

BHARATHIDASAN UNIVERSITY**TIRUCHIRAPPALLI-620024****B.Sc. GEOGRAPHY**

**CHOICE BASED CREDIT SYSTEM-LEARNING OUTCOMES BASED
CURRICULUM FRAMEWORK (CBCS - LOCF)**

(Applicable to the candidates admitted from the academic year 2026-2027 onwards)

Sem	Part	Courses	Title	Ins. Hrs.	Credits	Exam. Hours	Maximum Marks		
							Int.	Ext.	Total
I	I	Ability Enhancement Course – I (AEC - I)	(Tamil\$ / Other Languages+, #)	6	3	3	30	70	100
	II	Ability Enhancement Course – II (AEC - II)	English Course – I	6	3	3	30	70	100
	III	Core Course -1 (CC - 1)	Earth System Science	4	4	3	30	70	100
		Core Practical - 1 (CP - 1)	Scales And Relief Representation	4	4	3	40	60	100
		Allied Course – 1 (AC - 1)	Basics of IT – I / Statistics - I	4	4	3	30	70	100
		Allied Course Practical - I (AP-I)	Basics of IT – I / Statistics – I (Practical)	2	**	**	**	**	**
	IV	Value Education		2	2	3	30	70	100
		Interdisciplinary Course – 1 (IDC - 1) #	One Course from outside Department	2	2	3	30	70	100
	Total			30	22	--	--	--	700
II	I	Ability Enhancement Course – III (AEC - III)	(Tamil\$ / Other Languages+, #)	6	3	3	30	70	100
	II	Ability Enhancement Course – IV (AEC - IV)	English Course – II	6	3	3	30	70	100
	III	Core Course- 2(CC - 2)	Climatology and Oceanography	4	4	3	30	70	100
		Core Practical - 2(CP - 2)	Climatic Data Representation	4	4	3	40	60	100
		Allied Course – 2 (AC - 2)	Basics of IT – II / Statistics - II	4	4	3	30	70	100
		Allied Course Practical - I (AP-I)	Basics of IT – II / Statistics – II (Practical)	2	4	3	40	60	100
	IV	Skill Enhancement Course - 1 (SEC - 1) ##	Naan Mudhalvan Course	2	2	3	30	70	100
		Interdisciplinary Course – 2 (IDC - 2) #	One Course from outside Department	2	2	3	30	70	100
	Total			30	26	--	--	--	800

III	I	Ability Enhancement Course – V(AEC - V)	(Tamil\$ / Other Languages+, #)	6	3	3	30	70	100
	II	Ability Enhancement Course – VI (AEC - VI)	English Course – III	6	3	3	30	70	100
	III	Core Course- 3(CC - 3)	Geomorphology	4	4	3	30	70	100
		Core Practical - 3 (CP - 3)	Techniques of Terrain mapping and Analysis	4	4	3	40	60	100
		Allied Course – 3 (AC - 3)	Basics of Geology – I / Visual Communication – I	4	4	3	30	70	100
		Allied Course Practical - II (AP-II)	Basics of Geology – I / Visual Communication – I (Practical)	2	**	**	**	**	**
	IV	Skill Enhancement Course - 2 (SEC - 2) ##	Naan Mudhalvan Course	2	2	3	30	70	100
		Interdisciplinary Course – 3 (IDC - 3) \$\$	One Course from outside Department	2	2	3	30	70	100
		Health & Wellness @		--	1	--			100
Total			30	23	--	--	--	800	
I	Ability Enhancement Course – VII (AEC - VII)	(Tamil\$ / Other Languages+, #)	6	3	3	30	70	100	
IV	II	Ability Enhancement Course – VIII (AEC - VIII)	English Course – IV	6	3	3	30	70	100
	III	Core Course- 4(CC - 4)	Cartography	4	4	3	30	70	100
		Core Practical - 4(CP - 4)	Cartographic Appreciation and Map Interpretation	4	4	3	40	60	100
		Allied Course – 4 (AC - 4)	Basics of Geology – II / Visual Communication – II	4	4	3	30	70	100
		Allied Course Practical - II (AP-II)	Basics of Geology – II / Visual Communication – II (Practical)	2	4	3	40	60	100
	IV	Skill Enhancement Course - 3 (SEC - 3) ##	Naan Mudhalvan Course	2	2	3	30	70	100
		Interdisciplinary Course – 4 (IDC - 4) \$\$	One Course from outside Department	2	2	3	30	70	100
	Total			30	26	--	--	--	800
	Summer Internship / Industrial Activity during the Summer Vacation after II Year								

V	III	Core Course - 5 (CC - 5)	Geography of India	4	4	3	30	70	100
		Core Course - 6 (CC - 6)	Human Geography and Cultural Landscape	5	4	3	30	70	100
		Core Course - 7 (CC - 7)	Bio – Geography	5	4	3	30	70	100
		Core Course - 8 (CC - 8)	Geo – Informatics	5	4	3	30	70	100
		Core Practical - 5(CP - 5)	Geo – Informatics (Practical)	5	4	3	40	60	100
	IV	Skill Enhancement Course - 4 (SEC - 4)	Field Work and Report Writing	2	2	3	30	70	100
		Skill Enhancement Course - 5 (SEC - 5) ##	Naan Mudhalvan Course	2	2	3	30	70	100
		Introduction to Disaster Management		2	2	3	30	70	100
		Summer Internship / Industrial Activity @@	(with Viva-Voce)	--	2	--	20	80	100
	Total			30	28	--	--	--	900
VI	III	Core Course - 9(CC - 9)	Economic and Transport Geography	4	4	3	30	70	100
		Core Course- 10(CC - 10)	Geography of Asia	5	4	3	30	70	100
		Core Course- 11 (CC - 11)	Population and Settlement Geography	5	4	3	30	70	100
		Core Project Work(CPW) @@	Project Work (with Viva-Voce)	6	4	3	20	80	100
	IV	Value Added Course	Climate Change Vulnerability and Adaptation	2	1	--	30	70	100
		Skill Enhancement Course - 6 (SEC - 6)	Tourism and Travel Management	2	2	3	30	70	100
		Skill Enhancement Course - 7 (SEC - 7) ##	Naan Mudhalvan Course	2	2	3	30	70	100
		Environmental Studies		2	2	3	30	70	100
		Gender Studies		2	1	3	30	70	100
		Extension Activities *		--	1	--	--	--	--
	Total			30	25	--	--	--	900
	Grand Total			180	150	--	--	--	4900

ALLIED COURSE

First Year Students

Semester – I

Basics of IT – I / Statistics – I
Basics of IT – I / Statistics – I (P)

Semester – II

Basics of IT – I / Statistics – I
Basics of IT – I / Statistics – I (P)

Second Year Students

Basics of Geology – I / Visual Communication- I
Basics of Geology – I / Visual Communication- I (P)

Basic of Geology – II / Visual Communication - II
Basic of Geology – II / Visual Communication – II (P)

SKILL ENHANCEMENT COURSE(SEC)			
Sl. No.	Title of paper	Sl. No.	MANDATORY Naan Mudhalvan Scheme##
1.	Map Reading	1.	2 nd Semester:
2.	Population Data Mapping		
3.	Quantitative and Qualitative Data Mapping	2.	3 rd Semester:
4.	Sustainable Development		
5.	Field Work Report Writing	3.	4 th Semester:
6.	Tourism and Travel Management		
7.	Health and Well-being	4.	5 th Semester:
--		5.	6 th Semester:

INTERDISCIPLINARY COURSE(IDC) FOR WHO HAVE OPT TAMIL AS PART-I (for other Department Students only)	
1 st Semester	General Geography for Competitive Examination
2 nd Semester	Geography of India
3 rd Semester	Geography of Tamil Nadu
4 th Semester	Outlines of Continents

INTERDISCIPLINARY COURSE (IDC)# FOR WHO HAVE NOT OPT TAMIL AS PART - I		
Those who have studied Tamil upto 10 th +2 but opt for other languages in degree	1 st Semester	Special Tamil - I
	2 nd Semester	Special Tamil - II
Those who have not studied Tamil in school level	1 st Semester	Basic Tamil - I
	2 nd Semester	Basic Tamil - II
Those Students who opt for either special Tamil (or) Basic Tamil as IDCs, have to choose 2 more IDCs course in their 3 rd and 4 th Semester from Outside his/her department.		

INTERDISCIPLINARY COURSE (IDC) \$\$ FOR NCC CADETS ONLY	
NCC Course is a Compulsory Course for the NCC Cadets in the 3 rd Semester:	NCC Course is a Compulsory Course for the NCC Cadets in the 4 th Semester:
Introduction to NCC	1. Special Subject Army (or) 2. Special Subject Navy (or) 3. Special Subject Air force
Those students who opt for NCC Course as IDCs, have to choose 2 more IDCs course in their 1 st and 2 nd semester from outside his/her department.	

SUMMARY OF CURRICULUM STRUCTURE OF UG PROGRAMMES

Sl. No.	Part	Types of the Courses	No. of Courses	Credits for each Course	Total Credits	Marks
1.	I	Ability Enhancement Course	4	3	12	400
2.	II	Ability Enhancement Course	4	3	12	400
3.	III	Core Course	11	4	44	1100
4.		Core Practical	5	4	20	500
5.		Allied Course (AC)	4	4	16	400
6.		Allied Course Practical (AP)	2	4	8	200
7.		Core Project Work (CPW)	1	4	4	100
8.	IV	Skill Enhancement Course (SEC)	7	2	14	700
9.		Interdisciplinary Course (IDC)	4	2	8	400
10.		Value Education	1	2	2	100
11.		Health and Wellness	1	1	1	100
12.		Introduction to Disaster Management	1	2	2	100
13.		Summer Internship / Industrial Activity	1	2	2	100
14.		Value Added Course	1	1	1	100
15.		Environmental Studies	1	2	2	100
16.		Gender Studies	1	1	1	100
17.		EXTENSIONACTIVITIES (NCC / NSS / SPORTS / ANTI DRUG CELL / YRC & Any Other Activities	--	1	1	--
Total			49	-	150	4900

\$	For those who have studied Tamil upto10 th +2 (Regular Stream)															
+	Syllabus for other Languages should be onpar with Tamil at degree level															
#	Those who have studied Tamil upto10 th +2 but opt for other languages in degree level under Part -I should study special Tamil and those who have not studied Tamil in the school level should study Basic Tamil in Part– IV under the Interdisciplinary Course.															
**	Examination at the end of the next semester															
##	Naan Mudhalvan Scheme: As per the Naan Mudhalvan Scheme instructions, 5 courses from 2 nd to 6 th semester should be studied under Skill Enhancement Course.															
\$\$	NCC Course is one of the Choices in the Interdisciplinary Course. Only the NCC Cadets are eligible to choose this course. However, NCC Course is a Compulsory Course for the NCC Cadets.															
@	Health and Wellness: Assessments: • Use self-reflective worksheets to assess their understanding • submit the worksheets to internal audit / external audit • Every student’s activity report should be documented and the same have to be assessed by the Physical Director with Mentor. The evaluation should be for 100 marks. No examination is required. Scheme of Evaluation: <table><tr><th>Part</th><th>Description</th><th>Marks</th></tr><tr><td>A</td><td>Report</td><td>40</td></tr><tr><td>B</td><td>Attendance</td><td>20</td></tr><tr><td>C</td><td>Activities (Observation During Practice)</td><td>40</td></tr><tr><td colspan="2">Total</td><td>100</td></tr></table>	Part	Description	Marks	A	Report	40	B	Attendance	20	C	Activities (Observation During Practice)	40	Total		100
Part	Description	Marks														
A	Report	40														
B	Attendance	20														
C	Activities (Observation During Practice)	40														
Total		100														
@@	Summer Internship / Industrial Activity Internship will be carried our during the summer vacation after the second year. Viva-Voce will be conducted by the college and Marks shall be send to the University and the same will be included in the 5th semester Mark Statement. Summer Internship / Industrial Activity& Project Work Scheme of Evaluation: <table><tr><th>Description</th><th>Marks</th></tr><tr><td>Report</td><td>80</td></tr><tr><td>Viva-Voce</td><td>20</td></tr><tr><td>Total</td><td>100</td></tr></table>	Description	Marks	Report	80	Viva-Voce	20	Total	100							
Description	Marks															
Report	80															
Viva-Voce	20															
Total	100															
*	Extension Activities shall be outside instruction hours.															

Semester-I	Core Course - 1	Code:
Part-III	EARTH SYSTEM SCIENCE	Credits:4
Course Objectives ❖ To explain the origin of the universe and compare the characteristics of the solar system's planets, asteroids, and comets. ❖ To describe the Earth's geographic grid system and analyze the structure, composition, and systems of its internal layers. ❖ To examine the causes, waves, and global distribution patterns of earthquakes, volcanoes, and tsunamis. ❖ To classify igneous, sedimentary, and metamorphic rocks by their formation, practical uses, and roles in the rock cycle. ❖ Students will evaluate the evidence for continental drift and explain how plate tectonics and ocean currents reshape our dynamic planet.		
Unit 1: Earth System Science: Nature – scope – branches of earth sciences – recent trends. origin of the Universe: Bing Bang Theory – galaxy, Solar System: Origin (<i>Nebular Hypothesis, Planetesimal Hypothesis, Jeans Tidal Theory, Jeffery Collision Hypothesis, Binary star theory</i>)- Planets – inner planets – outer planets – Asteroids – meteoroids – comets – black hole.		
Unit 2: Earth: Origin, size, shape, rotation - revolution – latitude – longitude – time zone, Interior of Earth: Crust – Mantle – Core, Isostasy, magnetic field, temperature. Origin of atmosphere – ocean – life.		
Unit 3: Earthquake and Volcano: Earthquake: Causes and effects - seismic waves – distribution of earthquake, Volcanoes and volcanism, types and distribution of volcanoes - Tsunamis - World distribution.		
Unit 4: Rocks: Igneous rocks: Formation-types-uses, Sedimentary Rocks: sedimentation – forms – types – uses, Metamorphic rocks – Metamorphism – types and uses, rock cycle.		
Unit 5 Dynamic Planet: Wegener's continental drift theory: Evidences – criticism, Plate Tectonics: Major & Minor plates – Plate boundaries - Sea floor spreading - Oceanic current system.		
Unit 6 Current Contours: Space exploration – recent earthquake and volcanoes – recent fossil discoveries. (Not For Examination)		
References 1. Christopherson, R. W. and Birkeland, G. H., (2012) Geosystems: An Introduction to Physical Geography (8th edition), Pearson Education, New Jersey. 2. Emiliani, C. (1992). Planet Earth: cosmology, geology, and the evolution of life and environment. Cambridge University Press. 3. Diane Carlson, Charles C. Plummer Lisa, Hammersley (2010) Earth Revealed: Physical Geology, McGraw-Hill Science Engineering, USA. 4. Khullar, D.R., (2012) Physical Geography, Kalyani Publishers, New Delhi 5. Savindra Singh (2021) Physical Geography, Pravalika publication, Allahabad. 6. Siddhartha K. (2020) The Earth's Dynamic Surface: A Book of Geomorphology, Kitab Mahal Publishers., New Delhi.		

