low)**

SEMESTER - IV

CORE PAPER – VII : BASICS OF GEOINFORMATICS

Course Objectives:		
The main objectives of this course are to:		
1	provide students with a foundational understanding of remote sensing, GIS and GNSS principles, technology, and its applications in various fields.	**K1, K2**
2	familiarize students with remote sensing sensors, platforms, and data acquisition methods, and to develop skills in interpreting remote sensing imagery and recognizing features, patterns, and changes in the Earth's surface.	**K2, K3**
3	develop the skills in creating maps, cartographic design, and data visualization using GIS software and enable students to perform spatial analysis, such as proximity analysis, spatial queries, and spatial modelling,	**K3, K6**
4.	enable students to collect the 4D data from the GNSS and to process and analyze the GNSS data to solve the spatial issues.	**K5,K4**
5.	explore how geoinformatics data is applied to address geographical and environmental challenges, such as land use planning, disaster management, and natural resource management.	**K4, K5**
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		

Course – 10	**CORE PAPER**
Title of the Course:	**BASICS OF GEOINFORMATICS**
Credits:	04
Pre-requisites, if any:	A foundational knowledge of basic geography and earth science concepts
UNITS	
Unit -I	**INTRODUCTION TO REMOTE SENSING**
Definition; History of Remote Sensing; Physics of Remote Sensing: Electromagnetic Radiation (EMR), Characteristics; Electromagnetic Spectrum (EMS); Energy integration with atmosphere and surface - Atmospheric Windows; Types of Remote Sensing with Respect to Wavelength Regions. Remote Sensing Systems,	
Unit-II	**REMOTE SENSING DATA AND DATA INTERPRETATION**
Sensors, platforms, resolution and applications – Data products: photographic products and digital products – Data interpretation: Elements of Image Interpretation - Visual Interpretation – Digital Image interpretation - Accuracy Assessment	

Unit-III	INTRODUCTION TO GEOGRAPHIC INFORMATION SYSTEM (GIS)
Introduction to GIS and History and development, Components and Applications trends of GIS - Data models in GIS – Data sources, types and data entry in GIS.	
Unit-IV	**GEOGRAPHIC INFORMATION SYSTEM (GIS) DATA ANALYSIS**
Spatial Data Analysis: Vector Data Analysis: Concept of Topology and Topological Analysis- Overlay Analysis - Network Analysis - Proximity Analysis: Buffering; Thiessen Polygon; Multi-Criteria Analysis - Raster Data Analysis: Local; Neighbourhood and Regional Operations.	
Unit-V	**INTRODUCTION TO GNSS AND ITS APPLICATIONS**
Introduction to GNSS - History of Positioning System GNSS System Description - Error Sources and Receiver - Introduction to DGNSS - Performance and Applications.	

Expected Course Outcomes:

On the successful completion of the course, student will be able to:

1	Understand the geoinfrmatics principles, technologies, and the electromagnetic spectrum.	**K1, K2**
2	interpret remote sensing imagery, identifying land features, and understanding the applications of remote sensing in geography and environmental science.	**K2, K3**
3	grasp different geo-spatial data sets collected by the remote sensing sensors, and learn to process, and analysis the data by using GIS platform	**K3, K6**
4	perform advanced spatial analysis, including geo-statistics, spatial modeling, and interpolation. create effective maps and geospatial visualizations for conveying information.	**K6, K2**
5	develop critical thinking skills to evaluate the suitability of geoinformatics technology for various applications and understand its limitations.	**K5, K6**

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Reading List (s) :

1	Campbell, J.B., 1996. (2nd edition). Introduction to Remote Sensing, Taylor and Francis, London.717 pages.
2	Ian, H., 2010. An introduction to geographical information systems. Pearson Education India.464 pages.
3	Lillisand,T., Keifer, Ralph W., Chipman, J., 2011. Remote Sensing and Image Interpretation. John Wiley Pub., New York, 770 pages.
4	Lo, C. P., & Yeung, A. K., 2002. Concepts and techniques of Geographic Information Systems, Upper Saddle River, NJ: Prentice Hall, 532 pages.

Recommended Text (s) :	
1	Gupta R.K.., 2014. Principles of Geoinformatics, 5th edition - Jain Brothers publication, 712 pages.
2	Peter Atkinson., 2009. Geoinformatics - Volume I - EOLSS Publications, 263 page.
3	ShuanggenJin, Estel Cardellach, Feiqin Xie., 2013. GNSS Remote Sensing: Theory, Methods and Applications, Volume 19 - Springer Science & Business Media publication, 276 pages.
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.] :	
1	https://www.youtube.com/watch?v=PYAGngmfXAk&pp=ygUPZGF0YSBtb2RlbHMgR0lT
2	https://www.youtube.com/watch?v=2X352i1bT0s&pp=ygUkYWVyaWFsIHBob3RvZ3JhcGh5IGluIHJlbW90ZSBzZW5zaW5n
3	https://www.youtube.com/watch?v=X7MxlAIsW1g&pp=ygUhcGhvdG9ncmFtbWV0cnkgYW5kIHJlbW90ZSBzZW5zaW5n
4	https://www.youtube.com/watch?v=P17IRpCXTzs&pp=ygUDR0lT

Method of Evaluation :

Internal Assessment	End Semester Examination	Total	Grade
25	75	100	

Methods of Assessment

Recall (K1) - Simple definitions, MCQ, Recall steps, Concept definitions

Understand/ Comprehend (K2) - MCQ, True/False, Short essays, Concept explanations, Short summary or overview

Application (K3) - Suggest idea/concept with examples, Suggest formulae, Solve problems, Observe, Explain

Analyse (K4) - Problem-solving questions, Finish a procedure in many steps, Differentiate between various ideas, Map knowledge

Evaluate (K5) - Longer essay/ Evaluation essay, Critique or justify with pros and con

Create (K6) - Check knowledge in specific or offbeat situations, Discussion, Debating or Presentations

Mapping with programme Outcomes:

PCOs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	1	1	2	1	1
CO 2	2	1	3	1	1
CO 3	2	2	3	2	2
CO 4	1	2	1	1	1
CO 5	2	1	3	1	1

Map **Course Outcomes (CO)** for each Course with **Programme Specific Outcomes (PSO)** in the 3-Point scale of **1,2, 3 (Strong, Medium and Low)**

CORE PAPER – VIII : PRACICAL – IV : GEOINFORMATICS

Course Objectives:		
The main objectives of this course are to:		
1	provide hands-on experience in using geospatial software and tools for data collection, manipulation, and analysis.	**K2, K1**
2	teach students how to acquire, process, and manage geospatial data, including satellite imagery, GPS data, and geographic databases.	**K2, K5**
3	enable students to conduct spatial analysis, including spatial modelling, interpolation, and geostatistics, to address real-world geographic problems.	**K2, K6**
4	develop cartographic and data visualization skills, including the creation of thematic maps and interactive geospatial products.	**K6, K5**
5	prepare students for applying geoinformatics in diverse fields, including urban planning, environmental monitoring, disaster management, and location-based services.	**K6, K3**
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		

Course – 11	**CORE PAPER : PRACTICAL - IV**
Title of the Course:	**GEOINFORMATICS**
Credits:	04
Pre-requisites, if any:	A basic knowledge of geospatial concepts and prior coursework in geoinformatics or a related field

