KANNUR UNIVERSITY

(Abstract)

Scheme and Syllabus of B.Sc. Geography Programme in tune with KU-FYUGP Regulations 2024 with effect from 2024 Admission onwards- Approved- Implemented- Orders Issued

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FYUGP Spl.cell

FYUGPSC/FYSC-III/16386/2024 Dated: 18.10.2024

Read:-1. U.O. No. FYUGPSC/FYSC-I/5074/2024, dated: 18/04/2024

2. The Minutes of the Meeting of the Scrutiny Committee held on 10.06.2024 .
3. E-mail of the Chairperson, Board of Studies in Geography(Cd), dated: 20.06.2024
4. The Orders of the Vice Chancellor on 24.06.2024
5. The Minutes of the Meeting of the Academic Council, held on 25.06.2024

ORDER

1.The Regulations of the Kannur University Four Year UG Programmes (KU-FYUGP Regulations 2024) for affiliated Colleges was implemented with effect from 2024 admission onwards, vide paper read as (1) above.

2.Subsequently, the Scrutiny Committee, which included the Dean, Faculty of Science vide paper read as (2) above, scrutinized the Syllabus of B.Sc. Geography programme submitted by the Chairperson, Board of Studies in Geography (Cd) and recommended suggestions.

3.Thereafter, the Chairperson, Board of Studies in Geography (Cd) forwarded the modified Syllabus of the B.Sc.Geography programme in tune with KUFYUGP Regulations 2024 with effect from 2024 Admission onwards, as per vide paper read as (3) above.

4.Subsequently, the Vice Chancellor ordered to place the Syllabus before the Academic Council for consideration, as per the paper read (4) above.

5.Accordingly, the Syllabus of the B.Sc.Geography programme,prepared in tune with KU-FYUGP Regulations 2024 was approved by the meeting of the Academic Council held on 25-06-2024 and granted permission to publish the same, as and when it is ready, after making the necessary modifications, as per paper read as (5) above.

6.The Vice Chancellor approved the Minutes of the aforesaid meeting of the Academic Council and the Syllabus of the B.Sc.Geography programme, prepared in tune with KU-FYUGP Regulations, 2024.

8.The approved Scheme and Syllabus of the B.Sc. Geography programme is appended with this U.O. and uploaded in the University website.

Orders are issued accordingly.

Sd/-

ANIL CHANDRAN R

DEPUTY REGISTRAR (ACADEMIC)

For REGISTRAR

To: The Principals of Arts and Science Colleges affiliated to Kannur University

Copy To: 1. The Examination Branch (through PA to CE)

2. The Chairperson, Board of Studies in Geography(Cd)
3. PS to VC/PA to R
4. DR/AR (Academic)
5. The IT Cell (For uploading in the website)
6. SF/DF/FC

Forwarded / By Order

SECTION OFFICER

KANNUR UNIVERSITY

(Abstract)

Scheme and Syllabus of FYUG Geography Programme in Affiliated Colleges- implemented w e f 2024 admission- Defects in the Scheme and Syllabus part- Rectified & Approved -orders issued.

ACADEMIC C SECTION

ACAD C/ACAD C1/21586/2024 Dated: 25.08.2025

Read:-1. U O No. FYUGPSC/FYSC-III/16386/2024 dated 18.10.2024

2. E mail dated 15.07.2025 from the Chairperson, BoS, Geography(Cd).

3. E mail dated 05.08.2025 from the Chairperson, BoS, Geography(Cd).

3. E mail dated 07.08.2025 from the Den, Faculty of Science.

4. Minutes of the meeting of Standing Committee of Academic Council held on 08.08.2025.

5. Orders of Vice Chancellor dated 23.8.2025

ORDER

1. As per the paper read as (1) above, the scheme and complete syllabus of FYUG Geography Programme in affiliated Colleges were implemented w e f 2024 admission.

2. On verification of the approved scheme & syllabus during the course registration of Third semester, following defects are noted in the Third semester syllabus.

i. In the Scheme part, the course code of **Cartographic Techniques** is KU3DSCGEO202 whereas in Syllabus part it is wrongly written as KU3DSCGEO104.

ii. As per the scheme and syllabus part, all the courses are 4 credit theory courses. But in the syllabus part 8 hour practical is allotted for the courses KU3DSCGEO202 -Cartographic Techniques and KU3DSCGEO222- Basics of Mapping.

iii. Assessment Rubrics of Foundation courses are given incorrect.

3. The above matter has been intimated to the Chairperson, Board of Studies in Geography and requested to correct the syllabus and the Chairperson, vide the paper read as 2 above, forwarded the syllabus after rectifying the errors.

4. On verification, the same errors are noted in the Fourth to Eighth semester syllabus also and the matter has been intimated to the Chairperson and the complete syllabus of FYUG Geography Programme was submitted after rectifying the errors.

5. The defect rectified syllabus of FYUG Geography Programme was forwarded to the Dean, Faculty of Science for verification and the Dean recommended to approve the same.

6. The Standing Committee of Academic Council held on 08.08.2025, recommended to approve the defect rectified syllabus of FYUG Geography Programme w e f 2024 admission vid the paper read as (4) above.

7.The Vice Chancellor, after considering the recommendations of the Dean, Faculty of Science and the Standing Committee of the Academic Council and in exercise of the powers of the Academic Council, conferred under Section 11(1) Chapter III of Kannur University Act, 1996 and all other enabling provisions read together with, approved the defect rectified Syllabus of the FYUG Geography Programme in Affiliated Colleges under Kannur University w.e.f. 2024 admission, subject to reporting the same to Academic Council.

7. The defect rectified syllabus of FYUG Geography Programme in Affiliated Colleges under Kannur University w.e.f. 2024 admission, is appended with this U.O. and uploaded in the University

website.

Orders are issued accordingly

Bindu K P G

DEPUTY REGISTRAR (ACADEMIC)

For REGISTRAR

To: 1. The Controller of Examination (Through PA)

2. The Chairperson, Board of Studies in Geography (Cd)

Copy To: 1. The Examination Branch (Through PA to CE)

2. JR II/DR II/AR VII Examination
3. SO EXCI Examination
4. Computer Programmer
5. PS to VC/PA to R
6. DR/AR Academic
7. The web manager (For uploading in the website)

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SECTION OFFICER

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CIVIL STATION P.O.
KANNUR
Pin - 670 002
THAVAKKARA

KANNUR UNIVERSITY

B.Sc. GEOGRAPHY

SYLLABUS

Four Year Under Graduate Programme
FYUGP 2024

Graduate Attributes/Programme Outcomes (PO)

Graduate attribute	***Academic Level***	***Personal Level***	***Professional Level***
General	Critical thinking Scientific thinking Intellectual rigour Research-related skills Creativity and innovation	Cultural competency Gender sensitivity	Life-long learning Ethical awareness Team work
Work ready	Problem-Solving Knowledgeable information Digital Literacy	Multicultural Competence Social intelligence Communication skills	Leadership qualities Cooperativeness Team readiness
Successful	Autonomous Innovative Insightful Reflective thinking	Analytical reasoning Self-directed learning	Synergetic action

Programme Specific Outcomes (PSO)

At the end of the B.Sc Geography program at Kannur University, a student would:

PSO1	Mold young geographers with thorough knowledge in the process and mechanisms of the functioning of bio-physical and social world we live in.
PSO2	Demonstrate critical thinking aptitude by involving geographical elements such as space, place and environment.
PSO3	Proficiency in carrying out field oriented geographical research tools to address emergent epochal crisis of the Anthropocene experienced at various levels from global, regional, and local.
PSO4	Acquire practical skills and experience required for the application of Geoinformatics in the spatial decision making to address issues pertains to sustainability, social justice and development.
PSO5	Interpret and analyze the data to understand the complex geographic reality and enhance the skills level for effective visual portrayal of the spatial and non-spatial results.
PSO6	Develop proficiency in effective communication of conceptual and practical geographical knowledge to both scientific and public audiences.
PSO7	Work effectively in interdisciplinary and multicultural real-world contexts to combine theory and practice and forge collaborations and partnerships with academia, industry and local communities to contribute enduring solutions to issues at various scales for both humans and other-than-human.

COURSE STRUCTURE FOR **FOUR YEAR U G PROGRAMME (FYUGP) GEOGRAPHY**
(**2024** ADMISSION ONWARDS)

SEMESTER 1

No	Title	Hours/ week	Credit	CE	ESE	Total marks
1	**AEC 1**	3	3	25	50	75
2	**AEC 2**	3	3	25	50	75
3	**MDC 1**	3	3	25	50	75
4	**DSC A1**	4	4	30	70	100
5	**DSC B1**	4	4	30	70	100
6	**DSC C1**	4	4	30	70	100
	Total credits		**21**			

SEMESTER II

No	Title	Hours/ week	Credit	CE	ESE	Total marks
1	**AEC 3**	3	3	25	50	75
2	**AEC 4**	3	3	25	50	75
3	**MDC 2**	3	3	25	50	75
4	**DSC A2**	4	4	30	70	100
5	**DSC B2**	4	4	30	70	100
6	**DSC C2**	4	4	30	70	100
	Total credits		**21**			

SEMESTER III

No	Title	Hours/ week	Credit	CE	ESE	Total marks
1	**MDC 3 (KS)**	3	3	25	50	75
2	**VAC 1**	3	3	25	50	75
3	**DSC A3**	4	4	30	70	100
4	**DSC A4**	4	4	30	70	100
5	**DSC B3**	4	4	30	70	100
6	**DSC C3**	4	4	30	70	100
	Total credits		**22**			

SEMESTER IV

No	Title	Hours/ week	Credit	CE	ESE	Total marks
1	**SEC 1**	3	3	25	50	75
2	**VAC 2**	3	3	25	50	75
3	**VAC 3**	3	3	25	50	75
4	**DSC A5**	4	4	30	70	100
5	**DSC A6**	4	4	30	70	100
6	**DSC A7**	4	4	30	70	100
	Total credits		**21**			

SEMESTER V

No	Title	Hours/ week	Credit	CE	ESE	Total marks
1	**SEC 2**	3	3	25	50	75
2	**DSC A8**	4	4	30	70	100
3	**DSC A9**	4	4	30	70	100
4	**DSC A10**	4	4	30	70	100
5	**DSE 1 (A 11)**	4	4	30	70	100
6	**DSE 2 (A 12)**	4	4	30	70	100
	Total credits		**23**			

SEMESTER VI

No	Title	Hours/ week	Credit	CE	ESE	Total marks
1	**SEC 3**	3	3	25	50	75
2	**DSC A13**	4	4	30	70	100
3	**DSC A14**	4	4	30	70	100
4	**DSC A15**	4	4	30	70	100
5	**DSE 3 (A 16)**	4	4	30	70	100
6	**DSE 4 (A 17)**	4	4	30	70	100
7	**INTERNSHIP**	2	2	15	35	50
	Total credits		**25**			

EXIT WITH UG DEGREE/PROCEED TO FOURTH YEAR WITH 133 CREDITS

17 Major course *17 x 4 = 68*

6 minor course *6 x 4 = 24*

13 foundation courses (AEC, SEC, VAC, MDC) *13 x 3 = 39*

1 Internship *2 x 1 = 02*

Total = 133

SEMESTER VII

No	Title	Hours/ week	Credit	CE	ESE	Total marks
1	**DSC A18**	4	4	30	70	100
2	**DSC A19**	4	4	30	70	100
3	**DSC A20**	4	4	30	70	100
4	**DSC A21**	4	4	30	70	100
5	**DSE 3 (A 22)**	4	4	30	70	100
	Total credits		**20**			

SEMESTER VIII

No	Title	Hours/ week	Credit	CE	ESE	Total marks
1	**DSC A19**	4	4	30	70	100
2	**DSC A20**	4	4	30	70	100
3	**DSC A21**	4	4	30	70	100
4	**PROJECT**		12	40	60	100
	OR					
1	**DSC B4**	4	4	30	70	100
2	**DSC B5**	4	4	30	70	100
3	**DSC B6**	4	4	30	70	100
	OR					
1	**MOOC COURSE 1**	4	4	30	70	100
2	**MOOC COURSE 2**	4	4	30	70	100
3	**MOOC COURSE 3**	4	4	30	70	100
	Total credits		**24**			

(Student can opt either Project with 12 credits or 3 Core papers with 4 credit each)

KANNUR UNIVERSITY

FOUR YEAR UNDER GRADUATE PROGRAMME

Semester	Course Code	Course Name	Credits	Hours/ Week	Marks		
					ESE	CE	Total
DISCIPLINE SPECIFIC MAJOR PATHWAY COURSES							
I	**KU1 DSC GEO101**	Introduction to Dynamic Earth	4	4	70	30	100
II	**KU2 DSC GEO102**	Understanding Space and Society	4	4	70	30	100
III	**KU3 DSC GEO201**	Fundamentals of Geomorphology	4	4	70	30	100
	KU3 DSC GEO202	Cartographic Techniques	4	4	70	30	100
IV	**KU4 DSC GEO203**	Climate and Ocean Systems	4	4	70	30	100
	KU4 DSC GEO204	Geography of Population and Settlement	4	4	70	30	100
	KU4 DSCGEO205	Fundamentals of Geoinformatics	4	4	70	30	100
V	**KU5 DSC GEO301**	Environmental and Biogeography	4	4	70	30	100
	KU5 DSC GEO302	World Regional Geography	4	4	70	30	100
	KU5 DSC GEO303	Quantitative Techniques in Geography	4	4	70	30	100
	KU5 DSE GEO301	Agriculture and Food System	4	4	70	30	100
	KU5 DSE GEO302	Political Geography	4	4	70	30	100
	KU5 DSE GEO303	Economic Geography	4	4	70	30	100
	KU5 DSE GEO304	Hydrology and Soil Studies	4	4	70	30	100
VI	**KU6 DSC GEO304**	Geography of India with special reference to Kerala	4	4	70	30	100
	KU6 DSC GEO305	Principles of Remote Sensing	4	4	70	30	100
	KU6 DSC GEO306	Field Work and Research Methodology	4	4	70	30	100
	KU6 DSE GEO305	Urban Geography	4	4	70	30	100
	KU6 DSE GEO306	History and Philosophy of Geographical Thought	4	4	70	30	100
	KU6 DSE GEO307	Geography of Tourism	4	4	70	30	100
	KU6 DSE GEO308	Geography of Trade and Commerce	4	4	70	30	100
	INTERNSHIP		**2**	-	35	15	50
VII	**KU7 DSC GEO401**	Applied Geomorphology and Coastal Management	4	4	70	30	100
	KU7 DSC GEO402	Spatial Planning and Development	4	4	70	30	100
	KU7 DSC GEO403	Water Resource Management	4	4	70	30	100
	KU7 DSC GEO404	Geography of Health and Wellbeing	4	4	70	30	100
	KU7 DSC GEO405	Geo-statistics for Advanced Research	4	4	70	30	100

VIII	**KU8 DSC GEO406**	Gender and Development	4	4	70	30	100
	KU8 DSC GEO407	Advanced Climatology and Climate Change	4	4	70	30	100
	KU8 DSC GEO408	Disaster Risk Reduction and Management based Project Work	4	4	70	30	100
	KU8 RPH GEO401	Research Project	12	12	210	90	300
	MAJOR ELECTIVES						
	KU8 DSE GEO401	Climate Change: Science and Society	4	4	70	30	100
	KU8 DSE GEO402	Social and Cultural Geography with special reference to India	4	4	70	30	100
	KU8 DSE GEO403	Population and Welfare Geography	4	4	70	30	100
MULTI DISCIPLINARY COURSES (MDC)							
I	**KU1 MDC GEO101**	Introduction to Geosystems: Planet and People	3	3	50	25	75
II	**KU2 MDC GEO102**	Fundamentals of Mapping	3	3	50	25	75
III	**KU3 MDC GEO201**	KS	3	3	50	25	75
SKILL ENHANCEMENT COURSES (SEC)							
IV	**KU4 SEC GEO301**	Applications of GIS	3	3	50	25	75
V	**KU5 SEC GEO302**	Introduction to Surveying Techniques	3	3	50	25	75
VI	**KU6 SEC GEO303**	Advanced Geospatial Techniques	3	3	50	25	75
VALUE ADDITION COURSES (VAC)							
III	**KU3 VAC GEO201**	Western Ghat: Ecology and Culture	3	3	50	25	75
IV	**KU4 VAC GEO202**	Environment and Sustainability	3	3	50	25	75
IV	**KU4 VAC GEO203**	Kerala: Environment and Development	3	3	50	25	75
DISCIPLINE SPECIFIC MINOR PATHWAY COURSES IN BASKET							
I	**KU1 DSC GEO121**	Introduction to Earth System	4	4	70	30	100
II	**KU2 DSC GEO122**	Fundamentals of Human Geography	4	4	70	30	100
III	**KU3DSC GEO221**	Understanding Landforms	4	4	70	30	100
III	**KU3 DSC GEO222**	Basics of Mapping	4	4	70	30	100
IV	**KU4 DSC GEO223**	Climate and Oceans	4	4	70	30	100
IV	**KU4 DSC GEO224**	Population Geography	4	4	70	30	100
VIII	**KU8 DSE GEO421**	Climate Change and adaptation	4	4	70	30	100
VIII	**KU8 DSE GEO 422**	Cultural Geography - An Indian Context	4	4	70	30	100
VIII	**KU8 DSE GEO423**	Geography of Population and social well being	4	4	70	30	100

DISCIPLINE SPECIFIC MAJOR PATHWAY

KU1 DSC GEO101 Introduction to Dynamic Earth

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
I	DSC	100-199	KU1 DSC GEO101	4	4

Learning Approach (Hours/Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	0	30	70	100	2

Course Description:

In addition, this course examines the interconnectedness of Earth's systems and their influence on weather patterns, climate change, ocean currents, and ecosystems. Through case studies and real-world examples, students will analyze the environmental impacts of human activities. Thus, "Introduction to Dynamic Earth" offers a comprehensive foundation to unlock the secrets of our planet's past, present, and fut

It is a foundational course designed to explore the intricate processes and phenomena that shape our planet. Through a multidisciplinary lens, this course delves into the dynamic interactions between Earth's various systems, including the lithosphere, atmosphere, hydrosphere, and biosphere. Students will explore the principles of plate tectonics, continental drift, and the geological timescale, gaining insights into the Earth's long and complex history.

Course Pre-requisite: NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	Understand the fundamentals of Earth system	U
2	Develop knowledge on various agents of Earth processes	A
3	Derive overview on components of earth system	An

** **Remember (R), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C)***

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓						
CO 2		✓					
CO 3						✓	

COURSE CONTENTS

Contents for Classroom Transaction :

MODULE	UNIT	DESCRIPTION	HOURS
1		**Physical Geography**	12
	1	Nature and Scope of Physical Geography	
	2	Origin and evolution of earth as a planet	
	2	Earth as a system and its components	
	3	Geological Time Scale	
2		**Lithosphere**	12
	1	Earth's interior and Isostasy	
	2	Origin of Continents and Oceans: Continental Drift and Plate Tectonics	
	3	Earth's movement: endogenic and exogenic	
	4	Landforms- plains, plateaus and mountains- types	
3		**Atmosphere**	12
	1	Composition and Structure	
	2	Energy: Insolation and Temperature	
	3	Pressure Systems and wind circulation	
	4	Precipitation	
4		**Hydrosphere**	12
	1	Hydrological cycle	
	2	Ocean Salinity and Temperature	
	3	Ocean Water Movements: Waves, Tides and Currents	
	4	Oceanic deposits	

5		**Biosphere**	
	1	Fundamental concepts of ecosystem	12
	2	Soil: Formation and Distribution	
	3	Vegetation: Factors and Distribution	
	4	Environmental degradation **Conduct a Quadrant Survey for evaluating biomass**	

Essential Readings:

1. Barry, R.G., and Chorley, R.J. (2010): Atmosphere, Weather and Climate, Routledge, London, 516 pp.
2. Bhattacharya, S.K. 1988. Urban Domestic Water Supply in Developing Countries, CBS Publishers, CR Distributors, Delhi.
3. Chow, V.T., Maidment, D.R. and Mays, W.L. (1988) Applied Hydrology, McGraw-Hill International Editions, McGraw-Hill Book Company, New York.
4. Chow V.T (2017) - Handbook of Applied Hydrology, Tata McGraw Hill, New Delhi
5. Jain, S.K., Aggarwal, P.K. and Singh, V.P. 2007. Hydrology and Water Resources of India, Springer, The Netherlands.
6. Byers R.H. (1974): General Meteorology, McGraw Hill BKCo New York.
7. Critchfield, H.J, (2009): General Climatology; Prentice Hall, London
8. Das P. K. (1995): The Monsoon, Prayag Pustak Bhavan, Allahabad, National Book Trust.India
9. Ela Dean, (2017); Principles of Atmospheric Science, Larsen and Keller Education, 249 pp.
10. Hobbs, J.E. (1980): Applied Climatology, Butterworth, London.
11. John E Oliver and John J Hidore 2003, Climatology – An Atmospheric Science, Pearson Education Private Limited, Delhi.
12. K Siddhartha (2018), Oceanography: A Brief Introduction, Kitab Mahal, India
13. Dennis S Hartman (1994), Global Physical Geography, Academic Press, London
14. Mysooru R Yadupathi Putty, 2020, Fundamentals of Hydrology, Wiley India.
15. Prasad Prem Kumar, 2016, Biosphere Forms and Functions, Daya Publishing House
16. Spark, B. W. (1986): Geomorphology, Longman, London.
17. Strahler, A.N (1992): Physical Geography. John Wiley & Sons Inc., New York.

Suggested Readings:

1. Thomas, M.F. (1974): Tropical Geomorphology, Macmillan, London
2. Thornbury W.D (1969) Principles of Geomorphology, Wiley Intl. Edn & Wiley Eastern Reprints 1984.
3. Wooldridge S W and R. S. Morgan (2004)–The Physical Basis of Geography - An Outline of Geomorphology, Orient Longman Private Limited.
4. Worcester, P. G. (1948): Textbook of Geomorphology.

Assessment Rubrics:

Evaluation Type		Marks
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper - 1	10
b)	Test Paper - 2	
c)	Assignment	10
d)	Seminar	10
e)	Book/Article Review	
f)	Viva-Voce	
g)	Field Report	
Total		**100**

KU2 DSC GEO102 Understanding Space and Society

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
2	DSC	100-199	KU2 DSC GEO102	4	4

Learning Approach (Hours/Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	0	30	70	100	2

Course Description:

Space and society form a symbiotic relationship that has captivated the attention of geographers. The profound interconnectedness between these entities lies at the heart of geographical inquiry, offering a nuanced lens through which human activities and social structures are examined in the context of the spaces they inhabit. The paper attempts to introduce students to understand the co-production of social structure and space in the contemporary world.

Course Pre requisite : NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	Understand the relationship between space and society.	U
2	To analyse population growth and its spatial pattern	An
3	In-depth understanding of social space and its construction	E
4	Understanding the geographical manifestations of culture	A

****Remember(R), Understand(U), Apply(A), Analyse (An), Evaluate(E), Create (C)***

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓						
CO 2					✓		
CO 3		✓					
CO 4						✓	

COURSE CONTENTS

Contents for Classroom Transaction :

MODULE	UNIT	DESCRIPTION	HOURS
1		**Spatial Dimensions of Human Society**	14
	1	Nature and Contemporary relevance of Human Geography	
	2	Major Themes : Space (Absolute, Relative, Relational), Place, Scale, Movement, Region	
	3	Approaches in Human Geography (Positivism, Humanism, Structuralism)	
	4	Concept of Social Space and Topophilia	

2		**Population**	14
	1	World Population Distribution and Growth	
	2	Population Dynamics (Fertility, Mortality and Migration)	
	3	Demographic Transition and its Regional Pattern	
	4	Population Composition (Residence, Age, Sex)	

3	**Social Geography**		14
	1	Language	
	2	Religion	
	3	Tribes and Caste	
	4	Race and Ethnicity	
4	**Cultural Geography**		14
	1	Culture : Meaning and formation	
	2	Types of Culture, Components/Structure of Culture	
	3	Culture and Geography: Cultural Landscape	
	4	Cultural Realms of the World	
5	**Teacher Specific Module (Any one from the following)**		
	1. Field visit to distinguish urban and rural space		4
	2. Compiling demographic profile using census data		

Essential Readings:

1. Ahmad, Aijazuddin.(1999).Social Geography. Jaipur: Rawat Publications
2. Aitken,S.and Valentine,G(2006).Approaches to HumanGeography. Sage Publications.
3. Fouberg,E.H.,Murphy,A.B.,& De Blij,H.J.(2015).Human Geography: People, Place and Culture. John Wiley & Sons.
4. Knox,P.L.,Marston,S.A.,& Imort,M.(2016).Human Geography: Places and regions in global context. New York: Pearson.
5. Rubenstein,JamesM.(2017).TheCultural Landscape:An Introduction to Human Geography. Pearson. .