7. Strahler, A. H. and Strahler, A. N., (2001) Modern Physical Geography (4th Edition), John Wiley and Sons, Inc., New York
8. Surender Singh Jitender Saroha (2024) Physical Geography, Pearson, New Delhi, India

Course Outcome

Upon successful completion of the course, students will be able to:

CO1: Recall the fundamental concepts of Earth System Science, the origin and evolution of the Universe, Solar System and Earth, the structure and dynamics of the Earth, earthquakes and volcanoes, rock-forming processes, and plate tectonic mechanisms of the dynamic planet

CO2: Apply Earth Science concepts, theories, and principles to explain the origin and evolution of the Universe, Solar System, and Earth; interpret Earth systems and geodynamic processes; classify rocks and rock-cycle processes; and analyze plate tectonic movements.

CO3: Compare and evaluate different theories about the universe, analyze scientific data to understand Earth's hidden layers and rocks, and judge how plate tectonics cause major natural hazards around the world.

CO4: Demonstrate self-directed and lifelong learning by critically exploring Earth system processes, geological phenomena, natural hazards, and environmental changes, and applying geoscientific knowledge to promote sustainable development and support the achievement of the Sustainable Development Goals (SDGs).

CO5: Communicate Earth science concepts, geological processes, geoscientific data, and environmental challenges effectively through oral, written, and visual forms, using appropriate scientific terminology to engage diverse audiences, promote environmental awareness, and support informed decision-making for sustainability

CO6: Analyze and interpret the Earth science phenomena through critical thinking and scientific reasoning, while engaging in reflective evaluation of data, theories, and their applications to earth sciences and sustainability challenges.

Mapping of Pos with Cos

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	3	3	3	-	-	-	1	2
CO2	3	3	3	3	3	2	-	-	3	2
CO3	3	3	3	3	2	1	-	-	3	2
CO4	3	3	3	3	3	3	-	-	3	3
CO5	3	3	3	3	3	2	-	2	3	3
CO6	3	3	3	3	3	-	-	3	3	3

Semester-I	Core Practical -1 SCALES AND RELIEF REPRESENTATION (Practical)	Code:
Part-III		Credits: 4
Course Objectives		
❖ To understand and apply different types of map scales and map transformation techniques. ❖ To determine and convert bearings for accurate directional measurements and map interpretation. ❖ To construct and interpret cylindrical, zenithal, and conical map projections. ❖ To represent landforms using contours, contour diagrams, profiles, and block diagrams. ❖ To calculate and analyze slope, gradient, and other relief characteristics for terrain interpretation		
Ex-i Map Scale - Construction of Graphical, Comparative and Diagonal Scale		
Ex-ii Enlargement and Reduction of Maps		
Ex-iii Determination of True North Bearings and Conversion of Bearings		
Ex-iv Construction of Map Projections - Cylindrical and Zenithal Map Projections		
Ex-v Construction of Conical projections		
Ex-vi Methods of Representation of Relief and Preparation of a Contour Map		
Ex-v Drawing of contour diagram		
Ex –vi Drawing of Profiles and Calculation of Gradient and Slope		
Ex - vii Methods of Average Slope Determination		
Ex - viii Representation of Relief on a Block Diagram		
References		
1. Gopal Singh (1998) Map Work and Practical Geography (4th Edition), Vikas Publishing House, Ahmedabad. 2. King, C. A.M (1966) Techniques in Geomorphology, Edward Arnold, London. 3. Misra, R.P. and Ramesh, A. (1986) Fundamentals of Cartography, Concept Publishing Company Delhi. 4. Monk House, F.J. and Wilkinson, H.R. (1973) Maps and Diagrams, Methuen & Co Ltd, London. 5. Saha, P. and Basu, P. (2014) Advanced Practical Geography, Books and Allied Ltd., Kolkatta. 6. Sarkar A. K. (1997) Practical Geography: A Systematic Approach, Oriental Longman, Calcutta. 7. Singh, R.L. and Singh, R. P. B. (2009) Elements of Practical Geography, Kalyani Publishers, New Delhi. 8. Singh, R.L. and Singh, R. P. B. (2009) Elements of Practical Geography, Kalyani Publishers, New Delhi. 9. Zulfequar Ahmad Khan, M.D., (1998) Text book of Practical Geography, Concept Publishing Company, New Delhi. 1. 10. Babu Deokar and Anand Pandit (2020) Practical Geography, LAP Lambert Academic Publishing Company, New Delhi		

Course Outcomes

CO1: Construct and use graphical, comparative, and diagonal scales for map measurements and representation.

CO2: Enlarge and reduce maps accurately using appropriate cartographic techniques.

CO3: Determine true north bearings and convert different types of bearings for spatial analysis.

CO4: Construct and interpret cylindrical, zenithal, and conical map projections for geographic representation.

CO5: Prepare and interpret contour maps, contour diagrams, profiles, and block diagrams to represent terrain features.

CO6: Calculate and analyze gradient, slope, and average slope to evaluate topographic characteristics and landforms.

Mapping of Pos with Cos

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	1	2	3	1	3	1	-	3
CO2	-	3	1	2	3	1	3	1	-	3
CO3	-	3	1	2	3	-	3	-	-	1
CO4	-	3	2	1	3	-	3	-	-	2
CO5	-	3	2	2	3	1	3	1	1	2
CO6	-	3	3	3	3	1	3	1	-	2

Semester-I	INTERDISCIPLINARY COURSE 1	Code:
Part-IV	General Geography for Competitive Examination	Credits: 2
Course Objectives ❖ To understand the origin, structure, and components of the Universe, Solar System, Earth, and its major spheres. ❖ To explain the dynamic processes of the Earth, including plate tectonics, earthquakes, and volcanism. ❖ To examine the elements and processes of the atmosphere and their influence on weather and climate. ❖ To understand the physical characteristics and processes of the oceans, including ocean-floor features, currents, tides, and coral reefs. ❖ To analyze human–environment relationships, population dynamics, migration patterns, and contemporary global environmental issues.		
Unit 1: Universe: Origin of the Universe: Bing Bang Theory – galaxy, Solar System: Origin of solar system (Nebular Hypothesis) Planets – inner planets – outer planets – Asteroids – meteoroids. Earth: Size, shape, rotation - revolution – latitude – longitude – time zone, Interior of Earth: Crust – Mantle – Core. Major Spheres: Lithosphere - Atmosphere – Biosphere.		
Unit 2: Dynamic Earth: Continental Drift Theory – Plate Tectonics – Earthquake: Seismic waves – distribution – Volcano: Forms – Types – distribution.		
Unit 3: Climatology: Structure and Composition of atmosphere - Insolation - Heat Balance - Major Pressure belts of the world - winds (Planetary and Local winds) - Clouds - Rainfall - Cyclones		
Unit 4: Oceanography: Morphology of Ocean floor - Bottom Topography of Atlantic - Pacific and Indian Oceans – Major cold and warm currents - Tides - Coral reef.		
Unit 5: Human Geography: Man and Environment - World Population:- Growth - Distribution - Population problems. Migration:- Types - Causes and Consequences		
Unit 6: Current Contour (Not for Examination) : Recent Space Exploration – Disaster associated with tectonics – Climate change – Ocean exploration – Internal and international migration of India and global.		
References 1. Diane Carlson, Charles C. Plummer Lisa, Hammersley (2010) Earth Revealed: Physical Geology, McGraw-Hill Science Engineering, USA. 2. Khullar, D.R., (2012) Physical Geography, Kalyani Publishers, New Delhi 3. Savindra Singh (2021) Physical Geography, Pravalika publication, Allahabad. 4. Siddhartha K. (2020) The Earth's Dynamic Surface: A Book of Geomorphology, Kitab Mahal Publishers., New Delhi. 5. Lal, D S (2005) Climatology, Sharda Pustak Bhawan, Allahabad 6. Husain M, (2011), Human Geography (Fourth Edition)-Rawat Publications, Jaipur. 7. Paul .L.Knox,(2015) Human Geography place and Regions in Global Context -6th Edition, Pearson India.		

8. Rueda A, (2021), AP Human Geography 2021 and 2022 Study Guide, Test Prep Books
9. Bhalia. C (2008) Human Geography concept and Issues-Attantic Publishers New Delhi
10. Sharma, R. C. & Vatal, M., (1970) Oceanography for Geographers, Chaitanya Publishing House, Allahabad

Course Outcome

CO1: Recall and label the origin of Universe, Solar System, Earth, and its major spheres.

CO2: Describe the dynamic processes of the Earth, including continental drift, plate tectonics, earthquakes, and volcanism.

CO3: Analyze atmospheric structure, weather phenomena, and climatic processes influencing the Earth's environment.

CO4: Interpret the physical features and processes of the oceans, including ocean-floor relief, currents, tides, and coral reefs.

CO5: Examine population growth, distribution, migration, and human–environment interactions from a geographical perspective.

CO6: Evaluate contemporary global issues such as climate change, natural hazards, space exploration, ocean exploration, and migration using geographical knowledge and critical thinking skills

Mapping of Pos with Cos

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3		2	2	2	3	3	2	3
CO2	2		3							
CO3		1			2		3			
CO4	2		2			3		3	3	2
CO5		1								
CO6	2			3	2	1	1	1	1	2

Semester-I	Core Course-2 CLIMATOLOGY AND OCEANOGRAPHY	Code: CC-2
Part-III		Credits: 4
Course Objectives ❖ To understand the basics of climatic elements, atmospheric composition, Temperature factors and distribution ❖ To describe Pressure and Wind system, reveal the factors of moisture dynamics in the atmosphere. ❖ To examine the atmospheric disturbances, global factors, classification of climate and changing pattern of climate. ❖ To classify ocean morphology of major oceans of the world ❖ To evaluate the physical properties , dynamics of ocean currents and marine resources.		
UNIT – 1 Basics of Climate: Scope and Content – Climatic Elements- Atmosphere:Composition, Structure, Insolation and Temperature: Factors and Distribution - Heat Budget		
UNIT – 2 Dynamics of Atmosphere: Atmospheric Pressure and Wind system: Factors, distribution and Types. Atmospheric Moisture: Evaporation, Humidity, Condensation, Fog and Clouds, Precipitation Types, Stability and Instability		
UNIT – 3 Atmospheric disturbances: Cyclones: Tropical Cyclones, Temperate Cyclones, Monsoon - Origin and Mechanism, El Nino – LA Nina – Basics Climatic Classification – Climate change: indicators, factors, impact and international measures adopted.		
UNIT – 4 Ocean Morphology: Hypsometric curve – Continental shelf – Continental slope – Abyssal Plain – Deeps and Trenches - Bottom Relief of the Pacific, Atlantic and Indian Oceans		
UNIT – 5 Ocean Dynamics and resources: Ocean Temperature and Salinity: Distribution and factors – Ocean Currents: Types - Currents of Pacific, Atlantic and Indian Oceans - Ocean Deposits - Coral Reefs: Formation and types		
UNIT – 6 Current Contours: (Not For Examination) International setups and treaties on climate change, Marine Science, Potential and Organizations in India		
References 1. Critchfield (2008) General Climatology, 4th Edn, Pearson Education India 2. Gochenleong (2001): Certificate Physical and Human Geography, Oxford university press, New Delhi. 3. Jitender Saroha, Surender Singh (2024)Physical Geography, Ist Edition by Pearson, New Delhi 4. Khullar, D.R., (2012) Physical Geography, Kalyani Publishers, New Delhi 5. Lal, D S (2005) Climatology, Sharda Pustak Bhawan, Allahabad 6. Lal D.S, (2021) Physical Geography, Sharda Psutak Bhawan, Allahabad 7. Roger. G. Barry & Richard J. Choley, (2002): Atmosphere, Weather and Climate, Seventh Edition, Methunen& co Ltd, New York. 8. Savindra Singh (2021) Physical Geography, Pravalika publication, Allahabad. 9. Sharma, R. C. &Vatal, M., (1970) Oceanography for Geographers, Chaitanya Publishing House,Allahabad 10. Siddhartha. K , (2000): Atmosphere, Weather and Climate, Kisalaya publications Pvt Ltd Delhi.		
Learning Outcome CO1: Understands Climatic elements , the composition, Structure of the Atmosphere, Insolation, Heat Balance, Horizontal and Vertical Distribution of Temperature and defining the pattern of Atmospheric Pressure and wind		

CO2: Apply the elements of climate to identify pattern of climate and able to Interpret Atmospheric Moisture, Stability and Instability, Cyclones and ocean dynamic; classifying wind, air masses, fronts, clouds and precipitation.

CO3: Analyze and examining the cyclones, factors of monsoon, impacts of climate change and tele links.

CO4: Demonstrate the ability of recalling and expressing the variables of climate, geographical association, driving mechanism of global energy through climate and ocean currents: Able to correlate the monsoon and Sea surface temperature factors.

CO5: Exhibit self-directed, lifelong learning by critically exploring new knowledge and ideas over dynamics of climatic elements, ocean dynamics and its environmental consequences and resource potential.

CO6: Evaluate the need and formulating own strategy to conserve climate and realizes the community programmes and acting upon.

Mapping of Pos with Cos

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	-	2	2	2	-	1	1	2
CO2	3	3	2	3	2	3	3	3	3	3
CO3	3	3	1	3	1	2	-	-	3	3
CO4	3	3	3	3	3	2	2	3	3	3
CO5	3	3	2	3	3	3	2	2	3	3
CO6	3	3	3	3	2	2	3	2	3	3

Semester-II	Core Practical-2 CLIMATIC DATA REPRESENTATION (Practical)	Code:
Part-III		Credits:4
Course Objectives		
❖ To develop the ability to construct and interpret climatic graphs, including climatic graphs, ombrothermic graphs, and water balance graphs for analyzing climate characteristics. ❖ To equip students with skills in preparing and analyzing rainfall and climate-related diagrams such as rainfall dispersion graphs, ergographs, and climatographs. ❖ To enable students to apply climatic data in the preparation and interpretation of specialized climatic representations including Foster’s climograph, Taylor’s climograph, and hythergraphs. ❖ To train students in the analysis of atmospheric circulation patterns through the construction of wind roses, wind and visibility roses, and cyclone tracking techniques. ❖ To develop competency in thematic climatic mapping through the preparation and interpretation of isothermal, isohyetal, and rainy-day distribution maps for spatial climate analysis.		
EX: 1Climatic Graph EX: 2 Ombrothermic Graph EX: 3 Water balance Graph EX: 4 Rainfall Dispersion EX: 5 Ergograph EX: 6 Climatograph EX: 7 Climograph (E.E .Fosters) EX: 8 Climograph (Taylor’s) EX: 9 Hythergraph EX: 10 Wind Rose – Simple, Octagonal and Super Imposed) EX: 11 Wind and Visibility Rose EX: 12 Cyclone Tracking EX: 13 Isothermal Map EX: 14 Isohyetal Map EX: 15 Mapping of Rainy Days		
References		
1. Ashis Sarkar., (2015) The text book of practical geography A systematic approach, 3rd edition, Orient Blackswan Private Limited - New Delhi 2. Bagulia A.M (2006):Practical Geography, Anmol Publishers. 3. Bapu Deokar and Anand Pandit (2020) Practical Geography, LAP Lambert Academic Publishing Company, New Delhi 4. Lal, D S (2022) Climatology, Sharda Pustak Bhawan, Allahabad 5. Siddhartha K. (2020) The Earth's Dynamic Surface: A Book of Geomorphology, Kitab Mahal Publishers., New Delhi. 6. Saha, P. and Basu, P. (2014) Advanced Practical Geography, Books and Allied Ltd., Kolkatta		

Learning Outcome

CO1: Understand the visualization of climatic variables (average temperature and rainfall), revealing the Relationship between rainfall and temperature through the year and analyzing Water surplus and deficit throughout the year.