UNITS	
Unit -I	**REMOTE SENSING**
Satellite data appreciation : Analog and Digital – Image Interpretation Elements – Visual Image Interpretation Key – Image Interpretation Overlays – Visual Image Interpretation : Landuse/Landcover	
Unit-II	**IMAGE PROCESSING (DIGITAL AND MANUAL)**
Image Enhancement (Filtering); Classification (Supervised and Un-supervised) - Satellite Image Interpretation - Application of Remote Sensing: Land Use Land Cover	
Unit-III	**GLOBAL NAGIVATIONAL SATELLITE SYSTEM (GNSS**
Definition and Components – Collection and compilation of 4 D data – Principles and Uses; DGNSS	

Unit-IV	GIS DATA STRUCTURES	
Types (spatial and Non-spatial), Raster and Vector Data Structure.		
Unit-V	**GIS DATA ANALYSIS**	
Input; Editing, Output and Query; Overlays - Application of GIS: Land Use Mapping; Urban Sprawl Analysis; Forests Monitoring		
Expected Course Outcomes:		
On the successful completion of the course, student will be able to:		
1	familiarise the geospatial software and technologies for data collection, analysis, and visualization.	**K2, K1**
2	acquire, manage, and process geospatial data from various sources, including satellite imagery and GPS.	**K2, K4**
3	perform advanced level spatial analysis, including geostatistics, spatial modelling, and interpolation.	**K3, K4**
4	create effective maps and geospatial visualizations for conveying information.	**K5, K4**
5	apply geoinformatics in practical scenarios, including urban planning, environmental management, and decision support systems.	**K6, K3**
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		
Reading List (s) :		
1	Bhatta, B., 2008. Remote Sensing and GIS, Oxford University Press, New Delhi, 685 pages.	
2	Bhatta, B., 2010. Analysis of Urban Growth and Sprawl from Remote Sensing, Springer, Berlin Heidelberg.4, 191 pages.	
3	Burrough, P.A., McDonnell, R.A., 2000. Principles of Geographical Information System Spatial Information System and Geo-statistics. Oxford University Press, 540 pages.	
4	Campbell J. B., 2007.Introduction to Remote Sensing, Guildford Press, 634 pages.	
5	Heywoods, I., Cornelius, S and Carver, S., 2006. An Introduction to Geographical Information System. Prentice Hall, 464 pages.	
Recommended Text (s) :		
1	Jensen, J. R., 2005. Introductory Digital Image Processing: A Remote Sensing Perspective, Pearson Prentice-Hall, 526 pages.	
2	Jha, M.M. and Singh, R.B., 2008. Land Use: Reflection on Spatial Informatics Agriculture and Development, New Delhi: Concept, 318 pages.	
3	Joseph, G., 2005. Fundamentals of Remote Sensing, United Press India,225 pages.	

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.] :	
1	https://www.youtube.com/watch?v=aEp_mLCiAt4&list=PLG-cz6t92P1FIwG7IogwRJX2T1cXV6fgQ
2	https://www.youtube.com/watch?v=w_GK7cthFME&list=PLfFR1jcziMVj89k36XwEfqw5hWZ30n0P5
3	https://www.youtube.com/watch?v=2GYM0OawbCw&pp=ygUNR0lTIHByYWN0aWNhbA%3D%3D

Method of Evaluation :			
Internal Assessment	**End Semester Examination**	**Total**	**Grade**
25	75	100	

Methods of Assessment

Recall (K1) - Simple definitions, MCQ, Recall steps, Concept definitions

Understand/ Comprehend (K2) - MCQ, True/False, Short essays, Concept explanations, Short summary or overview

Application (K3) - Suggest idea/concept with examples, Suggest formulae, Solve problems, Observe, Explain

Analyse (K4) - Problem-solving questions, Finish a procedure in many steps, Differentiate between various ideas, Map knowledge

Evaluate (K5) - Longer essay/ Evaluation essay, Critique or justify with pros and con

Create (K6) - Check knowledge in specific or offbeat situations, Discussion, Debating or Presentations

Mapping with programme Outcomes:

PCOs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	2	1	1	1	1
CO 2	2	2	3	1	1
CO 3	1	2	1	3	2
CO 4	1	2	1	2	1
CO 5	1	1	2	1	1

Map **Course Outcomes (CO)** for each Course with **Programme Specific Outcomes (PSO)** in the 3-Point scale of **1,2, 3 (Strong, Medium and Low)**

NON MAJOR ELECTIVE-II : DISASTER MANAGEMENT

Course Objectives:		
The main objectives of this course are to:		
1	learn concepts, terminologies and developments in the field of Disaster Management	**K2, K1**
2	knowledge and understanding of the disaster phenomenon, its different contextual aspects and impacts	**K2, K5**
3	understand approaches of Disaster Risk Reduction (DRR) and the relationship between vulnerability, disasters, disaster prevention and risk reduction.	**K2, K6**
4	knowledge to create appropriate planning, preparation and response for emergency treatment in disaster situation.	**K6, K1**
5	ensure skills and ability to design, implement and evaluate research on disasters.	**K6, K5**
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		

Course – 12	**NON-MAJOR ELECTIVE -II**
Title of the Course:	**DISASTER MANAGEMENT**
Credits:	03
Pre-requisites, if any:	Basic knowledge in Geography
UNITS	
Unit -I	**UNDERSTANDING DISASTERS**
Disasters: Definition and Concepts – Types - Hazards, Risk, and Vulnerability	
Unit-II	**HYDRO-METROLOGICAL DISASTERS IN INDIA**
Hydro-metrological Disasters in India: Causes and effects - Distribution and Mapping: Flood, Landslide, Cyclone, Drought.	
Unit-III	**GEOLOGICAL DISASTERS IN INDIA**
Geological Disasters in India: Causes and effects - Distribution and Mapping: Earthquake, Tsunami	
Unit-IV	**HUMAN INDUCED DISASTERS IN INDIA**
Human induced disasters: Causes and effects - Distribution and Mapping.	

Unit-V	RESPONSE AND MITIGATION TO DISASTERS IN INDIA	
Response and Mitigation to Disasters: Mitigation and Preparedness, NDMA and NIDM; Indigenous Knowledge and Community-Based Disaster Management; Do's and Don'ts During Disasters		
Expected Course Outcomes:		
On the successful completion of the course, student will be able to:		
1	explain disaster management basics and theory (cycle, phases, risk, crisis, emergency, disasters, resilience)	**K2, K1**
2	compare hazards, disasters and associated natural phenomena and their interrelationships, causes and their effects	**K5, K4**
3	apply knowledge about existing global frameworks and existing agreements for disaster preparedness and mitigation measures in successful Disaster Risk Reduction	**K3, K6**
4	understand role of IT, remote sensing, GIS and GPS in risk reduction	**K2, K6**
5	understand disaster management acts and guidelines along with role of various stack-holders during disasters	**K5, K6**
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		
Reading List (s) :		
1	Government of India, 1997. Vulnerability Atlas of India. New Delhi, Building Materials & Technology Promotion Council, Ministry of Urban Development, Government of India, 500 page.	
2	Kapur, A., 2010. Vulnerable India: A Geographical Study of Disasters, Sage Publication, New Delhi, 270 pages.	
3	Modh, S., 2010. Managing Natural Disaster: Hydrological, Marine and Geological Disasters, Macmillan, and Delhi,+ 321 pages.	
4	Singh Jagbir, 2007. Disaster Management Future Challenges and Opportunities, 2007. Publisher- I.K. International Pvt. Ltd. S-25, Green Park Extension, Uphaar Cinema Market, New Delhi, India (www.ikbooks.com).395 pages.	
Recommended Text (s) :		
1	Singh, R. B., (ed.), 2006. Natural Hazards and Disaster Management: Vulnerability and Mitigation, Rawat Publications, New Delhi, 240 pages	
2	Sinha, A., 2001. Disaster Management: Lessons Drawn and Strategies for Future, New United Press, New Delhi. 255 pages.	
3	Stoltman, J.P. et al., 2004. International Perspectives on Natural Disasters, Kluwer Academic Publications. Dordrecht, 150 pages.	