Suggested Readings:

1 Chandna,R.C.(2017).Population Geography. NewDelhi, U.S.A.: Kalyani Publishers.

2 Hassan,M.I. (2005).Population Geography.Jaipur,India : Rawat Publications.

3 Jordan-Bychkov., et al. (2006). The Human Mosaic: A ThematicIntroductiontoCulturalGeography.NewYork, U.S.A.: W. H. Freeman and Company.

4

Assessment Rubrics:

Evaluation Type		**Marks**
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper - 1	10
b)	Test Paper - 2	
c)	Assignment	10
d)	Seminar	
e)	Book/Article Review	
f)	Viva-Voce	
g)	Field Report	10
	Total	**100**

KU3 DSC GEO201 Fundamentals of Geomorphology

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
3	DSC	200-299	KU3 DSC GEO201	4	4

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	0	30	70	100	2

Course Description

The course Landforms Studies deals with scientific exploration of landforms, their origin and the processes that shape and reshape Earth's surface. It offers a comprehensive understanding of these natural features and dynamic forces that have shaped the planet over millions of years. By the end of the course students will gain insights into the principles, theories and methods used to analyse and interpret these natural features.

Course Prerequisite : NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	Analyse the conceptual basis of Geomorphology	A
2	Understand the process that sculpts surface features.	U
3	Examine the features of various geomorphic processes and products	E
4	Analyses the interaction between endogenic as well as exogenic Processes	An

****Remember(R), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C)***

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓						
CO 2		✓					
CO 3			✓				
CO 4						✓	

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Introduction to Geomorphology**	14
	1	Geology and Geomorphology, Nature and development of Geomorphology- branches	
	2	Scaling of landforms Land forms – classification	
	3	Origin and evolution of earth crust	
	4	Composition and structure of earth	
2		**Tectonic Movements**	14
	1	Tectonic movements and landforms, Continental drift, Sea floor spreading, Plate tectonics	
	2	Vulcanicity and seismicity cusses and consequences	
	3	Mountain building theories	
	4	Rocks and lithification, soil processes and properties	
3		**Gradation and landforms**	14
	1	Weathering and mass wasting	
	2	Fluvial processes and associated landforms	
	3	Underground water and Karst topography, Aeolian topography	
	4	Glacial and Periglacial topography , coastal processes and landforms	
4		**Interpreting landforms**	14
	1	Factors of landscape evolution	
	2	Views of Davis and Penk	
	3	Rejuvenation- Polycyclic landforms	
	4	Recent trends in geomorphology	

	Teacher Specific Module	
5	Prepare a file containing hand-drawn diagrams associated with major concepts, processes and landforms discussed in the module 1-4.	4
	Conduct a field visit to a river bank or coastal location to identify major erosional and depositional landforms by the denudational agent. Prepare a photo album of the landforms identified along with the descriptive notes.	

Essential Readings:

1. ArthurL.Bloom(2003)Geomorphology–AsystematicAnalysisofLateCenozoic Landforms, Pearson Education, Singapore
2. ArthurN Strahler and Alan H Strahler(1998) Modern Physical Geography,John Wiley and Sons, Inc
3. Bloom,A.L.(1991):Geomorphology,2nd Ed Englewood Cliffs, M.J. Prentice Hall
4. Chorley,R.J. Schumm,S.A.& Sugden,D.E. (1985):Geomorphology, Methuen & Co. Ltd., London, New York
5. Thornbury W.D (1969) Principles of Geomorphology,Wiley Intl.Edn & Wiley Eastern Reprints 1984.
6. Christopherson,R.W.(1995):Elemental Geosystems A Foundationin Physical Geography, Prentice Hall Englewood Cliffs, New Jersey
7. Cook,R.U.& Doornkamp,J.C. (1974): Geomorphology in Environmental Management, An Introduction. Clarendon Press. Oxford
8. Hart,M.G.(1986):Geomorphology Pure and Applied, George Allenand Unwin, London.
9. Richard John Haggett (2003)Fundamentals of Geomorphology, Routledge, London
10. Strahler,A.N (1992) :Physical Geography. ohnWiley & Sons Inc., New York
11. VerstappenH.(1983) Applied Geomorphology, Geomorphological Surveys for Environmental Development, Elsevier, Amsterdam
12. Wooldridge SW and R.S.Morgan (2004)–The Physical Basis ofGeography-An Outline of Geomorphology, Orient Longman Private Limited

Suggested Readings:

1. Brierley,G.J. & Fryirs,K.A. (2005): Geomorphology and River Management, Blackwell Publishing, Oxford UK
2. Briggs,K.(1985):Physical Geography Process and System, Hodder and Stoughton, London
3. DayalP (1996) A Textbook of Geomorphology,Shukla Book Depot, Patna ,India
4. Fairbridge,R.W.,ed.(1968):Encyclopedia of Geomorphology Reinhold, NewYork
5. John P Miller and Luna Bergere Leopold, Fluvial Processes in Geomorphology
6. KaleVS and GuptaA (2010) Introduction to Geomorphology, Orient Longman, Calcutta
7. Leopold,L.B.Wolman,M.G.&Miller,J.P.(1964):Fluvial Processes in Geomorphology, W.H.Freeman, San Fransisco
8. Robinson,Harry (1969): Morphology and Landscape, University Tutorial Press Ltd. London
9. Spark,B.W. (1986): Geomorphology, Longman, London
10. Thomas,M.F.(1974): Tropical Geomorphology, Macmillan, London
11. Wadia,D.N.(1993):Geology of India,Tata McGraw Hill Edition, New Delhi

Assessment Rubrics:

Evaluation Type		Marks
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper - 1	10
b)	Test Paper - 2	
c)	Assignment	10
d)	Seminar	
e)	Book/Article Review	
f)	Viva-Voce	
g)	Field Report	10
Total		**100**

KU3 DSC GEO202 Cartographic Techniques

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
3	DSC	200-299	KU3 DSC GEO202	4	4

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	0	70	30	100	2

Course Description:

This course is designed to provide the knowledge and skills for understanding the process of map-making. This course covers the design, purpose, use, and proper development of maps and provides a general introduction to Cartography, broadly defined as the art, science, and ethics of map making and map use.

Course Pre-requisite : NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	Understand the types of maps and essentials of maps	U
2	Recognize the various methods of representing geographical data	A
3	Understand the basics of surveying techniques	U
4	Learn topographical and weather map interpretation	R

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓						
CO 2					✓		
CO 3			✓				
CO 4					✓		

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Maps and its essentials**	20
	1	Maps and its types	
	2	History of Cartography	
	3	Co-ordinates, and their functions (demarcation of location and time calculation)	
	4	Enlargement and Reduction	
2		**Representation of relief features**	30
	1	Quantitative: Spot height, Benchmarks, Triangulation marks, Contour	
	2	Layer tinting	
	3	Hachures	
	4	Hill Shading	
3		**Scales**	30
	1	Statement, RF and Graphical and Conversion	
	2	Plain Scale	
	3	Comparative: Time and Distance	
	4	Diagonal	

4	**Map Projections**		30
	1	Zenithal: Polar cases of Gnomonic, Stereographic, Orthographic, Equal Area and Equidistant	
	2	Conical: One Standard, Two Standard, Bonnes, Polyconic and International Projection	
	3	Cylindrical: Equal Area, equi-distant and Mercator	
	4	Mathematical: Sinusoidal and Molviede	

5	**Teacher Specific Module**	
	A Project File in pencil comprising one exercise each, on relief representation techniques, scale and map projection.	10

Essential Readings:

1. Arthur H Robinson etal.:Elements of Cartography, John Wiley & Sons, Singapore
2. Ashish Sarkar: Practical Geography-A systematic approach, Orient Blackswan Pvt. Ltd
3. Bangulia A.M: Practical Geography,Anmol Publishers Pvt. Ltd
4. Gopal Singh: Map work and Practical Geography,Vikas Publishing Pvt .Ltd
5. Misra R.P, Ramesh A: Fundamentals of Cartography, Concept Publishing Company New Delhi
6. Monkhouse and Wilkinson: Maps and Diagrams, Metheun and Company
7. Saha P and Basu P: A Practical Geography,Books and Allied Ltd. Kolkata
8. Singh RL and Rana PB Singh, Elements of Practical Geography, Kalyani Publishers
9. Siya Ram Sharma: Practical Geography,Murali Lal & Sons Pvt .Ltd.
10. Zulfequar Ahmad Khan MD Text book of Practical Geography, Concept Publishing Company

Suggested Readings:

1. Gupta KK and Tyagi VC:Working with Map, Survey of India ,DST, NewDelhi
2. Mishra R P and Ramesh A, :Fundamentals of Cartography, Concept Pub. NewDelhi
3. Robinson A H,Elements of Cartography, John Wiley and Sons, New York
4. Sarkar A:Practical Geography:A systematic Approach,Orient BlackSwan Pvt. Ltd, New Delhi

Assessment Rubrics:

Evaluation Type	Marks
End Semester Evaluation	**70**
Continuous Evaluation	**30**
a) Test Paper - 1	10
b) Test Paper - 2	
c) Project File	20
d) Seminar	
e) Book/Article Review	
f) Viva-Voce	
g) Field Report	
Total	**100**

KU4 DSC GEO203 Climate and Ocean Systems

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
IV	DSC	200-299	KU4 DSC GEO203	4	4

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE(Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	0	30	70	100	2

Course Description:

The course on Climate and Ocean system offers a comprehensive exploration of Earth's atmospheric and oceanic systems, focusing on their dynamic interactions and influence on the global climate. The syllabus encompasses a broad range of topics, including atmospheric circulation patterns, climate zones, ocean currents, climate change, and the impact of human activities on the environment. Through a combination of theoretical lectures, practical lab sessions and fieldwork, students gain a deep understanding of climate processes, ocean dynamics, and their intricate relationship with the Earth's ecosystems. Moreover, the course equips students with essential analytical and research skills, enabling them to assess climate data, develop climate models, and propose effective strategies for climate adaptation and mitigation.

Course Prerequisite: NIL

Course Outcomes:

CO No	Expected Outcome	Learning Domains
1	Understand the mechanism of climatic phenomena.	U
2	Understand the extreme weather phenomena, their occurrence, and its impact.	An
3	Classification of climate & analysis of climatic data, their interpretation and weather forecasts.	A
4	Understanding ocean relief features along with ocean circulations and physiochemical characteristic	R
5	To develop a solid idea about ocean resources and laws concerning oceans	E

****Remember(R), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C)***

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓						
CO 2		✓					
CO 3					✓		
CO 4	✓						
CO 5						✓	

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Introduction to Climatology**	12
	1	Nature and Scope of Climatology; Climatology and Meteorology	
	2	Weather and Climate, Elements and controls of climate	
	3	Insolation and Controlling factors, Heat Budget	
	4	Atmospheric temperature- Horizontal distribution and factors affecting; Vertical distribution- Normal lapse rate and Inversion of temperature	

2		**Atmospheric System**	14
	1	Atmospheric Pressure- Horizontal Distribution– Coriolis force; Major pressure belts; Vertical Distribution	
	2	Atmospheric disturbances- cyclones, anti-cyclones, air masses	
	3	Water in the atmosphere: Atmospheric humidity and its types; Evaporation – Condensation – Forms of condensation – Fog – Clouds – Classification – Precipitation – Types – Distribution	
	4	Climatic Regions and Classification	

3		**Ocean System**	12
	1	Relief of the ocean floor	
	2	Temperature and Salinity of the oceans– Distribution	
	3	Ocean circulations- Waves and Tides	
	4	Currents of the Indian, Pacific & Atlantic Ocean & Counter Currents	

4		**World Oceans**	12
	1	Oceanic Deposits	
	2	Coral reefs – Types - Barrier reef, Atoll, Fringing Reef & coral islands	
	3	Theories of Coral formation	
	4	Ocean resources and international cooperation	

5	**Teacher Specific Module**	10
	Directions	
	Climate data sources; Weather instruments: data acquisition and dissemination	
	Graphs and Diagrams-Columnar, Linear, and Circular graphs–Frequency Graphs – Trend graphs	
	Windrose diagrams- Stardiagram, Octagonal diagram, Compound wind roses; Hythergraph, Climograph, Climatograph	
	Preparation of climatic maps- Isopleths, Isotherms, Isobars, Isohytes, Equipluves, and Equi-Variable maps	
	Practical Record File comprising one exercise each from the above mentioned list should be prepared.	

Essential Readings:

1. Critchfield, HowardJ(2008):General Climatology, Prentice Hall, London
2. Barry,R.G.,andChorley,R.J.(2010):Atmosphere,Weather andC limate,Routledge,London
3. Oliver,JohnE & Hidore, JohnJ (2001):Climatology-Anatmospheri cscience,Pearson Education
4. Singh,Savindra(2020):Climatology, Pravallika publications, Allahabad
5. Sidhartha,K(2016):Atmosphere,Weather and Climate, Kisalaya Publications Private Limited, Delhi
6. Lal D S (2003):Climatology, Sharda Pustak Bhavan, Allahabad.
7. Sidhartha,K (2014): Oceanography-A brief introduction ,Kisalaya Publications, Private Limited, Delhi
8. Thurman,Harold V(2011): Essentials of Oceanography, Prentice Hall India, New Delhi
9. Ashish Sarkar(2009) Practical Geography–A systematic approach,Orient Black Swan, Kolkata.
10. Saha,Pijushkanti(2017) Advanced Practica lCartography,Books and Allied,Kolkata
11. Singh L R (2009) Fundamentals of Practical Geography, Sharda Pustak Bhavan
12. Singh RL and Rana B Singh(2004) Elements of Practical Geography, Kalyani Publishers, New Delhi
13. Robinson,P.J.and Sellers,H. (1986),Contemporary Climatology, Longman, London.

Suggested Readings:

1. Negi,B.S (2000):Climatology and Oceanography, Kedar Nathram Nath publishers, Meerut
2. Trewartha, G.T. (Latest edition) Introduction to Climate, McGraw Hill, New York.
3. Mayes and Hughes (2004):Understanding weather-a visual approach, Arnold publishers
4. Lutgens, Frederick K et.al (2018):The Atmosphere-An Introduction to Meteorology, Prentice Hall India, New Delhi
5. Strahler,A.H.and Strahler,AN.,(2001) Modern Physical Geography(4/E), JohnWiley and Sons, Inc., New York
6. https://www.noaa.gov/education/resource-collections/ocean-coasts/ocean-currents
7. https://worldoceanreview.com/en/wor-1/climate-system/great-ocean-currents/
8. Bulletin of the American Meteorological Society (https://journals.ametsoc.org/toc/bams/current)
9. Climate Dynamics (https://link.springer.com/journal/volumes And Issues/382)
10. International Journal of Climatology(https://rmets.onlinelibrary.wiley.com/journal/10970088) Journal of Climate (https://journals.ametsoc.org/toc/clim/current)
11. Nature Climate Change (https://www.nature.com/nclimate/)
12. Weather and Climat eExtremes (https://www.sciencedirect.com/journal/weather-and-climate-extremes)

Assessment Rubrics:

Evaluation Type	Marks
End Semester Evaluation	**70**
Continuous Evaluation	**30**
a) Test Paper - 1	10
b) Test Paper - 2	
c) Practical Record File	20
d) Seminar	
e) Book/Article Review	
f) Viva-Voce	
g) Field Report	
Total	**100**

KU4 DSC GEO204 Geography of Population and Settlement

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
IV	DSC	200-299	5KU4 DSC GEO204	4	4

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE(Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	1	30	70	100	2

Course Description:

The course delves into the dynamic interplay between human populations and the environments they inhabit. It shows the spatial distribution and growth patterns of population in the world and factors affecting it. Students will examine the fundamental principles and theories that underpin population geography, including migration dynamics, urbanization processes, and demographic transitions. They will explore how factors such as culture, politics, economics, and technology influence population distribution and settlement patterns at various scales, from local to global.

Course Prerequisite : NIL

Course Outcomes:

CO No	Expected Outcome	Learning Domains
1	Understand the dynamics of the population and its determinants.	R
2	Understand the implications of population composition in different regions of the world.	U
3	To know global refugee crisis	A
4	In-depth understanding about rural-urban dynamics of world population	An

****Remember(R), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C)***

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓						
CO 2		✓					
CO 3							✓
CO 4			✓				

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Approaches to Population Geography**	14
	1	Nature and Scope of Population Geography; Population Geography and Demography	
	2	Sources of Population Data (Census, Vital Statistics, Samples Surveys)	
	3	Population problems & optimum population	
	4	Population resource regions	

2	**Population Dynamics**		14
	1	Population theories: Malthus, Ricardo, Marx Theory	
	2	Fertility and Mortality- Measures and Determinants	
	3	Migration- Determinants and Implications	
	4	Migration theories	

3	**Contemporary Population Issues and Policies**		14
	1	Trends and spatial dynamics of sex ratio, Dynamics of Population Pyramids and Ageing	
	2	Demographic Dividends	
	3	Population and resource conflict; Global Refugee Crisis (push and pull factors)	
	4	Population policy: World and India	

4	**Human Settlements**		14
	1	Rural Settlements: Types and Characteristics (Site, Situation, Pattern and Morphology)	
	2	Urban Settlements: Definition, Classification	
	3	Urban Morphology: Classical Models of Burgess, Hoyt, Harris and Ullman	
	4	Rural-Urban Composition of world's population	

5	**Teacher Specific Module**	
	Collect district level data from Census of India (minimum 10 districts). Calculate population growth rate and population pyramid.	4
	Literature review/Book review/Movie Review on the theme Global Refugee Crisis or International Migration	
	Identify examples for various settlement patterns from the toposheet/google earth images. Write a brief account on the factors affecting the location of the settlement.	

Essential Readings:

1. Beaujeu-Garnier,J. (1966) Geography of Population.London: Longman
2. Chandna,R.C. (2017).Geography of Population.Kalyani Publishers, Ludhiana,India.
3. Clarks,John,I. (1972).Population Geography.Pergamon Press,New York.
4. HassanM.I. (2020).Population Geography, A Systematic Exposition. Routledge Taylor and Francis Group, New York.
5. Lutz, W., Warren, C. S. and Scherbov, S. (2004). The End of the World Population Growth in the 21st Century. UK: Earthscan.

6. Majumdar,P.K.(2010).Fundamentals of Demography. Rawat Publications, Jaipur.
7. Newbold,K.B.(2017).Population Geography: Tools and Issues. Rowman and Littlefield Publishers, NY, USA

Suggested Readings:

1. Clarke,J.I.(2003).Population Geography. Oxford: Pergamon Press.
2. Hudson,F.S.(2013).A Geography of Settlement. Plymouth: Macdonald & Evansltd.
3. Ghosh,S.(2002).A Geography of Settlement .Kolkatta: Orient Longman.
4. Jones,H.R.(2000).Population Geography.London: Paul Chappman.

Assessment Rubrics:

Evaluation Type		Marks
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper - 1	10
b)	Test Paper - 2	
c)	Assignment	10
d)	Seminar	
e)	Book/Article Review	10
f)	Viva-Voce	
g)	Field Report	
Total		**100**

KU4 DSC GEO205: Fundamentals of Geoinformatics

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
IV	DSC	200-299	KU4DSCGEO205	4	4

Learning Approach (Hours/Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
0	8	1	30	70	100	2

Course Description:

The Geographic Information System (GIS) Practical course aims to equip students with hands-on experience in using GIS software for spatial data analysis, mapping, and visualization. Students will learn practical skills in data manipulation, geo processing, and spatial analysis through laboratory exercises, projects, and case studies. The course covers a range of GIS applications in various

domains such as urban planning, environmental management, agriculture, and disaster response. By the end of the course, students will be proficient in utilizing GIS tools and techniques to solve real-world spatial problems.

Course Pre requisite : NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	Understand the basic principles and concepts of Geographic Information System (GIS).	U
2	Acquire, preprocess, and manage spatial data from various sources.	A
3	Perform spatial analysis tasks such as proximity analysis, spatial querying, and surface analysis using GIS software.	An
4	Create thematic maps, perform spatial interpolation, and visualize spatial data effectively.	C
5	Integrate and manipulate spatial datasets for decision-making and planning purposes	E
6	Design and implement GIS-based projects to address real-world spatial problems	C
7	Communicate spatial analysis findings effectively through maps, reports, and presentations	A

****RememberI, Understand(U), Apply(A), Analyse(An), EvaluateI, Create (C)***

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓						
CO 2				✓			
CO 3				✓			
CO 4					✓		
CO 5			✓				
CO 6						✓	

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Introduction to GIS**	20
	1	Introduction to GIS: Concepts and Applications	
	2	Components of GIS: Hardware, Software, Data, and People	
	3	Spatial Data Types and Formats	
	4	Coordinate Systems and Map Projections	
2		**Spatial Data Handling and Analysis**	30
	1	Spatial Data Acquisition Techniques: GPS, Remote Sensing	
	2	Data Preprocessing and Cleaning	
	3	Spatial Analysis Techniques: Buffering, Overlay, and Interpolation	
	4	Geo processing Tools and Functions in GIS	
3		**Advanced Spatial Analysis**	30
	1	Advanced Spatial Analysis Techniques: Network Analysis, 3D Analysis	
	2	Spatial Statistics and Modeling	
	3	Web GIS and Mobile GIS Applications	
	4	Case Studies and Practical Applications	
4		**Project-based Learning in GIS**	30
	1	Designing and Planning GIS Projects	
	2	Data Collection and Integration for Project Implementation	
	3	Analysis, Interpretation, and Presentation of Project Results	
	4	Real-world Applications and Case Studies	

5	**Teacher Specific Module**	
	Directions	
	Prepare a project file using the applications of GIS Software. The project may be designed on any of the following topic, if not limited to them: Land Use / Land Cover Change, Urban Studies, Environmental Hazards, resource mapping and management etc.	10

Essential Readings:

1. Fundamentals of Geographical Information Systems" by P. C. K. Mishra
2. "GIS Applications in Agriculture" by S. R. Pal and S. K. Ghosh
3. "Geographic Information Systems: An Introduction" by Mahesh Rao and Shashi Shekhar
4. "GIS and Remote Sensing: Principles and Applications" by Mohammed A. Kalkhan
5. "Geoinformatics: Principles, Applications, and Emerging Trends" by Prashant K. Srivastava and Lipi Das
6. "Introduction to GIS and Remote Sensing" by A. V. Senthil Kumar and C. V. Raja
7. "Practical Manual on GIS and Remote Sensing" by N. Thirunavukkarasu and V. R. Rajan
8. "Geospatial Technology for Digital Soil Mapping" by A. B. Panigrahy, S. K. Swain, and P. K. Srivastava
9. "Practical Manual on Geoinformatics" by R. R. Yadav and S. K. Srivastava
10. "Geographical Information System and Global Positioning System" by P. C. K. Mishra
11. "Remote Sensing and GIS: Principles and Applications" by P. C. K. Mishra and O. P. Mathur
12. "GIS for Environmental Applications: A Practical Approach" by X. Wang and V. P. Singh
13. "Geoinformatics: Theory and Practice" by K. S. Rajan and K. C. Tiwari
14. "Advanced Techniques in Geographic Information Systems" by P. R. Ahuja and K. P. K. Nair
15. "GIS and Remote Sensing: Principles and Applications" by Mohammed A. Kalkhan
16. "Advanced Geospatial Analysis: Theory and Applications" by K. C. Tiwari and K. S. Rajan
17. "Practical Applications of Geospatial Technology" by S. K. Swain, A. B. Panigrahy, and P. K. Srivastava
18. "Advanced Remote Sensing: Digital Image Processing and Applications" by P. C. K. Mishra
19. "Spatial Analysis and Modeling in Geographical Transformation Process" by P. L. N. Raju
20. "Spatial Data Analysis in Urban and Regional Planning" by A. K. Singh and O. P. Mathur
21. "Advanced Geographical Information Systems and Web Technologies" by B. P. Prakash
22. "Spatial Data Mining and Geographic Knowledge Discovery" by M. Anji Reddy
23. "Advanced Spatial Statistics: Geostatistics, Spatial Regression, and Spatial Econometrics" by G. S. Srinivasan and K. R. Prasad.