CO2: Explaining long-term normal trend of rainfall, finding interannual relationship of temperature and rainfall and demarcating thermal zones

CO3: Differentiating wet and dry periods, climatic thresholds, evaluating spatial and temporal climatic comfort using temperature and humidity and dividing climatic zones.

CO4: Exploring normal pattern of wind direction and visibility. Predicting cyclone tract and modeling cyclone movement.

CO5: Visualizing spatial pattern of rainfall, temperature and estimating rainy days.

CO6: Attaining application and research skills over applied climatology

Mapping of Pos with Cos

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	-	3	3	3	3	2	3	3	2	2
CO2	-	3	3	2	2	2	3	2	2	2
CO3	-	3	3	2	2	1	3	2	2	2
CO4	-	3	3	3	3	2	3	3	2	2
CO5	-	3	1	1	2	1	2	2	1	1
CO6	-	3	3	3	3	2	3	2	3	2

Semester-II	INTERDISCIPLINARY COURSE - 2	Code:
Part-III	GEOGRAPHY OF INDIA	Credits: 2
Course Objectives ❖ To provide an understanding of India's geographical setting, physiographic divisions, population distribution, growth patterns, and associated demographic challenges. ❖ To examine the drainage systems, climatic characteristics, monsoon mechanisms, and climatic regions of India and their influence on human activities. ❖ To develop knowledge of India's forest resources, wildlife management practices, agricultural systems, and the spatial distribution of major crops. ❖ To analyze the distribution of mineral resources, industrial development, and emerging industrial sectors contributing to India's economic growth. ❖ To evaluate the role of transportation networks, ports, and international trade in facilitating regional development and economic integration in India		
Unit 1: Location: Location – Administrative divisions - Physiographic Divisions –Himalayas – great plains – coastal plain – deccan plateau – islands, Population: Factors controlling distribution – density - Growth - Problems of Over population.		
Unit 2: Drainage & Climate: East flowing & west flowing rivers – canals – lakes – river basin – multipurpose projects, Climate – seasons – Indian monsoon - Climatic regions		
Unit 3: Forest & Agriculture: Forest types – distribution – forest products – wild life management, Agriculture: Types of agriculture - Problems andprospects of Indian Agriculture - Distribution and Cultivation Wheat - Rice - Cotton - Sugarcane - Coffee – Tea.		
Unit 4: Minerals & Industries:- Iron ore - Bauxite - Manganese – MicaCopper – coal – petroleum, Industries :- Iron and Steel - cotton textile - Sugar - Chemical –automobile industries – Nuclear power plants – IT Industry – Industrial corridors of India.		
Unit 5: Transport & Trade:- Asian Highway - National Highways - Railways - Inland Waterways - Airways.Ports:- Major ports, Trade: Major exports and Imports.		
Unit 6: Current Contours: (Not For Examination) Applied geomorphology – groundwater exploration – mineral exploration – tectonic geomorphology – quantitative geomorphology		
References 1. Aher, A. B, Chaudhari, A. P & Chaudhari Archana, (2015). Regional Geography of India, Prashant, Publication Jalgaon. 2. Chopra J.K., (2010). Geography of India, Unique Publisher, New Delhi. 3. Douglas L. Johnson, (2009). World Regional Geography, Tenth edition, Pearson Education Inc, New Jersey. 4. Jitender Saroha and Surender Singh (2022) Geography of India, Pearson, India. 5. Kapur, Anu. (2002) Indian Geography: Voice of Concern, Concept Publishing Co. 6. Khullar, D.R., (2014). India: A Comprehensive Geography, Kalyani Publishers, New Delhi. 7. Majid Husain, (2021). Geography of India, Mc Graw Hill Publishers, 8. Ravikumar P (2024) Geography of India, McGraw Hill, India. 9. Sharma, H.S. (Ed.). 2004. Progress in Indian Geography 2000-2004: A Country Report, New Delhi: Indian National Science Academy 10. Singh, R. B. and Pawel, (2016). Environmental Geography of South Asia, Springer, Japan		

Course Outcome

Upon successful completion of the course, students will be able to:

CO1: Recall and explain the physical, demographic, and economic characteristics of India and their spatial variations across different regions.

CO2: Analyze the interrelationships between physiography, climate, drainage, natural resources, and human activities in shaping India's geographical landscape.

CO3: Evaluate the distribution, utilization, and management of natural resources, including forests, wildlife, minerals, and water resources, from a sustainability perspective.

CO4: Assess the role of agriculture, industries, transportation, and trade in India's regional and national economic development.

CO5: Communicate informed perspectives on India's physical and economic geography through the interpretation of geographical data, maps, and regional case studies

CO6: Apply geographical concepts, spatial analysis, and critical thinking skills to interpret contemporary issues and development challenges in India.

Mapping of Pos with Cos

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	3	3	-	3	-	-	-	-
CO2	3	3	3	3	-	3	-	-	3	3
CO3	3	3	3	3	2	3	2	2	3	3
CO4	3	2	3	2	2	3	2	2	3	2
CO5	3	3	3	3	3	3	3	3	3	3
CO6	3	3	3	2	2	3	3	3	3	3

Semester-III	Core course 3	Code:
Part-III	GEOMORPHOLOGY	Credits: 4
Course Objectives ❖ To understand the origin, structure, and components of the Universe, Solar System, Earth, and its major spheres. ❖ To explain the dynamic processes of the Earth, including plate tectonics, earthquakes, and volcanism. ❖ To examine the elements and processes of the atmosphere and their influence on weather and climate. ❖ To understand the physical characteristics and processes of the oceans, including ocean-floor features, currents, tides, and coral reefs. ❖ To analyze human–environment relationships, population dynamics, migration patterns, and contemporary global environmental issues.		
Unit – 1 Geomorphology: Definition - nature – scope – concept of uniformitarianism - fundamental concepts of geomorphology – Classification of landform: Primary – secondary – tertiary – recent trends in geomorphology.		
Unit – 2 Endogenic Forces: Epirogenic & orogenic (slow movement) mountain building –types: fold and block mountain. Volcano – Earthquake (sudden movement) Fold and its types – Fault and its types. Exogeic forces: Factors control weathering - weathering-Types: Physical – chemical – biological, Mass wasting: rapid and slow mass movements, Erosion – transportation - deposition.		
Unit – 3 Fluvial, Karst & Glacial: Streams – types – Fluvial Process and landforms (erosional and depositional), Karst: Landforms (Erosional and Depositional Landforms) Glaciers: Types of Glaciers – Glacial Land forms (Erosional and Depositional)		
Unit – 4 Aeolian And Marine: Work of Wind- Erosional Landforms and Depositional Landforms. Work of waves- Erosional landforms- Depositional landforms of Sea waves and Types of coasts.-		
Unit – 5: Slope: Elements of slope – Slope development: Slope decline & slope replacement, Cycle of erosion: Davis W. M and Walther Penck.		
Unit – 6 Current Contours (Self-directed learning activities for Continuous Internal Assessments Only):		
References 1. Diane Carlson, Charles C. Plummer Lisa, Hammersley (2010) Earth Revealed: Physical Geology, McGraw-Hill Science Engineering, USA. 2. Khullar, D.R., (2012) Physical Geography, Kalyani Publishers, New Delhi 3. Savindra Singh (2021) Physical Geography, Pravalika publication, Allahabad. 4. Siddhartha K. (2020) The Earth's Dynamic Surface: A Book of Geomorphology, Kitab Mahal Publishers., New Delhi. 5. Lal, D S (2005) Climatology, Sharda Pustak Bhawan, Allahabad 6. Husain M, (2011), Human Geography (Fourth Edition)-Rawat Publications, Jaipur. 7. Paul .L.Knox,(2015) Human Geography place and Regions in Global Context -6th Edition, Pearson India. 8. Rueda A, (2021), AP Human Geography 2021 and 2022 Study Guide, Test Prep Books 9. Bhalia. C (2008) Human Geography concept and Issues-Attantic Publishers New Delhi 10. Sharma, R. C. & Vatal, M., (1970) Oceanography for Geographers, Chaitanya Publishing House, Allahabad		

Course Outcome

Upon successful completion of the course, students will be able to:

CO1: Recall the fundamental concepts of geomorphology, Earth's structure, rock types, geological structures, and geomorphic processes responsible for landform development.

CO2: Apply geomorphological concepts and theories to explain earth movements, continental drift, earthquakes, volcanoes, weathering processes, and landscape and slope evolution.

CO3 Analyze and evaluate the role of fluvial, glacial, groundwater, aeolian, and marine processes in shaping erosional and depositional landforms.

CO4: Demonstrate self-directed and lifelong learning by exploring recent developments in geomorphology, environmental change, natural hazards, and sustainable land management.

CO5: Communicate geomorphological concepts, geomorphic processes, and landform characteristics effectively through oral, written, and graphical presentations.

CO6: Interpret geomorphological phenomena using critical thinking, scientific reasoning, analytical skills, and research-oriented approaches to understand landscape and slope dynamics and environmental challenges

Mapping of Pos with Cos

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	2	2	2	1	2	2	2	2
CO2	1	3	3	3	3	2	3	2	2	2
CO3	-	3	2	1	1	1	2	1	1	2
CO4	3	3	2	2	2	3	2	3	3	3
CO5	-	3	2	2	2	3	2	2	1	1
CO6	-	3	3	3	3	1	3	2	3	2

Semester-III	Core practical - 3 TECHNIQUES OF TERRAIN MAPPING AND ANALYSIS (Practical)	Code:
Part-III		Credits:4
Course Objectives		
❖ To develop practical skills in terrain representation through the construction and interpretation of different types of topographical profiles. ❖ To understand and apply quantitative methods of slope analysis for the assessment of landform characteristics and relief features. ❖ To analyze drainage basin morphology using linear, areal, and relief aspects for geomorphological interpretation. ❖ To prepare, interpret, and compare various climatic diagrams for understanding climatic characteristics and environmental conditions.		
Interpolation		
Ex: 1 Drawing contour (Elevation Values)		
Slope Analysis		
Ex: 2 Smith's Method		
Ex: 3 Wentworth's Method		
Ex: 4 Robinson's Method		
Profile Analysis		
Ex: 5 Serial Profile		
Ex: 6 Superimposed Profile		
Ex: 7 Projected Profile		
Ex: 8 Composite Profile		
Morphometric Analysis		
Ex: 9 Linear Aspects		
Ex: 10 Areal Aspects		
Ex: 11 Relief Aspects		
Ex: 12 longitudinal profile		
References		
1. Bapu Deokar and Anand Pandit (2020) Practical Geography, LAP Lambert Academic Publishing Company, New Delhi 2. Gopal Singh (1998) Map Work and Practical Geography (4th Edition), Vikas Publishing House, Ahmedabad. 3. Misra, R.P. and Ramesh, A. (1986) Fundamentals of Cartography, Concept Publishing Company Delhi. 4. Monk House, F.J. and Wilkinson, H.R. (1973) Maps and Diagrams, Methuen & Co Ltd, London. 5. Saha, P. and Basu, P. (2014) Advanced Practical Geography, Books and Allied Ltd., Kolkatta. 6. Sarkar A. K. (1997) Practical Geography: A Systematic Approach, Oriental Longman, Calcutta. 7. Singh, R.L. and Singh, R. P. B. (2009) Elements of Practical Geography, Kalyani Publishers, New Delhi. 8. Singh, R.L. and Singh, R. P. B. (2009) Elements of Practical Geography, Kalyani Publishers, New Delhi. 9. Zulfequar Ahmad Khan, M.D., (1998) Text book of Practical Geography, Concept Publishing Company, New Delhi.		

Course Outcome

Upon successful completion of the course, students will be able to:

CO1: Construct contour maps and perform slope analysis using topographic data to represent and interpret terrain characteristics.

CO2: Apply quantitative methods such as Smith's, Wentworth's, and Robinson's techniques to analyze slope and relief variations in landscapes.

CO3: Prepare and interpret different types of topographic profiles, including serial, superimposed, projected, and composite profiles, for terrain evaluation.

CO4: Analyze landform characteristics through profile analysis and longitudinal profiles to understand drainage and landscape evolution.

CO5: Compute and interpret morphometric parameters of drainage basins using linear, areal, and relief aspects for geomorphological assessment.

CO6: Integrate cartographic, morphometric, and profile analysis techniques to evaluate terrain forms and demonstrate critical thinking in geomorphological investigations

Mapping of Pos with Cos

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	-	2	3	-	3	2	2	3
CO2	3	3	-	3	2	-	2	3	2	2
CO3	3	2	2	3	2	-	3	3	3	3
CO4	3	3	2	3	3	2	3	3	2	2
CO5	3	2	3	3	3	2	3	3	3	3
CO6	3	3	3	3	3	2	3	2	3	3

Semester-I	Interdisciplinary Course - 3	Code:
Part-III	GEOGRAPHY OF TAMIL NADU	Credits: 2
Course Objectives ❖ To understand the geographical location, physiography, climate, drainage systems, and environmental characteristics of Tamil Nadu. ❖ To examine the distribution and significance of soils, forests, wildlife resources, and biodiversity conservation in Tamil Nadu. ❖ To analyze agricultural patterns, major crops, livestock resources, fisheries, and their contribution to the state's economy. ❖ To study the distribution of mineral resources, industrial development, and regional economic growth in Tamil Nadu. ❖ To evaluate population characteristics, transportation networks, trade activities, and emerging economic developments for sustainable regional planning		
Unit 1: Physical Features and Climate of Tamil Nadu: Location – Administrative Units – Physiography – Mountains – Plateaus – Plains, Climate: Seasons – South West Monsoon – North East Monsoon – Cyclones – Distribution of Rainfall – Drainage: Rivers – lakes – reservoirs and dams – irrigation.		
Unit 2: Soils, Vegetation, and Wildlife Resources: Soils – Types - distribution – Natural Vegetation – Forests – Types – distribution, Wildlife Sanctuaries – Bird Sanctuaries.		
Unit 3: Agriculture : Crops: Distribution of Crops – Food Crops (Paddy, Millets, Pulses) – Cash Crops (Sugarcane, Cotton) – Plantation Crops (Tea, Coffee) – Livestock (Cattle, Sheep, Poultry) – Fisheries (Inland and Deep-Sea Fishing).		
Unit 4: Mineral Resources and Industries: Distribution of Minerals and Industries – Metallic and Non-Metallic Minerals (Iron, Manganese, Bauxite, Copper, Mica) – Energy and Power Resources: Coal – Petroleum – Natural Gas – Nuclear, Non-conventional energy, Agro-Based Industries (Textile, Sugar, Paper) – Cement Industry – Automobile Industry – Information Technology (Software) - Industrial corridors of Tamil Nadu		
Unit 5: Population, Transport, and EconomicActivities: Population Distribution – Growth – Density – Population Problems – Transportation: Surface: National – State – district roads - Railways, Airports and Ports – Trade (Import and Export) – Special Economic Zones (SEZs).		
Unit 6: Current Contours: (Not for Examination)_ Government initiatives – popular schemes – industrial MOUs – rainfall pattern - heat wave – disaster management.		
References 1. Aher, A. B, Chaudhari, A. P & Chaudhari Archana, (2015). Regional Geography of India, Prashant, Publication Jalgaon. 2. Chopra J.K., (2010). Geography of India, Unique Publisher, New Delhi. 3. Douglas L. Johnson, (2009). World Regional Geography, Tenth edition, Pearson Education Inc, New Jersey. 4. Jitender Saroha and Surender Singh (2022) Geography of India, Pearson, India. 5. Kapur, Anu. (2002) Indian Geography: Voice of Concern, Concept Publishing Co. 6. Khullar, D.R., (2014). India: A Comprehensive Geography, Kalyani Publishers, New Delhi. 7. Majid Husain, (2021). Geography of India, Mc Graw Hill Publishers, 8. Ravikumar P (2024) Geography of India, McGraw Hill, India. 9. Sharma, H.S. (Ed.). 2004. Progress in Indian Geography 2000-2004: A Country Report, New Delhi: Indian National Science Academy 10. Tamil Nadu Govt. (latest) Statistical Hand Book, Tamil Nadu		

Course Outcome

Upon successful completion of the course, students will be able to:

CO1: Demonstrate comprehensive knowledge of India's physical setting, population characteristics, natural resources, and economic activities.