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.] :	
1	https://library.wmo.int/index.php?lvl=author_see&id=7723#.YVmJLdpBzIU
2	https://nidm.gov.in/books.asp
3	https://nptel.ac.in/courses/105/104/105104183/
4	https://nptel.ac.in/courses/124/107/124107010/
5	https://www.youtube.com/watch?v=TB97oX7ANGo
6	https://www.youtube.com/watch?v=2YBx5NDIy8A
7	https://www.digimat.in/nptel/courses/video/124107007/L35.html

Method of Evaluation :

Internal Assessment	End Semester Examination	Total	Grade
25	75	100	

Methods of Assessment

Recall (K1) - Simple definitions, MCQ, Recall steps, Concept definitions

Understand/ Comprehend (K2) - MCQ, True/False, Short essays, Concept explanations, Short summary or overview

Application (K3) - Suggest idea/concept with examples, Suggest formulae, Solve problems, Observe, Explain

Analyse (K4) - Problem-solving questions, Finish a procedure in many steps, Differentiate between various ideas, Map knowledge

Evaluate (K5) - Longer essay/ Evaluation essay, Critique or justify with pros and con

Create (K6) - Check knowledge in specific or offbeat situations, Discussion, Debating or Presentations

Mapping with programme Outcomes:

PCOs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	1	1	1	1	2
CO 2	1	1	3	1	1
CO 3	1	2	3	2	1
CO 4	2	2	1	1	1
CO 5	1	1	2	1	1

Map **Course Outcomes (CO)** for each Course with **Programme Specific Outcomes (PSO)** in the 3-Point scale of **1,2, 3 (Strong, Medium and Low)**

SEMESTER - V

CORE PAPER – XI : GEOGRAPHY OF RESOURCES

Course Objectives:		
The main objectives of this course are to:		
1	provide students with a comprehensive understanding of the global distribution of natural resources, such as minerals, energy, water, and agricultural land.	**K2, K6**
2	explore strategies for sustainable resource management, including conservation, allocation, and responsible use.	**K5, K3**
3	examine the environmental and socio-economic impacts of resource extraction, processing, and consumption.	**K3, K6**
4	develop skills in using geospatial tools and technologies for resource mapping, analysis, and planning.	**K6, K5**
5	appreciate the interdisciplinary nature of resource geography, recognizing its connections with fields like environmental science, economics, and policy analysis.	**K4, K6**

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Course – 13	**CORE PAPER**
Title of the Course:	**GEOGRAPHY OF RESOURCES**
Credits:	04
Pre-requisites, if any:	No pre-requisites

UNITS

Unit -I	**INTRODUCTION TO NATURAL RESOURCES**
Natural Resources : Concept, nature and scopes of resources geography - Classification and Techniques	
Unit-II	**LAND AND WATER RESOURCES**
Land Resources and Water Resources : Distribution, Utilisation, Problems and Management	
Unit-III	**FOREST AND ENERGY RESOURCES**
Forests and Energy Resources : Distribution, Utilisation, Problems and Management	
Unit-IV	**RESOURCES CONSERVATION**
Resources appraisal and methods of Natural Resources conservation	

Unit-V	APPLICATION OF GEO-SPATIAL TECHNOLOGY	
Geospatial technology for Natural Resource Conservation Management		
Expected Course Outcomes:		
On the successful completion of the course, student will be able to:		
1	Understand the distribution, availability, and management of various natural resources on a global scale.	**K2, K1**
2	to analyze and propose sustainable resource management strategies, considering environmental, social, and economic factors.	**K2, K3**
3	develop an understanding of the environmental consequences of resource extraction and consumption, and the implications for ecosystems and climate.	**K5, K6**
4	Use geospatial tools and technologies to analyze resource data, create resource maps, and assess resource-related spatial patterns.	**K6, K4**
5	collaborate across various disciplines, integrating resource geography with environmental science, economics, and policy analysis for addressing complex resource-related challenges.	**K4, K6**
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		
Reading List (s) :		
1	Asthana, D.K., and Meera Astana., 1998. Environmental Problems and Solutions, S.Chand and Co., New Delhi.	
	Balbir Sing Negi, 1979. Geography of Resources, Kedamath Ramnath Publisher, Meerut.	
2	Dasmann, R.F., 1968. Environment Conservation, John Willey and Sons, New York Gurjar, R.K., Jat, B.C., 2009. Geography of Water Resources.Madison.Rawat Publications.	
3	Husain, M., 1994. Resource Geography. Perspectives in Economic Geography. New Delhi. Anmol Publications	
Recommended Text (s) :		
1	Khanna, and Gupta, 1982. Economic and commercial Geography, Sultan Chand and sons, New Delhi	
2	Khoshoo, T.N., 1988. Environment Concerns and Strategies, Ashish Pub. House, Delhi.	
3	Pachauri R. K., & Sridharan., 1997. Looking back to Think Ahead", The Energy Research Institute, New Delhi	
4	Sadhukah, S.K., 1990. Economic Geography, S. Chand and Company, New Delhi.	

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.] :	
1	https://www.youtube.com/watch?v=czJ1qAusGa8&pp=ygUVZ2VvZ3Jhc Gh5IG9mIHJlc291cmNl
2	https://www.youtube.com/watch?v=MOlL39c5Fw4&pp=ygUNbGFuZCBy ZXNvdXJjZQ%3D%3D
3	https://www.youtube.com/watch?v=ViXtT8c4z-c&pp=ygUPZW5lcmd5IHJlc291cmNl
4	https://www.youtube.com/watch?v=IcyM43z0UE8&pp=ygUYY29uc2VydmF0a W9uIG9mIHJlc291cmNl

Method of Evaluation :

Internal Assessment	End Semester Examination	Total	Grade
25	75	100	

Methods of Assessment

Recall (K1) - Simple definitions, MCQ, Recall steps, Concept definitions

Understand/ Comprehend (K2) - MCQ, True/False, Short essays, Concept explanations, Short summary or overview

Application (K3) - Suggest idea/concept with examples, Suggest formulae, Solve problems, Observe, Explain

Analyse (K4) - Problem-solving questions, Finish a procedure in many steps, Differentiate between various ideas, Map knowledge

Evaluate (K5) - Longer essay/ Evaluation essay, Critique or justify with pros and con

Create (K6) - Check knowledge in specific or offbeat situations, Discussion, Debating or Presentations

Mapping with programme Outcomes:

PCOs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	1	1	2	2	2
CO 2	1	1	3	1	1
CO 3	2	1	2	1	3
CO 4	1	2	1	2	2
CO 5	1	1	1	3	1

Map **Course Outcomes (CO)** for each Course with **Programme Specific Outcomes (PSO)** in the 3-Point scale of **1,2, 3 (Strong, Medium and Low)**