Suggested Readings:

1. Fundamentals of Geographical Information Systems" by P. C. K. Mishra
2. "GIS Applications in Agriculture" by S. R. Pal and S. K. Ghosh
3. "Geographic Information Systems: An Introduction" by Mahesh Rao and Shashi Shekhar

4. "GIS and Remote Sensing: Principles and Applications" by Mohammed A. Kalkhan
5. "Geoinformatics: Principles, Applications, and Emerging Trends" by Prashant K. Srivastava and Lipi Das
6. "Introduction to GIS and Remote Sensing" by A. V. Senthil Kumar and C. V. Raja
7. "Practical Manual on GIS and Remote Sensing" by N. Thirunavukkarasu and V. R. Rajan
8. "Geospatial Technology for Digital Soil Mapping" by A. B. Panigrahy, S. K. Swain, and P. K. Srivastava
9. "Practical Manual on Geoinformatics" by R. R. Yadav and S. K. Srivastava
10. "Geographical Information System and Global Positioning System" by P. C. K. Mishra
11. "Remote Sensing and GIS: Principles and Applications" by P. C. K. Mishra and O. P. Mathur
12. "GIS for Environmental Applications: A Practical Approach" by X. Wang and V. P. Singh
13. "Geoinformatics: Theory and Practice" by K. S. Rajan and K. C. Tiwari
14. "Advanced Techniques in Geographic Information Systems" by P. R. Ahuja and K. P. K. Nair
15. "GIS and Remote Sensing: Principles and Applications" by Mohammed A. Kalkhan
16. "Advanced Geospatial Analysis: Theory and Applications" by K. C. Tiwari and K. S. Rajan

Assessment Rubrics:

Evaluation Type		**Marks**
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper - 1	10
b)	Test Paper - 2	
c)	Practical File	20
d)	Seminar	
e)	Book/Article Review	
f)	Viva-Voce	
g)	Field Report	
Total		**100**

KU5 DSC GEO301 Environmental and Biogeography

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
V	DSC	300-399	KU5 DSC GEO301	4	4

Learning Approach (Hours/Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	1	30	70	100	2

Course Description:

Environmental and Biogeography provides a comprehensive foundation to navigate the dynamic interface between living organisms and their environment. This course integrates principles from ecology, climatology, and biogeography to elucidate the dynamic interactions shaping ecosystems and biodiversity patterns. Students will delve into the fundamental principles of ecology, examining the flow of energy and matter through ecosystems and the intricate web of interactions between organisms and their environment. In the realm of biogeography, students will explore the spatial patterns of biodiversity and the processes that shape them. The course will enable students to understand how factors such as climate, topography, and human activities influence biodiversity patterns and ecosystem dynamics across different spatial scales. This course delves into the pressing environmental challenges facing our planet, including habitat destruction, climate change, and species extinction. Students will critically evaluate strategies for conservation, sustainable resource management, and the restoration of degraded ecosystems, fostering an understanding of the complexities of environmental stewardship.

Course Prerequisite : NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	Detailed exposure of ecosystem and its geographical dimensions.	R
2	Appreciate the functionality of the bio geographical processes and biogeochemical cycles.	U
3	In-depth knowledge of human adaptation in various biomes.	A
4	Understand the factors affecting its distribution of flora and fauna and major environmental issues.	An

5	Critically evaluate the global and national level efforts to conserve biodiversity.	E

Remember(R), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create (C)

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1		✓					
CO 2	✓						
CO 3	✓						
CO 4			✓				
CO 5						✓	

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Ecosystem**	14
	1	Human-Environment Relationships: Historical Progression, Environment, Ecology and Ecosystem	
	2	Ecosystem: Concept, Structure and Functions	
	3	Introduction to Environmental Geography	
2		**Biogeographical Processes and Biogeochemical Cycles**	14
	1	Dispersal and Speciation; Ecological Succession and Extinction	
	2	Biogeochemical cycles	
	3	Factors influencing global distribution: Phyto-geographical realms and Zoogeographical realms	
3		**Human Environment Relationship and Contemporary Environmental Problems**	14
	1	Human life in different environmental regions: Mountain, desert, coastal	
	2	Major environmental issues in the world and India: Climate change, biodiversity loss, Pollution	
	3	Environmental movements in India: Western Ghat Conservation, Chipko Movement, Narmada Bachao Andolan	

4	**Biogeography**		14
	1	Definition, scope and significance of Biogeography; Basic Ecological Principles and Darwin's theory of Evolution	
	2	Ecotone and ecological niche, Concepts of Biome, distribution of flora and fauna	
	3	Bio-diversity- concept, Types, problems, Conservation measures; Biodiversity Hotspots in India	
5	**Teacher Specific Module**		
	Group wise documentary making on the theme 'Documenting Local Biodiversity and its Conservation'		4

Essential Readings:

1. Chandna R. C., 2002: Environmental Geography, Kalyani, Ludhiana.
2. Cunninghum W. P. and Cunninghum M. A., 2004: Principals of EnvironmentalScience: Inquiry andApplications, Tata Macgraw Hill, New Delhi.
3. Goudie A., 2001: The Nature of the Environment, Blackwell, Oxford.
4. Odum, E. P. et al, 2005: Fundamentals of Ecology, Ceneage Learning India.
5. Huggett, R.J. (1998). Fundamentals of Biogeography, USA: Routeldge
6. Lomolino, Mark. V., 2020, Biogeography: A Very Short Introduction,Oxford Publication, ISBN: 9780198850069
7. Cox, C.B, et.al, 2016, Biogeography: An Ecological and Evolutionary Approach, 9th Edition, Wiley-Blackwell.
8. Taylor, J.A., 2021, Themes in Biogeography, Routledge, Taylor andFrancis publications, ISBN 9780367351106

Suggested Readings:

1. MoEF, 2006: National Environmental Policy-2006, Ministry of Environment and Forests, Government of India.
2. Pielou, E.C., 1979, Biogeography, John Wiley & Sons, USA.10: 0471058459ISBN 13: 9780471058458
3. L.C Aggarwal, 2018, Biogeography, Rawat publication Jaipur
4. Mathur, H.S. (1998). Essentials of Biogeography. Jaipur, India: Anuj Printers.
5. Singh S., 1997: Environmental Geography, Prayag Pustak Bhawan. Allahabad.
6. UNEP, 2007: Global Environment Outlook: GEO4: Environment For Development, United Nations Environment Programme

Assessment Rubrics:

Evaluation Type		**Marks**
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper - 1	10
b)	Test Paper - 2	
c)	Assignment	10

d)	Seminar	
e)	Book/Article Review	
f)	Viva-Voce	
g)	Field Report- Documentary	10
Total		**100**

KU5 DSC GEO302 World Regional Geography

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
V	DSC	300-399	KU5 DSC GEO302	4	4

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE(Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	1	30	70	100	2

Course Description:

The course in World Regional Geography presents an immersive exploration of the diverse global, landscapes, examining continents through distinct modules dedicated to their unique physiography, population dynamics, and economic foundations. Students embark on a journey across continents, delving into the physical characteristics that shape their geographies, understanding the intricacies of population distribution, and analyzing the economic structures that define each region. By navigating through these modules, students gain a holistic perspective on the interplay between physical geography, demographics, and economic activities, cultivating a nuanced understanding of the complexities that contribute to the unique identity of each global region.

Course: Pre requisite NIL

Course Outcomes:

CO No	Expected Outcome	Learning Domains
1	Understand the concept of a region and its various types	U
2	Identify major natural regions of the world and interconnectedness of physical and human features over there.	U
3	Examine the role of physical setting on the regional development of various regions	E
4	Analyse the causes and consequences of regional disparities in the world	An

****Remember(R), Understand (U), Apply(A), Analyse(An), Evaluate(E), Create(C)***

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓						
CO 2		✓					
CO 3			✓				
CO 4						✓	

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Region and regionalization**	14
	1	Region concept in geography, and its types (Formal, functional, and planning)	
	2	Methods of regionalization	
	3	Natural regions of the world	
	4	Basic physiography - Relief, Drainage, Climate, Natural Vegetation, Soils.	
2	1	**Tropics - Man environment and activities**	
	2	Equatorial region	

	3	Monsoon region	14
	4	Tropical deserts and Tropical grass lands	
3		**Temperate and polar region - Man environment and activities**	14
	1	Mediterranean region	
	2	Temperate grass lands	
	3	Taiga	
	4	Tundra	
4		Case studies (Physical and socio-economic setting)	14
	1	Australia	
	2	USA	
	3	China	
	4	Argentina	
5	**Teacher Specific Module**		4
	Directions		
	Practical exercise involving methods of regionalization. *1. Flow analysis* *2. Overlay method/Super imposition method* *3. Composite index method* *4. Gravitational analysis*		

Essential Readings:

1. ChristopherLSatter,JospehJHobbs–EssentialsofWorldRegionalGeography, Thompson Books
2. Deblij,H.J.:Geography: Regions and Concepts, John Wiley, New York, 1994.
3. Maurya,SD (2015).World Regional Geography. Pravalika Publications. Allahabad
4. Gautam,A (2015).Regional Geography of the World. Sharda Pustak Bhawan. Allahabad
5. Hussain,M(2016). World Geography. Rawat Publications. Jaipur
6. Alka Gautam(2007)–World Geography, Sharda Pustak Bhawan, Allahabad.
7. Tikkha,Bali,Sekhon(2007)–WorldRegionalGeography,New Academic Publishing Co., Jalandhar

Suggested Readings:

1. Nijman, Muller and Shin(2020):The world today:Concepts and regions in geography. Wiley
2. http://caitiefinlayson.com/WRGTextbook.pdf(Ebook)
3. Manku,DS(2017).A Regional Geography of the World .Kalyani Publishers.New Delhi
4. JKole :A Geography of the World's Major Regions, Routledge, London,1996..

Assessment Rubrics:

Evaluation Type		Marks
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper - 1	10
b)	Test Paper - 2	
c)	Assignment/Practical Excercse as part of module 5	20
d)	Seminar	
e)	Book/Article Review	
f)	Viva-Voce	
g)	Field Report	
Total		**100**

KU5 DSC GEO303 Quantitative Techniques in Geography

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
V	DSC	300-399	KU5 DSC GEO303	4	4

Learning Approach (Hours/Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4		0	30	70	100	2

Course Description:

The course would enable students to explore the principles and applications of statistical methods in spatial analysis and geographic research. It equips them with the essential skills to analyze, interpret, and visualize geographic data, providing a robust foundation for understanding spatial patterns and processes.

Throughout the course, students will learn how to collect, organize, and manipulate geographic data using statistical techniques. They will delve into descriptive and inferential statistics, exploring techniques such as measures of dispersion, spatial sampling and regression analysis.

Course Prerequisite : NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	To know the nature of geographic data and its various sources.	R
2	To distinguish and apply descriptive and inferential statistical techniques.	U
3	Understand the advantages and disadvantages of central tendencies and dispersion.	U
4	Evaluate centrographic techniques and its application in geography.	A
5	Comprehend the science and techniques of sampling, probability and hypothesis testing.	U
6	Apply bivariate statistical analysis such as correlation and regression.	An

****Remember(R), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create (C)***

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓						
CO 2						✓	
CO 3					✓		
CO 4				✓			
CO 5					✓		
CO 6			✓				

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
		Statistical Methods in Geography	20
	1	Quantitative Revolution in Geography, Significance of Statistical Methods and its limitation	
	2	Sources of Data in Geography	

1	3	Geographical Data Matrix, Frequency Distribution Tables and Cross Tabulation	
	4	Scales of Measurement (Nominal, Ordinal, Interval, Ratio)	
2		**Descriptive Statistics**	30
	1	Measures of Central Tendency (Mean, Median, Mode, Harmonic Mean and Geometric Mean)	
	2	Measures of Dispersion (Mean deviation, Quartile Deviation, Standard Deviation, Variance, Coefficient of Variation and Lorenz Curve)	
	3	Partition Values: Quartiles, Deciles and Percentiles	
	4	Centro-graphic Techniques: Mean Centre, Median Centre, Standard Distance	
3		**Sampling, Probability and Hypothesis Testing**	30
	1	Theory of Sampling and Types	
	2	Theory of probability	
	3	Probability distribution function- Normal Distribution and Fitting of Normal Curve, Concept of Skewness and Kurtosis	
	4	Testing of Hypothesis: T-test, F-test, Chi-square	
4		**Bivariate Analysis**	30
	1	Karl Pearson's Product Moment Correlation	
	2	Spearman's Rank Correlation	
	3	Simple Regression	
	4	Residuals from regression and its mapping	
5		**Teacher Specific Module**	
		Teacher may circulate a data matrix of about (100 x 10) with each row representing an aerial unit (100 districts or villages) and about 10 columns of relevant attributes of the areal units like demographic variables etc. Construct frequency distribution table for at least 2 variables and calculate descriptive statistical measures for the frequency distribution table constructed.	10
		From the data matrix a sample set (20 Percent) would be drawn using systematic or stratified methods of sampling and locate the samples on a map with a short note on methods used. Bivariate analysis should be carried out on these randomly selected districts.	
		Each student will submit a record containing five exercises from each modules.	

Essential Readings:

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

Suggested Readings:

1. Silk J., 1979: Statistical Concepts in Geography, Allen and Unwin, London.
2. Spiegel M. R.: Statistics, Schaum's Outline Series.
3. Hammond P. and McCullagh P. S., 1978: Quantitative Techniques in Geography: An Introduction, Oxford University Press.
4.

Assessment Rubrics:

Evaluation Type		**Marks**
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper - 1	10
b)	Test Paper - 2	
c)	Practical Record	20
d)	Seminar	
e)	Book/Article Review	
f)	Viva-Voce	
g)	Field Report	
Total		**100**

KU5 DSE GEO301 Agriculture and Food System

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
V	DSE	300-399	KU5 DSE GEO301	4	4

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE(Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	0	30	70	100	2

Course Description:

Agricultural Geography is concerned with the spatial variations, distribution and location of agricultural activities on the earth's surface and the factors responsible for them. It is dominated by the interrelationship and effects of both physical and socio-economic factors on spatial farm enterprises and farm operations. Agricultural Geography addresses bio-physical determinants of agricultural patterns and productivity; socio- cultural and economic determinants of agricultural patterns and productivity; agricultural activities and spatial organization; agricultural decision-making analysis; agricultural technological changes; agriculture and economic development; and global emerging issues in agriculture from spatial and temporal perspectives.

Course Pre requisite : NIL

Course Outcomes:

CO No	Expected Outcome	Learning Domains
1	Understand about the introduction to agriculture, nature, scope, significance and Development of agriculture geography, study approaches applied in agriculture	U
2	Understand the influence of physical, Economic and Technological factors on agriculture patterns.	An
3	Understand the agricultural system its meaning and concept, Whittlesey's classification of agricultural system, types of	A
	agricultural, study the types of agricultural in respect of area, salient features and their problems.	
4	Understand the agricultural regionalization and modes in agricultural geography and their classification of agricultural models and some theories.	E
5	Identify the problems and prospects of Indian agriculture	E

****Remember(R), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C)***

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓						
CO 2		✓					
CO 3	✓						
CO 4					✓		
CO 5							✓

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Introduction to Agriculture**	14
	1	Nature, Scope and Significance in the development of Agricultural Geography	
	2	Approaches to the study of Agricultural Geography	
	3	Origin and evolution of Agriculture, Types of Agriculture	
	4	Determinants of Agriculture	
2		**Agricultural Regionalization**	14
	1	Land Use and Land capability classification	
	2	Crop Combination, crop concentration, Crop diversification and agricultural productivity	
	3	Agricultural location Theories- Von Thunen agricultural model	
	4	Whittlesey's agricultural systems of the world	
3		**Indian Agriculture**	14
	1	Agricultural regions of India	
	2	Agro-climatic regions of India	
	3	Green Revolution and Organic farming movement	
	4	Problems and Prospects of Indian agriculture	
4		**Food System**	14
	1	Agro-food system linkages	
	2	Food security	
	3	Food Sovereignty	
	4	Public Distribution System and Right to Food	

5	**Teacher Specific Module**	
	Directions	
	Practical exercises 1. Major sources of agricultural statistics- India and Kerala 2. Calculate inequality in the distribution of landholding- Lorenz Curve method. 3. Measurement of agricultural productivity and crop diversification 4. Crop combination using Weaver's method	4

Essential Readings:

1 Bansil,B.C.(1975):'Agricultural Problems of India', Delhi.
2 Berry,B.J.L.et.al.(1976):The Geography of Economic Systems.Prentice Hall, New York.
3 Gregor,H.P.:Geography of Agriculture.Prentice Hall,NewYork, 1970.
4 Grigg,D.(1984):'An Introduction to Agricultural Geography',Hutchinson Publication, London
5 Hartshorn,T.N.and Alexander,J.W.(1988):Economic Geography.PrenticeHall, New Delhi.
6 MorganW.B.and Norton,R.J.C.(1971): Agricultural Geography. Mathuen, London,
7 Morgan,W.B.and Munton,R.J.C.(1977):'Agricultural Geography'Methuen, London..
8 Sauer,C.O.(1952):'Agricultural Origins and Dispersals',American Geographical Journal
Sauer,C.O.(1969):Agricultural Origins and Dispersals.M.I.T.Press,Mass, U.S.A.
9 SinghJ.(1997):Agricultural Development in SouthAsia:A Comparative A Study in the Green Revolution Experiences, national Books Organization, New Delhi.
10 Singh,J.andDhillon,S.S.(1984):'Agricultural Geography',McGrawHill, New Delhi.
11 Singh,J.andDhillon,S.S.(1988),"AgriculturalGeography",2ndedition,Tata McGraw-Hill, New Delhi
12 Symons,L.(1972):'Agricultural Geography',Belland Sons,London
13 Tarrant,J.R.(1974):AgriculturalGeography, Problems in Modern Geography Series, John Wiley and Sons. Page 2 of 3

Suggested Readings:

1 Bayliss Smith,T.P.(1987):The Ecology of Agricultural Systems.Cambridge University Press, London
2 Morgan,W.B.(1978):Agriculture in the Third World-A Spatial Analysis.Westview Press, Boulde.
3 Sauer,C.O.(1969):Agricultural Origins and Dispersals.M.I.T.Press,Mass, U.S.A.
4 SinghJ.(1997):Agricultural Development in SouthAsia: A Comparative A Study in the Green Revolution Experiences, National Books Organization, New Delhi.
5 TheHindu(2006):Survey of Indian Agriculture2006. New Delhi.
6 Wigley,G.(1981), TropicalAgriculture:The Development of Production, 4thedition, Arnold, London.

Assessment Rubrics:

Evaluation Type		Marks
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper - 1	10
b)	Test Paper - 2	
c)	Assignment/Practical work outlined in Module 5	20
d)	Seminar	
e)	Book/Article Review	
f)	Viva-Voce	
g)	Field Report	
Total		**100**

KU5 DSE GEO302 Political Geography

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
V	DSE	300-399	KU5 DSE GEO302	4	4

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE(Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	0	30	70	100	2

Course Description:

This course attempts to provide a comprehensive understanding of how space, place, and territory influence political dynamics, governance structures, and geopolitical relations. The course begins by exploring foundational concepts in political geography, including the nature of political borders, territoriality, sovereignty, and the role of space in shaping political identities and power relations. Students will examine different theories and approaches within political geography, such as geopolitics, critical geopolitics, and territoriality studies, to analyze how states and non-state actors navigate and contest space for political ends.

Course Prerequisite : NIL

Course Outcomes:

CO No	Expected Outcome	Learning Domains
1	Understand the interlinkage of space and power politics.	U
2	Comprehend and apply key concepts and theories in political geography and geopolitics.	A
3	Analyze the historical formation of nation State.	An
4	Critically evaluate the geographies of resource conflicts in contemporary world.	E
5	Analyze and interpret the influence of geographical factors on electoral processes.	An

****Remember(R), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C)***

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓	✓					
CO 2		✓					
CO 3	✓						
CO 4		✓				✓	
CO 5			✓				✓

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Political Geography and Geopolitics**	14
	1	Nature, scope of political geography; perspective and approaches in political geography	
	2	Geopolitics- meaning and concept, determinants and divisions of world regions	
	3	Historical overview of geopolitical world order- Imperialist and Cold War geopolitics; Globalization and Liberal Democracy	
	4	Theoretical Frameworks: Heartland and Rimland Theory; World System Theory, Marxian Theory, Realist Theory	
		State, Nation and Nation State	
	1	Concept of Nation and State and Nationalism	

2	2	Attributes of State– Frontiers, Boundaries, Shape, Size, Territory and Sovereignty	14
	3	Frontiers and Boundaries- Concept and Types	
	4	Territorial State System- historical development; and Nation State and Federalism	
3		**Electoral Geography**	14
	1	Methods in electoral geography and Geographic Influences on Voting pattern	
	2	Geography of electoral support and representation: constituencies and their evolution in Indian context; and Gerrymandering	
	3	India's political alliance; role of caste, religion and language in electoral politics and party systems	
	4	Politico electoral regions of India	
4		**Resource Conflicts & Politics of Displacement**	14
	1	Internal colonization separate state movement in India: Jharkhand movement, Uttarakhand movement	
	2	Water Sharing Disputes- International and India Disputes	
	3	Conflicts Related to Forest Rights and Minerals- International and India	
	4	Issues of relief, compensation and rehabilitation: with reference to Dams, National Highway Development and Special Economic Zones	
		Teacher Specific Module	
5		*Directions* Seminar on following topics: 1. Climate change and the geopolitics of Indian Ocean 2. Politics of Arctic Governance 3. Globalization, Nation State and Global Refugee Crisis 4. Biopolitics and Biopower	4

Essential Readings:

1. Adhikari, S. 1997. Political Geography, Rawat publications, Jaipur and Delhi
2. Agnew, J. 2002. Making Political Geography, Arnold, London
3. Agnew, J., Mitchell, K. and Toal, G. eds.2003.A Companion to Political Geography, Blackwell, Oxford
4. Cohen, S. .1964. Geography and Politics in a World Divided, Random House, New York
5. Cox, K.R., .2002.Political Geography: Territory, State and Society, Wiley-Blackwell, Chichester
6. Glassner M.,1993: Political Geography, Wiley.
7. Hodder Dick, Sarah J Llyod and Keith S M., 1998. Land Locked States of Africa and Asia (vo.2), Frank Cass.
8. Jeffrey, A. and Painter, J., 2008. Political geography: An introduction to space and power. Sage.

9. Smith, S., 2020. Political geography: A critical introduction. John Wiley & Sons.
10. Jones, M., Jones, R., Woods, M., Whitehead, M., Dixon, D. and Hannah, M., 2014. An introduction to political geography: space, place and politics. Routledge.

Suggested Readings:

1. AgnewJ.,2002. Making Political Geography, Arnold.
2. Agnew J.,Mitchell K.and ToalG.,2003: A Companion to Political Geography, Blackwell.
3. Cox .R.,Low M.and Robinson J.,2008:The Sage Hand book of Political Geography, Sage Publications.
4. Painter, J., 1995. Politics, Geography and 'Political Geography': A Critical Perspective. London: Arnold
5. Mellor,R.E.H. 2015. Nation, State and Territory: A Political Geography. United Kingdom: Taylor & Francis.
6. Painter J. and Jeffrey A., 2009: Political Geography, Sage Publications.
7. Gallaher C.,et al., 2009. Key Concepts in Political Geography. Sage Publications.

Assessment Rubrics:

Evaluation Type		**Marks**
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper - 1	10
b)	Test Paper - 2	
c)	Assignment	
d)	Seminar	20
e)	Book/Article Review	
f)	Viva-Voce	
g)	Field Report	
Total		**100**

KU5 DSE GEO303 Economic Geography

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
V	DSE	300-399	KU5 DSE GEO303	4	4

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE(Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	0	30	70	100	2

Course Description:

This course in Economic Geography offers students a comprehensive exploration of the spatial dimensions of economic activities, equipping them with a nuanced understanding of the intricate relationships between space and economic processes. Throughout the course, students delve into the spatial organization of economic activities and dissect global economic systems. the course prepares students to communicate effectively about economic geography concepts and engage in discussions on the geopolitical dimensions of global economic interdependencies. By the course's conclusion, students emerge with a well-rounded skill set, enabling them to conduct independent research, analyze complex economic patterns, and contribute meaningfully to discussions on the evolving economic landscapes at local, regional, and global scales.

Course Prerequisite: NIL

Course Outcomes:

CO No	Expected Outcome	Learning Domains
1	Develop an understanding on how geographical factors organize economic space	U
2	Acquire knowledge about spatial patterns of various economic activities on the earth.	A
3	Evaluate the interconnectedness of global economic systems	E
4	Engage in critical discussions about the geopolitical aspects of economic geography	An

****Remember (R), Understand (U), Apply(A), Analyse (An), Evaluate (E),Create(C)***

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓						
CO 2		✓					
CO 3							✓
CO 4						✓	

COURSE CONTENTS

Contents for Classroom Transaction :

MODULE	UNIT	DESCRIPTION	HOURS
1		**Economic Geography- Introduction**	14
	1	Meaning and Scope of Economic Geography	
	2	Concept and classification of Economic activities	
	3	Approaches and Fundamental Concepts of Economic Geography	
	4	Factors Affecting location of Economic Activity	
2		**Resources**	14
	1	Concept and classification	
	2	Mineral Resources- World Distribution	
	3	Energy resources- World Distribution	
	4	Conservation and Management of Resources for Sustainable Development	
3		**Agriculture and Allied Sectors**	14
	1	Forestry, livestock, animal husbandry and fisheries	
	2	Agriculture: Subsistence and Commercial	
	3	Factors affecting agriculture	
	4	Challenges faced by primary economic sector	

4		**Secondary and Quaternary Sectors**	14
	1	Industries-factors of localization, location theory (Weber), major industries - iron and steel, textile, chemicals, paper	
	2	Transport: major water, land, and air transport; geographical factors in their development	
	3	Internal and International Trade, Major Trade Blocs	
	4	Quaternary activities – Information and communications technology industry	
5		**Teacher Specific Module**	
		Directions	
		Prepare atlas showing the distribution of resources	4
		Visit any industry in the locality to map the factors responsible for its location and working conditions in the industry.	