CO 2: Analyze the influence of physiography, climate, and drainage systems on the distribution of population, agriculture, industries, and settlements in India.

CO 3: Examine the spatial distribution and utilization of forests, wildlife, water resources, minerals, and energy resources across different regions of India.

CO 4: Evaluate the patterns, challenges, and prospects of agricultural and industrial development in the context of regional disparities and sustainable growth.

CO 5: Assess the significance of transportation networks, ports, and trade in promoting economic integration and regional development in India.

CO 6: Apply geographical concepts, map interpretation skills, and critical thinking to investigate contemporary environmental, demographic, and economic issues in India and propose informed solutions.

Mapping of Pos with Cos

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	2	2	2	1	2	2	1	2
CO2	-	3	3	2	3	3	3	2	2	2
CO3	-	3	1	1	1	2	1	1	1	3
CO4	-	3	3	2	3	3	3	2	2	2
CO5	-	3	2	2	2	2	2	3	2	1
CO6	-	3	3	3	3	3	2	3	2	2

Semester-IV	Core course 4	Code:
Part-III	CARTOGRAPHY	Credits: 4
Course Objectives ❖ To develop an understanding of the principles, concepts, evolution, and communication functions of cartography and map-making. ❖ To equip students with the knowledge and skills required for map scale determination, coordinate systems, bearings, and the selection and application of map projections. ❖ To provide training in the collection, classification, compilation, generalization, design, and construction of maps using standard cartographic techniques and tools. ❖ To enhance students' ability to prepare, interpret, and evaluate thematic, topographic, and atlas maps for effective spatial representation and analysis. ❖ To familiarize students with modern cartographic technologies, including GIS, remote sensing, web mapping services, digital cartography, online GIS platforms, and mobile mapping applications.		
Unit 1: Cartography: Definition, scope and content - cartography as a science of communication - Map – Definition, types and uses -Development of Cartography.		
Unit 2: Map scales and Projections: Determination of map scales – Enlargement and reduction Direction and Bearings – Co-ordinate system – Projections – Classification and uses.		
Unit 3: Map data: Collection and classification – Base map – Compilation – Generalization.		
Unit 4: Map Design: Map design and layout – Symbolization – Lettering, Standardization of Names – Styles -Mechanics of Map Construction: Drawing materials, Equipment and instruments.		
Unit 5: Thematic mapping : Thematic and complex Mapping – Topographic Mapping – Atlas Mapping – Mapping organizations of India: SOI - NATMO – NRSC/ISRO – remote sensing and GIS in Cartography – Web Map Services (Bhuvan - Online maps portal - Survey of India - TNGIS)		
Unit 6: Current Contours: (Not for Examination) Online GIS – Digital Cartography — mobile maps.		
References 1. Erwin Raiz, (1948). General Cartography, McGraw Hill Company., New York. 2. Keates, J. S., (1982). Understanding Maps, Longman, London and New York. 3. Lawrence, G.R.P., (1979). Cartographic Methods, Methuen, London. 4. Misra, R.P. and Ramesh, A., (2002). Fundamentals of Cartography, Concept 5. Publication Company, New Delhi. 6. Monkhouse, F.J. and Wilkinson, H.R., (1989), Maps and Diagrams, B.I.Publications, New Delhi. 7. Robinson, A.H., (1984). Elements of Cartography, John Wiley, London. 8. Monkhouse, F.J. and Wilkinson, H.R. (1994) Maps and Diagrams, Methuen, London 9. Singh, R.L. and Dutt, P.K. (1979) Elements of Practical Geography, Kalyani Publishers, New Delhi 10. Terry A. Slocum , Robert B. McMaster, et al (2022) Thematic Cartography and Geovisualization, 4th Edition, CRC Press International Ltd.		

Course Outcome

Upon successful completion of the course, students will be able to:

CO1: Explain the concepts, principles, evolution, and communication functions of cartography and the significance of maps in geographical studies.

CO2: Apply map scales, coordinate systems, directions, bearings, and map projections for accurate spatial representation and map preparation.

CO3: Demonstrate skills in collecting, classifying, compiling, generalizing, and organizing spatial data for map production.

CO4: Design and construct maps using appropriate cartographic techniques, symbols, lettering standards, and map layout principles.

CO5: Analyze and interpret thematic, topographic, and atlas maps to extract and communicate spatial information effectively.

CO6: Evaluate and utilize modern cartographic technologies, including GIS, remote sensing, web mapping services, digital cartography, and mobile mapping applications for spatial analysis and decision-making.

Mapping of Pos with Cos

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	1	-	1	1	1	1	1	2
CO2	1	3	2	2	2	2	1	1	-	1
CO3	3	2	1	1	1	2	1	-	-	2
CO4	-	3	-	-	-	2	-	1	-	2
CO5	1	3	3	2	3	3	3	2	1	3
CO6	1	3	3	3	3	3	2	3	2	2

Semester-IV	Core practical - 4 CARTOGRAPHIC APPRECIATION AND MAP INTERPRETATION	Code:
Part-III		Credits:4
Course Objectives ❖ To develop an understanding of conventional signs, symbols, and the numbering system used in topographical maps prepared by the Survey of India. ❖ To provide practical knowledge of different scales and types of topographical sheets, including Open Series Maps, for geographic analysis. ❖ To train students in the identification and interpretation of physical features represented on topographical maps. ❖ To enhance the ability to analyze cultural features, land use patterns, settlements, and transportation networks using topographical maps. ❖ To develop skills in interpreting and evaluating topographical and district resource maps for regional planning and resource assessment.		
Conventional Signs and Symbols Ex No: 1.1 Physical Features Ex No: 1.2 Cultural Features Ex No: 2 Survey of India (Numbering System) Appreciation of Indian Topographical Sheets Ex No: 3 1: 63,630 Ex No: 4 1: 250,000 Ex No: 5 1:50,000 Ex No: 6 Open Series Maps (OSM) Interpretation of Physical and Cultural Features Ex No: 7 Physiographic & Drainage Ex No: 8 Land Use / Land Cover Ex No: 9 Settlements and Transport Networks Ex No: 10 District Resource Map (Survey of India)		
References 1. Erwin Raiz, (1948). General Cartography, McGraw Hill Company., New York. 2. Keates, J. S., (1982). Understanding Maps, Longman, London and New York. 3. Lawrence, G.R.P., (1979). Cartographic Methods, Methuen, London. 4. Misra, R.P. and Ramesh, A., (2002). Fundamentals of Cartography, Concept Publication Company, New Delhi. 6. Monkhouse, F.J. and Wilkinson, H.R., (1989), Maps and Diagrams, B.I.Publications, New Delhi. 7. Robinson, A.H., (1984). Elements of Cartography, John Wiley, London. 8. Monkhouse, F.J. and Wilkinson, H.R. (1994) Maps and Diagrams, Methuen, London 9. Singh, R.L. and Dutt, P.K. (1979) Elements of Practical Geography, Kalyani Publishers, New Delhi 10. Terry A. Slocum , Robert B. McMaster, et al (2022) Thematic Cartography and Geovisualization, 4th Edition, CRC Press International Ltd.		

Course Outcome

Upon successful completion of the course, students will be able to:

CO1: Identify and explain conventional signs, symbols, and the Survey of India numbering system used in topographical maps.

CO2: Demonstrate proficiency in reading and interpreting topographical sheets of different scales, including Open Series Maps.

CO3: Analyze physiographic features and drainage patterns represented on topographical maps.

CO4: Interpret land use/land cover characteristics and evaluate their spatial distribution using topographical maps.

CO5: Assess settlement patterns, transport networks, and cultural features to understand regional development characteristics.

CO6: Integrate physical, cultural, and resource information from topographical and district resource maps for geographical interpretation and decision-making.

Mapping of Pos with Cos

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	-	-	-	2	1	-	3	3
CO2	2	3	1	-	1	2	1	1	2	3
CO3	1	3	-	1	1	3	2	2	1	2
CO4	1	3	3	3	3	3	3	3	2	2
CO5	-	3	1	-	-	2	2	2	1	2
CO6	-	2	3	3	3	3	3	2	3	2

Semester-I	Interdisciplinary Course - 4	Code:
Part-III	OUTLINE OF CONTINENTS	Credits: 2
Course Objectives ❖ To develop an understanding of the geographical setting of the world's continents, including their location, extent, political divisions, and global significance. ❖ To examine the physical environment, climate, drainage systems, natural vegetation, and resource distribution of major continents. ❖ To analyze the spatial patterns of agriculture, minerals, industries, transportation, population, and urbanization across different continents. ❖ To evaluate the role of geopolitical developments, international trade, regional cooperation, and economic integration in shaping global relations. ❖ To enhance students' ability to interpret regional geographical variations and contemporary global issues using geographical concepts and spatial perspectives.		
Unit: 1 The Continents: Location & Extent of the continents - Boundaries - Countries & Capitals of all continents - Geopolitics - International Trade - Intercontinental Transportation.		
Unit: 2 Europe: Physiographic divisions - Drainage- Great Lakes - Major climatic regions - Major crops and distribution - Mineral Distribution - Power resources - Transport types- Population – European Union.		
Unit: 3 North America & South America: Physical Landscape - Drainage - Climatic Regions – Natural Vegetation - Major crops - Agricultural regions - Important Minerals and its distribution – Major industries - Transport Types.		
Unit: 4 Africa: Relief Feature - Drainage Patterns - Lakes - Major Crops and Distribution – Natural Vegetation and Animal Life - Minerals and distribution - Transportation - Cultural Regions - Distribution and Density of population - Level of Urbanization.		
Unit: 5 Asia & Australia: Physical Features - Drainage Patterns - Main Producers - Major Vegetation Regions and Type of Animals - Minerals and Power resources - Transportation - Trade: Exports and Imports - Population - Urbanization - Major Cities		
Unit: 6 Current Contours: (Not for Examination) Ukraine war - Iran War – geopolitical developments – international treaties – global trade blocs.		
References 1. Douglas L .Johnson (2009) World Regional Geography, Tenth edition, Pearson Education Inc, New Jersey. 2. Jones, J. (2011). World Regional Maps Coloring Book: Maps of World Regions, Continents, World Projections, USA and Canada. United States: CreateSpace Independent Publishing Platform. 3. Laborde, E. D. (2013). The World in Outline: A Text-Book of Geography. United Kingdom: Cambridge University Press. 4. Lydia Mihelic Pulsipher (2019), World regional Geography, Eight Edition, WH Freeman & Co. 5. Majid Husain (2015) World Geography, Fifth edition, Rawat Publications, Jaipur. 6. Richard G. Boehm (2005), World Geography, Eight Edition, McGrawHill Publications		

Course Outcome

Upon successful completion of the course, students will be able to:

CO1: Describe the location, extent, political divisions, and major geographical characteristics of the continents of the world.

CO2: Explain the physical features, climate, drainage systems, vegetation, and resource base of Europe, the Americas, Africa, Asia and Australia.

CO3: Analyze the distribution and significance of agriculture, minerals, industries, transportation systems, and population across different continents.

CO4: Compare regional variations in physical and human geographical characteristics among the major continents of the world.

CO5: Evaluate the impact of globalization, international trade, regional organizations, and geopolitical developments on continental and global development.

CO6: Apply geographical knowledge and critical thinking skills to interpret contemporary global issues and emerging geopolitical challenges.

Mapping of Pos with Cos

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	3	3	2	3	-	-	-	-	2	2
CO2	3	3	2	3	-	1	-	-	3	3
CO3	3	3	2	3	-	1	-	1	3	3
CO4	3	3	3	3	-	1	-	1	3	3
CO5	3	3	-	3	-	-	-	-	3	3
CO6	3	3	-	3	-	2	2	2	3	3

Semester-V	CORE COURSE 5	Code:
Part-III	GEOGRAPHY OF INDIA	Credits: 4
Course Objectives ❖ To develop a comprehensive understanding of India's physical environment, including physiographic divisions, drainage systems, climate, soils, and natural vegetation, and their spatial variations. ❖ To examine the distribution, utilization, and management of India's natural resources, including water, minerals, forests, and energy resources, in the context of sustainable development. ❖ To analyze the spatial patterns, challenges, and regional dimensions of agricultural and industrial development in India. ❖ To assess the demographic characteristics and transportation infrastructure of India and their role in regional and national development. ❖ To apply geographical concepts and spatial analysis techniques to evaluate contemporary issues such as natural hazards, environmental degradation, regional disparities, and geopolitical challenges affecting India.		
Unit – 1: Physical Setting and Drainage Systems- Physiographic Divisions: Detailed study of the Northern Mountains (Himalayas), Indo - Gangetic Plains, Peninsular Plateau, Coastal Plains and the Islands - Drainage Systems: Evolution and comparative study of Himalayan rivers (Indus, Ganga, Brahmaputra) and Peninsular rivers (East and West flowing).		
Unit –2: Climate, Soil, and Natural Vegetation - Indian Monsoon: Mechanism, origin spatial variability of rainfall. - Climatic Regions: Classification of India's climate regions. - Soils: Soil classification, characteristics, distribution, problem soils, soil erosion and conservation methods. - Natural Vegetation: Types, spatial distribution, forest resources, deforestation issues, and conservation initiatives (Social Forestry, Biosphere Reserves).		
Unit – 3: Resource Base and Utilization - Water Resources: Irrigation methods (canals, tube-wells, tanks), and watershed management.- Mineral Resources: Distribution, production, and utilization of metallic minerals (Iron ore, Manganese, Bauxite) and non-metallic minerals (Mica, Limestone). - Energy Resources: Conventional (Coal, Petroleum, Natural Gas) and Non-Conventional/Renewable energy sources (Solar, Wind, Hydroelectric, Nuclear potential) .		
Unit – 4: Agricultural and Industrial Dynamics - Agriculture: Major crop patterns (Kharif, Rabi, Zaid), spatial distribution of food grains (Wheat, Rice and Pulses) and cash crops (Cotton, Sugarcane, Coffee, Tea); Green Revolution and its spatial impact; Agro-climatic zone. - Industrial Development: Distribution of major industries (Iron and Steel, Cotton Textiles, Information Technology, and Automobile). Major industrial regions and corridors.		
Unit – 5: Population and Transportation - Demographic Profile: Growth, distribution, and density of population; Composition (Sex ratio, Literacy and Rural-Urban ratio). - Infrastructure Network: Spatial patterns of Roads (Golden Quadrilateral), Railways (Dedicated Freight Corridors), Airways, and Water ways.		
Unit – 6: Current Contours (Not for Examinations)- Case Studies on Natural Hazard - Environmental Degradation. - Regional Disparities.- Geopolitics & Borders		

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4. Jitender Saroha and Surender Singh (2022) Geography of India, Pearson, India.
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7. Majid Husain, (2021). Geography of India, Mc Graw Hill Publishers,
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Course Outcome

Upon successful completion of the course, students will be able to:

CO1: Explain the physiographic divisions, drainage systems, climate, soils, and natural vegetation of India and their spatial characteristics.