CORE PAPER – X :
REGIONAL PLANNING ANDDEVELOPMENT

Course Objectives:		
The main objectives of this course are to:		
1	provide students with the skills to analyze the unique characteristics and challenges of different regions.	**K2, K1**
2	explore strategies for sustainable regional development, including land use planning, infrastructure, and environmental conservation.	**K2, K5**
3	examine the economic and social factors that influence regional development and the role of policy in shaping regions.	**K2, K6**
4	foster community involvement in the planning and development process, promoting participatory decision-making.	
5	appreciate the interdisciplinary nature of regional planning, recognizing its connections with fields like geography, economics, sociology, and environmental studies.	**K2, K3**
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		

Course – 14	**CORE PAPER**
Title of the Course:	**REGIONAL PLANNING AND DEVELOPMENT**
Credits:	04
Pre-requisites, if any:	No pre-requisites
UNITS	
Unit -I	**REGIONAL PLANNING**
Regional Planning : Concept, need and types of regional Planning.	
Unit-II	**PLANNING REGIONS**
Planning Regions: Characteristics and Delineation of Planning Region.	
Unit-III	**REGIONALIZATION OF INDIA**
Regionalization of India for Planning (Agro Ecological Zones).	
Unit-IV	**MODELS IN REGIONAL PLANNING**
Models for Regional Planning: Growth Pole Theory; Core Periphery Model and Growth Foci Concept in Indian Context.	

Unit-V	REGIONAL PLANNING IN INDIA	
Backward Regions and Regional Plans - Special Area Development Plans in India; DVC - The Success Story and the Failures; NITI Aayog.		
Expected Course Outcomes:		
On the successful completion of the course, student will be able to:		
1	gain knowledge about definition of region, evolution and types of regional planning.	**K1, K2**
2	develop an idea about choice of a region for planning.	**K6, K5**
3	build an idea about theories and models for regional planning.	**K3, K6**
4	know about measuring development indicators.	**K2, K5**
5	develop a keen interest in the socio and economic development strategies and importance of regional development	**K5, K6**
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		
Reading List (s) :		
1	Blij H. J. De., 1971. Geography: Regions and Concepts, John Wiley and Sons, 656 Pages.	
2	Claval P.l., 1998. An Introduction to Regional Geography, Blackwell Publishers, Oxford and Massachusetts, 316 Pages.	
3	Friedmann J. and Alonso W., 1975. Regional Policy - Readings in Theory and Applications, MIT Press, Massachusetts, 808 Pages.	
4	Gore C. G., 1984. Regions in Question: Space, Development Theory and Regional Policy, Methuen, London, 290 Pages.	
5	Gore C. G., Köhler G., Reich U-P., Ziesemer T., 1996. Questioning Development; Essays on the Theory, Policies and Practice of Development Intervention, Metropolis- Verlag, Marburg,460 Pages.,	
Recommended Text (s) :		
1	Chandna R.C. (2020),” Regional Planning and Development”, Kalyani Publisher, New Delhi,380 Pages.	
2	Janki Jiwan (2021),”Regional Development and Planning”, Rawat publication, ,Jaipur, Rajasthan, 304 Pages.	
3	Kanan Chatterjee (2017),”Regional Planning : Concept Theory and Practice”, Concept Publishing Company Pvt. Ltd., New Delhi, 221 Pages.	
4	Misra.R.P. (2002),” Regional Planning: Concepts, Techniques, policies and Case Studies”, Concept Publishing Pvt. Ltd., New Delhi. 887 Pages.	
5	Mishra, R.P., (1980),” Multi-Level Planning”, Heritage Publishers, Delhi, 234 Pages.	

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.] :	
1	https://www.youtube.com/watch?v=2eTHk5u0Ycs&pp=ygUucmVnaW9uYWwgcGxhbm5pbmcgYW5kIGRldmVsb3BtZW50IGluIGdlb2dyYXBoeQ%3D%3D
2	https://www.youtube.com/watch?v=9l-dAy1tLwI&pp=ygUeZGVsaW5lYXRpb24gb2YgcmVnaW9uIHBsYW5uaW5n
3	https://www.youtube.com/watch?v=MRP2WQZT80o&pp=ygUZbW9kZWxzIG9mIHJlZ2lvbiBwbGFubmluZw%3D%3D

Method of Evaluation :

Internal Assessment	End Semester Examination	Total	Grade
25	75	100	

Methods of Assessment

Recall (K1) - Simple definitions, MCQ, Recall steps, Concept definitions

Understand/ Comprehend (K2) - MCQ, True/False, Short essays, Concept explanations, Short summary or overview

Application (K3) - Suggest idea/concept with examples, Suggest formulae, Solve problems, Observe, Explain

Analyse (K4) - Problem-solving questions, Finish a procedure in many steps, Differentiate between various ideas, Map knowledge

Evaluate (K5) - Longer essay/ Evaluation essay, Critique or justify with pros and con

Create (K6) - Check knowledge in specific or offbeat situations, Discussion, Debating or Presentations

Mapping with programme Outcomes:

PCOs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	1	1	2	2	2
CO 2	1	1	3	1	1
CO 3	2	2	1	3	1
CO 4	1	1	1	2	1
CO 5	1	1	1	1	1

Map **Course Outcomes (CO)** for each Course with **Programme Specific Outcomes (PSO)** in the 3-Point scale of **1,2, 3 (Strong, Medium and Low)**

CORE PAPER – XI : PRACTICAL - V
FIELD WORK AND RESEARCH METHODS

Course Objectives:		
The main objectives of this course are to:		
1	recall specific facts in connection with the syllabus content	**K2, K1**
2	show understanding of geographical concepts, ideas, principles contained in the syllabus and their application in the context of the physical and human environments	**K2, K3**
3	understanding of the spatial patterns and interactions within these environments	**K2, K5**
4	demonstrate locational knowledge applied to the specific problem solving	**K5, K6**
5	understanding of the report writing and field tools	**K2, K6**
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		

Course – 15	**CORE PAPER – PRACTICAL-V**
Title of the Course:	**FIELD WORK AND RESEARCH METHODS**
Credits:	05
Pre-requisites, if any:	A basic understanding of research methodologies and field survey techniques
UNITS	
Unit -I	**FIELD WORK IN GEOGRPAHICAL STUDIES**
Field Work in Geographical Studies : Role, Value and Ethics of Field-Work.	
Unit-II	**CASE STUDIES**
Defining the Field and Identifying the Case Study : Rural / Urban / Physical / Human /Environmental.	
Unit-III	**FIELD TECHNIQUES**
Merits, Demerits and Selection of the Appropriate Technique; Observation (Participant / Non Participant).	
Unit-IV	**FIELD TOOLS, TECHNIQUES AND ANALYSIS**
Questionnaires (Open/ Closed / Structured / Non-Structured); Interview with Special Focus on Focused Group Discussions; Space Survey (Transects and Quadrants, Constructing a Sketch).	
Unit-V	**DESIGNING THE FIELD REPORT**
Aims and Objectives, Methodology, Analysis, Interpretation and Writing the Report.	

FIELD REPORT:

This course work contains - Plan and schedule of the work carried out and comprehensive report on the field work. The student should prepare an individual report based on primary and secondary data collected during field work. The maximum length of the report should not exceed 12000 words, excluding figures, tables, photographs, maps, references and appendices.