Essential Readings:

1. Alexander J. W. (1963). Economic Geography. New Jersey, USA: Prentice-Hall Inc.
2. Coe N. M., Kelly P. F. and Yeung H. W. (2007). Economic Geography: A Contemporary Introduction, USA: Wiley-Blackwell.
3. Combes P., Mayer T. and Thisse J. F. (2008). Economic Geography: The Integration of Regions and Nations. USA: Princeton University Press.
4. Durand L. (1961). Economic Geography. USA: Crowell.
5. Roy,Prithwish (2014). Economic Geography (6thedition), New Central Book Agency
6. Gautham, Alka (2015).Advanced economic geography (4th edition), Sharda Pusthak Bhavan
7. Maurya, SD (2022). Resource Geography, Pravalika publications.
8. Barnes, T. J., & Christophers, B. (2018). Economic geography: A critical introduction. John Wiley & Sons.

Suggested Readings:

1. Saxena, H.M., (2013). Economic Geography, Rawat Publications, Jaipur
2. Hartshorne,T.N. and Alexander,J.W., (1988). Economic Geography, Prentice Hall, New Delhi.
3. Jones CF and Darkenwald, G.G. (1975).Economic Geography Mc.Millan Company, New York.
4. Hodder B. W. and Lee R. (1974). Economic Geography. UK: Taylor and Francis.
5. Wheeler J. O., (1998). Economic Geography. USA: Wiley.
6. Willington D. E., (2008). Economic Geography. UK: Husband Press.
7. Knowles, R. (1990). Economic and Social Geography made simple, Rupa Publicati

.

Assessment Rubrics:

Evaluation Type		Marks
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper - 1	10
b)	Test Paper - 2	
c)	Assignment	10
d)	Seminar	
e)	Book/Article Review	
f)	Viva-Voce	
g)	Field Report	10
Total		**100**

KU5 DSE GEO304 Hydrology and Soil Studies

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
V	DSE	300-399	KU5 DSE GEO304	4	2

Learning Approach (Hours/Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	0	30	70	100	2

Course Description:

This course delves into the intricate relationship between water and soil systems, exploring the fundamental principles of hydrology and soil science. Through a blend of theoretical study and hands-on exercises, students will gain a comprehensive understanding of the dynamic processes that govern water movement, distribution, and quality within terrestrial ecosystems, as well as the critical role soil plays in these processes.

Course Prerequisite : NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	Understand basic concepts of hydrological regime.	U
2	Analyze and explain various components of water balance and management of river basins.	An
3	Understand and evaluate best practices of integrated watershed management.	E
4	Identify different types of soil, distribution and management of soil resources.	U

******Remember(R), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create (C)***

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓	✓					
CO 2	✓	✓					
CO 3			✓			✓	
CO 4	✓					✓	

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Hydrological Cycle and Water Balance**	14
	1	Systems approach in hydrology	
	2	Components of hydrological cycle: precipitation, interception, evaporation, evapo-transpiration, infiltration, percolation, run-off and over land flow, ground water-table, flow of water in aquifers	
	3	Concept of Water Balance, Inter- relationships between components of water balance	
	4	water balance equation, concept of potential and actual evapotranspiration, soil moisture storage, water deficit and water surplus	

2	**Water Resource Management**		14
	1	Characteristics of river basins: basin parameters, river network, discharge, runoff, inter-flow and base-flow.	
	2	Integrated water resource management: watershed delineation, conjunctive- with case studies	
	3	Ground-water management strategies: water harvesting, artificial recharge of ground-water- with case studies	
	4	River Water Disputes: nature of dispute, sharing principles; river linkages	
	Soil Resource		
	1	Properties of soil, soil water balance	
3	2	Soil profile	14
	3	Soil forming processes	
	4	Soil classification systems, orders and distribution of soil	
4	**Soil Resource Management**		14
	1	Utilisation of soil resource	
	2	Soil erosion, estimation of soil losses	
	3	Problems, treatment and management of soil resource	
	4	Soil management policies	
5	**Teacher Specific Module**		
	Workshop on water resource assessment and management.		4
	Handson training on soil sample collection and its testing.		

Essential Readings:

1. Andrew. D.W., and Stanley, T. (2004). Environmental Hydrology, 2nd edition. USA: Lewis Publishers, CRC Press.
2. Fetter, C.W. (2005). Applied Hydrogeology. New Delhi, India: CBS Publishers & Distributors.
3. Karanth, K.R. (1988). Ground Water: Exploration, Assessment and Development. New Delhi, India:- Tata- McGraw Hill.
4. Lyon, J.G. (2003). GIS for Water Resource and Watershed Management, NY, USA: Taylor and Francis.
5. Singh, M., Singh, R.B., and Hassan, M.I. (Eds.) (2014): Landscape ecology and water management, Proceedings of IGU Rohtak Conference, Volume 2. Advances in Geographical and Environmental Studies, Springer.
6. Strahler A. and Strahler A. (2008). Physical Geography: Science and Systems of the Physical Environment. New York , USA: John Wiley & Sons.

Suggested Readings:

1. Rao, K.L. (1982). India's Water Wealth,2nd edition. Delhi, India: Orient Longman.
2. Reddy, K. Ramamohan, VenkateswaraRao,B, Sarala, C. (2014). Hydrology and Watershed Management. India: Allied Publishers.
3. Singh, V. P. (1995). Environmental Hydrology. The Netherlands: Kluwar Academic Publications.

4. Tideman, E.M. (1999). Watershed management - Guidelines for Indian Conditions. Delhi, India: Omega Scientific Publishers.
5. Todd, D.K. (1959). Ground water Hydrology. New Delhi, India: Wiley India Edition.

Assessment Rubrics:

Evaluation Type		Marks
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper - 1	10
b)	Test Paper - 2	
c)	Assignment/Practical work outlined in Module 5	20
d)	Seminar	
e)	Book/Article Review	
f)	Viva-Voce	
g)	Field Report	
Total		**100**

KU6 DSC GEO304 Geography of India with special reference to Kerala

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
VI	DSC	300-399	KU6 DSC GEO304	4	4

Learning Approach (Hours/Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	ESE	CE	Total	
4	0	0	70	30	100	2

Course Description:

The course offers a comprehensive exploration of the geographical landscape of India, with a focused lens on the vibrant state of Kerala. Through a blend of theoretical concepts, case studies, and practical applications, students will delve into the diverse physical, cultural, and socio-economic aspects that shape the geography of both India and Kerala. Thus, the course enable students in gaining nuanced understanding of the geography of India, with a particular focus on Kerala, and its implications for various aspects of human life and development.

Course Prerequisite : NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	Understand a comprehensive idea about physical structure of India	U
2	Create a general awareness of socio- cultural diversity and resource utilization of country.	An
3	Analyze the physical setting of Kerala and its influence on socio-cultural fabric.	A
4	Critical Examination of the state of Kerala's economy & Development	E

****Remember(R), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create (C)***

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓						
CO 2		✓					
CO 3	✓						
CO 4						✓	

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Physical Settings**	14
	1	Geo-political Significance of Location of India and its boundary	
	2	Physiographic divisions and major features; Soil and natural vegetation	
	3	Drainage Systems and Pattern: Himalayan and Peninsular River system	
	4	Climate- Factors influencing Indian climate; classification; Indian Monsoon	

	People		
2	1	Population: Density, Distribution and Growth	14
	2	Population Composition: Rural and Urban; Age and Sex	
	3	Social Composition: Language, Religion, Caste and Tribes	
	4	Population Problem and Policies	
3	**Resources and Economy**		14
	1	Major mineral resources of India	
	2	Distribution and utilization of major resources	
	3	Agriculture: production and distribution of major crops	
	4	Industrial Development: Automobile and Information Technology; major industrial belts	
4	**Kerala**		14
	1	Physical Setting: Location, Physiographic Division, Climate, Drainage Systems, Soil and Vegetation	
	2	Demography: Density and Growth of Population; Literacy, Sex- Ratio and Rural-Urban Composition; Caste, Tribes and Religion and its spatial dimensions	
	3	Economy: Agriculture; Distribution of major resources; Major Industries; Tourism	
	4	Kerala Model of Development	
5	**Teacher Specific Module**		
	Direction		
	Prepare handmade atlas with following plates: 1. Physiographic divisions of India 2. Drainage 3. Soil and Vegetation 4. Distribution of population 5. Population composition- Rural-Urban; Sex Ratio, Religion 6. Resources		4
	Book review exercise		

Essential Readings:

1. Husain. (2012). *Geography Of India*. McGraw-Hill Education (India) Pvt Limited.
2. Khullar, D. R. (n.d.). *Geography Textbook*. New Saraswati House India Pvt Ltd.
3. Chattopadhyay, S. 2017. Geomorphological Field Guide Book on Laterites and Backwaters of Kerala (Edited by AmalKar). Indian Institute of Geomorphologists, Allahabad
4. Ranjan, A. (2023). *Federalism and Inter-State River Water Disputes in India*. Taylor & Francis.
5. Sadasivan, S. N. (2003). *River Disputes in India: Kerala Rivers Under Siege*. Mittal Publications.
6. Deb, M., & Sarkar, S. C. (2017). *Minerals and Allied Natural Resources and their Sustainable Development: Principles, Perspectives with Emphasis on the Indian Scenario*. Springer.

7. State of Environment Report Kerala, (2007). Land environments, Wetlands of Kerala and Environmental Health. Vol I.
8. State Planning Board, Thiruvananthapuram (2017). Economic Review.
9. Government of Kerala. Urban Policy and Action Plan for Kerala. Available from http://www.kerala.gov.in/annualprofile/urban.htm.

Suggested Readings:

1. Holland, S. T. H., & India, G. S. of. (2023). Sketch Of The Mineral Resources Of India. LEGARE STREET Press.
2. Valdiya, K. S. (2001). Himalaya: Emergence and Evolution. Universities Press.
3. Agarwala, S. N. (1975). India's Population: Some Problems in Perspective Planning: Proceedings. Bloomsbury Academic.
4. Anjali, G., Tridib, C., J, M., Anindyo, & Shibashis (eds), C. (2009). India's Foreign Policy. Pearson Education India.
5. Cassen, R. (1978). India: Population, Economy, Society. Macmillan.
6. Ancient Communities of the Himalaya—Google Books. (n.d.). Retrieved February 1, 2024, from https://www.google.co.in/books/edition/Ancient_Communities_of_the_Himalaya/tK5y4iPArKQC?hl=en&gbpv=0
7. Gulia, K. S. (2007). Discovering Himalaya: Tourism Of Himalayan Region (2 Vols.). Gyan Publishing House.
8. Indian Minerals Yearbook. (2006). Indian Bureau of Mines.
9. India's Foreign Policy. (n.d.). Drishti IAS. Retrieved February 1, 2024, from https://www.drishtiias.com/daily-updates/daily-news-editorials/india-s-foreign-policy-1
10. Life in the Himalaya—Google Books. (n.d.). Retrieved February 1, 2024, from https://www.google.co.in/books/edition/Life_in_the_Himalaya/E5EmDwAAQBAJ?hl=en&gbpv=0
11. Problems and Prospects of Mineral Industry in India: A Study of Mica Indust... - Google Books. (n.d.). Retrieved February 1, 2024, from https://www.google.co.in/books/edition/Problems_and_Prospects_of_Mineral_Indust/9V8thT364UgC?hl=en&gbpv=0

Assessment Rubrics:

Evaluation Type		**Marks**
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper - 1	10
b)	Test Paper - 2	
c)	Assignment	15
d)	Seminar	
e)	Book/Article Review	5
f)	Viva-Voce	
g)	Field Report	
Total		**100**

KU6 DSC GEO305 Principles of Remote Sensing

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
VI	DSC	300-399	KU6 DSC GEO305	4	4

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	0	30	70	100	2

Course Description:

The course is designed to introduce students to the fundamental concepts and applications of remote sensing technology. This course emphasizes hands-on experience, providing students with the skills needed to acquire, analyze, and interpret remote sensing data. Through practical exercises and projects, students will learn how to apply remote sensing techniques in various fields such as environmental monitoring, agriculture, urban planning, and disaster management.

Course Prerequisite: NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	To create a basic knowledge on different types of remote sensing, basic principles of remote sensing	U
2	To make the students aware about the significance of the applications of remote sensing as a tool for monitoring objects & phenomena and suggesting their strategic management.	A
3	Examine the recent trends in RS technology and its application in various fields of research.	An
4	To apply the potentials of remote sensing technology in multidisciplinary research and to make suggestions for various problems	E

**Remember (R), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C)*

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓						
CO 2		✓		✓			
CO 3			✓	✓			✓
CO 4						✓	✓

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Principles of Remote Sensing**	20
	1	Evolution of Remote Sensing, Process of remote Sensing,	
	2	Advances in Indian remote sensing	
	3	Electromagnetic Radiation, EMS, Energy Interactions with Atmosphere and Ground.	
	4	Development of Aerial remote Sensing, Basic Principles of Photogrammetry - Flight Planning Mission, Types of Aerial Photographs, Film-Filters-Aerial cameras	
2		**Principles of Satellite remote sensing.**	30
	1	LANDSAT, SPOT, IRS, ERS, INSAT programmes and their characteristics.	
	2	Types of satellites and sensors, Platforms / Sensor properties	
	3	Multispectral and Hyperspectral Remote Sensing, Thermal and micro wave Remote Sensing.	
	4	Data products- Geometric Characteristics.	

3	**Principles of Image Interpretation**		30
	1	Basic Principles of Visual Interpretation of an Image	
	2	Digital Image Processing, Procedures in Digital Image Processing, Data Pre-processing, Ground Truth verification.	
	3	Image Classification- Supervised and Unsupervised Classification, Accuracy Assessment	
	4	Indices; NDVI, SAVI, NDWI, EVI, NDBI	
4	**Application of Remote Sensing**		30
	1	Application of RS in Agriculture-Forestry, Land use Land Cover mapping	
	2	Application of RS Environmental studies, Hydrology, Marine and Coastal studies	
	3	S for Urban studies Regional Planning and disaster management	
	4	Recent Trends in Remote Sensing, LIDAR, Drone Mapping, Hyperspectral Remote Sensing.	

5	**Teacher Specific Module**	
	Directions	
	Prepare Practical Record File containing at least 5 exercises from the following: 1. Practical 1: Calculation of Scale of Aerial Photograph (Using following methods: Focal Length and Flying Height of the Aircraft, Using Photo Distance and Ground Distance, Using Photo Distance and Map Distance). 2. Practical 2: Orientation of Aerial Photo using available Stereoscope (Mirror or Pocket Stereoscope). 3. Practical 3: Identification, Image Interpretation Key and interpretation of Feature Types in Aerial Photographs using a stereoscope. 4. Practical 4: Downloading various remote sensing data (Bhuvan and Landsat data). Preparation of spectral signatures curves for different Various Feature Types (LU/LC) types (only four: Water body, Vegetation, Open/fallow land and built up). 5. Practical 5: Clip, merge, band stacking / virtual raster.	

	6. Practical 6: Satellite Image Classification Using Supervised Methods and Preparation of Land Use/Land Cover Map Using Bhuvan or Landsat Data. 7. Practical 7: Satellite Image Classification using unsupervised/supervised classification methods. 8. Practical 8: Urban Sprawl mapping using NDBI or LULC or Vegetation Monitoring using NDVI or LULC	10

Essential Readings:

1. James B Campbell and Randolph H W (2011) Introduction to Remote Sensing, Gulford Press, New York.
2. Basudeb Bhatta (2008) Remote Sensing and GIS, OUP India Publication.
3. Christian Matzler (2006) Thermal microwave radiation: Applications for remote sensing, The Institution of Engineering and Technology, London.
4. Lillesand T M, Kiefer R W and J W Chipman (2008) Remote sensing and Image Interpretation, John Wiley, New Delhi.
5. Christian Matzler (2006) Thermal microwave radiation: Applications for remote sensing, The Institution of Engineering and Technology, London.

Suggested Readings:

1. Remote Sensing and Environment, Elsevier Publication
2. Journal of Geodesy, Springer Publication.
3. IEEE Transactions on Geoscience and Remote Sensing, Institute of Electrical and Electronics Engineers Inc.
4. Remote Sensing in Ecology and Conservation, Zoological society of London, Online ISSN:2056-3485
5. Sailesh Samanta, A Text Book of Remotesensing , GIS and GNSS, Nation press Publication.

Assessment Rubrics:

Evaluation Type		**Marks**
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper- 1	10
b)	Test Paper-2	
c)	Practical Record File	10
d)	Seminar	
e)	Book/ Article Review	
f)	Viva-Voce	
g)	Field Report	
Total		**100**

KU6 DSC GEO306 Field Work and Research Methodology

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
VI	DSC	300-399	KU6 DSC GEO306	4	8

Learning Approach (Hours/Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	0	30	70	100	2

Course Description:

Essential characteristic of geography is the desire to explore more about the world in which we live; to record its many parts, ceaselessly to encounter the strange and new, and yet return to our roots - to the place we have chosen to call home. Geography emerged as an institutionalized academic endeavor by positioning itself as the study of the Earth's surface. Surface includes not only the solid land but also the envelope of atmosphere immediately above it, structures that lie immediately below it, and the social and cultural environments contributed by the people who occupy it. Geographers look at these phenomena and processes from local to global scales - making geography a broad dynamic discipline.

The course introduces young geography students to explore the nature of academic geographies and various traditions in its methodological praxis. It equips them to critically engage with the integrative traditions in geographical methods by positioning geographical research in an interdisciplinary perspective. It trains students on various methods of research and sources of data in geography and their underlying epistemological discourses. By encouraging research aptitude amongst the students, workshop seeks to promote ethical practices in research activities.

Course Pre requisite : NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	Understand philosophical underpinnings of research methods.	U
2	Detailed exposure of new geographical landscape as a study area.	A
3	In-depth knowledge of different field techniques.	An
4	Understanding field ethics and different tools of field study.	E

****Remember(R), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create (C)***

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓						
CO 2		✓					
CO 3			✓				
CO 4				✓			

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Geographic Enquiry**	20
	1	Research: Meaning and Types	
	2	Routes of scientific explanation: Inductive, Deductive, Abductive; Research Approaches- Quantitative, Qualitative and Mixed methods	
	3	Nature of Geographic Inquiry: Questions investigated, Models for Geographic Inquiry	
	4	Values and Ethics in Research; Intellectual Property Rights	
2		**Developing Research Proposal**	30
	1	Identifying the research problem and study area	
	2	Literature review	
	3	Framing research questions, hypothesis, objectives	
	4	Sources of Data and Methods	
3		**Data collection and fieldwork**	30
	1	Field Visit and collecting primary data using various techniques	
	2	Collect Socio-economic Data: Observation (Participant / Non-Participant); Questionnaires (Open/Closed/ Structured/Non-Structured); Interviews (Key-informant, in-depth) and Focus Group Discussions	
	3	Spatial Survey: Transects and Quadrants, Triangulation, Constructing a Sketch; Use of GPS	
	4	Physical Data: Riverbed survey, soil sample collection	
4		**Data analysis, Interpretation and Report Writing**	30
	1	Data coding, editing and feeding	
	2	Qualitative and Quantitative Data Analysis	
	3	Data Representation Techniques	
	4	Designing the Field Report: Organization and preparation, referencing, endnote, footnotes, supplementary materials	

5	**Teacher Specific Module: Field Work**	
	A piolet survey may be conducted on the campus to introduce various survey instruments to students and equip them for field work.	10
	The duration of the field work should not exceed 10 days	
	Each student will prepare an individual report based on primary and secondary data collected during field work.	
	The word count of the report should be about 8000 to 12,000 excluding figures, tables, photographs, maps, references and appendices.	

Essential Readings:

1. Creswell J., 1994: Research Design: Qualitative and Quantitative Approaches Sage Publications.
2. Dikshit, R. D. 2003. The Art and Science of Geography: Integrated Readings. Prentice-Hall of India, New Delhi
3. Stoddard R. H., 1982: Field Techniques and Research Methods in Geography, Kendall/Hunt.
4. Wolcott, H. 1995. The Art of Fieldwork. Alta Mira Press, Walnut Creek, CA.

Suggested Readings:

1. Lavrakas, P. J. (2008). Encyclopedia of survey research methods. Sage publications.
2. Ridley, D. (2012). The literature review: A step-by-step guide for students.
3. Sarkar, A. (2015). Practical geography: A systematic approach. Delhi, India: Orient Black Swan Private Ltd.
4. Sarkar, A. (2013). Quantitative Geography: Techniques and Presentation. Delhi, India: Orient Black Swan Private Ltd.
5. Mukherjee, Neela. (1993). Participatory Rural Appraisal: Methodology and Application. Delhi, India: Concept Publs. Co.

Assessment Rubrics:

Evaluation Type		**Marks**
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper - 1	10
b)	Test Paper - 2	
c)	Assignment	
d)	Seminar	
e)	Book/Article Review	
f)	Viva-Voce	
g)	Field Report	20
Total		**100**

KU6 DSE GEO305 Urban Geography

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
VI	DSE	300-399	KU6 DSE GEO305	4	4

Learning Approach (Hours/Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	0	30	70	100	2

Course Description:

Urban geography is a field of study within human geography that focuses on the spatial aspects of cities and urban areas. It explores the patterns, processes, and dynamics of urban spaces, examining how cities are organized, function, and change over time. It focusses on the interplay between human activities and the physical environment within urban areas, as well as the social, economic, cultural, and political factors that shape urban development and equips with the knowledge and skills to understand urban challenges, critically analyze urban policies, and contribute to the planning and development of sustainable and livable cities.

Course Prerequisite : NIL

Course Outcomes:

CO No	Expected Outcome	Learning Domains
1	Understand the scope and approaches of urban studies and complexities of urban area	U
2	Understand the development of transformation of cities over time, morphology and structure of cities	An
3	Analyse the social organization of the city	A
4	Develop a basic social, political and economic understanding of contemporary urban issues	E
5	Assess and evaluate the dimensions of urbanization in India and its trends	E

****Remember(R), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create (C)***

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓						
CO 2		✓					
CO 3		✓					
CO 4			✓				
CO 5						✓	

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Introduction to Urban Geography**	14
	1	Urban studies in Geography: Nature and evolution; approaches and contemporary trends	
	2	Origin and Evolution of urban centres	
	3	Urbanization and Urban Growth; Dimensions of Urbanization and structural changes	
	4	World urbanization –trends, patterns; challenges in developing world	
2		**Urban System**	14
	1	Urban settlement system, City region- city periphery relations-–rural urban fringe	
	2	Urban Economic base- Urban function, interaction and classifications	
	3	Urban hierarchy, rank size rule, primate cities; Central places – Christaller and Losch models	
	4	Morphology of cities – land use Models - Urban Ecology, urban transport	
3		**City Scape**	14
	1	Social organisation of the city, urbanism, emergence of urban cultures and sub-cultures, Social area analysis.	
	2	Globalization and cities; Smart Cities; Gentrification and social exclusion in cities	
	3	Problems of Urban growth in developing countries- Urban slums and squatters, urban crimes	
	4	Principles of urban planning, climate change and cities	

4	**India's Urban Experience**		14
	1	Nature of and pattern of Indian Cities, Trends of urbanization in India	
	2	Problems of Housing, Slum and Urban transport in India with special reference to Metropolitan cities- Delhi, Mumbai, Kolkata and Chennai	
	3	Urbanization in Kerala	
	4	Urban Governance and Planning (India and Kerala)	
5	**Teacher Specific Module**		
	Direction		
	Writing exercise: A narrative of the City- Urbanization and its People (Develop an ethnographic story of a city/neighborhood through the narratives of communities, their society, and their situatedness.		4
	Practical exercise: rank size rule, Central Place Theory		

Essential Readings:

1. Andrew, E.G.J, McCann, E and Thomas, M 2015. Urban Geography: A Critical Introduction, Wiley, Blackwell,UK.
2. Friedmann, J. 1995. Where we stand: A Decade of World City Research, In: P. L. Knox and P. Taylor (eds) World Cities in a World-system. 21-47. Cambridge University Press,Cambridge:
3. Hall, T. 2002. Urban Geography (2nd Edition), Routledge: London and NewYork
4. Harold Carter (1995) The Study of Urban Geography, Arnold, London
5. Knox, P and Pinch, S. 2010.Urban Social Geography (6th edition), Pearson:England
6. Majid Husain (2003) Urban Geography, Anmol Publications, New Delhi.
7. Mandal R B (2000) Urban Geography, Concepts Publishing Company, New Delhi.
8. Misra, R.P. (ed.) 2013. Urbanization in South Asia: Focus on Mega Cities, Cambridge University Press, NewDelhi.
9. Ramachandran R (1992) Urbanization and Urban Systems in India, Oxford University Press, Delhi.
10. Singh R Y (2002) Geography of Settlement, Rawat Publication, Jaipur.