CO2: Analyze the mechanism of the Indian monsoon, determine climatic zones, evaluate soil distribution, and formulate solutions for soil erosion and vegetation degradation.

CO3: Appraise the spatial distribution, utilization patterns, and conservation of India's water, mineral, and conventional/renewable energy resources.

CO4: Evaluate the regional distribution of major cropping systems, agro-climatic zones, industrial clusters, and corridors across India.

CO5: Assess India's demographic profile (growth, distribution, density) and evaluate the infrastructural connectivity of road, rail, air, and water networks

CO6: Investigate real-world regional challenges through case studies of natural hazards, environmental pollution tracking, regional disparities, and Indian Ocean geopolitics.

Mapping of Pos with Cos

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	-	3	2	1	-	1	-	-	-	2
CO2	-	3	3	2	1	1	2	2	-	2
CO3	-	3	2	3	-	2	-	2	1	2
CO4	1	3	2	2	-	2	-	1	-	2
CO5	2	3	1	2	-	1	-	2	-	2
CO6	3	2	3	3	2	3	3	3	3	3

Semester-V	Core Course 6 HUMAN GEOGRAPHY AND CULTURAL LANDSCAPE	Code:
Part-III		Credits: 4
Course Objectives		
❖ To introduce the core concepts, philosophies, and historical evolution of human geography as a distinct discipline. ❖ To analyse global and regional population dynamics, demographic transitions, and migration patterns. ❖ To explore the spatial distribution and evolution of cultural elements, including race and ethnicity. ❖ To understand the origin classification, language and religion ❖ To examine how human societies interact with and modify the environment to create distinct cultural landscapes.		
Unit – 1: Human Geography:Nature and Perspectives of Human Geography - Evolution and Scope: Definition, nature, and scope of Human Geography. - Schools of Thought: Determinism Possibilism, Neo-determinism (Stop-and-Go Determinism). - Core Concepts: Space, place, scale, and the concept of the "Cultural Landscape" (Carl Sauer’s perspective).		
Unit – 2:Population:Global Population and Migration Dynamics - Population Distribution Spatial patterns of global population; factors influencing population distribution. - Demographic Growth: Theories of population growth (Malthusian theory, Demographic Transition Model). - Human Migration: Types (internal and international), causes (Push and Pull factors) consequences.		
Unit – 3: Cultural landscapes:Cultural Realms and Global Diversity - Concepts of Culture Culture traits, complexes, regions, and cultural hearths. - Major racial groups - Geographical Distribution of Races and Ethnicity - spatial distribution		
Unit – 4: Language & Religion: Geography of Languages: Classification of major world language families, language diffusion. - Geography of Religions: Spatial distribution of major universalizing (Christianity, Islam, Buddhism) and ethnic (Hinduism, Judaism) religions.		
Unit – 5: Human Environment interaction: Human-Environment Interaction and Economic Adaptation - Human Adaptation to Environment: Case studies of traditional societies living in primitive environments (e.g., Eskimos, Bushmen, Pygmies, Bedouins, Gujjars).- Evolution of Livelihoods: From hunting-gathering and pastoral nomadism to intensive agriculture and industrialization.		
Unit – 6: Current Contours: (Not for ExaminationField Mapping & Survey: Conducting a local field survey to document the changing architectural or cultural landscape of a neighbourhood. - Demographic Analysis Digital Storytelling & GIS: Mapping the diffusion route of a specific language, religion, or ethnic group using geopolitical boundary disputes climate refugees, or cultural globalization.		
References		
1. Amit Harichandran & M.A. Chaudhany (2010), Human Geography –Global Vision Publishing, New Delhi. 2. Finlayson C, (2021), Introduction to Human Geography, Pressbooks publication. 3. Gillespie C.A. , (2021), 5 Steps to a 5: AP Human Geography, McGrawhill Publications		

4. Goh Cheng Leong (2010), Human & Economic Geography, Oxford University Press.
5. Rubenstein, J.M. (2024): The Cultural Landscape: An Introduction to Human Geography, Pearson.
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7. Husain M, (2011), Human Geography (Fourth Edition)-Rawat Publications, Jaipur.
8. Paul .L.Knox, (2015) Human Geography place and Regions in Global Context -6th Edition, Pearson India.
9. S.C.Bhalia (2008) Human Geography concept and Issues-Attantic Publishers New Delhi

Course Outcome

Upon successful completion of the course, students will be able to:

CO1: Deconstruct and compare core geographical schools of thought (Determinism, Possibilism, Neo-determinism) and analyze spatial dimensions of cultural landscapes.

CO2: Evaluate global population patterns, apply demographic models, and interpret spatial patterns, causes, and impacts of human migration.

CO3: Analyze the geographic distribution, diffusion pathways, and spatial patterns of major world racial groups, language families, and world religions.

CO4: Classify and analyze the human role in cultural landscape and its multi-dimensional nature.

CO5: Assess the socio-ecological adaptation strategies of traditional primitive societies and trace global economic evolution from nomadism to modern industrialization.

CO6: Execute field mapping projects, construct age-sex population pyramids from census databases, build digital diffusion story-maps, and write critical policy reviews.

Mapping of Pos with Cos

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	-	3	3	2	-	1	-	-	-	2
CO2	-	3	2	2	-	1	1	3	-	2
CO3	1	3	2	3	-	-	-	1	-	2
CO4	-	3	2	2	-	2	-	1	-	2
CO5	2	3	2	2	-	1	-	-	1	2
CO6	3	2	3	3	2	3	3	3	3	3

Semester-V	Core Course 7	Code:
Part-III	BIO-GEOGRAPHY	Credits: 4
Course Objectives ❖ To introduce the fundamental concepts, scope, and historical evolution of biogeography as an interdisciplinary science. ❖ To analyse the structural, functional, and dynamic aspects of global ecosystems and bio-geochemical cycles. ❖ To examine the spatial distribution, adaptation, and diversification patterns of flora and fauna across major biomes. ❖ To explore the principles of zoogeography, continental drift, and the evolution of distinct faunal realms. ❖ To cultivate critical awareness regarding biodiversity depletion, climate change impacts, and modern conservation strategies.		
UNIT – 1: Foundations of Biogeography: Introduction: Definition, nature, scope, and historical development of Biogeography. - Basic Ecological Principles: Concepts of habitats, ecological niches, adaptation, speciation, and biological succession.		
UNIT – 2: Ecosystem Dynamics and Bio-Geochemical Cycles: Ecosystem Structure: Trophic levels, food chains, food webs, and ecological pyramids. - Energy Flow: Principles of thermodynamics in ecosystems, primary and secondary productivity. - Bio-Geochemical Cycles: Spatial pathways and recycling mechanisms of the Carbon, Nitrogen and Oxygen.		
UNIT – 3: Phytogeography and Global Biomes - Plant Geography: Factors influencing plant distribution. - Global Biomes: Structural characteristics, geographic distribution, and human impacts on major terrestrial biomes: Equatorial and Tropical Rainforests, Savanna and Tropical Grasslands, Temperate Grasslands (Steppes, Prairies), Boreal/Taiga Forests and Tundra and Arid and Desert Ecosystems		
UNIT – 4: Zoogeography and Faunal Distribution - Faunal Realms: Wallace's classification of world zoogeographical regions (Palearctic, Nearctic, Neotropical, Ethiopian, Oriental, and Australian realms). - Paleobiogeography: Impact of continental drift, plate tectonics and modern distribution patterns.		
UNIT – 5: Biodiversity and Conservation Biogeography - Biodiversity: Concepts of genetic, species, and ecosystem diversity; global biodiversity hotspots with special reference to India. - Ecosystem Degradation: Deforestation, biological invasions (exotic species) and extinctions. - Conservation Strategies: In-situ conservation (National Parks, Wildlife Sanctuaries, Biosphere Reserves) and Ex-situ conservation (Botanical Gardens, Gene Banks); global frameworks (IUCN, CITES, CBD).		
UNIT –6: Current Contours (Self-directed learning activities for Continuous Internal Assessments Only): - Biome Mapping Exercise-Invasive Species - Biodiversity Audit - Policy Review Seminar		
References 1. Bhattacharyya, N., (2003). Biogeography, Rajesh Publications, New Delhi. 2. Clarke, G. L., (1967). Elements of ecology, New York: John Wiley Pub. 3. Dash, M.C., (2001). Fundamental of Ecology, 2nd edition, Tata McGraw-Hill, New Delhi 4. Surender Singh Jitender Saroha (2024) Physical Geography, Pearson, New Delhi, India 5. Mal, Suraj and Singh, R.B., (Eds.) (2009). Biogeography and Biodiversity, Rawat Publication, Jaipur 6. Mathur, H.S., (1998). Essentials of Biogeography, Anuj Printers, Jaipur.		

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8. Savindra Singh., (2020). Biogeography, Pravalika Publications.
9. Sharma, P.D., (2011). Ecology and Environment, Rastogi Publications.
10. Sivaperuman, Chandrakasan et al., (2018). Biodiversity and Climate Change Adaptation in Tropical Islands, Academic Press, London.

Course Outcome

Upon successful completion of the course, students will be able to:

CO1: Understand and explain the foundational concepts, historical development, scope, and basic ecological principles of Biogeography.

CO2: Analyze ecosystem structure, energy dynamics through trophic levels, and the spatial pathways/recycling mechanisms of core bio-geochemical cycles..

CO3: Evaluate and compare the geographic distribution, structural characteristics, and human impacts on major global plant geographies and terrestrial biomes.

CO4: Examine zoogeographical faunal realms (Wallace's classification) and the deep-time impact of plate tectonics and continental drift on modern distribution patterns.

CO5: Assess global and national biodiversity hotspots, categorize threats like biological invasions, and formulate/justify in-situ and ex-situ conservation strategies.

CO6: Design and execute practical biogeographical activities, including digital biome mapping, invasive species tracking, biodiversity field audits, and policy review seminars.

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	-	3	1	-	-	1	-	-	-	2
CO2	-	3	2	2	1	-	2	3	1	2
CO3	1	3	2	3	-	2	-	2	-	2
CO4	-	3	3	2	-	3	-	-	1	2
CO5	2	3	2	2	-	2	-	-	2	3
CO6	3	2	3	3	3	3	3	3	3	3

Semester-V	Core course 8	Code:
Part-III	GEOINFORMATICS	Credits:4
Course Objectives ❖ To introduce the fundamental principles, concepts, and components of Remote Sensing (RS), Geographic Information Systems (GIS), and Global Navigation Satellite Systems (GNSS). ❖ To explain the physics of electromagnetic radiation and its interactions with various earth surface features. ❖ To develop technical skills in spatial data structures, data acquisition, database management, and geospatial analysis techniques. ❖ To provide hands-on familiarity with satellite positioning systems, data accuracy, and coordinate transformations. To foster critical thinking for applying geo-informatics toolsets to solve real-world environmental, urban, and resource-management problems		
Unit – 1: Foundations of Remote Sensing - Introduction: Definition, history, scope, and components of Remote Sensing; types of remote sensing (Active vs. Passive). - Radiation Physics: Electromagnetic Radiation (EMR) spectrum; blackbody radiation concepts; atmospheric windows and attenuation. - platforms and Sensors: Types of platforms (Airborne, Spaceborne); sensor resolutions (Spatial, Spectral, Radiometric, and Temporal); overview of major satellite series (Landsat, Sentinel, IRS).		
Unit – 2: Digital Image Processing (DIP) - Pre-processing: Geometric correction, radiometric and atmospheric corrections. - Information Extraction: Visual image interpretation keys; digital image classification: supervised and an unsupervised.		
Unit – 3: Geographic Information Systems (GIS) - Foundations of GIS: Definition, Components and historical development of GIS. - Spatial Data Models: Raster data structures (grid cells, data compression) and Vector data structures (points, lines, polygons) - Non-Spatial Data: Attribute data management, Relational Database Management Systems (RDBMS). - Spatial Reference Systems: Shape of the Earth (Geoid and Ellipsoid); Datums (WGS84); major map projections (UTM, Polyconic).		
Unit – 4: Spatial Analysis and non-spatialModelling - Vector Analysis: Buffering, overlay operations (Union, Intersect, Clip, Erase), network analysis, and connectivity. - Raster Analysis: Surface analysis (Slope, Aspect, Hills shade, Contour generation). - Terrain Modelling: Generation of Digital Elevation Models (DEM), Digital Terrain Models (DTM), and Triangulated Irregular Networks (TIN) – non spatial modelling.		
Unit – 5: Global Navigation Satellite Systems (GNSS) - Foundations of GNSS: Principles, segments (Space, Control, User), and historical development of GPS (USA), GLONASS (Russia), Galileo (EU), and NavIC (India). - Errors and Accuracy: Sources of GNSS errors (atmospheric delays, multipath, satellite geometry/GDOP) and mitigation strategies.		
Unit – 6:Current Contours(Not for examination): - Open-Source Software Lab - Field GNSS Survey - Cloud Computing Project - Web Mapping Presentation.		
References 1. Agarwal, N. K., (2006). Essentials of GPS, Geodesy and GPS publications, Hyderabad. 2. Burrough, P. A., & McDonnell, R., (2000). Principles of Geographical Information Systems, Oxford Press, London. 3. Chandra, A. M. (2017). Geoinformatics. India: New Academic Science. 4. Claudia, K., Stefan, D., 2014. Quantitative Remote Sensing in Thermal Infrared, 11, Springer.		

5. Gomasasca, M. A. (2009) Basics of Geometrics, Springer Science, New York
6. Gupta, R. K. (2014). Principles Of Geoinformatics. India: Jain Brothers.
7. Jawahar Lal Jain (2024) Fundamentals of Cartography and Geoinformatics, Atlantic Publishers and Distributors (P) Ltd, India
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9. Noel Lane (2022) Geoinformatics: Methods and Applications. United States: Callisto
10. Peter Atkinson (2009) Geoinformatics - Volume I. United Kingdom: EOLSS Publications

Course Outcome

Upon successful completion of the course, students will be able to:

CO1: Explain radiation physics principles, atmospheric windows) and differentiate between satellite platforms, sensors, and structural resolutions..

CO2: Appraise image pre-processing stages and execute supervised/unsupervised thematic classification workflows for digital information extraction.

CO3: Distinguish between raster and vector spatial data structures, manage attribute, and apply complex spatial reference systems.

CO4: Formulate topological vector operations (buffers, overlays) and construct complex surface terrain models.

CO5: Analyze the operational architecture of global/regional constellations and mitigate systemic GNSS errors.