Expected Course Outcomes:

On the successful completion of the course, student will be able to:

1	observe, record, classify and interpret data collected in the field or from secondary sources, to form conclusions and communicate ideas	**K2, K1**
2	read, interpret and use maps, photos and statistical data	**K5, K3**
3	represent geographical information in simple map form (sketch maps), graphs or diagrams, and to write in a coherent manner	**K5, K3**
4	demonstrate awareness of environmental issues in terms of the conservation and the protection of both the physical and the human environments;	**K6, K5**
5	form reasonable judgements in relation to environmental issues of a geographical nature	**K6, K5**

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyse; **K5** - Evaluate; **K6** - Create

Reading List (s) :

1	Creswell J., 1994. Research Design: Qualitative and Quantitative Approaches SagePublications, 270 Pages.
2	Dikshit, R. D., 2003. The Art and Science of Geography: Integrated Readings. Prentice-Hall of India, New Delhi, 204 Pages.
3	Evans M., 1988. Participant Observation: The Researcher as Research Tool in Qualitative Methods in Human Geography, eds. J. Eyles and D. Smith, Polity, 1-16 pages.
4	Mukherjee, Neela, 1993. Participatory Rural Appraisal: Methodology and Application, Concept Publications. Co., New Delhi, 160 Pages.

Recommended Text (s) :

1	Mukherjee, Neela, 2002. Participatory Learning and Action: with 100 Field Methods. Concept Publications. Co., New Delhi,335 Pages.
2	Special Issue, (2001). “Doing Fieldwork” The Geographical Review 91, 1-2Pages
3	Wolcott, H., (1995). The Art of Fieldwork. Alta Mira Press, Walnut Creek, CA, 285 Pages.

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.] :	
1	https://www.youtube.com/watch?v=nc9RVbg66Sw
2	https://www.youtube.com/watch?v=J7vTrayt0-c
3	https://www.youtube.com/watch?v=QNrWPVN_UhM
4	https://www.youtube.com/watch?v=yTT3hPVoCoY
5	https://www.youtube.com/watch?v=-Id1Xk1Hav8
6	https://www.youtube.com/watch?v=kNLfAama-PY
7	https://www.youtube.com/watch?v=FBN0Bk6_I10

Method of Evaluation :

Internal Assessment	End Semester Examination	Total	Grade
25	75	100	

Methods of Assessment

Recall (K1) - Simple definitions, MCQ, Recall steps, Concept definitions

Understand/ Comprehend (K2) - MCQ, True/False, Short essays, Concept explanations, Short summary or overview

Application (K3) - Suggest idea/concept with examples, Suggest formulae, Solve problems, Observe, Explain

Analyse (K4) - Problem-solving questions, Finish a procedure in many steps, Differentiate between various ideas, Map knowledge

Evaluate (K5) - Longer essay/ Evaluation essay, Critique or justify with pros and con

Create (K6) - Check knowledge in specific or offbeat situations, Discussion, Debating or Presentations

Mapping with programme Outcomes:

PCOs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	1	1	2	2	2
CO 2	1	1	1	1	1
CO 3	1	2	1	2	1
CO 4	1	2	1	1	1
CO 5	1	1	1	1	1

Map **Course Outcomes (CO)** for each Course with **Programme Specific Outcomes (PSO)** in the 3-Point scale of **1,2, 3 (Strong, Medium and Low)**

CORE ELECTIVE – I : CLIMATE CHANGE: VULNERABILITY AND ADAPTATION

Course Objectives:		
The main objectives of this course are to:		
1	provide students with a deep understanding of the science behind climate change, its causes, and consequences.	**K2, K1**
2	equip students with the skills to assess the vulnerability of communities, ecosystems, and economies to climate change impacts.	**K2, K3**
3	explore and develop strategies for adapting to climate change, including policy, technology, and community-based approaches.	**K2, K5**
4	promote the development of resilient systems and practices that can withstand and recover from climate-related challenges.	**K5, K6**
5	appreciate the interdisciplinary nature of climate change adaptation, recognizing its connections with fields like environmental science, policy, and social sciences.	**K2, K6**
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		

Course – 16	**CORE ELECTIVE**
Title of the Course:	**CLIMATE CHANGE: VULNERABILITY AND ADAPTATION**
Credits:	03
Pre-requisites, if any:	A basic knowledge of environmental science and climate change concepts
UNITS	
Unit -I	**SCIENCE OF CLIMATE CHANGE**
Understanding Climate Change; Green House Gases and Global Warming; Global Climatic Assessment – IPCC Working Group	
Unit-II	**CLIMATE CHANGE AND VULNERABILITY**
Vulnerability: Physical Vulnerability; Economic Vulnerability; Social Vulnerability	
Unit-III	**IMPACT OF CLIMATE CHANGE**
Impact of climate change : Agriculture and Water; Flora and Fauna; Human Health	

Unit-IV	ADAPTATION AND MITIGATION INITIATIVES	
Global Initiatives with Particular Reference to South Asia; National Action Plan on Climate Change; Local Institutions (Urban Local Bodies, Panchayats)		
Unit-V	**CLIMATE CHANGE - CASE STUDIES**	
Effects of climate change: land use and land use planning - GIS for climate change – GIS based Action Plan - decision making, and application to climate science - Comprehensive Climate Information System		
Expected Course Outcomes:		
On the successful completion of the course, student will be able to:		
1	understand the science, causes, and consequences of climate change.	**K2, K1**
2	assess the vulnerability of different systems to climate change impacts, considering social, economic, and environmental factors.	**K5, K3**
3	prepare students for developing and evaluating climate change adaptation strategies, including policy, technology, and community-based approaches.	**K5, K3**
4	foster the ability to promote and implement resilience-building practices, enhancing the capacity to withstand and recover from climate-related challenges.	**K6, K5**
5	appreciate the interdisciplinary nature of climate change adaptation, recognizing its connections with environmental science, policy, social sciences, and international development.	**K6, K5**
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		
Reading List (s) :		
1	Elizabeth Kolbert, (2006) Field Notes from A Catastrophe: Man, Nature and Climate Change, Bloomsbury Publishing Plc.	
2	Howard J. Critch field (1995); General Climatology; Prentice, Hall of India Pvt. Ltd., New Delhi.	
3	Lisa F. Schipper and Ian Burton (Ed.) (2008) Adaptation to climate Change, Earth scan Reader Series	
Recommended Text (s) :		
1	Roger G. Berry & Richard J. Chorley (1998); Atmosphere, Weather and Climate; Routledge London & New York.	
2	Sharma R.C and M. Vatal (1987); Oceanography for Geographers; Chaitanya Publishing House, Allahabad.	
3	Tom Garrison (1996); Oceanography – An Invitation to marine science; Wadsworth Publishing co., Washington	

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.] :	
1	https://www.youtube.com/watch?v=dcBXmj1nMTQ&pp=ygUOY2xpbWF0ZSBjaGFuZ2U%3D
2	https://www.youtube.com/watch?v=gRnvx75D0W8&pp=ygUVY2xpb WF0ZSB2dWxuZXJhYmlsaXR5
3	https://www.youtube.com/watch?v=SDRxfuEvqGg&pp=ygUVY2xpb WF0ZSB2dWxuZXJhYmlsaXR5
4	https://www.youtube.com/watch?v=1pSoQXgnn5s&pp=ygUVY2xpb WF0ZSB2dWxuZXJhYmlsaXR5
5	https://www.youtube.com/watch?v=pUqmhipWvzA&pp=ygUbY2xpb WF0ZSBjaGFuZ2UgY2FzZSBzdHVkaWVz

Method of Evaluation :

Internal Assessment	End Semester Examination	Total	Grade
25	75	100	

Methods of Assessment

Recall (K1) - Simple definitions, MCQ, Recall steps, Concept definitions

Understand/ Comprehend (K2) - MCQ, True/False, Short essays, Concept explanations, Short summary or overview