Suggested Readings:

1. Bhattacharya, B. 2006. Urban Development in India since Pre-Historic Times, Concept Publishing Company, NewDelhi.
2. Bridge, G Watson, S. (eds.) 2010. The Blackwell City Reader (2nd Edition), Wiley-Blackwell,UK.
3. Brunn, S.D., Hays-Mitchell, M., Ziegler, D.J. 2012. Cities of the World: World Regional Urban Development (5th edition), Rowman and Littlefield Publishers: England
4. Datta, A. and Shaban, A. (eds), 2017. Mega-Urbanisation in Global South: Fast Cities and New Urban Utopias of the Post-colonial State, Routledge: London and NewYork.
5. Hardoy, J. E., Mitlin, D. Satterthwaite, D. 1992. Environmental Problems in Third World Cities, Earthscan, GreatBritain.
6. James H Johnson, Urban Geography-An Introductory Analysis
7. LeGates T.R. and Stout F. (ed.) 2016. The City Reader (6th edition), Routledge: London and New York.

8. Nandy, A, 2001. An Ambiguous Journey to the City: The Village and other Odd Ruins of the Self in the Indian Imagination, New Delhi:OUP.
9. Roberts, P., Ravetz, J. and George, C. 2009. Environment and the City. Routledge,London
10. Sassen, S (ed.) 2002. Global Network, Linked Cities, New York:Routledge.
11. Scott, A.J. 2002. Global City-Regions: Trends, Theory, Policy, Oxford:OUP.
12. Sivaramakrishnan (1996) Urbanization in India, Concepts Publishing Company, New Delhi.
13. Southhall, A. 1998. The City in Time and space, Cambridge, Cambridge UniversityPress.
14. Vaysali Singh (2011) Urban Geography, Alfa Publication, New Delhi.
15. White, R. 1994. Urban Environmental Management, Routledge,London

Assessment Rubrics:

Evaluation Type		Marks
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper - 1	10
b)	Test Paper - 2	
c)	Assignment	20
d)	Seminar	
e)	Book/Article Review	
f)	Viva-Voce	
g)	Field Report	
Total		**100**

KU6 DSE GEO306 History and Philosophy of Geographical Thought

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
VI	DSE	300-399	KU6 DSE GEO306	4	4

Learning Approach (Hours/Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	1	30	70	100	2

Course Description:

The course enables students to explore how geographical thought has developed over time, from ancient civilizations to the present day. It introduces key concepts, methodologies, and debates that

have influenced geographical thinking, such as environmental determinism, possibilism, positivism, radicalism etc. Moreover, students will critically analyze the contributions of prominent geographers and philosophers to the field, considering their impacts on societal perceptions of space, place, and landscape. By tracing the historical and philosophical roots of geographical thought, students will gain a deeper understanding of the complexities inherent in the study of geography and its relevance to contemporary global challenges.

Course Prerequisite : NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	In depth understanding about the evolution of geographical thought	U
2	Detailed knowledge about the paradigms and debates in the geographical studies.	A
3	Understanding of emerging traditions and practices in geography	An
4	Critically appreciate how the past shaped the present of geography	E

****Remember(R), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create (C)***

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1		✓					
CO 2	✓						
CO 3			✓				
CO 4						✓	

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Paradigms in Geography**	14
	1	Definition, Nature and Traditions in Geography	
	2	Place of Geography in Classification of the Sciences	
	3	Paradigmatic Shifts (as per Kuhn's Model)	

	4	Major Paradigms in Geography (Spatial, Regional & Environmentalism)	
2	**Geography during the Pre-Modern Period**		14
	1	Classical Philosophies: Greek and Roman School	
	2	Medieval Period: Arab and Chinese School	
	3	Indian Geographical Traditions	
	4	Age of Discovery and its Impact	
3	**Modern Geographical Thought**		14
	1	Disciplinary Trends in Germany	
	2	French Geographical School	
	3	Geography in Britain	
	4	Development of Geography in USA	
4	**Contemporary Trends in Geography**		
	1	Quantitative Revolution & System's Approach	14
	2	Behaviouralism and Humanism	
	3	Radicalism and Feminism	
	4	Post-modernism and post-colonialism	
5	**Teacher Specific Module**		
	Reading and reviewing academic book		10
	Stage any dramatic movement in the history of geographical thought (eg. Schaefer-Hartshorne Debate and the Quantitative revolution; Age of discovery and voyages; environmental determinism versus possibilism)		

Essential Readings:

1. Cresswell, T. (2024). Geographic thought: a critical introduction. John Wiley & Sons.
2. Holt-Jenson, A. (2011), Geography: History and Concepts: A Students Guide, Sage.
3. Dikshit, R.D. (1997), Geographical Thought: A Contextual History of Ideas, Prentice Hall of India.
4. Nayak, A., & Jeffrey, A. (2013). Geographical thought: An introduction to ideas in human geography. Routledge.
5. Martin, G. J. (2005). All possible worlds: A history of geographical ideas. OUP Catalogue.
6. Sudeepta, A. (2015). Fundamentals of Geographical Thought. Delhi, India: Orient Black Swan private limited.
7. Thakur, B. (1994) Indian Geography: Development, Trends and Prospects, Trans. Inst. Indian Geographers, 16(1): 67-85.
8. Singh, R.S. (2009). Indian Geography: Perspectives, Concerns & Issues, Rawat Publications.

Suggested Readings:

1. Pauline Couper (2015) A Student's Introduction to Geographical Thought; SAGE Publications.
2. Arentsen M., Stam R. and Thuijis R., 2000: Post-modern Approaches to Space, ebook.
3. Bhat, L.S. (2009) Geography in India (Selected Themes). Pearson
4. Hartshone R., 1959: Perspectives of Nature of Geography, Rand MacNally and Co.
5. Johnston R. J., (Ed.): Dictionary of Human Geography, Routledge.
6. Soja, Edward 1989. Post-modern Geographies, Verso, London. Reprinted 1997: Rawat Publ., Jaipur and New Delhi.
7. Dikshit, K.R. (2006). "The Changing Western Perspective on geography and the Indian Context", Transactions, Institute of Indian Geographers, 28 (2): 123-155.
8. Dikshit, R.D. (2001). "Indian geography: An encounter with reality", Transactions, Institute of Indian Geographers, 23 (1 & 2).
9. Kumar, B. (2022) Geography: Paradigm and Contemporary Development, Ghaziabad: Globe Publishing House

Assessment Rubrics:

Evaluation Type		**Marks**
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper - 1	10
b)	Test Paper - 2	
c)	Assignment	10
d)	Seminar	
e)	Book/Article Review	10
f)	Viva-Voce	
g)	Field Report	
Total		**100**

KU6 DSE GEO307 Geography of Tourism

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
VI	DSE	300-399	KU6 DSE GEO307	4	4

Learning Approach (Hours/Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	0	30	70	100	2

Course Description:

The course "Geography of Tourism" explores the relationship between tourism and geography, focusing on the spatial aspects of tourism development, destinations, and impacts. It examines how geographical factors shape and influence tourism activities, patterns, and experiences around the world.

Course Pre-requisite : NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	Understand the significance of tourism as a human expression in spatial context.	U
2	Evaluate the significance of tourism in the cultural, social, economic and environmental milieu of geographic spaces.	A
3	Analyse various types of tourism and their geo-backup	An
4	Examine the spatial dimensions of tourism attractions at national and international level	E
5	Evaluation of emerging tourist research paradigms and tourism planning	E

****Remember(R), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create (C)***

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓	✓					
CO 2		✓					
CO 3		✓	✓				
CO 4		✓					
CO 5							✓

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Introduction**	14
	1	Tourism – Concept, nature, scope, and importance	
	2	Components of tourism – approaches to the study of tourism	
	3	Significance of tourism in social, cultural and economic realms	
	4	Tourism and resources: water, climate, natural and cultural landscape and Wildlife resources	
2		**Factors affecting Tourism**	14
	1	Factors influencing the growth of tourism – Infrastructure and support systems	
	2	Concepts of mobility and spatialities in tourism, tourism fluxes	
	3	Cultural geography of tourism and leisure, Gender differences in Leisure	
	4	Place marketing and place formation- Spatial tradition of mobility, Time space Geography, Tourism Area Life Cycle	
3		**Types of Tourism**	14
	1	Types of Tourism -Eco-tourism, green tourism, Heritage tourism, Adventure tourism, Monsoon tourism, Niche tourism and medical tourism	
	2	Participation and community-based tourism, Responsible tourism, rural tourism and Urban tourism	
	3	Social, cultural and Economic significance of tourism, Multiplier effect on the economy - Impact of tourism on environment, carrying capacity and tourism development.	
	4	Climate change and tourism	

4	**Tourism Dynamisms**		14
	1	Global tourism flows – Distance decay and power curves, spatial dimensions of tourism attractions at national and international level	
	2	Major natural and cultural attractions in India with special reference to Kerala	
	3	Growth and development of tourism in spatio-temporal context Problems and prospects of Tourism in India, National Tourism Policy	
	4	Tourist Research Paradigms, Tourism-energy model, Tourism planning –Application of Geospatial Technology in tourism planning and modelling – Case studies	
5	**Teacher Specific Module**		4
	Data sources for tourism- local, district, state and national		
	Field work- identify tourism potential of a locality		

Essential Readings:

1. Krishan K Kamra Mohinder Chand, (2006), Basics of Tourism Theory, Operation and Practice, Kanishka Publishers
2. Naveen Kumar, (2018), Global Tourism Policies, Laws and Action Plans, Paradise Press, New Delhi
3. Arpita Mathur,2019, Fundamentals of Travel and Tourism, Ane Books Pvt.Ltd
4. Sampad Kumar Swain, Jitendra Mohan Mishra, (2012), Tourism Principles and Practices, Oxford University Press, New Delhi
5. Guptajit Pathak, (2015), Tourism in India Continuity, Development, Challenges and Issues, Avon Publications, New Delhi.

Suggested Readings:

1 R.K. Goswami, (2007), Tourism and Environment, Cybertech Publications,New Delhi
2 Julie Wilson, (2012), The Routledge Handbook of Tourism Geographies, Routledge Publishers
3. Bhatia A K (1996), Tourism Development, Principles and Practices, SterlingPublishers
4. Kennell, J., 2016. Carrying capacity. In Encyclopedia of Tourism (pp. 133-135) Springer International Publishing

Assessment Rubrics:

Evaluation Type		Marks
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper - 1	10
b)	Test Paper - 2	
c)	Assignment	10
d)	Seminar	
e)	Book/Article Review	
f)	Viva-Voce	
g)	Field Report	10
Total		**100**

KU6 DSE GEO308 Geography of Trade and Commerce

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
VI	DSE	300-399	KU6 DSE GEO308	4	4

Learning Approach (Hours/Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	0	30	70	100	2

Course Description:

The Geography of Trade and Commerce course explores the intricate relationship between geography and the global economy. Through an interdisciplinary approach drawing from geography, economics, and international relations, students will delve into the spatial dynamics of trade and commerce, examining how geographical factors shape patterns of production, distribution, and consumption on local, regional, and global scales. The course begins by providing a foundational understanding of key concepts such as globalization, trade theories, and economic geography. Students will then explore the role of physical geography, including topography, climate, and natural resources, in influencing trade routes, regional specialization, and the location of industries. Historical perspectives will be integrated to analyze the evolution of trade networks and the impact of colonization, imperialism, and technological advancements on global commerce.

Course Prerequisite : NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	Understand key theories and concepts in trade geography.	U
2	Analyze the spatial organization of global trade networks.	An
3	Evaluate the impacts of geographical factors on trade patterns and economic development.	E
	Identify the institutional mechanisms governing international trade	
4	Evalaute the patterns of International Trade with reference to India	E

****Remember(R), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create (C)***

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓	✓					
CO 2	✓	✓				✓	
CO 3		✓					
CO 4						✓	✓
CO 5			✓			✓	

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Introduction to Trade and Commerce**	14
	1	Definition and Concepts: International trade, Commerce, Export/Import and Balance of trade	
	2	Definition and scope of geography of trade	
	3	Theories of Trade: David Ricardo's Comparative Advantage, Heckscher-Ohlin theory and Paul Krugman's New Trade Theory	
2		**Globalization and Trade**	14
	1	Historical evolution of globalization	
	2	Spatial organization of economic activities- Fordism to Post-Fordism and New International Division of Labour	

	3	Economic Geography Perspectives: Core-periphery model and World-systems theory	
3	**Geographical Factors Shaping Trade**		14
	1	Influence of climate and topography on trade routes; Resource endowments and comparative advantage	
	2	Population distribution and market access, Transportation and Infrastructure and Cultural factors influencing trade patterns	
	3	Environmental impacts of trade and Sustainable Trade Practices	
4	**International Trade Regulation and Regional Dynamics**		14
	1	Tariffs, quotas, and trade barriers and multilateral trade negotiations: from GATT to WTO	
	2	Regional Trade Agreements- EU, NAFTA, ASEAN, CACM, OPEC	
	3	Patterns of International Trade with reference to India: Volume of Trade and Direction of Trade Flows	
5	**Teacher Specific Module**		
	Following activities may be conducted: • Literature review on Trade Governance and Developing Countries/ Globalization and the Politics of Trade		4
	• Debate on "International Trading System and Its Future" • Case Studies: Impact of Trade on Bangladesh garment industry/Brazil service trade		

Essential Readings:

1. Batra, A. (2022). India's Trade Policy in the 21st Century. Routledge.
2. Clark, G. L., Feldman, M. P., & Gertler, M. S. (Eds.). (2003). The Oxford handbook of economic geography. Oxford University Press.
3. Gandolfo, G., & Trionfetti, F. (2014). International trade theory and policy. Berlin, Heidelberg, New York: Springer.
4. Kobayashi, K., Rashid, K. A., Furuichi, M., & Anderson, W. P. (Eds.). (2017). Economic Integration and Regional Development: The ASEAN Economic Community. Routledge.
5. Krugman, P. (1992). Geography and trade. MIT press.
6. Krugman, P. R. (2018). International trade: Theory and policy. Pearson.
7. Leong, G.H. and Morgan, G. C. (1982) Human and Economic Geography. Oxford University Press.
8. Peet, R. (2009). Unholy Trinity: the IMF, World Bank and WTO. Bloomsbury Publishing.
9. Redding, S. J. (2022). Trade and geography. Handbook of International Economics, 5, 147-217.
10. Seymour, I. (1980). OPEC: Instrument of Change. Springer.
11. Sheppard, E., & Barnes, T. J. (2008). A Companion to Economic Geography.
12. Stiglitz, J., & Pike, R. M. (2004). Globalization and its Discontents.
13. Thoman, R. S., & Conkling, E. C. (1967). Geography of International Trade. Prentice-Hall.
14. Yadav, P. (2021). Geographical Perspectives on International Trade. Springer International Publishing.

Suggested Readings:

1. Dee, M. (2015). The European Union in a Multipolar World: World Trade, Global Governance and the case of the WTO. Springer.

2. Garavini, G. (2019). The rise and fall of OPEC in the twentieth century. Oxford University Press.
3. Hoekman, B. M., Mattoo, A., & English, P. (Eds.). (2002). Development, Trade, and the WTO: A Handbook (Vol. 1). World Bank Publications.
4. Kathuria, S., & Malouche, M. M. (2015). Toward New Sources of Competitiveness in Bangladesh: Key Insights of the Diagnostic Trade Integration Study. World Bank Publications.
5. Michael, P. Todaro, and C. Smith Stephen (2000). Economic Development. Pearson.
6. Rahman, S. (2013). Broken Promises of Globalization: The case of the Bangladesh Garment Industry. Lexington Books.
7. Raychauduri, A., De, P., & Gupta, S. (Eds.). (2020). World Trade and India: Multilateralism, Progress and Policy Response. Sage Publications Pvt. Limited.
8. Suranovic, S. (2010). International Trade: Theory and policy.
9. Veeramani, C., & Nagaraj, R. (Eds.). (2018). International trade and industrial development in India: Emerging trends, Patterns and Issues. Orient BlackSwan.
10. Pereira, L. V., Sennes, R. U., & Mulder, N. (2009). Brazil's Emergence at the Regional Export Leader in Services: A Case Specialization in Business Services. ECLAC.
11. Lopez-Acevedo, G., & Robertson, R. (Eds.). (2016). Stitches to Riches?: Apparel employment, trade, and economic development in South Asia. World Bank Publications.

Assessment Rubrics:

Evaluation Type		**Marks**
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper - 1	10
b)	Test Paper - 2	
c)	Assignment	20
d)	Seminar	
e)	Book/Article Review	
f)	Viva-Voce	
g)	Field Report	
Total		**100**

KU7 DSC GEO401 Applied Geomorphology and Coastal Management

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
VII	DSC	400-499	KU7 DSC GEO 401	4	4

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE(Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	0	30	70	100	2

Course Description:

This course integrates principles of geomorphology with practical applications in coastal management. Geomorphic processes and landforms play a crucial role in shaping coastal environments, influencing both natural and human-induced changes. It will explore the dynamic interactions between land, sea ,and human activities, gaining insights into sustainable coastal management practices.

Course Pre requisite : NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	It involves the practical application of principles and concepts from geomorphology to address real-world issues related to landforms, landscapes, and their dynamics	A
2	Understanding fundamental concepts of coastal geomorphology	U
3	Apply basic techniques from global to regional level and to identify the problems of coastal area	A

****Remember(R), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C)***

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓		✓				
CO 2	✓	✓				✓	
CO 3				✓			✓

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Introduction to Applied Geomorphology**	14
	1	Applied Geomorphology: Nature, Scope and Significance	
	2	Modern techniques in geomorphology and their application-Profile, Hypsometry, Altimetry, Clinographic and Slope Analysis.	
	3	Drainage Basin: Network Characteristics, Morphology, Phases of drainage network development, Drainage modification and rearrangement	
	4	Evolution of landforms based on terrain elements-Local Relief, Slope, Profile, Texture, Locational Sequence, Surface material, and dimensions	
		Geomorphology for spatial planning and management	
2	1	Geomorphic application in soil studies- Weathering, Profile of weathering, Various types of weathering formation, Soil as a product of weathering, its formation, Vertical zonation, and major soil groups.	14
	2	Environmental Geomorphology: Meaning and Application; Natural hazards and environmental management;	
	3	Geomorphology in engineering construction: Construction of large Dams, roads, and tunnels and their impact; Geomorphology in groundwater studies; geomorphology in mineral exploration.	
	4	Geomorphic hazards: Volcanic, Earthquakes, Landslide and Floods; Anthropogenic activities and their effects on erosion and sedimentation.	
		Coastal morphology and processes	
	1	Definition of coastal zone and related nomenclature. Classification of coasts and shore: submerged and emerged coasts, classification of coasts by Johnson and Shepard	

3	2	Factors influencing coastal morphology and processes; Sea level fluctuations and changes; Wave processes–sediment transportation	14
	3	Processes and mechanism of marine erosion and resultant landforms.	
	4	Depositional landforms: Origin, classification and distribution.(Sandy and muddy shores- beaches and beach ridge, barriers spit and bar; mudflats and marshes (salt and tidal), formation of estuaries and mangrove swamps, coastal sand dunes and deltas.	
4	**Geomorphology for costal engineering and management**		14
	1	Shoreline change mechanism, rates and causes. Structural control of shore zone morphology	
	2	Coastal zone management: Coastal regulations with special reference to India	
	3	Human utilization of coasts, environmental impacts, and management: Navigation, mining, fishing and fish- -processing, off-shore oil exploitation, reclamation and tourism	
	4	Coastal engineering and its impacts: Ports and harbors, measures for prevention of erosion and sedimentation.	
5	**Teacher Specific Module**		
	• *Conduct a field study and prepare report on coastal landforms and processes.* • *Analyse the shoreline changes and coastal morphodynamics of a nearby region. (apply DSAS)* • *Examine the state of coastal protection measures through field visit.*		4

Essential Readings:

1. BloomA.L.(2012) Geomorphology. Rawat Publication, Jaipur
2. Hugget,R.J.(2017) Fundamentals of geomorphology, Routledge Taylor & Francis, London
3. ChorleyR J(1973) Spatial Analysis in Geomorphology, Methuen, London
4. John,P(1984) An Introduction to Coastal Geomorphology.Arnold Heinemann, London.
5. Bird,E.C.F.(2000):An Introduction to Coastal Geomorphology, John Wiley and Sons Ltd. New York
6. French,P.W(1997) Coastal and Estuarine Management, Routledge ,London, 1997.

Suggested Readings:

1. Strahler,A.N.andStahler,A.M. Modern Physical Geography.Wiley India,New Delhi, 2016.
2. Bryant Richard,H.Physical Geography.Rupa Publication.New Delhi,2016.
3. Wooldridge,S.W.and Morgan,R.S.The Physical Basis of Geography-An Outline of Geomorphology. Longman, London, 1959.
4. Hussain M .Physical Geography. Anmol Publication. New Delhi. 2014.

5. Shepard,F.P.andWanless,N.R.: Our changing Coastlines. Oxford University Press, 1971.
6. Clark,J.R.(1996) Coastal Zone Management Handbook,CRC Press/Lewes Publishers.
7. Carter,R.W.G.1988.Coastal Environments: An Introduction to th ePhysical, Ecological and Cultural Systems of Coastlines, Academic Press.
8. Clark,J.R.1998.CoastalSeas: The Conservation Challenge, Blackwell Science.

Assessment Rubrics:

Evaluation Type		**Marks**
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper - 1	10
b)	Test Paper - 2	
c)	Assignment	
d)	Seminar	
e)	Book/Article Review	
f)	Viva-Voce	
g)	Field Report	20
Total		**100**

KU7 DSC GEO402 Spatial Planning and Development

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
VII	DSC	400-499	KU7 DSC GEO402	4	4

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	0	30	70	100	2

Course Description:

Spatial planning is a critical process for guiding the sustainable development and management of land and resources within a geographical area. This course provides students with an in-depth understanding of the principles, methods, and practices of spatial planning and its role in shaping communities, regions, and landscapes. Through a multidisciplinary approach, students will explore the intersection of environmental management, social equity, and economic development to address complex spatial challenges.

Course Prerequisite: NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	Examine the major planning paradigms and their applications; and articulate processes leading to regional growth and development and provide rationales for planned interventions	An
2	Equip students with thorough knowledge of the concepts, theories and issues in Regional Planning and Development	U
3	Analyse the meaning and concept of modern economic growth; and Examine various Development issues and dimensions of Regional inequalities	A
4	Evaluate the salient features of Indian planning, Provide service to government, communities, and others concerned with urban and regional planning	E

**Remember (R), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C)*

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1			✓	✓			
CO 2	✓	✓				✓	
CO 3	✓						✓
CO 4			✓			✓	

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Concept of Spatial Planning**	14
	1	Place and space, concept of Region, Types Characteristics and Hierarchy	
	2	Regional Planning: Scope, objective, Principles, Methods, techniques, characteristics, significance,	
	3	Types of Regional Planning, Delimitations of regions, Purposes of regional planning,	
	4	Regional growth and development, Regional planning processes, Norms and Standards for Regional planning.	
2		**Models of Economic Development**	14
	1	Economic Systems, economic growth, Indicators and measurement of development-	
	2	Classical theory of economic development, Marxian approach	
	3	Schumpeter theory of economic development, Myrdal theories of circular causation, Leontief-input output model, Hirschman theory of Balanced and unbalanced growth,	
	4	Francis Perroux-Growth pole theory, R.P. Misra Core Peripheral model and Growth Foci, Export Base Theory by Doughlass C North	

	Spatial pattern of Regional Imbalance		
3	1	Development issues and challenges Vicious cycle of poverty- The dependency theory of under development-	14
	2	Theories of limits to Growth Model and beyond the limits, Studies in regional imbalance-Bimaldas Gupta, Hemalatha Rao, Ashok Mehta and V.Nadh	
	3	Regional development strategies: Growth Center, Special Economic Zones, watershed approach, micro level planning	
	4	Sustainable development- Millennium Development Goals and UN Agenda 21.	
4	**Spatial Planning in India**		14
	1	History of planning in India, Five year Plans and Niti Ayog, Government Planning Programmes in India,	
	2	Economic development and Regional Imbalance in India-	
	3	Micro and Multilevel planning, Rural and urban planning, Decentralized Planning in India,	
	4	Disaster management , Watershed Based Planning, recent trends in Planning	
5	**Teacher Specific Module**		
	Directions		
	Project on measuring regional imbalances by taking district as the unit of analysis. Data may be collected from census of India, panchayath statistics etc.		5

Essential Readings:

1. Chandna, R. C. (2000): Regional Planning: A Comprehensive Text. Kalyani Publishers., New Delhi.
2. Chaudhuri, J. R. (2001): An Introduction to Development and Regional Planning with special reference to India. Orient Longman, Hyderabad.
3. Cowen, M.P. and Shenton, R.W. (1996): Doctrines of Development, Routledge, London.
4. Doyle, T. and McEachern, D. (1998): Environment and Politics. Routledge, London.
5. Friedmann, J. (1992): Empowerment: The Politics of Alternative Development. Blackwell, Cambridge MA and Oxford.
6. Friedmann, J. and Alonso, W. (ed.) (1973): Regional Development and Planning. The MIT Press, Mass.
7. Hettne, B., Inotai, A. and Sunkel, O. (eds.) (1999 – 2000): Studies in the New Regionalism. Vol. I-V. Macmillan Press, London.
8. Isard, W. (1960): Methods of Regional Analysis. MIT Press, Cambridge, MA.
9. Kuklinski, A. R. (1972): Growth Poles and Growth Centres in Regional Planning. Mouton and Co., Paris.