CO6: Develop and deploy advanced geospatial solutions using cloud computing (Google Earth Engine), field-GNSS logging, and web-mapping dashboards

Mapping of Pos and COs

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	-	3	1	2	2	-	1	1	-	2
CO2	-	3	2	3	2	1	2	2	-	2
CO3	-	3	2	2	1	-	2	3	-	2
CO4	1	3	2	3	-	2	2	3	1	2
CO5	2	3	2	1	3	1	2	2	-	2
CO6	3	2	3	3	3	3	3	3	3	3

Semester-V	Core practical 5 GEOINFORMATICS	Code: CP-5
Part-III		Credits: 4
Course Objectives		
❖ To develop proficiency in Geospatial software environments for spatial data management. ❖ To provide hands-on training in satellite data acquisition, image enhancement, and thematic classification techniques. ❖ To master the skills of georeferencing, vector data creation, digitization, and attribute database management. ❖ To execute complex raster and vector spatial analysis operations to solve real-world geographical inquiries. ❖ To train students in handling GNSS equipment, field data extraction, and final cartographic map compilation		
EX:1 Overview of user interfaces, toolboxes, and plug in configurations in open-source platforms.		
EX: 2 Geo referencing and Rectification		
EX: 3 Water balance Graph		
EX: 4 conversions between geographic coordinates and Projected Coordinate Systems		
EX: 5 Vector data Creation: Digitization (Point / Line / Polygon)		
EX: 6 Attribute: Building attribute tables, adding fields		
EX: 7 Digital Image Processing: Geometric Correction & Layer Stack (True colour Composite & False Colour Composite)		
EX: 8 Image Classification: Unsupervised classification		
EX: 9 Image Classification: Supervised classification		
EX: 10 Buffer: Simple – multi ring (Point / Line / Polygon)		
EX: 11 Over Lay Analysis: Vector Layers		
EX: 12 Over Lay Analysis: Raster Layers		
EX: 13 preparation of landuse / landcover map		
EX: 14 DEM Visualization (Slope & Aspect)		
EX: 15 Map Design & Layout		
References		
1. Agarwal, N. K., (2006). Essentials of GPS, Geodesy and GPS publications, Hyderabad. 2. Burrough, P. A., & McDonnell, R., (2000). Principles of Geographical Information Systems, Oxford Press, London. 3. Gomasasca, M. A. (2009) Basics of Geometrics, Springer Science, New York 4. Gupta, R. K. (2014). Principles Of Geoinformatics. India: Jain Brothers. 5. Jawahar Lal Jain (2024) Fundamentals of Cartography and Geoinformatics, Atlantic Publishers and Distributors (P) Ltd, India 6. Scott Madry (2021)Introduction to QGIS: Open Source Geographic Information System, Locate Press 7. Sutton, T., Dassau, O., and Sutton, M. (2009): A Gentle Introduction to GIS, QGIS Project Documentation 8. Lillisand T.M and R.W. Kiefer (1994) Remote Sensing and Image Interpretation. John Wiley & Sons, New York.		

Course Outcome

Upon successful completion of the course, students will be able to:

CO1: Configure open-source GIS software environments, perform geometric rectification using GCPs, and execute coordinate transformations across geographic and projected reference systems.

CO2: Acquire satellite imagery from open platforms and construct structured vector geospatial datasets via digitization and systematic attribute database management.

CO3: Execute digital image processing techniques including layer stacking, band combinations, and thematic image classifications

CO4: Perform spatial vector analysis, generate surface models, and design professional-grade thematic maps utilizing mandatory cartographic design elements.

CO5: Conduct field-based spatial data collection using GNSS hardware or mobile applications to log coordinates, tracks, and waypoints accurately.

CO6: Formulate, build, and deploy localized independent GIS mini-projects, web-map applications, and technical e-portfolios for peer evaluation.

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	-	3	1	2	2	-	2	3	-	2
CO2	-	3	2	2	-	1	2	-	1	2
CO3	-	3	3	3	2	1	3	2	-	2
CO4	2	3	2	3	1	2	2	3	-	2
CO5	2	3	3	1	3	2	1	-	2	2
CO6	3	2	3	3	2	3	3	3	3	3

Semester-V	Skill Enhancement Course 4	Code:
Part-III	FIELD WORK AND REPORTWRITING	Credits: 2
Course Objectives ❖ To Develop Field Observation Skills: Learning to identify and document physical landscapes (landforms, drainage patterns, vegetation) and human landscapes (settlement types, land-use patterns, socio-economic activities). ❖ To Master Primary Data Collection: Gaining hands-on experience with field tools and techniques, such as conducting household questionnaires, traffic volume counts, land-use mapping, or using basic surveying instruments (like a prismatic compass or GPS). ❖ To Understand Spatial Relationships: Learning how to correlate physical geography features with human activities in a specific locality ❖ To Learn Data Processing and Representation: Training you to tabulate raw field data, perform basic statistical calculations, and translate your findings into thematic maps, graphs, and diagrams. ❖ To Cultivate Academic Writing: Developing the ability to structure a scientific report, integrate visual aids with text, and draw logical conclusions from observed data.		
Unit: 1Introduction: Fieldwork in Geographical studies – Role and significance. Selection of study area and objectives. Pre-field preparations. Ethics of fieldwork		
Unit: 2Field techniques and tools: Observation (participant, non-participant), questionnaires (open, closed, structured, non-structured). Interview with special reverence to focused group discussions.		
Unit: 3Field techniques and tools: Landscape survey using transects and quadrants, constructing a sketch, photo and video recording.		
Unit: 4Data collection: Positioning and collection of samples. Preparation of inventory from field data. Post-field tasks.		
Unit: 5Data output: Problem identification - Designing of questionnaire and sampling method – Data collection - Tabulation - Statistical Analysis - Report writing and prepare thematic maps		
Unit: 5 Current Contours: (Not for Examination) – familiarization of National and State Surveys – NFHS – Natinal Sample Survey (NSS) – Census, Recently published journals National and International (One Each)		
UG Geography Relevance For UG students, this course builds practical geographical skills and prepares them for higher studies, research, and field-based jobs. ✓ <i>The total number of pages should be minimum of 30, including text, figures, tables, photographs, references and appendices.</i> ✓ <i>The viva-voce presentation is with the help of equipment which are available in the department.</i>		

References

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2. Dikshit, R. D. (2003) Geographical Fieldwork in the 21st Century. (2021). United Kingdom: Taylor & Francis.
3. Maity, S. K. (2021). Essential Graphical Techniques in Geography. Singapore: Springer Singapore.
4. Rogerson, P. A. (2019). Statistical Methods for Geography: A Student's Guide. United Kingdom: SAGE Publications.
5. Stoddard R. H., (1982) Field Techniques and Research Methods in Geography, Kendall/Hunt.
6. R. D. DIKSHIT (1994) The Art and Science of Geography: Integrated Readings. Prentice-Hall of India, New Delhi.

Course Outcome

Upon successful completion of the course, students will be able to:

CO1: Explain the significance, principles, ethics, and procedures of geographical fieldwork, including the selection of study areas and research objectives.

CO2: Apply appropriate field techniques and tools, including observation, questionnaires, interviews, and focus group discussions, for collecting geographical data.

CO3: Demonstrate competency in conducting landscape surveys, preparing sketches, and documenting field observations through photographs and video recordings.

CO4: Analyze and organize field data through inventory preparation, sample collection, data classification, and post-field processing techniques.

CO5: Evaluate geographical problems using suitable sampling methods, data tabulation, statistical analysis, and thematic mapping techniques.

CO6: Design and produce a comprehensive geographical field report by integrating field observations, data analysis, thematic maps, and research findings.

Course Outcomes	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	-	3	1	2	2	-	2	3	-	2
CO2	-	3	2	2	-	1	2	-	1	2
CO3	-	3	3	3	2	1	3	2	-	2
CO4	2	3	2	3	1	2	2	3	-	2
CO5	2	3	3	1	3	2	1	-	2	2
CO6	3	2	3	3	2	3	3	3	3	3

Semester-VI	Core Course 9 ECONOMIC AND TRANSPORT GEOGRAPHY	Code:
Part-III		Credits:4
Course Objectives ❖ To understand the scope, concepts, and significance of economic geography and resource classification. ❖ To examine agricultural activities, factors influencing agriculture, and the distribution of major food and commercial crops. ❖ To analyze the distribution and utilization of mineral and energy resources and their economic importance. ❖ To evaluate industrial localization factors and the development of major agro-based and mineral-based industries. ❖ To study transport systems, connectivity measures, network analysis, and their role in regional development.		
Unit – 1 - Economic Geography- Definition- Scope and Content- Significance of Economic Geography– Classification of resources – Conservation of resources - Major Economic activity		
Unit – 2– Agriculture: Agriculture Types – Factors affecting Agriculture – Food and Non - food crops – Production and Distribution Rice, Wheat, Sugarcane, Pulses, Cotton, Jute, Tea, coffee and rubber.		
Unit – 3Mineral and Energy Resources: Mineral Resources- Metallic and Non-Metallic Minerals - Production and Distribution of major minerals: Iron and Copper, Energy resources- Coal, Petroleum, Natural gas, Hydel, Thermal, Atomic powers.		
Unit - 4Industries – Localization factors for Industries –Agro-based – (Textile Industry, Cotton, Jute) - Mineral Based-(Iron and Steel, Engineering Industries)-Shipbuilding, Automobile-Chemicals Industries – Fertilizer Industry and Industrial region.		
Unit – 5Transport Geography: Nature and Scope of Transport Geography - Importance of Transport - Network Characteristics – Topology - Graph Theory - Binary Matrix – Measures of Connectivity and Accessibility - Types of Transport – Railways, Roads, Airways and Waterways and Pipelines.		
Unit 6 Current Contours: (Not for Examinations) India: Major Import and Export – world trade blocs – pandemic – war influence in economy – international summits– modern transport operations		
References 1. Alexander, J.W. (2016). Economic Geography. Prentice Hall of India, New Delhi. 2. Debt and Austerity: Implications of the Financial Crisis. (2020). United Kingdom: Edward Elgar 3. Hartshorne, T.A. & Alexander, J.W. (2017). Economic Geography. Prentice Hall, New Delhi. 4. Haggett, P. (2019). Geography: A Global Synthesis. Pearson Education, London. 5. Hodder, B. W., Lee, R. (2015). Economic Geography. United Kingdom: Taylor & Francis. 6. Prithwish Roy (2014) Economic Geography - A study of Resources, New Central Book Agency, Kolkata Publishing 7. Rodrigue, J.P. (2023). The Geography of Transport Systems. Routledge Publications, New York. 8. Saxena, H.M. (2013) Economic Geography, Rawat Publications, Jaipur 9. Taaffe, E.J., Gauthier, H.L. & O'Kelly, M.E. (2015). Geography of Transportation. Pearson Education, New York. 10. Yadav, P. (2021). Geographical Perspectives on International Trade. Switzerland: Springer International Publishing		

Course Outcome

Upon successful completion of the course, students will be able to:

CO1: Recall the concepts, scope, significance, resources, agricultural activities, industrial systems, energy resources, transport networks, and connectivity measures in economic geography.

CO2: Apply economic and transport geography principles to explain resource utilization, agricultural production, industrial localization, and transportation systems.

CO3: Compare and evaluate different economic activities, industrial regions, transport networks, and resource distribution patterns to understand regional economic development.

CO4: Demonstrate lifelong learning by exploring emerging trends in resource conservation, sustainable transportation, industrial development, and economic planning.

CO5: Communicate economic and transport geographical information effectively through maps, graphs, reports, and spatial analyses using appropriate technical terminology.

CO6: Analyze economic and transportation systems using critical thinking, quantitative methods, network analysis, and scientific reasoning to solve regional development problems.

Mapping of POs with COs

COs \ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	-	3	-	-	2	-	-	-	-	-
CO2	-	3	2	3	2	-	-	2	-	-
CO3	-	2	3	3	2	-	1	2	-	-
CO4	-	1	-	1	-	3	2	1	-	3
CO5	3	2	-	1	-	-	2	-	1	-
CO6	1	2	3	3	3	-	2	3	2	-

Semester-VI	Core Course 10	Code: CC - 10
Part-III	GEOGRAPHY OF ASIA	Credits: 4
Course Objectives ❖ To understand the geographical location, extent, physiographic divisions, and climatic characteristics of Asia and evaluate their influence on regional development. ❖ To analyze the drainage systems, soil resources, and natural vegetation patterns of Asia and their environmental significance. ❖ To examine the agricultural systems, major crops, and fisheries resources of Asia and assess their contribution to food security and economic growth. ❖ To evaluate the distribution and utilization of mineral resources and industrial development across Asian countries. ❖ To study population characteristics and transport networks in Asia and assess their role in regional integration and economic development.		
Unit – 1 - Asia: Geographic Location and Extent – Locational significance – Physiography; Climate: Season - patterns of monsoons - Climatic regions.		
Unit – 2- Drainage, Soil & Natural vegetation: Drainage System – Soil – Natural vegetation: Types and Distribution		
Unit – 3 - Agriculture: Farming types – Major crops: Rice, Wheat, Cotton, Jute, Tea, Coffee and Rubber; Fishing – Inland and Marine.		
Unit – 4- Mineral Resources: Distribution and Production of Iron ore, Coal, Manganese, Copper and Mica; Industries: Textiles, Sugar, Iron and Steel – Locational Factors and Distribution.		
Unit – 5- Population: Controlling Factors – Growth – Distribution and Density; Transport - Factors and Distribution: Roadways – Railways – Airways – Waterways.		
Unit – 6 Current Contours (Not For Examinations) Historical evolution of Asia and its regions, Persistent Poverty and Regional Backwardness - Geopolitics of Asia - Population Policies - Asia in Future		
References 1. Cressey, George B, (1951), Asia's Lands and Peoples, McGraw Hill, New York. 2. Douglas L. J., (2009) World Regional Geography, 10th Edition, Pearson Education, Inc., New Jersey. 3. Dudley Stamp L. (1967), Asia: A Regional Economic Geography, Methuen young books, London. Geography of the World: The Essential Family Guide to Geography and Culture (2006), DK Children, UK. 4. Husain M. & Tasawwur Husain Zaidi., (2022) Indian and World Geography, 6th Edition, McGraw Hill Education (India), Noida. 5. Hussain M., (2015) World Geography, 5th Edition, Rawat Publications, Jaipur 6. Norton Ginsburg (1964), The pattern of Asia, Prentice-Hall, USA 7. Ranjit Tirtha., (2006) Geography of Asia, Rawat Publications, New Delhi. 8. Thomas A. Rumney (2010) Geography of South East Asia: A Scholarly Bibliography, 9. Chaturbhuj Memoria (2022) Geography of Asia 1 Edition, SBPD Publishing House, India		

Course Outcome

Upon successful completion of the course, students will be able to:

CO1: Recall the geographical location, extent, physiographic divisions, climatic regions, drainage systems, soils, natural vegetation, agricultural activities, mineral resources, industries, population characteristics, and transport networks of Asia.

CO2: Apply geographical concepts and regional analysis techniques to explain the spatial distribution of climate, agriculture, resources, industries, population, and transportation systems across Asia.

CO3: Compare and evaluate the regional variations in physical and human environments of Asia and analyze their influence on economic development, resource utilization, and regional disparities.

CO4: Demonstrate self-directed and lifelong learning by exploring contemporary issues related to population growth, resource management, environmental sustainability, and regional development in Asia.

CO5: Communicate knowledge of Asian geography, resource distribution, agricultural systems, industrial development, and transportation networks effectively through maps, reports, presentations, and geographical interpretations.

CO6: Analyze geographical patterns and regional interactions in Asia through critical thinking, scientific reasoning, and spatial analysis to address developmental and environmental challenges.