Application (K3) - Suggest idea/concept with examples, Suggest formulae, Solve problems, Observe, Explain

Analyse (K4) - Problem-solving questions, Finish a procedure in many steps, Differentiate between various ideas, Map knowledge

Evaluate (K5) - Longer essay/ Evaluation essay, Critique or justify with pros and con

Create (K6) - Check knowledge in specific or offbeat situations, Discussion, Debating or Presentations

Mapping with programme Outcomes:

PCOs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	1	1	2	2	2
CO 2	1	1	1	1	1
CO 3	1	2	1	2	1
CO 4	1	2	1	1	1
CO 5	1	1	1	1	1

Map **Course Outcomes (CO)** for each Course with **Programme Specific Outcomes (PSO)** in the 3-Point scale of **1,2, 3 (Strong, Medium and Low)**

SEMESTER - VI

CORE PAPER XII: GEOGRAPHY OF INDIA

Course Objectives:		
The main objectives of this course are to:		
1	provide students with a comprehensive understanding of India's diverse physical and human geography, including regions, landscapes, and cultural diversity.	**K2, K1**
2	explore the geopolitical aspects of India's borders, foreign policy, and its regional and global significance	**K2, K3**
3	examine India's economic activities, resource distribution, environmental challenges, and their impact on the country's development.	**K2, K5**
4	understand the cultural, social, and demographic diversity of India and how it shapes the country's geographic patterns.	**K5, K6**
5	encourage critical thinking about the geographic factors influencing India's social, economic, and political landscape, including its historical and contemporary dimensions.	**K2, K6**
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		

Course – 17	**CORE PAPER**
Title of the Course:	**GEOGRAPHY OF INDIA**
Credits:	04
Pre-requisites, if any:	A basic understanding of geography concepts and some familiarity with Indian history and culture
UNITS	
Unit -I	**PHYSICAL SETTING OF INDIA**
Physical Setting : Location, strategic boundaries, Relief, Drainage, and Climate	
Unit-II	**INDIA'S POPULATION**
Population : Size and Growth since 1901, Population Distribution, Literacy rate, and Sex Ratio	
Unit-III	**SETTLEMENTS IN INDIA**
Settlement System : Rural Settlement Types and Patterns, Urbanisation and Urban Pattern.	

Unit-IV	INDIA'S RESOURCE BASE
Resource Base : Livestock (Cattle and Fisheries), Power (Coal, and Hydroelectricity), Minerals (Iron Ore and Bauxite) distribution	
Unit-V	**INDIAN ECONOMY**
Economy: Agriculture (Rice, Wheat, Sugarcane, Groundnut, Cotton); Industries (Cotton Textile, Iron and Steel, Automobile), Mode of Transportation (Road and Rail).	

Expected Course Outcomes:

On the successful completion of the course, student will be able to:

1	understand of India's diverse regions, climates, and landscapes.	**K2, K1**
2	familiarise with India's geopolitical challenges, its border disputes, and its role in international relations.	**K5, K3**
3	explore India's economic activities, natural resource distribution, and the environmental challenges it faces.	**K5, K3**
4	appreciate the cultural and social diversity of India, understanding how it influences geographic patterns.	**K6, K5**
5	foster critical thinking about the geographic factors shaping India's social, economic, and political dynamics, both historically and in a contemporary context.	**K6, K5**

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Reading List (s) :

1	Hussain M., 1992. Geography of India, Tata McGraw Hill Education, 882 Pages.
2	Mamoria C. B., 1980. Economic and Commercial Geography of India, Shiva Lal Agarwala, 523 Pages.
3	Miller F. P., Vandome A. F. and McBrewster J., 2009. Geography of India: Indo- Gangetic Plain, Thar Desert, Major Rivers of India, Climate of India, Geology of India, Alpha script Publishing,691 Pages.
4	Nag P., Sengupta S., 1992. Geography of India, Concept Publishing, 280 Pages.
5	Pichamuthu C. S., 1967. Physical Geography of India, National Book Trust,212 Pages.

Recommended Text (s) :

1	Rana, Tejbir Singh, 2015. Diversity of India, R.K. Books, Delhi, 715 Pages.
2	Sharma T. C., Coutinho O., 1997. Economic and Commercial Geography of India, Vikas Publishing, 400 Pages.
3	Singh Gopal, 1976. A Geography of India, Atma Ram, 488 Pages.
4	Spate O. H. K., and Learmonth A. T. A., 1967. India and Pakistan: A General and Regional Geography, Methuen, 914 pages.

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.] :	
1	https://www.youtube.com/watch?v=Ej5cITfrhRs&pp=ygUSZ2VvZ3JhcGh5IG9mIGluZGlh
2	https://www.youtube.com/watch?v=JpAiBg0hrfQ&pp=ygURcG9wdWxhdGlvbiBncm93aHQ%3D
3	https://www.youtube.com/watch?v=1ZrF6GCLDL4&pp=ygURc2V0dGxlbWVudCBzeXN0ZW0%3D
4	https://www.youtube.com/watch?v=AilsUB-vLW0&pp=ygUHZWNvbm9teQ%3D%3D

Method of Evaluation :

Internal Assessment	End Semester Examination	Total	Grade
25	75	100	

Methods of Assessment

Recall (K1) - Simple definitions, MCQ, Recall steps, Concept definitions

Understand/ Comprehend (K2) - MCQ, True/False, Short essays, Concept explanations, Short summary or overview

Application (K3) - Suggest idea/concept with examples, Suggest formulae, Solve problems, Observe, Explain

Analyse (K4) - Problem-solving questions, Finish a procedure in many steps, Differentiate between various ideas, Map knowledge

Evaluate (K5) - Longer essay/ Evaluation essay, Critique or justify with pros and con

Create (K6) - Check knowledge in specific or offbeat situations, Discussion, Debating or Presentations

Mapping with programme Outcomes:

PCOs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	1	1	2	2	2
CO 2	1	1	1	1	1
CO 3	1	2	1	2	1
CO 4	1	2	1	1	1
CO 5	1	1	1	1	1

Map **Course Outcomes (CO)** for each Course with **Programme Specific Outcomes (PSO)** in the 3-Point scale of **1,2, 3 (Strong, Medium and Low)**

PAPER XIII :

GEOGRAPHY OF HEALTH AND WELL BEING

Course Objectives:		
The main objectives of this course are to:		
1	provide students with a geographic perspective on health, exploring how location influences health patterns and outcomes.	**K2, K1**
2	examine the impact of social determinants such as socio-economic status, culture, and environment on health and well-being.	**K2, K3**
3	develop skills in using geographic tools and methods to analyse health data, map health patterns, and assess spatial inequalities.	**K2, K5**
4	understand how geographic factors influence health policy and to develop strategies for promoting well-being in diverse geographical contexts.	**K5, K6**
5	foster an appreciation for the interdisciplinary nature of health geography, recognizing its connections with public health, sociology, and urban planning.	**K2, K6**
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyse; **K5** - Evaluate; **K6** - Create		

Course – 18	**CORE PAPER**
Title of the Course:	**GEOGRAPHY OF HEALTH AND WELL BEING**
Credits:	04
Pre-requisites, if any:	A basic knowledge of geography concepts and an understanding of basic health principles.
UNITS	
Unit -I	**PERSPECTIVES ON HEALTH**
Definition; linkages with environment, development and health; driving forces in health and environmental trends - population dynamics, urbanization, poverty and inequality.	
Unit-II	**PRESSURE ON ENVIRONMENTAL QUALITY AND HEALTH**
Human activities and environmental pressure - land use and agricultural development; industrialization; transport and energy.	