10. Kuklinski, A.R. (ed.) (1975): Regional Development and Planning: International Perspective, Sijthoff-Leydor.
11. Leys, C. (1996): The Rise and Fall of Development Theory. Indian University Press,Bloomington, and James Curry, Oxford.

Suggested Readings:

1. Mahapatra, A.C. and Pathak, C. R. (eds.) (2003): Economic liberalisation and Regional Disparities in India. Special Focus on the North Eastern Region. Star Publishing House, Shillong.
2. Mahesh Chand and Puri V K (2011), Regional Planning in India, Allied Publishers Private Limited, New Delhi.
3. Misra, R. P. (ed.) (1992): Regional Planning: Concepts, Techniques, Policies and CaseStudies. 2nd edition. Concept Publishing Company., New Delhi.
4. Misra, R.P. and Natraj, V.K. (1978): Regional Planning and National Development. Vikas, New Delhi.
5. Nath, V. 2009. Regional Development and Planning in India, Concept Publishing Company.
6. Sundaram K V 1997, Decentralised Multi level Planning – Principles and Practice, Concept Publishing Company, New Delhi

Assessment Rubrics:

Evaluation Type		**Marks**
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper- 1	
b)	Test Paper-2	
c)	Assignment- Project Report	20
d)	Seminar	
e)	Book/ Article Review	
f)	Viva-Voce	10
g)	Field Report	
Total		**100**

KU7 DSC GEO403 Water Resource Management

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
VII	DSC	400-499	KU7 DSC GEO403	4	4

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	0	30	70	100	2

Course Description:

Water resource management is a crucial discipline that addresses the sustainable utilization, allocation, and conservation of water resources to meet the needs of both present and future generations. This signature course provides students with a comprehensive understanding of the principles, theories, and practices involved in the management of water systems at local, regional, and global scales. Through a blend of theoretical study, case analyses, and practical applications, students will explore the complexities of water governance, policy development, and integrated water resource management.

Course Prerequisite: NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	To appraise the significance of hydrology and to understand the complex water systems of the earth and to find solutions for water problems.	U
2	To know the water cycle and its relevance in the sustenance of water resources and to apply the water balance equation to various hydrological problems.	A
3	To analyse the nature of processes involved in surface and ground water systems.	An
4	To examine the impact of human activities on water resources and contributing to the water resource management of the area based on the analysis of hydrological data.	E

Remember (R), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C)

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓						
CO 2		✓			✓		
CO 3		✓	✓				
CO 4			✓			✓	✓

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Water resource management -Conceptual basis**	14
	1	Water – The environmental, technological of societal complexities system concepts in Hydrology	
	2	Scope of WRM, Sustainable water management and sustainable water development goals (SDG6).	
	3	Hydrological Cycle; systems concepts, lumped and distributed systems, deterministic and stochastic Systems,	
	4	Global Water Balance, Human impact on the hydrological cycle,	
2		**Surface and ground water resource**	14
	1	Surface Water Systems, Drainage Basin as Geohydrological unit	
	2	Springs Darcy's Law and elementary groundwater flow equation, ground water monitoring, groundwater resource estimation	
	3	Ground water - factors affecting groundwater- aquifers and their characteristics/classification, groundwater basins,	
	4	Elementary groundwater resource estimation, ground water monitoring, groundwater recharging	

3	**WRM- issues and challenges**		14
	1	Water use conflicts, water quality and major water pollutants (points and non-point source),	
	2	Water quality criteria analysis	
	3	Flood causes and types – flood frequency analysis, flood plain zoning, estimation of flood for different frequencies, flood forecasting,	
	4	Drought- causes and types, drought assessment and monitoring	
4	**Spatial Planning in India**		14
	1	Concept and Practice of Water Management- Approaches of Surface Water Management -	
	2	Traditional Water Harvesting, Storing and Management practices of water- world and in India.	
	3	Micro and Decentralized Planning in india, Rainwater Harvesting – Significance. Artificial groundwater recharge, Wetlands Management,	
	4	Disaster management , Watershed Based Planning, Government of India and State Government Initiatives for Water Management	
5	**Teacher Specific Module**		
	Directions		
	Prepare a field report on rain water harvesting system *Calculate water balance of the locality* *Practice methods of Ground water estimation*		4

Essential Readings:

1. Abbas, B.M. 1982. The Ganges Water Dispute, Vikas Publishing House Pvt. Ltd., New Delhi.
2. Aggarwal, A. 1991. Floods, Floodplains and Environmental Myths, Centre for Science and Environment, New Delhi.
3. Andrew, D. W. and Trimble, S. 2004. Environmental Hydrology, 2nd Edition, Lewis Publishers, CRC Press.
4. Beek, E., Loucks, P.D. 2005. Water Resource Systems Planning and Management: An Introduction to Methods, Models and Applications, UNESCO, Paris.
5. Bhattacharya, S.K. 1988. Urban Domestic Water Supply in Developing Countries, CBS Publishers, CR Distributors, Delhi.
6. Chow, V.T., Maidment, D.R. and Mays, W.L. (1988) Applied Hydrology, McGraw-Hill International Editions, McGraw-Hill Book Company, New York.
7. Chow V.T (2017) - Handbook of Applied Hydrology, Tata McGraw Hill, New Delhi
8. Jain, S.K., Aggarwal, P.K. and Singh, V.P. 2007. Hydrology and Water Resources of India, Springer, The Netherlands.
9. Jaya Rami Reddy (2011) A Textbook of Hydrology, University Science Press
10. Joseph Holden (2013) Water Resources-An Integrated Approach, Routledge
11. Karanth, K.R. 1988. Groundwater: Exploration, Assessment and Development, Tata-McGraw Hill, New Delhi.

12. Mahajan G. 1989. Evaluation and Development of Groundwater, Ashish Publishing House, New Delhi.

Suggested Readings:

1. Micklin, Philip, P. 1996. Man and the water cycle: Challenges for the 21st century, Geojournal, 39 (3): 285-298.
2. Mysooru R Yadupathu Putty (2013) Principles of Hydrology I.K. International, New Delhi, 2013
3. Pietro Laureano (2001) Water Conservation Techniques in Traditional Human Settlements, Copal Publishing House
4. Raghunath, H.M (1987) Groundwater, Wiley Eastern Ltd., New Delhi.
5. Raghunath H M, (2006) Hydrology Principles, Analysis and Design, New Age International

Assessment Rubrics:

Evaluation Type		**Marks**
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper- 1	10
b)	Test Paper-2	
c)	Assignment	
d)	Seminar	
e)	Book/ Article Review	
f)	Viva-Voce	
g)	Field Report	20
Total		**100**

KU7 DSC GEO404 Geography of Health and Wellbeing

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
VII	DSC	400-499	KU7 DSC GEO404	4	4

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE(Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	0	30	70	100	2

Course Description:

This course explores the intricate relationship between human and environmental health- how people interact with their physical and social environment to promote health and wellbeing or to increase their vulnerability to disease and/or illness. It elucidates the profound influence of environmental conditions, socio-economic factors, and spatial disparities on health status. The approach taken in this course will focus on providing a comprehensive understanding of the spatial dimensions of health, the social and natural determinants of health, role of governmental organizations and the pivotal role of the environment in shaping health and wellbeing. geographical scales in health care systems and access, health patterns and spatial analysis as well as the handling of population data is also part of the course.

Course Prerequisite: NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	To equip students with the tools to analyze health issues from a geographical perspective, with applications in fields such as public health, urban planning, environmental studies and policy-making.	An
2	To outline the developing role of geography in the theoretical and practice-based issues in the areas of health and healthcare	E
3	To comprehend the spatial patterns of diseases and health care provisions as well as the influence of place and location on human health	U

****Remember(R), Understand(U), Apply(A), Analyse(An) ,Evaluate(E), Create(C)***

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓	✓					
CO 2			✓				
CO 3		✓				✓	

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Introduction**	14
	1	Nature, scope, and significance of health,	
	2	Geography geographical approaches- ecological, social ,and spatial approaches	
	3	Health indices	
	4	Sequential development of health geography-methods and techniques.	
2		**Physical and social environment in public health**	14
	1	Geographical determinants of Human health-physical, social, economic, and environmental factors.	
	2	Man, and environment relationship, environment and public health	
	3	Emerging environmental issues, organic and inorganic pollutants, effects of quality of air, water, and soil in different environs on health, the impact of climate change, environmental management and planning-national and international policies, programs, and legislation.	
	4	Social environment and public health – population dynamics and poverty, Gender equity in health; migration and health ,socio-cultural and developmental status, urban health, the role of lifestyle, regional disparity, role of health care services.	
		Diseases and healthcare systems	
	1	Diseases and mitigation –types of diseases - communicable and non-communicable, occupational, deficiency, infection, pollution diseases. WHO classification of diseases	

3	2	Diseases Diffusion -factors, causes and type, Epidemiology and geography, Epidemiological transition theory of epidemiological transition (Omran theory), patterns of global distribution of major diseases.	14
	3	Health care systems and planning-concept and significance of international and national models and organizations	
	4	Structure and evolution of health care system in India, geographical evaluationofhealthcareservicesandpoliciesinIndiawithrelevantcase studies, Geography of urban versus rural health in India.	
4		**Data and techniques**	
	1	Handling of physical and population data in health, spatial analysis, and interpolation of data	
	2	GIS techniques in disease mapping, mapping of health care systems and their accessibility	14
	3	Statistical interpretation of health indicators, formulation of environmental and public health management policies and practices.	
	4	Data modeling	
5		**Teacher Specific Module**	
		Directions	
		Practice GIS application in disease mapping and health care planning *Mini project on role of social environment in public health*	4

Essential Readings:

1. Misra,R.P.2007 .Geography of Health: A Treatise on Geography of Life and Health in India, Concept Publishing Company, New Delhi.
2. Journal of Health and Social science, The scientific Journal of SIPISS,ISSN2499 2240. Journal of Health science,ISSN2232-7576(Print)ISSN1986-8049(Online)
3. Savindra Singh (2008) Environmental Geography, Prayag Pusthak Bhavan, Allahabad.
   https://onlinelibrary.wiley.com/doi/abs/10.1002/9781118410868.wbehibs420
4. Anthamatten,P.andHazen,H.2011.An introduction to the Geography of Health, Routledge, New York
5. Gatrell, A.C. and Elliott, S.J. 2015. Geographies of Health: An Introduction. 3rdedition, Wiley- Blackwell, Oxford

Suggested Readings:

1. Ashraf,S.W.A., Agriculture, Environment and Health,Concept Pub.,New Delhi.
2. Banerjee,B and Hazra J.,Geo-Ecology of Cholera in West Bengal,Univ of Calcutta, 1980.
3. Chatterjee Mera, Implementing Health Policy, Centre for Policy Research, New Delhi,1988.

4. Cliff,A.&Stewart,L.,(eds.),Atlas of Diseases distribution ,Basil Blackwell, Oxford, 1989.
5. Hazra,J.,(eds.),HealthCare Planning in Developing Centres,Unv of Culcutta, 1997.
6. Learmonth,A.T.A., Patterns of Diseases and Hunger–A Study in Medical Geography, David & Charles, Victoria, 1978.
7. May,J.M., EcologyandHumanDiseases,M.D.Pub.NewYork,1959.
8. Mc.Glashan.N.D.,Medical Geography,Methuen,London,1972.
9. Misra,R.P.,Medical Geography of India, National Book.Inst, India,NewDelhi.
10. Rais,AandLearmonth,A.T.A.,Geomorphic aspect of health and diseases in India.
11. Stamp,L.D.,The Geography of Life and Death,Cornell Univ.Ithaca,1964.
12. Aikat,B.K.(1985)Tropical diseases in India,Arnold Meinemann,Delhi,1st Edition
13. Akhtar Rais (1990), Environmental population and health problems, Ashish Publishers Home, New Delhi.

Assessment Rubrics:

Evaluation Type		**Marks**
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper - 1	10
b)	Test Paper - 2	
c)	Assignment	20
d)	Seminar	
e)	Book/Article Review	
f)	Viva-Voce	
g)	Field Report	
Total		**100**

KU7 DSC GEO405 Geo-Statistics for Advanced Research

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
VII	DSC	400-499	KU7 DSC GEO405	4	4

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	0	30	70	100	2

Course Description:

In a time where every decision is data driven, immense opportunities rest with academia to explore, assess the real ground situations its trajectories and predictions and way forward. The course just meant to do the same, and in process equip the students with the latest in the segment of data analysis in a geographical perspective.

Course Prerequisite: Basic statistics knowledge at plus two level.

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	Introduce basic idea of Geo-statistics	U
2	Demonstrate how Data analytical skills are used in domain of Geography.	An
3	Awareness about latest and tested statistical methods and its application.	A
4	Equipping the students with quantitative skills for advanced research in geography	C

****Remember (R), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C)***

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Introduction to Geo-Statistics**	**20**
	1	Scope and significance of Geo-Statistics in research	
	2	**Application of Univariate Statistics**:. Measures tools of Location and Spread. Univariate Plots: Histogram, Probability Density Function (PDF), Cumulative Density Function (CDF). Types of Distribution: Parametric: Normal (Gaussian), Log-Normal, Non-Parametric.	
	3	**Application of Bivariate Statistics**: Bivariate Data Display: Scatterplot or Cross plot, Bivariate Measures (Covariance, Correlation Coefficient). Bi-variate & Multiple correlation and regression,	
	4	Correlation analysis Scatter Diagram & Residual mapping, T-test, Z-Score, Root Mean Square Error, Principal Component analysis.	
2		**Characterisation of Spatial process**	**30**
	1	**Surface Modelling:1** Spatial autocorrelation, Role of Interpolation, Methods of Interpolation – Global and Local Deterministic Methods.	
	2	**Surface Modelling:2** Moving Averages, Inverse Distance Weighted Interpolation, Thiessen polygons, Optimal Interpolation using Geo-statistics	
	3	**Variogram and covariance.** Understanding of semivariogram: Components, types and functions. **Variogram and its use for Interpolation**, Interpolation by Kriging – Ordinary Kriging, Block Kriging, Non-Linear Kriging, Stratified Kriging, Co-Kriging, Universal Kriging, Probabilistic Kriging	
3		**Introducing Statistical Software**	30
	1	SPSS Package or R	
	2	Comparison between Excel and SPSS Package/ R	
	3	Comparison between SPSS and R software	
	4	Geo-statistics into GIS	
4		**Use of Factor and cluster analysis in geographical research**	30
	1	**Factor analysis.1** Introduction and conceptual framework Factor Analysis using SPSS and Arc-Gis/ Q-GIS	
	2	**Factor analysis.2** Assumptions and axioms Factor Analysis using SPSS and Arc-Gis/ Q-GIS	
	3	**Cluster analysis. 1** Introduction and conceptual framework Cluster anlysis using Arc Gis/Q-GIS	
	4	**Cluster analysis. 2** Assumptions and axioms Cluster anlysis using Arc Gis/Q-GIS	

5	**Geostatistics for Disaster Management:**	
	Landslide Susceptibility Modeling - Bi-Variate Statistical Methods: Probabilistic Likelihood Analysis (Frequency Ratio, Information Value Method, Weights of Evidence Method. Multivariant Methods: Multiple logical Regression, Discriminant analysis.	10
	Field Visit to nearby landslide prone/Affected area, report drafting.	

Essential Readings:

1. SALKIND N J and FREY B B. *Statistics for Those Who Think They Hate Statistics*. 7th ed. Sage Publishers, 2019 ISBN: 978-1-5443-9339-1.
2. WEBSTER, R. and M. A. OLIVER. *Geostatistics for environmental scientists*. 2nd ed. Chichester: John Wiley & Sons, 2007, xii, 315. ISBN 9780470028582.
3. DE SMITH, Michael John, Michael F. GOODCHILD and Paul LONGLEY. *Geospatial analysis : a comprehensive guide to principles, techniques and software tools*. 2nd ed. Leicester: Metador, 2007, xxii, 491. ISBN 9781906221980.
4. BORROUGH, P.A., McDONNELL, R.,A (1988): Principles of Geographical Information Systems. Oxford University Press, Oxford, 333s.
5. MCKILLUP, Steve and M. Darby DYAR. *Geostatistics explained : an introductory guide for earth scientists*. 1st pub. Cambridge: Cambridge University Press, 2010, xvi, 396. ISBN 9780521746564.

Assessment Rubrics:

Evaluation Type		**Marks**
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper- 1	10
b)	Test Paper-2	
c)	Assignment	20
d)	Seminar	
e)	Book/ Article Review	
f)	Viva-Voce	
g)	Field Report	
Total		**100**

KU8 DSC GEO406 Gender and Development

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
VIII	DSC	400-499	KU8 DSC GEO406	4	4

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	0	30	70	100	2

Course Description:

The course equip students to explore how gender identities, roles, and inequalities intersect with development processes at local, national, and global levels. The course will critically evaluate existing frameworks, policies, and interventions aimed at promoting gender equality and women's empowerment within the development agenda. Through case studies and discussions, students will assess the differential impacts of development initiatives on individuals and communities based on gender, thus it further highlights the significance of incorporating gender perspectives in planning, implementation, and evaluation. Overall, the course aims to prepare students with the analytical tools and knowledge needed to address gender inequalities and promote inclusive and sustainable development outcomes.

Course Pre requisite : NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	Introduce basic idea of development through gender lens	U
2	Awareness about the role of gender in determining access to social welfare measures	An
3	Introduce methods and measures of gender development	A

****Remember(R), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C)***

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓						
CO 2		✓				✓	
CO 3					✓		✓

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Geography of Gender and Development**	14
	1	Nature and Scope of Gender Geographies	
	2	Sex and Gender, gender roles, gender relations, gender neutrality	
	3	LGBTQIA+	
	4	Contemporary trends in Geography of Gender	
2		**Measures of Gender and Development**	14
	1	Gender and Social Well Being: Trends and patterns of child sex ratio, sex ratio, female literacy, maternal mortality, Crime against women and electoral participation.	
	2	Gender Transformative Programmes: Women in Development (WID), Women and Development (WAD) Gender and Development (GAD)	
	3	Measures of Gender Empowerment: Gender Development Index (GDI) and Gender Empowerment Measure (GEM)	
3		**Gendered Work and Livelihoods**	14
	1	Gender division of work, Productive paid work and Reproductive work	
	2	Trends and differentials of gendered indicators of women's work participation in rural and urban areas of Global North and Global	
	3	Invisible work and double burdens	
4		**Gender and Contemporary Global Concerns**	14
	1	Gendered impacts of hazards and disasters	
	2	Gender and climate change	
	3	Gendered violence and livelihood loss	
	4	Need for a resilient communities through women's participation	

5	**Teacher Specific Module**	
	Directions	
	Write research project on any subtheme from the module 1-4. The research paper may use secondary data, however the analysis required to be original in nature.	4

Essential Readings:

1. Coles,A., LeslieG.,and JanetM.,(eds.)(2015) The Routledge Handbook of Gender and Development. Routledge.
2. Evans,M.and WilliamsC.(2013).Gender: The Key Concepts. Routledge.
3. Massey,D.(1994).Space, Place and Gender.University of Minnesota Press, Minneapolis
4. Moghadam,V.,etal.(2011) The Women,Gender and Development Reader. Bloomsbury Publishing.
5. Momsen,J.(2019).Gender and Development. Routledge.
6. Moser,C.(2012) Gender planning and development: Theory, practice and training. Routledge.
7. Spary,C.,(2019) Gender ,Development, and the State in India. Routledge.
8. Visvanathan, Nalini, Lynne Duggan, Nan Wiegersma, and Laurie Nisonoff.(2011) The Women, Gender and Development Reader. Halifax, Canada: Fernwood Publishing.

Sugested Readings:

1. Domosh,M.,Seager,J.,& Buck,B.(2001).Putting women in place : Feminist geographers make sense of the world (p. 74). New York: Guilford Press.
2. Mc Dowell, L.(1999).Gender, identity and place: Understanding feminist geographies. U of Minnesota Press.
3. Rose,G.(1993).Feminism & geography:The limits of geographical knowledge.U of Minnesota Press.
4. Raju,S.,& Lahiri-Dutt,K.(Eds.).(2011).Doing gender, doing geography: emerging research in India.
5. Bell,D.,& Valentine,G.(2003).Mapping desire: Geog sexuality. Routledge.

Assessment Rubrics:

Evaluation Type		**Marks**
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper - 1	
b)	Test Paper - 2	
c)	Assignment/Research Project	20
d)	Seminar	
e)	Book/Article Review	
f)	Viva-Voce	10
g)	Field Report	
Total		**100**

KU8 DSC GEO407 Advanced Climatology and Climate Change

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
VIII	DSC	400-499	KU8 DSC GEO407	4	4

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	0	30	70	100	2

Course Description:

This course is to provide students with adequate analytical tools to evaluate the complexity of climate change as a problem that includes scientific, social, cultural, economic, technological and political elements. Earth has a complex, interconnected system of processes that control the state of the climate. This course explores the science of climate change, perhaps the defining environmental issue of the 21st century. Students will learn how the climate system works; what factors cause climate to change across different time scales and how those factors interact; how climate has changed in the past; how scientists use models, observations and theory to make predictions about future climate; and the possible consequences of climate change for our planet. Finally, the course looks at the connection between human activity and the current warming trend and considers some of the potential social, economic and environmental consequences of climate change

Course Pre requisite : NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	To understand fundamental physical processes underlying climate variability and climate change	U
2	To explain and evaluate the evidence for human-caused climate change, in the context of historical climate change, as well as the relevant scientific uncertainties	A
3	Explain the impacts of climate change on human well-being and the natural world, and evaluate means by which these impacts can be reduced(adaptation).	An
4	To analyse the climatic data and make models on climate change and its interpretation for accurate weather forecasting	E

****Remember(R), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C)***

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓	✓					
CO 2	✓					✓	
CO 3			✓				✓
CO 4				✓	✓	✓	

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Stability and Air Mass**	14
	1	Stability and instability, Adiabatic cooling of atmosphere; Cloud Development	
	2	Air Masses and Fronts; Cyclones– origin, distribution and associated weather.	
	3	Monsoon, Regional aspects of Indian Monsoon, ENSO, IOD, Jet Stream, Polar Vertex.	
	4	Thunder storms, Tornadoes, Cloud Bursts, Squalls, Downburst, Hail storm Flash flood and Derecho.	
2		**Climate Measurement and Classification**	14
	1	Climate classifications - Koeppen, Trewartha and Thornthwaite, Major climates of the world-Tropical Rain Forest, Mediterranean, Tropical Deserts and Tundra Climates	
	2	Applied climatology-Weather station, Weather industry, Bio- climatology	
	3	Analysis of climatic data, their interpretation, Forecasting and tracking of Extreme Weather Phenomenon-numerical weather prediction, process and limitations	
	4	Empirical orthogonal function, Exceedance probability and relative operating characteristics (ROC), regression method, use of general circulation modals for weather prediction	

3	**Climate Change- Physical Science Basis**		
	1	Science of Climate Change, Theories on climate change, Climatic changes in the past, present trends of climate change; Role of IPCC	
	2	Evidence of Climate Change: Earth Climate system, Radiation Budget, Greenhouse gases, Global warming, Extreme events- sea level rise, cyclones, drought, flood, Monsoon Variability, urban heat island	14
	3	Causes of climate change–natural and human made	
	4	Impacts of climate change: on Natural System and Human System	
4	**Vulnerability and Adaptation**		
	1	Climate change and Vulnerability–physical, economic and social vulnerability	14
	2	Climate Change Mitigation- UNFCCC and Global Initiatives	
	3	Indian initiative- National Action Plan on Climatic Change	
	4	Climate Change Adaptation- Climate emergency, Knowledge, Technology, Society and Politics; maladaptation	
5	**Teacher Specific Module**		
	Directions		
	Conduct a workshop on any of the topics of contemporary relevance such as • air pollution and urban environment • climate change and coastal community • living with climate disasters		4

Essential Readings:

1. Ahrens,C.D.,and Samson,P.(2011):ExtremeWeatherandClimate,Brooks/Cole, Belmont, 508pp.
2. Dessler, A.E.,and Parson,E.A.(20 09):The Science and Politics of Global Climate Change–A Guide to the Debate, Cambridge University Press,Cambridge,190pp.
3. IPCC5thAssessment report on Climate Change :http://www.ipcc.ch/report/ar5/11.
4. IPCC6thAssessmentreportonClimateChange:https://www.ipcc.ch/assessment-report/ar6/
5. Khan,M.Z.A.,and Gangawala,S. (2011):Global Climate Change–Causes and Consequences, Rawat Publications, Jaipur, 298pp
6. Ruddiman,W.F.(2008):Earth's Climate–Past and Future,W.H.Freeman, NewYork, 388pp.
7. Adger,W.N.2006.Vulnerability, Global Environmental Change,16(3),268-281
8. Barros, Vicente R. (eds.), 2014. Climate Change 2014. Impacts, Adaptation and Vulnerability: Global and Sectoral Aspects. Fifth Assessment Report of the Intergovernmental Panel on Climate Change (Part B; RegionalAspect),Cambridge University Press, New York.
9. Barry,R.G .and Chorley, R.J.2003.Atmosphere, Weather and Climate, Routledge, London
10. Brewster,E.N. 2010. Climate Change Adaptation: Steps for a Vulnerable Planet, New York, Nova Science
11. Critchfield,H.J. 1983.General Climatology. Prentice Hall India Ltd (2010Reprint)

12. IPCC, 2013. Climate Change 2013: The Physical Science Basis, the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner,M.Tignor,S.K.Allen,J.Boschung,A.Nauels,Y.Xia,V.BexandP.M.Midgley (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA,
13. John E Hobbs,2016.Applied climatology: A study of Atmospheric Resources,Elsevier, London

Suggested Readings:

1. Emaunuel K (2018). Know about climate change. Massachusetts Institute of technology, United States.
2. Ahmad J (2013):Climate change and sustainable development in India. New century publications, New Delhi, India.
3. Tarhule Aondover (2013). Climate variability: Reginal and thematic patterns .Intech publication, Croatia.
4. Shagufta C.J (2010):Global warming and climate change. A.P.H publishing corporation, New Delhi.
5. Letcher,T.M(2009).Climate change: observed impacts on planet earth.Elsevier publications, United Kingdom.
6. Letcher,T.M (2009).Managing global warming:An interface of technology and human issues. Elsevier publications, United Kingdom.
7. Silver,J(2008).Global warming and climate change demystified. McGraw Hill Educations, New York.
8. Kumar H.D (2006):Global climate change: insights, impacts and concerns.Vistara Publishing Pvt. Ltd, New Delhi.