Mapping of POs with COs

COs \ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	-	3	-	-	2	-	-	-	-	-
CO2	-	3	2	3	2	-	-	2	-	-
CO3	-	2	3	3	2	-	2	2	-	-
CO4	-	1	-	1	-	3	2	1	1	3
CO5	3	2	-	1	-	-	2	-	1	-
CO6	2	2	3	3	3	-	2	3	2	-

Semester - VI	Core Course 11 POPULATION AND SETTLEMENT GEOGRAPHY	Code:
Part - III		Credits: 4
Course Objectives ❖ To understand the nature, scope, and significance of population geography and major theories of population growth. ❖ To examine demographic processes including fertility, mortality, migration, sex ratio, population distribution, and density. ❖ To analyze the characteristics, patterns, functions, and development of rural settlements. ❖ To study the origin, growth, classification, and hierarchy of urban settlements. ❖ To evaluate urban structure theories and contemporary concepts such as smart cities and sustainable settlements.		
Unit – 1- Population geography: Nature, Scope and Significance of Population Geography –Theories of Population Growth – Malthus theory, Optimum theory, theory of Demographic Transition. Unit - 2 - Components of Demography: Determinants of Fertility, Mortality and Sex ratio - World Population Growth, Distribution and Density - Migration: Causes - types - consequences. Unit –3 - Rural Settlement: Site and Situation - Growth and Development – Characteristics. Distribution: Cluster and Dispersed- Function Classification - Patterns: – Rectangular, Linear, Circular, Semicircle, Star, Triangular, Nebular. Unit – 4 - Urban Settlement: – Origin and Growth of towns and cities - site and situation - classification of urban settlements: functional and hierarchical classification of Urban settlements. Unit – 5 - Morphology and Theories: Concentric, sector, Multiple nuclei and Christaller’s central Place theory - Smart cities and sustainable settlements. Unit – 6 Current Contours: (Not For Examinations) Population explosion – migration – socio economic and health dynamics of population – smart city – green building – Urban zero carbon – national and state urban missions.		
Reference 1. Carter, H. (2016). The Study of Urban Geography. Arnold Publishers, London. 2. Chandna, R.C. (2021). Population Geography. Kalyani Publishers, New Delhi. 3. Clarke, J.I. (2017). Population Geography. Pergamon Press, Oxford. 4. Hussain, M. (2020). Population Geography. Rawat Publications, Jaipur. 5. Jitender Saroha and Surender Singh (2021) Urban Geography, Pearson, India 6. Misra R. P & K.V. Sundaram (1971) Regional planning and Development, University of Mysore 7. Ramachandran, R. (2018). Urbanization and Urban Systems in India. Oxford University Press, New Delhi. 8. Debjani Roy., (2015). Population Geography, Books and Allied Private Limited, 9. KolkataMay, J.F., (2012). World population policies: their origin, evolution, and impact, Washington DC: 10. SpringeMohammad Izhar Hassan. (2020). Population Geography-A systematic Exposition, Routledge India 11. Carter.H. (1972) the study of Urban Geography, Edward Arnold, London		

Course Outcome

Upon successful completion of the course, students will be able to:

CO1: Recall the concepts, theories, principles, and terminology of population geography, demography, rural settlements, urban settlements, and settlement morphology.

CO2: Apply demographic concepts and settlement geography principles to explain population growth, migration, fertility, mortality, settlement distribution, and urbanization processes.

CO3: Compare and evaluate population theories, settlement patterns, urban structure models, and central place theory in understanding population dynamics and settlement development..

CO4: Demonstrate self-directed learning by investigating emerging issues such as population pressure, migration, smart cities, and sustainable settlements for societal development.

CO5: Communicate demographic and settlement-related information effectively using maps, diagrams, statistical data, and geographical terminology for academic and professional purposes.

CO6: Analyze geographical patterns and regional interactions in Asia through critical thinking, scientific reasoning, and spatial analysis to address developmental and environmental challenges.

CO7: Analyze population and settlement patterns through critical thinking and scientific reasoning to address urban and rural planning challenges and sustainable development issues.

Mapping of POs with COs

COs \ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	-	3	-	-	2	-	-	-	-	-
CO2	-	3	2	3	2	-	-	2	-	-
CO3	-	2	3	3	2	-	1	2	-	-
CO4	-	1	-	1	-	3	2	1	-	3
CO5	3	2	-	1	-	-	2	-	1	-
CO6	1	2	3	3	3	-	2	3	2	-

Semester - VI	Core Project Work DISSERTATION AND VIVA VOCE	Code:
Part - III		Credits: 5
Student have to submit the Dissertation pertain to Geography with the report of not less than 50 pages including text, figures, tables, photographs, references and appendices.		
The Dissertation would be in the following format		
- Title page. - Introduction. - Aim &Objectives. - Study area. - Methodology. - Data presentation and analysis. - Maps, tables, and charts. - Findings. - Conclusion and suggestions. - References and appendix.		
Dissertation evaluation and viva voce oral examination also as per University norms.		

Semester - VI	Value Added Course	Code:
Part - III	CLIMATE CHANGE VULNERABILITY AND ADAPTATION	Credits: 1
<u>Course Objectives</u> ❖ Explain the basic concepts of climate change, greenhouse gases, global warming, and the role of the IPCC in climate assessment. ❖ Describe the physical, economic, and social vulnerabilities associated with climate change. ❖ Examine the impacts of climate change on agriculture, water resources, biodiversity, and human health. ❖ Discuss climate change adaptation and mitigation strategies, with special reference to global and South Asian initiatives. ❖ Analyze the role of national policies and local institutions, including Panchayats and Urban Local Bodies, in addressing climate change challenges		
Unit 1: Climate Change: Understanding Climate Change; Greenhouse Gases and Global Warming; Global Climatic Assessment- IPCC Unit 2: Climate Change and Vulnerability: Physical Vulnerability; Economic Vulnerability; Social Vulnerability Unit 3: Impact of Climate Change: Agriculture and Water; Flora and Fauna; Human Health Unit 4: Adaptation and Mitigation: Global Initiatives with Particular Reference to South Asia. Unit 5: National Action Plan on Climate Change; Local Institutions (Urban Local Bodies, Panchayats) Unit 6: Current contours (Not for Examinations) Climate Global submit – State and Central Govt. initiatives.		
Reference 1. IPCC (2014): Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. 2. IPCC (2007): Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change. 3. OECD (2008): Climate Change Mitigation: “What do we do?” (Organisation and Economic Co-operation and Development). 4. Sen, Roy, S., and Singh, R.B., (2002): Climate Variability, Extreme Events and Agricultural Productivity in Mountain Regions, Oxford & IBH Pub., New Delhi. 5. Singh, M., Singh, R.B., and Hassan, M.I., (Eds.) (2014): Climate change and biodiversity, Proceedings of IGU Rohtak Conference, Volume 1. Advances in Geographical and Environmental Studies, Springer 6. Singh, R.B., Mal, Suraj, and Huggel, Christian (2018): Climate Change, Extreme Events and Disaster Risk Reduction, Springer, Switzerland 7. UNEP (2007): Global Environment Outlook: GEO4: Environment for Development, United Nations Environment Programme		

Course Outcome

Upon successful completion of the course, students will be able to:

CO1: Define and explain the concepts of climate change, greenhouse gases, global warming, and climate assessment frameworks.

CO2: Interpret climate change data and reports, including the role of the IPCC in global climate assessments.

CO3: Classify and examine the physical, economic, and social dimensions of climate vulnerability.

CO4: Analyze the impacts of climate change on agriculture, water resources, biodiversity, and human health.

CO5: Evaluate adaptation and mitigation measures implemented at global, regional, and South Asian levels.

CO6: Assess and propose climate action strategies by considering the National Action Plan on Climate Change and the role of local institutions such as Panchayats and Urban Local Bodies.

Mapping of POs with COs

COs \ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	2	3	-	3	2	-	-	-	3	3
CO2	2	3	2	3	2	-	3	2	3	3
CO3	1	2	3	3	2	-	1	2	3	3
CO4	1	1	-	1	-	3	2	1	2	3
CO5	1	2	-	1	-	-	2	2	1	2
CO6	1	2	3	3	3	-	2	3	2	1

Semester - VI	Skill Enhancement Course 6	Code: SEC - 6
Part - III	TOURISM AND TRAVEL MANAGEMENT	Hours: 2 Credits: 2
Course Objectives ❖ To understand the concepts, scope, significance, and growth of tourism and classify different categories of tourists. ❖ To examine the structure and functions of travel agencies and the importance of travel documentation. ❖ To analyze the elements of tourism including attractions, accessibility, amenities, and accommodation facilities. ❖ To evaluate tourism policies and the role of government agencies in promoting tourism in India and Tamil Nadu. ❖ To study major tourist destinations in India and Tamil Nadu and assess their tourism potential and management practices.		
Unit - 1 Tourism: Scope and Content - Significance - Growth of Tourism: Classification of tourist travellers: Merchants - Explorers - Pilgrims - factors controlling tourism - types of tourism.		
Unit - 2 Travel agency: Travel Agency and Tourist Documents - Functions and role of travel agencies; Passport - Visa and its types; Travellers Cheque - Credit and debit Cards; Role of Accommodation - Hospitality and Transport in tourism development.		
Unit - 3 Elements: Elements of Tourism - Attraction, accessibility and amenities - classification of tourist spots - accommodation - primary and supplementary accommodation - Hotels, Inns and Motels.		
Unit - 4 Tourism Development: Development of Tourism in India - Govt. Policy - Role of ITDC in Tourism promotion; Development of Tourism in Tamil Nadu - Role of TTDC in promotion of tourism in the state.		
Unit - 5 Major Centres: A General Study on Tourist Centers in India and Tamil Nadu: Himalayan zone, Mumbai, Chennai, Bangalore, Thiruvanthapuram, Madurai, Ooty and islands		
Unit 6: Current contours (Not for Examinations) Spiritual & Cultural - Geo heritage park – medical and sport tourism – eco tourism – impact of social media.		
Reference 1. Ankur Dogra., (2020). Geography of Tourism, Akinik Publications 2. Bhatia, A.K. (2022). Tourism Development: Principles and Practices. Sterling Publishers Pvt. Ltd., New Delhi. 3. Negi, J.M.S. (2019). Travel Agency and Tour Operation. Kanishka Publishers, New Delhi. 4. Cooper, C., Fletcher, J., Gilbert, D. & Wanhill, S. (2018). Tourism: Principles and Practice. Pearson Education, London. 5. Burkart, A.J. & Medlik, S. (2016). Tourism: Past, Present and Future. Heinemann Publishers, London. 6. Kaul, R.N. (2017). Dynamics of Tourism. Sterling Publishers Pvt. Ltd., New Delhi. 7. Shiv Raj Prof. Suman Sharma (2023) Introduction of Travel & Tourism Management, Bharti Publications, India. 8. Rashmi Rana (2023) Geography of Travel & Tourism, The Hospitality Press, India.		

Course Outcome

Upon successful completion of the course, students will be able to:

CO1: Recall the concepts, scope, significance, types of tourism, travel agencies, tourist documentation, tourism elements, accommodation facilities, and tourism promotion organizations

CO2: Apply tourism management principles to explain tourism development, tourist behavior, travel documentation procedures, hospitality services, and tourism infrastructure

CO3: Compare and evaluate different tourism types, tourism policies, accommodations systems, and tourism development strategies at national and regional levels.

CO4: Demonstrate self-directed and lifelong learning by exploring sustainable tourism practices, tourism entrepreneurship, destination management, and emerging tourism trends

CO5: Communicate tourism-related information effectively through reports, presentations, brochures, itineraries, and professional interactions using tourism terminology.

CO6: Analyze tourism resources, tourist destinations, tourism policies, and management practices through critical thinking and problem-solving approaches to promote sustainable tourism development.

Mapping of POs with COs

COs \ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	1	3	-	-	-	2	-	1	-	2
CO2	-	2	2	2	-	2	2	1	1	3
CO3	-	3	-	1	-	2	-	-	-	1
CO4	1	2	3	2	1	3	2	2	2	3
CO5	3	2	1	1	1	2	1	1	-	2
CO6	1	2	2	2	2	2	3	2	1	3

Semester - II	Skill Enhancement Course 1	Code:
Part - IV	Map Reading	Credits: 2
Course Objectives ❖ Understand the fundamental concepts of maps and cartography, including the nature, types, components, and significance of maps in geographical studies. ❖ Apply map reading skills and cartographic techniques to measure distances, determine directions, use scales, and locate places through coordinate systems and grid references. ❖ Interpret topographical and atlas maps to identify physical and cultural features, relief characteristics, and spatial distributions at local, regional, and global scales. ❖ Develop basic knowledge of modern geospatial technologies, including digital mapping, GIS, remote sensing, GNSS, and web-based mapping services. ❖ Utilize maps as tools for spatial understanding and decision-making in everyday life, environmental studies, resource management, and geographical analysis		
Unit 1: Maps: Definition, nature and importance of maps - History and development of cartography. Types of maps: Physical, political, thematic, topographical, atlas and digital maps. Essential map elements: Title, scale, legend, direction, coordinates and marginal information. Unit 2: Scale, Direction and Coordinate Systems: Concept and importance of scale - Types of scales: Statement, representative fraction (RF) and linear scales - Conversion and calculation of distance and area - Directions and bearings - Latitude and longitude - Grid references and coordinate systems. Unit 3: Topographical Map Reading and Interpretation: Characteristics and components of topographical maps - Relief representation: Contours, spot heights and benchmarks - conventional signs and symbols – basic level interpretation. Unit 4 : Atlas maps: Political maps – physical maps – resource atlas: NATMO Atlas – soil atlas – Map reading: locating places – Word major rivers – bays – islands – straits – countries. Unit 5: Modern Digital Mapping: Digital mapping – GIS – remote sensing – GNSS – web map services - maps in daily life. Unit 6: Current contours (Not for Examinations) maps in social media – mapping software – open source tools.		
Reference 1. Erwin Raiz, (1948). General Cartography, McGraw Hill Company., New York. 2. Keates, J. S., (1982). Understanding Maps, Longman, London and New York. 3. Misra, R.P. and Ramesh, A., (2002). Fundamentals of Cartography, Concept Publication Company, New Delhi. 4. Monkhouse, F.J. and Wilkinson, H.R., (1989), Maps and Diagrams, B.I.Publications, New Delhi. 6. Robinson, A.H., (1984). Elements of Cartography, John Wiley, London. 7. Monkhouse, F.J. and Wilkinson, H.R. (1994) Maps and Diagrams, Methuen, London 8. Singh, R.L. and Dutt, P.K. (1979) Elements of Practical Geography, Kalyani Publishers, New Delhi 9. Terry A. Slocum , Robert B. McMaster, et al (2022) Thematic Cartography and Geovisualization, 4th Edition, CRC Press International Ltd.		

Course Outcome

Upon successful completion of the course, students will be able to:

CO1: Explain the concepts, history, significance, types, and essential elements of maps and cartography used in geographical studies.

CO2: Apply scales, bearings, directions, latitude–longitude, and grid reference systems to determine location, distance, and spatial relationships accurately.

CO3: Interpret topographical maps using contours, spot heights, benchmarks, and conventional signs and symbols to identify physical and cultural features.

CO4: Analyze and locate major physical and political features of the world using atlas maps, including countries, rivers, bays, straits, islands, and natural resources.

CO5: Describe the principles, components, and applications of modern geospatial technologies such as digital mapping, GIS, remote sensing, GNSS, and web map services.