Unit-III	EXPOSURE AND HEALTH RISKS
Environmental pollution; Air, Water, soil - Environmental status: household wastes, housing; workplace.	
Unit-IV	**HEALTH AND DISEASE PATTERN**
Health and Disease Pattern - Environmental context with special reference to India ; Types of Diseases and their regional pattern (Communicable and Lifestyle related diseases).	
Unit-V	**CLIMATE CHANGE AND HUMAN HEALTH**
Climate Change and Human Health: Changes in climate system – heat and cold; Biological disease agents; food production and nutrition.	

Expected Course Outcomes:

On the successful completion of the course, student will be able to:

1	have a geographic perspective on health, understanding how location influences health disparities and outcomes.	**K2, K1**
2	explore the social determinants of health, including economic, cultural, and environmental factors, and their impact on well-being.	**K5, K3**
3	use geographic tools and methods to analyse health data, map health patterns, and assess spatial inequalities.	**K5, K3**
4	understand the implications of geographic patterns on health policy and the development of strategies for promoting well-being.	**K6, K5**
5	appreciate the interdisciplinary nature of health geography, recognizing its connections with fields like public health, sociology, and urban planning.	**K6, K5**

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyse; **K5** - Evaluate; **K6** - Create

Reading List (s) :

1	Akhtar Rais (Ed.), 1990. Environment and Health Themes in Medical Geography, Ashish, Publishing House, New Delhi, 649 Pages.
2	Bradley, D., 1977. Water, Wastes and Health in Hot Climates, John Wiley Chichesten, 399 Pages.
3	Christaler George, and Hristopoles Dionissios, 1998. Spatio-Temporal Environment Health Modelling, Boston Kluwer Academic Press, 489 Pages.
4	Cliff, A.D. and Peter,H., 1988. Atlas of Disease Distributions, Blackwell Publishers, Oxford, 508 Pages.

Recommended Text (s) :	
1	Gatrell, A.,and Loytonen, 1998. GIS and Health, Taylor and Francis Ltd, London, 198 Pages.
2	Murray C. and A. Lopez, 1996. The Global Burden of Disease, Harvard University Press,, 934 Pages.
3	Moeller Dade wed., 1993. Environmental Health, Cambridge, Harward Univ. Press, 624 Pages.
4	Phillips, D.and Verhasselt, Y., 1994. Health and Development, Routledge, London, 780 Pages.
Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.] :	
1	https://www.youtube.com/watch?v=DaHTOFphlMY&pp=ygUhZ2VvZ3JhcGh5IG9mIGhlYWx0aCBhbmQgd2VsbGJlaW5n
2	https://www.youtube.com/watch?v=EwWIm4eR0Nc&pp=ygUhcHJlc3N1cmUgb2YgZW52aXJvbm1lbnRhbCBxdWFsaXR5

Method of Evaluation :

Internal Assessment	End Semester Examination	Total	Grade
25	75	100	

Methods of Assessment

Recall (K1) - Simple definitions, MCQ, Recall steps, Concept definitions

Understand/ Comprehend (K2) - MCQ, True/False, Short essays, Concept explanations, Short summary or overview

Application (K3) - Suggest idea/concept with examples, Suggest formulae, Solve problems, Observe, Explain

Analyse (K4) - Problem-solving questions, Finish a procedure in many steps, Differentiate between various ideas, Map knowledge

Evaluate (K5) - Longer essay/ Evaluation essay, Critique or justify with pros and con

Create (K6) - Check knowledge in specific or offbeat situations, Discussion, Debating or Presentations

Mapping with programme Outcomes:

PCOs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	1	1	2	2	2
CO 2	1	1	1	1	1
CO 3	1	2	1	2	1
CO 4	1	2	1	1	1
CO 5	1	1	1	1	1

Map **Course Outcomes (CO)** for each Course with **Programme Specific Outcomes (PSO)** in the 3-Point scale of **1,2, 3 (Strong, Medium and Low)**

PAPER XIV :

PROJECT WORK / DISSERTATION, VIVA-VOCE

Course Objectives:		
The main objectives of this course are to:		
1	get an idea about the scientific processes and ethics of quality research	**K1, K2**
2	able to distinguish a purpose statement, a research question or hypothesis, and a research objective.	**K5, K4**
3	familiar with ethical issues in educational research, including those issues that arise in using quantitative and qualitative research	**K2, K4**
4	acquaint with the basic knowledge about research in terms of; research design, data collection, analysis, and report writing.	**K4, K5**
5	develop a keen interest in research and use the knowledge for future research	**K2 K6**
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		

Course – 19	**CORE PAPER**
Title of the Course:	**PROJECT WORK / DISSERTATION VIVA-VOCE EXAMINATION**
Credits:	05
Pre-requisites, if any:	No pre-requisites

B.Sc Project Work / Dissertations (a minimum of 50 pages or 15,000 words) at the sixth semester of the programme to demonstrate a student's ability to formulate a geographic research problem, collect and analyze relevant data or appropriate literature, arrive at logical conclusions, and to present the entire exercise at a seminar in the department/center. B.Sc Project Work / Dissertations are more often-learning experiences than substantive contributions to the field.

Since the Project work / Dissertation is offered under distance education, the work will be carried out in the Distance Education computer lab or approved educational institution labs, where the GIS / Remote Sensing / Statistical software or map facilities are available. By using the geo-spatial software, a detailed statistical analysis followed by derived relevant thematic maps are to be interpreted properly.by the candidate. Such project undertaken by the Distance Education Stream shall be compulsory for a period of four continuous days. At the fifth day viva-voce examination shall be conducted.

The Student should prepare an individual report based on primary and secondary data collected during field work. The maximum length of the neatly typed report should not exceed 15000 words, excluding figures, tables, photographs, maps, references and appendices. The report consists of the following format

Format of the Report:

1.Title, 2. Introduction, 3. Statement of problem, 4. Study area, 5. Brief review of literature, 6. Theoretical frame work, 7. Research question / Hypothesis, 8. Methodology and Methods, 9. Chaptalization, 10. Results and discussion, 11. Conclusion and 12. References.

There will be generally no restrictions on the type of geographical study that one can undertake. The dissertation may be carried out within one of the systematic branches of the subject, or in an interdisciplinary nature. Each student has to carried out the dissertation work under the supervision of a faculty member and should submit three copies of the work done to the department on the 6th day morning i.e before the Viva-voce examination.

Expected Course Outcomes:

On the successful completion of the course, student will be able to:

1	design and execute a meaningful research project that demonstrates spatial thinking	**K2, K6**
2	articulate research or project objectives and questions clearly and situate research within an academic or Scholarly context	**K2, K3**
3	understand the challenges of empirical geographical research with practical research problems	**K2, K4**
4	narrate the research process clearly in the form of a formal multichapter master's dissertation in a structured format.	**K4, K5**
5	defend her/his thesis in any scholarly engagements	**K6, K5**

K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create

Reading List (s) :

1	Basil Gomez and John Paul Jones 2010. Research Methods in Geography, Wiley Blackwell, USA, 480 Pages.
2	Clifford, N. and Valentine, G. 2003. Key Methods in Geography. Sage Publications, London, 568 Pages.
3	Creswell, J.W. 1994. Research design: qualitative and quantitative methods. Sage Publication, London, 438 Pages.
4	Daniel R. Montello and Paul Sutton, 2013. An Introduction to Scientific Research Methods in Geography and Environmental Studies, Sage, London, 328 Pages.