Assessment Rubrics:

Evaluation Type		**Marks**
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper - 1	10
b)	Test Paper - 2	
c)	Assignment	10
d)	Seminar	10
e)	Book/Article Review	
f)	Viva-Voce	
g)	Field Report	
Total		**100**

KU8 DSC GEO408 Disaster Risk Reduction and Management based Project Work

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
VIII	DSC	200-299	KU8 DSC GEO408	4	8

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE(Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	0	30	70	100	2

Course Description:

course designed to provide students with hands-on experience in understanding, assessing, and mitigating disaster risks. This course focuses on applying theoretical knowledge to real-world scenarios through project-based learning. Students will work on projects that simulate disaster risk reduction (DRR) and management efforts, preparing them for careers in disaster management, emergency response, and related fields.

Course Prerequisite: NIL

Course Outcomes:

CO No	Expected Outcome	Learning Domains
1	Demonstrate a solid understanding of the fundamental concepts and principles of disaster risk reduction and management.	U
2	Identify and evaluate various types of disaster risks, assess their potential impacts on communities, and utilize risk assessment tools and methodologies.	An
3	Create and implement effective disaster risk reduction strategies and preparedness plans tailored to specific hazards and community needs.	C
4	Work effectively in multidisciplinary teams to design and implement comprehensive disaster management solutions.	A
5	Integrate modern technologies, such as Geographic Information Systems (GIS), in the assessment and management of disaster risks.	E

6	Articulate disaster risk reduction strategies and management plans clearly and persuasively to diverse stakeholders, including community members, policymakers, and emergency responders.	C

Remember(R), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C)

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓						
CO 2		✓	✓				
CO 3		✓			✓		
CO 4			✓				✓
CO 5			✓	✓			
CO 6						✓	

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Conceptual Basis**	20
	1	Disaster Management- Concepts: Hazard and Disaster (Classification), Risk, Vulnerability, Disaster Management, Disaster Risk Reduction, Resilience	
	2	Disaster Management Cycle	
	3	Community Based Disaster Management	
	4	HRVC Analysis and Mapping	
2		**Natural Disasters: Hydrological and Mass-Movement Hazards**	30
	1	Flood: Causes, Impact, Distribution and Mapping	
	2	Drought: Causes, Impact, Distribution and Mapping	
	3	Coastal Erosion: Causes, Impact, Distribution and Mapping	
	4	Landslide: Causes, Impact, Distribution and Mapping	

3	**Natural Disasters: Tectonic and Meteorological Hazards**		30
	1	Earthquake: Causes, Impact, Distribution and Mapping	
	2	Tsunami: Causes, Impact, Distribution and Mapping	
	3	Cyclone: Causes, Impact, Distribution and Mapping	
	4	Heat Waves: Causes, Impact, Distribution and Mapping	
4	**Human Made and Biological Hazards**		30
	1	Fires: Causes, Impact, Distribution and Mapping	
	2	Industrial: Causes, Impact, Distribution and Mapping	
	3	Nuclear: Causes, Impact, Distribution and Mapping	
	4	Epidemic: Causes, Impact, Distribution and Mapping	
5	**Teacher Specific Module**		10
	Directions • Project 1- it should be field-based case study. Conduct a field survey for a duration not exceeding 10 days to a locality recently affected by any of the hazards covered in the syllabus. • Project 2- it should be local / college-based. • Project 3- Prepare a CBDM Plan for any of the locality chosen for Project 1 and 2. • Project 4- Conduct a Hazard, Risk, Vulnerability and Capacity Analysis (HRVC) of any selected hazard for a state of interest. The analysis should be at district level using secondary data sources.		

Essential Readings:

1. Coppola, D. P. (2006). Introduction to international disaster management. Elsevier.
2. Fuchs, S., & Thaler, T. (Eds.). (2018). Vulnerability and Resilience to Natural Hazards. Cambridge University Press.
3. Kapur ,Anu(2010). Vulnerable India: A Geographical Study Of Disasters. Sage Publications.
4. Singh, J. (2007). Disaster Management: Future Challenges and Opportunities. IK International Pvt. Ltd, New Delhi.
5. Smith, Keith (2013). Environmental Hazards: Assessing risk and reducing disasters
6. Wisner, B., Blaikie P et al. (2004). At Risk: Natural Hazards, People's Vulnerability and Disasters. Routledge Taylor and Francis Group.

Suggested Readings:

1. Government of India. (2011). Disaster Management in India. Delhi, India: Ministry of Home Affairs.
2. Government of India. (2008). Vulnerability Atlas of India. New Delhi, India: Building Materials & Technology Promotion Council, Ministry of Urban Development, Government of India
3. Modh, S. (2010). Managing Natural Disaster: Hydrological, Marine and Geological Disasters. Delhi, India: Macmillan.

4. Ramkumar, M. (2009). Geological Hazards: Causes, Consequences and Methods of Containment. New Delhi, India: New India Publishing Agency.
5. Stoltman, J.P., et al. (2004). International Perspectives on Natural Disasters. Dordrecht, the Netherlands: Kluwer Academic Publications.

Assessment Rubrics:

Evaluation Type	**Marks**
End Semester Evaluation	**70**
Continuous Evaluation	**30**
a) Test Paper - 1	
b) Test Paper - 2	
c) Practical Record File	15
d) Seminar	
e) Book/Article Review	
f) Viva-Voce	
g) Field Report	15
Total	**100**

KU8 RPH GEO401 Research Project

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
VIII	RPH	400-499	KU8 RPH GEO401	4	8

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE(Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
0	8	0	30	70	100	-

MAJOR ELECTIVES

KU8 DSE GEO401 Climate Change: Science and Society

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
VIII	DSE (Major)	400-499	KU8 DSE GEO401	4	4

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE(Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	0	30	70	100	2

Course Description:

This course offers an in-depth examination of climate change from both scientific and societal perspectives. Students will explore the fundamental scientific principles underlying climate change, including the greenhouse effect, carbon cycling, and the impacts of human activities on the climate system. The course will delve into the complexities of climate change science, addressing topics such as climate modeling, paleo climate evidence, and the role of feedback mechanisms. From a societal standpoint, the course will analyze the social, economic, and political dimensions of climate change. The course will also explore the intersection of climate change with issues of environmental justice, equity, and human rights and students will be encouraged to think critically and creatively about potential solutions to the climate crisis.

Course Prerequisite: NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	Understand the scientific basis of modern climate change.	U
2	To analyze the social, economic, and political dimensions of climate change.	An

3	Evaluate mitigation and adaptation strategies for addressing climate change at various scales.	E
4	To examine the intersections of climate change with issues of environmental justice, equity, and human rights.	An
5	To develop the skills to engage in informed discussions and decision-making related to climate change.	A

**Remember(R), Understand (U), Apply(A), Analyse(An), Evaluate(E), Create(C)*

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓						
CO 2		✓					
CO 3	✓		✓				
CO 4							✓
CO 5						✓	

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1	**Climate Change**		14
	1	Earth's Climate System; Understanding Climate Change- past and present	
	2	Green House Gases and Global Warming; Feedback mechanism	
	3	Causes of Climate Change	
	4	Global Climatic Assessment- IPCC	
2	**Vulnerability and Impact**		14
	1	Climate Change Vulnerability- Theoretical Basis	
	2	Physical, Social and Economic Vulnerability- with case studies	
	3	Climate Change Impact on Natural System (sea level rise, melting glacier, extreme weather events, biodiversity)	
	4	Climate Change Impact on Human System (Agriculture, Water Resources and Human Health)	

3	**Adaptation and Mitigation**		14
	1	Adaptation- Concepts, Need and Strategies (Incremental and Transformational); Risks of maladaptation	
	2	Mitigation- Concepts, Strategies and Pathways	
	3	Global Initiatives for adaptation and mitigation	
	4	South Asia- Climate vulnerability and adaptation and mitigation measures	
4	**Climate Change Policy Framework**		14
	1	Global Initiatives: UNFCCC and COPs	
	2	Kyoto Protocol	
	3	Paris Agreement and Nationally Determined Contributions (NDCs)	
	4	India: National Action Plan on Climatic Change; Mission LiFE	
5	**Teacher Specific Module**		
	Directions		
	Following activity may be conducted to sensitize students about climate change and its impact. • Movie/Documentary Screening. • Book review and discussion- fictions written in the backdrop of natural calamity may be chosen for the book review. • Visit a climate hazard affected locality and interview local communities affected by the disaster.		4

Essential Readings:

1. Dessler,A.E.,and Parson,E.A.(2009):The Science and Politics of Global Climate Change – A Guide to the Debate, Cambridge University Press, Cambridge, 190pp.
2. IPCC 5th Assessment report on Climate Change :http://www.ipcc.ch/report/ar5/11.
3. IPCC 6th Assessment report on Climate Change :https://www.ipcc.ch/assessment-report/ar6/
4. Khan,M.Z.A.,and Gangawala,S.(2011): Global Climate Change– Causes and Consequences, Rawat Publications, Jaipur, 298pp
5. Ruddiman,W.F.(2008):Earth's Climate–Pasta nd Future,W.H.Freeman,NewYork, 388pp.
6. Adger,W.N.2006.Vulnerability,Global Environmental Change, 16(3),268-281
7. Barros, Vicente R. (eds.), 2014. Climate Change 2014. Impacts, Adaptation and Vulnerability: Global and Sectoral Aspects. Fifth Assessment Report of the Intergovernmental Panel on Climate Change (PartB;Regional Aspect),Cambridge University Press, New York.
8. Barry,R.G.and Chorley, R.J.2003.Atmosphere,Weather and Climate,Routledge, London
9. Brewster,E.N.2010. Climate Change Adaptation: Steps for a Vulnerable Planet, New York, Nova Science
10. Critchfield,H.J. 1983.General Climatology. Prentice Hall India Ltd(2010 Reprint)
11. IPCC, 2013. Climate Change 2013: The Physical Science Basis, the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)].Cambridge University Press, Cambridge,United Kingdom and New York, NY, USA,

Suggested Readings:

1. OECD. (2008). Climate Change Mitigation: What do we do? (Organization and Economic Co-operation and Development).
2. UNEP. (2007). Global Environment Outlook: GEO4: Environment for Development. Nairobi, Kenya: United Nations Environment Programme.
3. Reddy M.A, Vijay Lakshmi T "Climate Change:Vulnerability and Adaptation"
4. Trevor. M. Letcher(edited) 2009: Climate Change: Observed impacts on Planet Earth
5. Narain.S 2021: Climate Change Science and Politics. Centre for Science and Environment
6. Sarah L. Burch and Sara E. Harris: Understanding Climate Change: Science, Policy and Practice
7. Sen, Roy, S., and Singh, R.B., (2002). Climate Variability, Extreme Events and Agricultural Productivity in Mountain Regions. Delhi, India: Oxford & IBH Pub.
8. Pachori RK 2015:Dealing with Climate Change: Setting a Global agenda for Mitigation and Adaptation

Assessment Rubrics:

Evaluation Type		**Marks**
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper - 1	10
b)	Test Paper - 2	
c)	Assignment	10
d)	Seminar	
e)	Book/Article Review	10
f)	Viva-Voce	
g)	Field Report	
Total		**100**

KU8 DSE GEO 402 Social and Cultural Geography with special reference to India

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
VIII	DSE (Major)	400-499	KU8 DSE GEO402	4	4

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE(Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	1	30	70	100	2

Course Description:

Social and cultural geography investigates the interaction between human societies and their environments, unraveling the spatial dimensions of social and cultural phenomena. The paper by introducing students to the geographies of social and cultural phenomena in a globalizing world will take to a case study of one of the most complex cultural landscape- India.

The paper sets the social and cultural geography of India as a captivating journey through time and space, unveiling the intricate connections between geography, history, and societal structures. The nation's diversity, shaped by religious, linguistic, and economic factors, creates a unique tapestry that continues to evolve .By equipping students with the understanding of the complexities of India's social and cultural geography, the course offers insights for policy formulation for a vast and diverse nation like India.

Course Prerequisite: NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	To learn the concept of culture and its intersections with Geography	U
2	To acquaint the students to the unique social geography of India	A
3	To allow students to appreciate the roles of geographic factors in socio-cultural regionalization of India.	An

Remember(R), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C)

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓	✓					
CO 2			✓			✓	
CO 3		✓				✓	

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Culture and Geography**	14
	1	Culture as a Geographical Process: Carl O Sauer and The Berkeley School, Cultural Turn and New Cultural Geography	
	2	Cultural Hearths and Diffusion Gender and sexuality	
	3	Identity and Space: Gender, Sexuality and (Dis)ability	
	4	Power and Place: Citizenship and Nationalism	
2		**Culture and Globalization**	14
	1	Cultural politics, Hegemony, and Ideology	
	2	Culture, consumption, and globalization	
	3	Role of global capital, media, and technology	
	4	Deterritorialization of identities and places Hybrid identities	
3		**Social Geography of India**	14
	1	Social Geography and Social Space	
	2	Indian society – a study in unity and diversity	
	3	Centripetal and centrifugal forces in India's socio-regional structures	
	4	Socio cultural regionalization of India-Continuity and Change	
		Regional Dynamics of Social Structure	
4	1	Spatial patterning of language in India	14
	2	Religious diversity and regional identity	
	3	Caste Regions: Varna and jati-pan Indian structure and regional specificity	
	4	Tribes in India: Tribal regions, dominance and dispersion of tribal Population	
5		**Teacher Specific Module**	
		Directions	
		Following activity may be conducted: • Movie/documentary screening • Literature review • Identify a social problem in the locality and develop a research proposal on the same.	4

Essential Readings:

1. Ahmed,A.1999. Social Geography, Rawat publications, Jaipur.
2. Anderson,Jon (2010). Understanding Cultural Geography: Places and Traces. Routledge: London and New York
3. Blunt Alisonetall.(eds)(2003). Cultural Geography in Practice. Hodder Education, Great Britain.
4. Fellmann J.D.,GetisA.and GetisJ.(2007) Human geography ,Landscapes of Human activities. Mcgraw-Hill International edition: New York
5. ValentineGill.(2001) Social Geographies: Space and Society.

Suggested Readings:

1. AgnewJ.A.and DuncanJ.S.(2011) theWiley-Blackwell Companion to Human Geography. Blackwell publishing Ltd; UK
2. Schwartzberg,J.1978. A HistoricalAtlas of SouthAsia, University of Chicago Press, Chicago.
3. CraneRobert,I.1973.Regions and Regionalism in South Asian Studies:An Exploratory Study, Duke University Durham.
4. Jackson Peter(1989).Meaning of Maps.Routledge.London. This edition published in the Taylor and Francis e-library, 2003
5. Norton William (2007) Human Geography. Oxford University Press:New York
6. Oakes Timothy S. and Price Patricia L.(eds)(2008).The Cultural Geography Reader. Routledge,NewYork This edition published in theTaylor and Francise-library,2003
7. Rubenstein J.M (2010) Contemporary Human Geography. Pearson Education: New Jersey. Indian Edition published by Pearson India Education services Pvt .Ltd.2015.
8. Singh Rana P.B.etall.Places and Cultura lLandscapes.Springer.IGU-UGI

Assessment Rubrics:

Evaluation Type		**Marks**
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper - 1	10
b)	Test Paper - 2	
c)	Assignment	20
d)	Seminar	
e)	Book/Article Review	
f)	Viva-Voce	
g)	Field Report	
Total		**100**

KU8 DSE GEO403 Population and Welfare Geography

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
VIII	DSE (Major)	400-499	KU8 DSE GEO403	4	4

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE(Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	0	30	70	100	2

Course Description:

This course provides a comprehensive exploration of the intersection between population dynamics and social welfare within geographic contexts. Students will gain an understanding of the demographic processes shaping human populations and their implications for the well-being of individuals and communities. The course will examine key theories, methodologies, and contemporary issues in both population and welfare geography.

Course Prerequisite: NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	To understand Fundamental Demographic Concepts	U
2	To introduce students to the changing approaches in population geography	U
3	To evaluate welfare dimensions of population	E
4	To analyse the spatial dimensions of Migration and displacement	An

****Remember(R), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C)***

Mapping of Course Outcomes to PSOs

PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
✓					✓	
✓	✓					
✓				✓		
				✓	✓	

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Introduction to Population Geography**	14
	1	Population studies: Nature and Scope, Historical evolution and contemporary trends of the discipline, Sources of Population data.	
	2	Key demographic concepts- population, birth rate, death rate, fertility rate, migration, life expectancy, population density and population growth	
	3	Theories of population geography-Optimum population, Malthus, Ricardo, and Marx, Demographic transition theory	
	4	Population resource regions; Population problems	
2		**Population distribution and migration**	14
	1	World population: Grwoth and Distribution; Attributes of population- age-sex composition	
	2	Fertility and Mortality- Determinants (reproduction, health and education)	
	3	Migration-Types, causes, consequences and models, Contemporary trends in developed and developing countries	
	4	Forced migration- Refugees in the world; Diaspora and identify crisis	
3		**Welfare Geography**	14
	1	Nature and development of welfare geography	
	2	Needs and wants and Quality of Life	
	3	Level of living and state of well-being	
	4	Economic development and inequality- international and intra-national	

4	**Dimensions of Social Well being**		14
	1	Indicators of social well being(education, employment, health, housing, security, environmental quality and political and social inclusion.	
	2	Geography of Poverty: Poverty line and Multidimensional Poverty Index (India and Kerala),policy measures for poverty alleviation in India and Kerala	
	3	Gender Dimensions of Wellbeing-Gender empowerment measures	
	4	Human Development Index, Environment and Sustainability	
5	**Teacher Specific Module**		
	Directions		
	Practical exercise using real world demographic data • Construct age-sex pyramid • Map population density and growth		4

Essential Readings:

1. Asha A Bhende and Tara Kanitkar: Principles of Population Studies ,Himalaya Publishing House
2. Clarke ,John I,(1971) Population Geography. McGraw Hill
3. Hassan,M.I.(2020).Population Geography: A Systematic Exposition. United Kingdom: Routledge.
4. Newbold,K.B.(2013).Population Geography: Tools and Issues. United States: Rowman & Littlefield Publishers.

Suggested Readings:

1. Rajesh Arora: Population Geography Sonal iPublications New Delhi
2. Qazi,S.A.(2010).Population Geography.India:APH Publishing Corporation.
3. Social Factors and Community Well-Being.(2016).Germany: Springer International Publishing.
4. Kulkarni,K.M.(1990).Geographical Patterns of Social Well-being:With Special Reference to Gujarat. India: Concept Publishing Company.
5. Fuller,S.(2016). Wellbeing and Place.United Kingdom:Taylor & Francis

Assessment Rubrics:

Evaluation Type		**Marks**
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper - 1	10
b)	Test Paper - 2	
c)	Assignment	20
d)	Seminar	
e)	Book/Article Review	
f)	Viva-Voce	
g)	Field Report	
Total		**100**

MINOR COURSES

KU1 DSC GEO121 Introduction to Earth System

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
I	DSC- minor	100-199	KU1 DSC GEO121	4	4

Learning Approach (Hours/Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	0	30	70	100	2

Course Description:

It is a foundational course designed to explore the intricate processes and phenomena that shape our planet. Through a multidisciplinary lens, this course delves into the dynamic interactions between Earth's various systems, including the lithosphere, atmosphere, hydrosphere, and biosphere. Students will explore the principles of plate tectonics, continental drift, and the geological timescale, gaining insights into the Earth's long and complex history.
In addition, this course examines the interconnectedness of Earth's systems and their influence on weather patterns, climate change, ocean currents, and ecosystems. Through case studies and real-world examples, students will analyze the environmental impacts of human activities. Thus, "Introduction to Dynamic Earth" offers a comprehensive foundation to unlock the secrets of our planet's past, present, and future.

Course Pre-requisite: NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	Understand the fundamentals of Earth system	U
2	Develop knowledge on various agents of Earth processes	A
3	Derive overview on components of earth system	An

**Remember (R), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C)*

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓						
CO 2		✓					
CO 3						✓	

COURSE CONTENTS

Contents for Classroom Transaction :

MODULE	UNIT	DESCRIPTION	HOURS
1		**Physical Geography**	12
	1	Nature and Scope of Physical Geography	
	2	Origin and evolution of earth as a planet	
	2	Earth as a system and its components	
	3	Geological Time Scale	
2		**Lithosphere**	12
	1	Earth's interior and Isostasy	
	2	Origin of Continents and Oceans: Continental Drift and Plate Tectonics	
	3	Earth's movement: endogenic and exogenic	
	4	Landforms- plains, plateaus and mountains- types	
3		**Atmosphere**	12
	1	Composition and Structure	
	2	Energy: Insolation and Temperature	
	3	Pressure Systems and wind circulation	
	4	Precipitation	
4		**Hydrosphere**	12
	1	Hydrological cycle	
	2	Ocean Salinity and Temperature	
	3	Ocean Water Movements: Waves, Tides and Currents	
	4	Oceanic deposits	

5		**Biosphere**	
	1	Fundamental concepts of ecosystem	12
	2	Soil: Formation and Distribution	
	3	Vegetation: Factors and Distribution	
	4	Environmental degradation **Conduct a Quadrant Survey for evaluating biomass**	

Essential Readings:

1. Barry, R.G., and Chorley, R.J. (2010): Atmosphere, Weather and Climate, Routledge, London, 516 pp.
2. Bhattacharya, S.K. 1988. Urban Domestic Water Supply in Developing Countries, CBS Publishers, CR Distributors, Delhi.
3. Chow, V.T., Maidment, D.R. and Mays, W.L. (1988) Applied Hydrology, McGraw-Hill International Editions, McGraw-Hill Book Company, New York.
4. Chow V.T (2017) - Handbook of Applied Hydrology, Tata McGraw Hill, New Delhi
5. Jain, S.K., Aggarwal, P.K. and Singh, V.P. 2007. Hydrology and Water Resources of India, Springer, The Netherlands.
6. Byers R.H. (1974): General Meteorology, McGraw Hill BKCo New York.
7. Critchfield, H.J, (2009): General Climatology; Prentice Hall, London
8. Das P. K. (1995): The Monsoon, Prayag Pustak Bhavan, Allahabad, National Book Trust.India
9. Ela Dean, (2017); Principles of Atmospheric Science, Larsen and Keller Education, 249 pp.
10. Hobbs, J.E. (1980): Applied Climatology, Butterworth, London.
11. John E Oliver and John J Hidore 2003, Climatology – An Atmospheric Science, Pearson
12. Education Private Limited, Delhi.
13. K Siddhartha (2018), Oceanography: A Brief Introduction, Kitab Mahal, India
14. Dennis S Hartman (1994), Global Physical Geography, Academic Press, London
15. Mysooru R Yadupathi Putty, 2020, Fundamentals of Hydrology, Wiley India.
16. Prasad Prem Kumar, 2016, Biosphere Forms and Functions, Daya Publishing House
17. Spark, B. W. (1986): Geomorphology, Longman, London.
18. Strahler, A.N (1992): Physical Geography. John Wiley & Sons Inc., New York.

Suggested Readings:

1. Thomas, M.F. (1974): Tropical Geomorphology, Macmillan, London
2. Thornbury W.D (1969) Principles of Geomorphology, Wiley Intl. Edn & Wiley Eastern Reprints 1984.
3. Wooldridge S W and R. S. Morgan (2004)–The Physical Basis of Geography - An Outline of Geomorphology, Orient Longman Private Limited.
4. Worcester, P. G. (1948): Textbook of Geomorphology.