CO6: Utilize maps and geospatial information effectively for spatial thinking, geographical inquiry, and everyday decision-making in academic and real-world contexts.

Mapping of POs with COs

COs \ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	-	3	2	2	1	-	1	-	1	2
CO2	-	3	3	3	2	2	3	2	2	2
CO3	1	3	3	3	1	1	3	2	2	1
CO4	1	3	3	3	2	2	2	2	3	2
CO5	1	3	1	1	1	2	1	1	-	1
CO6	1	3	3	3	3	3	3	3	2	2

Semester - II	Skill Enhancement Course 2	Code:
Part - IV	Population Data Mapping	Credits: 2
Course Objectives ❖ Understand the fundamental concepts of maps and cartography, including the nature, types, components, and significance of maps in geographical studies. ❖ Apply map reading skills and cartographic techniques to measure distances, determine directions, use scales, and locate places through coordinate systems and grid references. ❖ Interpret topographical and atlas maps to identify physical and cultural features, relief characteristics, and spatial distributions at local, regional, and global scales. ❖ Develop basic knowledge of modern geospatial technologies, including digital mapping, GIS, remote sensing, GNSS, and web-based mapping services. ❖ Utilize maps as tools for spatial understanding and decision-making in everyday life, environmental studies, resource management, and geographical analysis		
Unit 1: Population Geography: Definition – nature – scope – population distribution – density – factors controls – population distribution.		
Unit 2: Population data sources: Census –Sample Registration System (SRS) - Civil Registration System (CRS)National Sample Survey (NSS) - National Family Health Survey (NFHS) – digital sources: population estimate – global and national scale.		
Unit 3: Techniques of Population Data Mapping: Choropleth maps - Dot density map - Proportional and graduated symbol map - Isopleth and dasymetric mapping - Cartograms and population pyramids.		
Unit 4 : Statistical inferences: Descriptive & Summary Statistics on analysing: literacy, sex ratio, occupation and migration - Analyzing Spatial Distribution & Clustering: nearest neighbour – centro graphic – hotspot analysis.		
Unit 5: Applications of Population Maps: rural – urban – urban fringe population characteristics – modelling with open population data sources – essentials of population geography in epidemiology.		
Unit 6: Current contours (Not for Examinations) global open sources population data – urban sprawl – population problems – population policy.		
Reference 1. Debjani Roy., (2015). Population Geography, Books and Allied Private Limited, 2. KolkataMay, J.F., (2012). World population policies: their origin, evolution, and impact, Washington DC: 3. Carter, H. (2016). The Study of Urban Geography. Arnold Publishers, London. 4. Chandna, R.C. (2021). Population Geography. Kalyani Publishers, New Delhi. 5. Clarke, J.I. (2017). Population Geography. Pergamon Press, Oxford. 6. Hussain, M. (2020). Population Geography. Rawat Publications, Jaipur.		

Course Outcome

CO1: Describe the concepts, nature, scope, distribution patterns, density measures, and controlling factors of population geography

CO2: Explain the characteristics, significance, and applications of major population data sources at national and global scales

CO3: Apply appropriate cartographic techniques to represent and visualize population data using thematic maps and population pyramids.

CO4: Analyze demographic indicators and spatial population patterns using descriptive statistics and spatial analytical techniques.

CO5: Evaluate population characteristics and demographic issues in rural, urban, and fringe regions using population datasets and spatial models.

CO6: Develop population-based thematic maps and analytical reports utilizing open-source demographic data for planning, research, and public health applications.

Mapping of POs with COs

COs \ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	1	3	2	1	1	2	1	1	1	1
CO2	1	2	1	-	-	2	1	1	1	1
CO3	1	2	2	2	2	1	2	3	2	2
CO4	-	2	3	3	3	3	2	3	2	2
CO5	-	3	3	3	3	3	3	3	2	2
CO6	-3	3	2	3	2	3	3	3	2	3

Semester - III	Skill Enhancement Course 3	Code:
Part - IV	Quantitative and Qualitative Data Mapping	Credits: 2
Course Objectives ❖ Understand the fundamental concepts, principles, and applications of statistical methods in geographical studies. ❖ Develop skills in collecting, organizing, and analyzing geographical data using appropriate sampling and statistical techniques. ❖ Apply quantitative models and statistical tests to investigate spatial patterns, relationships, and geographical processes. ❖ Interpret measures of spatial distribution and geographical models for understanding regional variations and spatial organization. ❖ Acquire cartographic skills for representing and communicating qualitative geographical data through thematic mapping techniques.		
Unit: 1 Introduction: Definition of statistics, Importance and use of statistical techniques in geography, Statistical data, Various types of averages, Measures of dispersion and their calculation, Normal frequency distribution, Curve and its uses Unit 2: Geographic Matrices: Characteristics of samples, Methods of sampling, Statistical significance, Standard error of difference, Significance test in small samples, Student's 't' test, Snedecor's variance ratio test (F test). Unit 3: Statistics Techniques and Models: Difference between large and small samples, Significance test in large samples, Standard error of the difference of sample means, Chi Square test- Gravity models, Lorenze curve, Ginn's coefficient. Unit 4: Measures of spatial distribution: Point and line distribution, Nearest neighbour index, Models, Importance of models in geography, Models as quantitative technique - Ternary diagram Unit 5: Qualitative Data Mapping: Concept and characteristics of qualitative data - Categorical and nominal data - Chorochromatic (area-class) maps - Land use and land cover mapping - Vegetation, soil, and settlement-type mapping - Map symbols, colours, and patterns for qualitative data representation Unit 6: Current Contours (Not For Examinations) 2D and 3D data representation – Infographic visualization.		
Reference 1. Ashis Sarkar (2020) Quantitative Geography Techniques and Presentations, Orient Blackswan, Pvt. Ltd. Hyderabad. 2. Ashis Sarkar, (2013), quantitative geography: tech. & presentations orient blackswan private limited - New delhi. 3. Gregory, S. (1978), Statistical Methods and the Geographer (4th Edition), Longman, 4. Haan, M. (2013). An Introduction to Statistics for Canadian Social Scientists. Oxford. 5. Hammond, R. and McCullagh, P.S. (1974), Quantitative Techniques in Geography: An Introduction, Clarendon Press, Oxford. 6. Harris, R. and C. Jarvis (2011). Statistics for Geography and Environmental Science. Pearson 7. Jha, Shiva Nand (2020): Statistical Methods in Geography, Raghav Publications, New. Delhi. 8. Johnston R. J. (1973), Multivariate Statistical Analysis in Geography, Longman, London. 9. Peter a. Rogerson (2015), statistical methods for geography: a student's guide, sage publications ltd, london, united kingdom.		

Course Outcome

Upon successful completion of the course, students will be able to:

CO1: Explain the fundamental concepts of statistics, measures of central tendency, dispersion, and frequency distributions used in geographical analysis.

CO2: Apply sampling methods and statistical significance tests to evaluate geographical data and research problems.

CO3: Analyze spatial and non-spatial datasets using statistical techniques such as t-test, F-test, Chi-square test, gravity model, Lorenz curve, and Gini coefficient.

CO4: Examine patterns of spatial distribution using quantitative measures, nearest neighbour analysis, and geographical models.

CO5: Evaluate the suitability of qualitative data mapping techniques for representing geographical phenomena using thematic maps and cartographic principles.

CO6: Develop geographical representations and analytical outputs by integrating statistical methods, spatial models, and modern visualization techniques.

Mapping of POs with COs

COs \ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	-	3	-	-	-	2	1	-	1	2
CO2	-	2	2	2	2	2	3	3	1	2
CO3	-	3	1	1	2	2	1	2	2	1
CO4	-	3	2	3	2	2	1	2	2	1
CO5	-	3	3	3	2	3	3	3	2	2
CO6	-	3	2	3	2	3	3	3	2	3

Semester - III	Skill Enhancement Course 4	Code:
Part - IV	Sustainable Development	Credits: 2
Course Objectives		
❖ To solve complex problems with a systems thinking approach. ❖ To communicate complex social, economic, and environmental issues and their interrelationships to diverse audiences. ❖ To analyze and critically evaluate evidence to formulate and organize sustainable strategies. ❖ To engage and lead sustainability initiatives at local, national, and global level ❖ To understate the sensitivity of New SDGs		
Unit: 1 Introduction: Definition - scope and elements - History, Concepts, Historical Background, Components, Strategies, Measurement, Limitations, Sustainable Development Goals. Unit: 2 Challenges for Sustainable Development: Land Management, Water Crisis, Energy Crisis, Food Security and Agriculture, Poverty, unemployment, inadequate housing, unsafe drinking water, deficiency of energy sources and supply, sanitation, unscientific waste management, lack of transportation facilities. Unit: 3 Sustainable Utilization of Resources and Environmental Protection: Land, Water and Energy - National Environment Policy (NEP) - Environment protection policies, waste management, Pollution control, reduce the use, reuse and recycle, sustainable energy, preservation of forest and water sources. Unit: 4 Global goals for sustainable development: Domain, conflict, crisis and compromise - Role of SDGs in India Unit: 5 Sustainability in Urban areas: Increasing imperviousness in cities, thermal environment (Urban Heat Island), Urban disaster risk management, Sustainable Smart Cities and Good Governance, Sustainable approaches to Urban Water Management. Unit: 6 Current Contours: [Not for Examination] Sustainable Agriculture, Climatic Change and Sustainability, Feasibility of Sustainable Development, Technical glossary		
Reference		
1. Agyeman, Julian, Robert D. Bullard, & Bob, Evans (Eds.) (2003), Just Sustain abilities: Development in an Unequal World. London: Earthscan. (Introduction and conclusion.). 2. Ayers, Jessica & David Dodman (2010). Climate change adaptation and development I: the state of the debate. Progress in Development Studies 10 (2): 161-168. 3. Baker, Susan (2006). Sustainable Development. Milton Park, Abingdon, Oxon; New York, N.Y.: Routledge. (Chapter 2, "The concept of sustainable development"). 4. Blewitt, J. 2017. Understanding Sustainable Development 3rd ed, Routledge. 5. Browne, S. 2017. Sustainable Development Goals and UN Goal-Setting, Routledge. 6. Elliott, J. 2012. An Introduction to Sustainable Development, 4th ed, Routledge. 7. Robert Brinkmann., (2022). Practical Sustainability. Kindle E-Book. 8. Roling, N.G., & Wagerutgers, M.A.E., (ed.) (1998). Facilitating Sustainable Agriculture, Cambridge: Cambridge University Press. 9. Singh, R. B. (Ed.). (2001). Urban Sustainability in the Context of Global Change: towards promoting healthy and green cities. Science Pub Incorporated		

CO1: principles, components, indicators, and goals of sustainable development, including their historical evolution and global significance.

CO2: Explain the major environmental, social, and economic challenges that hinder sustainable development at local, national, and global scales.

CO3: Apply principles of sustainable resource management and environmental protection for the conservation of land, water, energy, and ecosystems.

CO4: Analyze the role of policies, governance frameworks, and Sustainable Development Goals (SDGs) in addressing sustainability issues and promoting inclusive development.

CO5: Evaluate urban sustainability challenges and assess strategies for sustainable cities, disaster risk reduction, urban water management, and good governance.

CO6: Propose sustainable solutions to contemporary environmental and developmental issues by integrating sustainability principles with emerging global concerns such as climate change and sustainable agriculture.

Mapping of POs with COs

COs \ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	-	3	-	-	-	2	1	-	1	3
CO2	-	3	1	-	1	2	1	1	-	2
CO3	-	3	3	2	3	3	3	3	2	1
CO4	-	3	1	2	3	3	3	2	1	2
CO5	-	3	3	3	3	2	3	3	2	1
CO6	-	3	3	3	2	3	3	3	1	2

Semester - III	Skill Enhancement Course	Sub. Code: SEC - 2
Part - IV	Health and Well-being	Hours: 2 Credits: 2
Course Objectives ❖ Introduce the concepts of health, environment, and development and their interrelationships in shaping human well-being. ❖ Develop an understanding of the environmental and socio-economic factors affecting health, including population growth, urbanization, poverty, and inequality. ❖ Examine the impacts of human activities and environmental degradation on public health through pollution, waste generation, and resource utilization. ❖ Familiarize students with disease patterns and health risks associated with environmental conditions, with special reference to India. ❖ Promote awareness of climate change, environmental health challenges, and the role of institutions and policies in health care management and sustainable development.		
Unit1:Perspectives on Health: Definition; linkages with environment, development and health;driving forces in health and environmental trends - population dynamics, urbanization,poverty and inequality. Unit 2:Pressure on Environmental Quality and Health: Human activities and environmentalpressure land use and agricultural development; industrialisation; transport and energy. Unit 3. Exposure and Health Risks: Air and water pollution; household wastes-; housing;workplace. Unit 4: Health and Disease Pattern in Environmental Context with special reference to India,Types of Diseases and their regional pattern (Communicable and Lifestyle relateddiseases). Unit 5: Climate Change and Human Health: Changes in climate system – heat and cold;Biological disease agents; food production and nutrition Unit 6: Current Contour (Not for Examinations) Pandemic – CDC – NFHS – WHO – Central and state government role on health care management.		
Reference 1. Rais, Akhtar., (Ed.), (1990): Environment and Health Themes in Medical Geography, Ashish Publishing House, New Delhi. 2. Avon, Joan, L. and Jonathan, A, Patzed (2001): Ecosystem Changes and Public Health,Baltimin, John Hopling Unit Press(ed). 3. Bradley,D.,(1977): Water, Wastes and Health in Hot Climates, John Wiley Chichesten. 4. Christaler, George and Hristopoles, Dionissios., (1998): Spatio-Temporal Environment Health Modelling, Boston Kluwer Academic Press. 5. Cliff, A.D. and Peter,H., (1988): Atlas of Disease Distributions, Blackwell Publishers, Oxford. 6. Gatrell, A. andLoytonen, (1998): GIS and Health, Taylor and Francis Ltd, London. 7. Harpham T. and Tanner, M.,(eds)(1995): Urban Health in Developing Countries; Progress and Prospects, Routledge, London. 8. Hazra, J., (1997): Health Care Planning in Developing Countries. University of Calcutta,Calcutta. 9. Moeller, Dade, wed., (1993): Environmental Health, Cambridge, Harward Univ. Press. 10. Murray, C. and A. Lopez, (1996): The Global Burden of Disease, Harvard University Press		

Course Outcome

Upon successful completion of the course, students will be able to:

CO1: Describe the concepts of health, environment, and development and explain their interrelationships in influencing human well-being.

CO2: Interpret the effects of population dynamics, urbanization, poverty, and inequality on environmental quality and public health.

CO3: Analyze the impacts of human activities, including agriculture, industrialization, transportation, and energy use, on environmental health.

CO4: Assess environmental health risks associated with air and water pollution, waste management, housing conditions, and workplace environments.

CO5: Evaluate the spatial patterns and determinants of communicable and lifestyle-related diseases in relation to environmental conditions, particularly in India.

CO6: Develop sustainable and evidence-based strategies to address health challenges arising from climate change, environmental degradation, and emerging public health issues.

Mapping of POs with COs

COs \ POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10
CO1	1	3	2	-	2	2	2	2	1	2
CO2	-	3	3	2	2	3	3	3	-	3
CO3	-	3	-	1	1	3	2	1	1	2
CO4	-	3	2	3	1	2	2	1	1	3
CO5	-	3	3	2	2	3	3	3	1	3
CO6	-	3	2	3	2	3	3	3	2	3