Recommended Text (s) :

1	Baxter, L., Hughes, C. and Tight, M. 1996. How to research, Open University Press – McGraw Education, UK, 306 Pages.

2	Bell, J. 1993. Doing your Research Project, Open University Press – McGraw Education, UK, 293 Pages.
3	Cooper, B.M. 1964. Writing Technical Reports, Penguin, USA, 198 Pages.
4	Loyd Haring L.L 1992. Introduction to Scientific Geographical Research, Brown (William C), Company, US, 224 Pages.

Related Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.] :

1	https://nptel.ac.in/courses/121/106/121106007/
2	https://www.youtube.com/watch?v=P0mdjQizdUw
3	https://onlinecourses.nptel.ac.in/noc20_hs78/preview

Method of Evaluation :

Internal Assessment	End Semester Examination	Total	Grade
20	80	100	

Methods of Assessment

Recall (K1) - Simple definitions, MCQ, Recall steps, Concept definitions

Understand/ Comprehend (K2) - MCQ, True/False, Short essays, Concept explanations, Short summary or overview

Application (K3) - Suggest idea/concept with examples, Suggest formulae, Solve problems, Observe, Explain

Analyse (K4) - Problem-solving questions, Finish a procedure in many steps, Differentiate between various ideas, Map knowledge

Evaluate (K5) - Longer essay/ Evaluation essay, Critique or justify with pros and con

Create (K6) - Check knowledge in specific or offbeat situations, Discussion, Debating or Presentations

Mapping with programme Outcomes:

PCOs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	1	1	2	2	2
CO 2	1	1	2	1	1
CO 3	1	1	1	2	1
CO 4	1	2	1	1	1
CO 5	1	1	1	1	1

Map **Course Outcomes (CO)** for each Course with **Programme Specific Outcomes (PSO)** in the 3-Point scale of **1,2, 3 (Strong, Medium and Low)**

CORE ELECTIVE – II HYDROLOGY AND OCEANOGRAPHY

Course Objectives:		
The main objectives of this course are to:		
1	provide students with a comprehensive understanding of the Earth's hydrological and oceanographic systems, including the water cycle and ocean dynamics.	**K2, K1**
2	explore the sustainable management of water resources, including surface water, groundwater, and the role of oceans in global climate systems.	**K2, K5**
3	To examine the environmental impact of human activities on water bodies and the implications for ecosystems and climate.	**K2, K6**
4	develop skills in collecting, analyzing, and interpreting hydrological and oceanographic data, including the use of field and remote sensing techniques	**K6, K1**
5	encourage students to appreciate the interdisciplinary nature of hydrology and oceanography, recognizing their connections to fields like geology, meteorology, and environmental science.	**K6, K5**
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		

Course – 20	**CORE ELECTIVE**
Title of the Course:	**HYDROLOGY AND OCEANOGRAPHY**
Credits:	03
Pre-requisites, if any:	Basic knowledge in geography
UNITS	
Unit -I	**HYDROLOGICAL CYCLE**
Systems approach in hydrology - human impact on the hydrological cycle; Precipitation, interception, Evaporation, Evapo-transpiration, Infiltration, Ground-water, Run off and overland flow - Hydrological input and output.	
Unit-II	**RIVER BASIN AND PROBLEMS OF REGIONAL HYDROLOGY**
Characteristics of river basins - basin surface run-off - measurement of river discharge - floods and droughts.	

Unit-III	OCEAN FLOOR TOPOGRAPHY AND OCEANIC MOVEMENTS	
Ocean Floor Topography and Oceanic Movements – Waves, Currents and Tides.		
Unit-IV	**OCEAN SALINITY AND TEMPERATURE**	
Ocean Salinity and Temperature – Distribution and Determinants		
Unit-V	**OCEAN RESOURCES**	
Coral Reefs - Marine Deposits - Ocean Resources: Types and Theories of Origin; Biotic, Mineral.		
Expected Course Outcomes:		
On the successful completion of the course, student will be able to:		
1	understand the Earth's hydrological and oceanographic systems, including the water cycle, ocean currents, and their interactions.	**K2, K1**
2	aware of the environmental challenges related to water resources, ocean health, and climate change, as well as potential solutions and management strategies.	**K5, K4**
3	develop the ability to collect, analyze, and interpret hydrological and oceanographic data, including fieldwork, remote sensing, and laboratory techniques.	**K3, K6**
4	appreciate the interdisciplinary nature of hydrology and oceanography, recognizing their connections with fields like geology, ecology, and meteorology.	**K2, K6**
5	prepare students for careers in fields related to water resource management, environmental conservation, climate science, and marine research.	**K5, K6**
K1 - Remember; **K2** - Understand; **K3** - Apply; **K4** - Analyze; **K5** - Evaluate; **K6** - Create		
Reading List (s) :		
1	Andrew. D. ward and Stanley, Trimble 2004. Environmental Hydrology, 2ndedition, Lewis Publishers, CRC Press, 502 Pages.	
2	Karanth, K.R., 1988. Ground Water: Exploration, Assessment and Development, TataMcGraw Hill, New Delhi, 720 Pages.	
3	Ramaswamy, C. 1985. Review of floods in India during the past 75 years: A Perspective. Indian National Science Academy, New Delhi, 164 Pages.	
4	Rao, K.L., 1982 . India's Water Wealth 2nd edition, Orient Longman, Delhi, 286 Pages.	

Recommended Text (s) :	
1	Singh, Vijay P. 1995. Environmental Hydrology. Kluwar Academic Publications, The Netherlands
2	Anikouchine W. A. and Sternberg R. W., 1973. The World Oceans: An Introduction to Oceanography, Prentice-Hall.
3	Kershaw S., 2000. Oceanography: An Earth Science Perspective, Stanley Thornes, UK
R1elated Online Contents [MOOC, SWAYAM, NPTEL, Websites etc.] :	
1	https://www.youtube.com/watch?v=6EJ6ZhTx1OA&pp=ygUOb2NlYW4gc2FsaW5pdHk%3D
2	https://www.youtube.com/watch?v=ZiULxLLP32s&pp=ygUKY29yYWwgcmVlZg%3D%3D

Method of Evaluation :

Internal Assessment	End Semester Examination	Total	Grade
25	75	100	

Methods of Assessment

Recall (K1) - Simple definitions, MCQ, Recall steps, Concept definitions

Understand/ Comprehend (K2) - MCQ, True/False, Short essays, Concept explanations, Short summary or overview

Application (K3) - Suggest idea/concept with examples, Suggest formulae, Solve problems, Observe, Explain

Analyse (K4) - Problem-solving questions, Finish a procedure in many steps, Differentiate between various ideas, Map knowledge

Evaluate (K5) - Longer essay/ Evaluation essay, Critique or justify with pros and con

Create (K6) - Check knowledge in specific or offbeat situations, Discussion, Debating or Presentations

Mapping with programme Outcomes:

PCOs	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO 1	1	1	1	1	2
CO 2	1	1	3	1	1
CO 3	1	2	3	2	1
CO 4	2	2	1	1	1
CO 5	1	1	2	1	1

Map **Course Outcomes (CO)** for each Course with **Programme Specific Outcomes (PSO)** in the 3-Point scale of **1,2, 3 (Strong, Medium and Low)**