Assessment Rubrics:

Evaluation Type		Marks
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper - 1	10
b)	Test Paper - 2	
c)	Assignment	10
d)	Seminar	10
e)	Book/Article Review	
f)	Viva-Voce	
g)	Field Report	
Total		**100**

KU2 DSC GEO122 Fundamentals of Human Geography

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
2	DSC- Minor	100-199	KU2 DSC GEO122	4	4

Learning Approach (Hours/Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	0	30	70	100	2

Course Description:

Space and society form a symbiotic relationship that has captivated the attention of geographers. The profound interconnectedness between these entities lies at the heart of geographical inquiry, offering a nuanced lens through which human activities and social structures are examined in the context of the spaces they inhabit. The paper attempts to introduce students to understand the co-production of social structure and space in the contemporary world.

Course Pre requisite : NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	Understand the relationship between space and society.	U
2	To analyse population growth and its spatial pattern	An
3	In-depth understanding of social space and its construction	E
4	Understanding the geographical manifestations of culture	A

****Remember(R), Understand(U), Apply(A), Analyse (An), Evaluate(E), Create (C)***

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓						
CO 2					✓		
CO 3		✓					
CO 4						✓	

COURSE CONTENTS

Contents for Classroom Transaction :

MODULE	UNIT	DESCRIPTION	HOURS
1		**Spatial Dimensions of Human Society**	14
	1	Nature and Contemporary relevance of Human Geography	
	2	Major Themes : Space (Absolute, Relative, Relational), Place, Scale, Movement, Region	
	3	Approaches in Human Geography (Positivism, Humanism, Structuralism)	
	4	Concept of Social Space and Topophilia	

2		**Population**	14
	1	World Population Distribution and Growth	
	2	Population Dynamics (Fertility, Mortality and Migration)	
	3	Demographic Transition and its Regional Pattern	
	4	Population Composition (Residence, Age, Sex)	

3	**Social Geography**		14
	1	Language	
	2	Religion	
	3	Tribes and Caste	
	4	Race and Ethnicity	
4	**Cultural Geography**		14
	1	Culture : Meaning and formation	
	2	Types of Culture, Components/Structure of Culture	
	3	Culture and Geography: Cultural Landscape	
	4	Cultural Realms of the World	
5	**Teacher Specific Module (Any one from the following)**		
	1. Field visit to distinguish urban and rural space		4
	2. Compiling demographic profile using census data		

Essential Readings:

1. Ahmad, Aijazuddin.(1999).Social Geography. Jaipur: Rawat Publications
2. Aitken,S.and Valentine,G(2006).Approaches to HumanGeography. Sage Publications.
3. Fouberg,E.H.,Murphy,A.B.,& De Blij,H.J.(2015).Human Geography: People, Place and Culture. John Wiley & Sons.
4. Knox,P.L.,Marston,S.A.,& Imort,M.(2016).Human Geography: Places and regions in global context. New York: Pearson.
5. Rubenstein,JamesM.(2017).TheCultural Landscape:An Introduction to Human Geography. Pearson. .

Suggested Readings:

1. Chandna,R.C.(2017).Population Geography. NewDelhi, U.S.A.: Kalyani Publishers.
2. Hassan,M.I. (2005).Population Geography.Jaipur,India : Rawat Publications.
3. Jordan-Bychkov., et al. (2006). The Human Mosaic: A Thematic Introduction to Cultural Geography.NewYork, U.S.A.: W. H. Freeman and Company.

Assessment Rubrics:

Evaluation Type		**Marks**
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper - 1	10
b)	Test Paper - 2	
c)	Assignment	10
d)	Seminar	
e)	Book/Article Review	
f)	Viva-Voce	
g)	Field Report	10
Total		**100**

KU3 DSC GEO221 Understanding Landforms

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
3	DSC- Minor	200-299	KU3 DSC GEO221	4	4

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	0	30	70	100	2

Course Description

The course Landforms Studies deals with scientific exploration of landforms, their origin and the processes that shape and reshape Earth's surface. It offers a comprehensive understanding of these natural features and dynamic forces that have shaped the planet over millions of years. By the end of the course students will gain insights into the principles, theories and methods used to analyse and interpret these natural features.

Course Prerequisite : NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	Analyse the conceptual basis of Geomorphology	A
2	Understand the process that sculpts surface features.	U
3	Examine the features of various geomorphic processes and products	E
4	Analyses the interaction between endogenic as well as exogenic Processes	An

****Remember(R), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C)***

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓						
CO 2		✓					
CO 3			✓				
CO 4						✓	

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Introduction to Geomorphology**	14
	1	Geology and Geomorphology, Nature and development of Geomorphology- branches	
	2	Scaling of landforms Land forms – classification	
	3	Origin and evolution of earth crust	
	4	Composition and structure of earth	
2		**Tectonic Movements**	14
	1	Tectonic movements and landforms, Continental drift, Sea floor spreading, Plate tectonics	
	2	Vulcanicity and seismicity cusses and consequences	
	3	Mountain building theories	
	4	Rocks and lithification, soil processes and properties	
3		**Gradation and landforms**	14
	1	Weathering and mass wasting	
	2	Fluvial processes and associated landforms	
	3	Underground water and Karst topography, Aeolian topography	
	4	Glacial and Periglacial topography , coastal processes and landforms	
4		**Interpreting landforms**	14
	1	Factors of landscape evolution	
	2	Views of Davis and Penck	
	3	Rejuvenation- Polycyclic landforms	
	4	Recent trends in geomorphology	

	Teacher Specific Module	
5	Prepare a file containing hand-drawn diagrams associated with major concepts, processes and landforms discussed in the module 1-4.	4
	Conduct a field visit to a river bank or coastal location to identify major erosional and depositional landforms by the denudational agent. Prepare a photo album of the landforms identified along with the descriptive notes.	

Essential Readings:

1. ArthurL.Bloom(2003)Geomorphology–AsystematicAnalysisofLateCenozoic Landforms, Pearson Education, Singapore
2. ArthurN Strahler and Alan H Strahler(1998) Modern Physical Geography,John Wiley and Sons, Inc
3. Bloom,A.L.(1991):Geomorphology,2nd Ed Englewood Cliffs, M.J. Prentice Hall
4. Chorley,R.J. Schumm,S.A.& Sugden,D.E. (1985):Geomorphology, Methuen & Co. Ltd., London, New York
5. Thornbury W.D (1969) Principles of Geomorphology,Wiley Intl.Edn & Wiley Eastern Reprints 1984.
6. Christopherson,R.W.(1995):Elemental Geosystems A Foundationin Physical Geography, Prentice Hall Englewood Cliffs, New Jersey
7. Cook,R.U.& Doornkamp,J.C. (1974): Geomorphology in Environmental Management, An Introduction. Clarendon Press. Oxford
8. Hart,M.G.(1986):Geomorphology Pure and Applied, George Allenand Unwin, London.
9. Richard John Haggett (2003)Fundamentals of Geomorphology, Routledge, London
10. Strahler,A.N (1992) :Physical Geography. ohnWiley & Sons Inc., New York
11. VerstappenH.(1983) Applied Geomorphology, Geomorphological Surveys for Environmental Development, Elsevier, Amsterdam
12. Wooldridge SW and R.S.Morgan (2004)–The Physical Basis ofGeography-An Outline of Geomorphology, Orient Longman Private Limited

Suggested Readings:

1. Brierley,G.J. & Fryirs,K.A. (2005): Geomorphology and River Management, Blackwell Publishing, Oxford UK
2. Briggs,K.(1985):Physical Geography Process and System, Hodder and Stoughton, London
3. Dayal P (1996) A Textbook of Geomorphology,Shukla Book Depot, Patna ,India
4. Fairbridge,R.W.,ed.(1968):Encyclopedia of Geomorphology Reinhold, NewYork
5. John P Miller and Luna Bergere Leopold, Fluvial Processes in Geomorphology
6. KaleVS and GuptaA (2010) Introduction to Geomorphology, Orient Longman, Calcutta
7. Leopold,L.B.Wolman,M.G.&Miller,J.P.(1964):Fluvial Processes in Geomorphology, W.H.Freeman, San Fransisco
8. Robinson,Harry (1969): Morphology and Landscape, University Tutorial Press Ltd. London
9. Spark,B.W. (1986): Geomorphology, Longman, London
10. Thomas,M.F.(1974): Tropical Geomorphology, Macmillan, London
11. Wadia,D.N.(1993):Geology of India,Tata McGraw Hill Edition, NewDelhi

Assessment Rubrics:

Evaluation Type	Marks
End Semester Evaluation	**70**
Continuous Evaluation	**30**
a) Test Paper - 1	10
b) Test Paper - 2	
c) Assignment	10
d) Seminar	
e) Book/Article Review	
f) Viva-Voce	
g) Field Report	10
Total	**100**

KU3 DSC GEO222 Basics of Mapping

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
3	DSC- Minor	200-299	KU3 DSC GEO222	4	4

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	0	70	30	100	2

Course Description:

This course is designed to provide the knowledge and skills for understanding the process of map-making. This course covers the design, purpose, use, and proper development of maps and provides a general introduction to Cartography, broadly defined as the art, science, and ethics of map making and map use.

Course Pre-requisite : NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	Understand the types of maps and essentials of maps	U
2	Recognize the various methods of representing geographical data	A
3	Understand the basics of surveying techniques	U
4	Learn topographical and weather map interpretation	R

****Remember(R), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C)***

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓						
CO 2					✓		
CO 3			✓				
CO 4					✓		

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Maps and its essentials**	20
	1	Maps and its types	
	2	History of Cartography	
	3	Co-ordinates, and their functions (demarcation of location and time calculation)	
	4	Enlargement and Reduction	
2		**Representation of relief features**	30
	1	Quantitative: Spot height, Benchmarks, Triangulation marks, Contour	
	2	Layer tinting	
	3	Hachures	
	4	Hill Shading	

3	**Scales**		30
	1	Statement, RF and Graphical and Conversion	
	2	Plain Scale	
	3	Comparative: Time and Distance	
	4	Diagonal	

4	**Map Projections**		30
	1	Zenithal: Polar cases of Gnomonic, Stereographic, Orthographic, Equal Area and Equidistant	
	2	Conical: One Standard, Two Standard, Bonnes, Polyconic and International Projection	
	3	Cylindrical: Equal Area, equi-distant and Mercator	
	4	Mathematical: Sinusoidal and Molviede	

5	**Teacher Specific Module**	
	A Project File in pencil comprising one exercise each, on relief representation techniques, scale and map projection.	10

Essential Readings:

1. Arthur H Robinson etal.:Elements of Cartography, John Wiley & Sons, Singapore
2. Ashish Sarkar: Practical Geography-A systematic approach, Orient Blackswan Pvt. Ltd
3. Bangulia A.M: Practical Geography,Anmol Publishers Pvt. Ltd
4. Gopal Singh: Map work and Practical Geography,Vikas Publishing Pvt .Ltd
5. Misra R.P, Ramesh A: Fundamentals of Cartography, Concept Publishing Company New Delhi
6. Monkhouse and Wilkinson: Maps and Diagrams, Metheun and Company
7. Saha P and Basu P: A Practical Geography,Books and Allied Ltd. Kolkata
8. Singh RL and Rana PB Singh, Elements of Practical Geography, Kalyani Publishers
9. Siya Ram Sharma: Practical Geography,Murali Lal & Sons Pvt .Ltd.
10. Zulfequar Ahmad Khan MD Text book of Practical Geography, Concept Publishing Company

Suggested Readings:

1. Gupta KK and Tyagi VC:Working with Map, Survey of India ,DST, NewDelhi
2. Mishra R P and Ramesh A, :Fundamentals of Cartography, Concept Pub. NewDelhi
3. Robinson A H,Elements of Cartography, John Wiley and Sons, New York
4. Sarkar A:Practical Geography:A systematic Approach,Orient BlackSwan Pvt. Ltd, New Delhi

Assessment Rubrics:

Evaluation Type		Marks
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper - 1	10
b)	Test Paper - 2	
c)	Project File	20
d)	Seminar	
e)	Book/Article Review	
f)	Viva-Voce	
g)	Field Report	
Total		**100**

KU4 DSC GEO223 Climate and Oceans

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
IV	DSC- Minor	200-299	KU4 DSC GEO223	4	4

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE(Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	0	30	70	100	2

Course Description:

The course on Climate and Ocean system offers a comprehensive exploration of Earth's atmospheric and oceanic systems, focusing on their dynamic interactions and influence on the global climate. The syllabus encompasses a broad range of topics, including atmospheric circulation patterns, climate zones, ocean currents, climate change, and the impact of human activities on the environment. Through a combination of theoretical lectures, practical lab sessions and fieldwork, students gain a deep understanding of climate processes, ocean dynamics, and their intricate relationship with the Earth's ecosystems. Moreover, the course equips students with essential analytical and research skills, enabling them to assess climate data, develop climate models, and propose effective strategies for climate adaptation and mitigation.

Course Prerequisite: NIL

Course Outcomes:

CO No	Expected Outcome	Learning Domains
1	Understand the mechanism of climatic phenomena.	U
2	Understand the extreme weather phenomena, their occurrence, and its impact.	An
3	Classification of climate & analysis of climatic data, their interpretation and weather forecasts.	A
4	Understanding ocean relief features along with ocean circulations and physiochemical characteristic	R
5	To develop a solid idea about ocean resources and laws concerning oceans	E

****Remember(R), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C)***

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓						
CO 2		✓					
CO 3					✓		
CO 4	✓						
CO 5						✓	

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Introduction to Climatology**	12
	1	Nature and Scope of Climatology; Climatology and Meteorology	
	2	Weather and Climate, Elements and controls of climate	
	3	Insolation and Controlling factors, Heat Budget	
	4	Atmospheric temperature- Horizontal distribution and factors affecting; Vertical distribution- Normal lapse rate and Inversion of temperature	

2		**Atmospheric System**	14
	1	Atmospheric Pressure- Horizontal Distribution– Coriolis force; Major pressure belts; Vertical Distribution	
	2	Atmospheric disturbances- cyclones, anti-cyclones, air masses	
	3	Water in the atmosphere: Atmospheric humidity and its types; Evaporation – Condensation – Forms of condensation – Fog – Clouds – Classification – Precipitation – Types – Distribution	
	4	Climatic Regions and Classification	

3		**Ocean System**	12
	1	Relief of the ocean floor	
	2	Temperature and Salinity of the oceans– Distribution	
	3	Ocean circulations- Waves and Tides	
	4	Currents of the Indian, Pacific & Atlantic Ocean & Counter Currents	

4		**World Oceans**	12
	1	Oceanic Deposits	
	2	Coral reefs – Types - Barrier reef, Atoll, Fringing Reef & coral islands	
	3	Theories of Coral formation	
	4	Ocean resources and international cooperation	

5		**Teacher Specific Module**	10
	Directions		
		Climate data sources; Weather instruments: data acquisition and dissemination	
		Graphs and Diagrams-Columnar, Linear, and Circular graphs–Frequency Graphs – Trend graphs	
		Windrose diagrams- Stardiagram, Octagonal diagram, Compound wind roses; Hythergraph, Climograph, Climatograph	
		Preparation of climatic maps- Isopleths, Isotherms, Isobars, Isohytes, Equipluves, and Equi-Variable maps	
		Practical Record File comprising one exercise each from the above mentioned list should be prepared.	

Essential Readings:

1. Critchfield, HowardJ(2008):General Climatology, Prentice Hall, London
2. Barry,R.G.,andChorley,R.J.(2010):Atmosphere,Weather andC limate,Routledge,London
3. Oliver,JohnE & Hidore, JohnJ (2001):Climatology-Anatmospheri cscience,Pearson Education
4. Singh,Savindra(2020):Climatology, Pravallika publications, Allahabad
5. Sidhartha,K(2016):Atmosphere,Weather and Climate, Kisalaya Publications Private Limited, Delhi
6. Lal D S (2003):Climatology, Sharda Pustak Bhavan, Allahabad.
7. Sidhartha,K (2014): Oceanography-A brief introduction ,Kisalaya Publications, Private Limited, Delhi
8. Thurman,Harold V(2011): Essentials of Oceanography, Prentice Hall India, New Delhi
9. Ashish Sarkar(2009) Practical Geography–A systematic approach,Orient Black Swan, Kolkata.
10. Saha,Pijushkanti(2017) Advanced Practica lCartography,Books and Allied,Kolkata
11. Singh L R (2009) Fundamentals of Practical Geography, Sharda Pustak Bhavan
12. Singh RL and Rana B Singh(2004) Elements of Practical Geography, Kalyani Publishers, New Delhi
13. Robinson,P.J.and Sellers,H. (1986),Contemporary Climatology, Longman, London.

Suggested Readings:

1. Negi,B.S (2000):Climatology and Oceanography, Kedar Nathram Nath publishers, Meerut
2. Trewartha, G.T. (Latest edition) Introduction to Climate, McGraw Hill, New York.
3. Mayes and Hughes (2004):Understanding weather-a visual approach, Arnold publishers
4. Lutgens, Frederick K et.al (2018):The Atmosphere-An Introduction to Meteorology, Prentice Hall India, New Delhi
5. Strahler,A.H.and Strahler,AN.,(2001) Modern Physical Geography(4/E), JohnWiley and Sons, Inc., New York
6. https://www.noaa.gov/education/resource-collections/ocean-coasts/ocean-currents
7. https://worldoceanreview.com/en/wor-1/climate-system/great-ocean-currents/
8. Bulletin of the American Meteorological Society (https://journals.ametsoc.org/toc/bams/current)
9. Climate Dynamics (https://link.springer.com/journal/volumes And Issues/382)
10. International Journal of Climatology(https://rmets.onlinelibrary.wiley.com/journal/10970088) Journal of Climate (https://journals.ametsoc.org/toc/clim/current)
11. Nature Climate Change (https://www.nature.com/nclimate/)
12. Weather and Climat eExtremes (https://www.sciencedirect.com/journal/weather-and-climate-extremes)

Assessment Rubrics:

Evaluation Type	Marks
End Semester Evaluation	**70**
Continuous Evaluation	**30**
a) Test Paper - 1	10
b) Test Paper - 2	
c) Practical Record File	20
d) Seminar	
e) Book/Article Review	
f) Viva-Voce	
g) Field Report	
Total	**100**

KU4 DSC GEO224 Population Geography

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
IV	DSC- Minor	200-299	KU4 DSC GEO224	4	4

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE(Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	1	30	70	100	2

Course Description:

Thecoursedelvesintothedynamicinterplaybetweenhumanpopulationsandtheenvironments they inhabit. It shows the spatial distribution and growth patterns of population in the world and factors affecting it. Students will examine the fundamental principles and theories that underpin population geography, including migration dynamics, urbanization processes, and demographic transitions. They will explore how factors such as culture, politics, economics, and technology influence population distribution and settlement patterns at various scales, from local to global.

Course Prerequisite : NIL

Course Outcomes:

CO No	Expected Outcome	Learning Domains
1	Understand the dynamics of the population and its determinants.	R
2	Understand the implications of population composition in different regions of the world.	U
3	To know global refugee crisis	A
4	In-depth understanding about rural-urban dynamics of world population	An

****Remember(R), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C)***

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓						
CO 2		✓					
CO 3							✓
CO 4			✓				

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Approaches to Population Geography**	14
	1	Nature and Scope of Population Geography; Population Geography and Demography	
	2	Sources of Population Data (Census, Vital Statistics, Samples Surveys)	
	3	Population problems & optimum population	
	4	Population resource regions	
2		**Population Dynamics**	
	1	Population theories: Malthus, Ricardo, Marx Theory	
	2	Fertility and Mortality- Measures and Determinants	

	3	Migration- Determinants and Implications	14
	4	Migration theories	

3		**Contemporary Population Issues and Policies**	14
	1	Trends and spatial dynamics of sex ratio, Dynamics of Population Pyramids and Ageing	
	2	Demographic Dividends	
	3	Population and resource conflict; Global Refugee Crisis (push and pull factors)	
	4	Population policy: World and India	

4		**Human Settlements**	14
	1	Rural Settlements: Types and Characteristics (Site, Situation, Pattern and Morphology)	
	2	Urban Settlements: Definition, Classification	
	3	Urban Morphology: Classical Models of Burgess, Hoyt, Harris and Ullman	
	4	Rural-Urban Composition of world's population	

5	**Teacher Specific Module**	
	Collect district level data from Census of India (minimum 10 districts). Calculate population growth rate and population pyramid.	4
	Literature review/Book review/Movie Review on the theme Global Refugee Crisis or International Migration	
	Identify examples for various settlement patterns from the toposheet/google earth images. Write a brief account on the factors affecting the location of the settlement.	

Essential Readings:

1. Beaujeu-Garnier,J. (1966) Geography of Population.London: Longman
2. Chandna,R.C. (2017).Geography of Population.Kalyani Publishers, Ludhiana,India.
3. Clarks,John,I. (1972).Population Geography.Pergamon Press,New York.
4. HassanM.I. (2020).Population Geography, A Systematic Exposition. Routledge Taylor and Francis Group, New York.
5. Lutz, W., Warren, C. S. and Scherbov, S. (2004). The End of the World Population Growth in the 21st Century. UK: Earthscan.
6. Majumdar,P.K.(2010).Fundamentals of Demography. Rawat Publications, Jaipur.
7. Newbold,K.B.(2017).Population Geography: Tools and Issues. Rowman and Littlefield Publishers, NY, USA

Suggested Readings:

1. Clarke,J.I.(2003).Population Geography. Oxford: Pergamon Press.
2. Hudson,F.S.(2013).A Geography of Settlement. Plymouth: Macdonald & Evansltd.
3. Ghosh,S.(2002).A Geography of Settlement .Kolkatta: Orient Longman.
4. Jones,H.R.(2000).Population Geography.London: Paul Chappman.

Assessment Rubrics:

Evaluation Type	Marks
End Semester Evaluation	**70**
Continuous Evaluation	**30**
a) Test Paper - 1	10
b) Test Paper - 2	
c) Assignment	10
d) Seminar	
e) Book/Article Review	10
f) Viva-Voce	
g) Field Report	
Total	**100**

KU8 DSE GEO421 Climate Change and adaptation

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
VIII	DSE (Minor)	400-499	KU8 DSE GEO421	4	4

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE(Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	0	30	70	100	2

Course Description:

This course offers an in-depth examination of climate change from both scientific and societal perspectives. Students will explore the fundamental scientific principles underlying climate change, including the greenhouse effect, carbon cycling, and the impacts of human activities on the climate system. The course will delve into the complexities of climate change science, addressing topics such as climate modeling, paleo climate evidence, and the role of feedback mechanisms. From a societal standpoint, the course will analyze the social, economic, and political dimensions of

climate change. The course will also explore the intersection of climate change with issues of environmental justice, equity, and human rights and students will be encouraged to think critically and creatively about potential solutions to the climate crisis.

Course Prerequisite: NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	Understand the scientific basis of modern climate change.	U
2	To analyze the social, economic, and political dimensions of climate change.	An
3	Evaluate mitigation and adaptation strategies for addressing climate change at various scales.	E
4	To examine the intersections of climate change with issues of environmental justice, equity, and human rights.	An
5	To develop the skills to engage in informed discussions and decision-making related to climate change.	A

Remember(R), Understand (U), Apply(A), Analyse(An), Evaluate(E), Create(C)

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓						
CO 2		✓					
CO 3	✓		✓				
CO 4							✓
CO 5						✓	

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1	**Climate Change**		
	1	Earh's Climate System; Understanding Climate Change- past and present	

			14
	2	Green House Gases and Global Warming; Feedback mechanism	
	3	Causes of Climate Change	
	4	Global Climatic Assessment- IPCC	
2	**Vulnerability and Impact**		14
	1	Climate Change Vulnerability- Theoretical Basis	
	2	Physical, Social and Economic Vulnerability- with case studies	
	3	Climate Change Impact on Natural System (sea level rise, melting glacier, extreme weather events, biodiversity)	
	4	Climate Change Impact on Human System (Agriculture, Water Resources and Human Health)	
3	**Adaptation and Mitigation**		14
	1	Adaptation- Concepts, Need and Strategies (Incremental and Transformational); Risks of maladaptation	
	2	Mitigation- Concepts, Strategies and Pathways	
	3	Global Initiatives for adaptation and mitigation	
	4	South Asia- Climate vulnerability and adaptation and mitigation measures	
4	**Climate Change Policy Framework**		14
	1	Global Initiatives: UNFCCC and COPs	
	2	Kyoto Protocol	
	3	Paris Agreement and Nationally Determined Contributions (NDCs)	
	4	India: National Action Plan on Climatic Change; Mission LiFE	
5	**Teacher Specific Module**		
	Directions		
	Following activity may be conducted to sensitize students about climate change and its impact. • Movie/Documentary Screening. • Book review and discussion- fictions written in the backdrop of natural calamity may be chosen for the book review. • Visit a climate hazard affected locality and interview local communities affected by the disaster.		4

Essential Readings:

1. Dessler,A.E.,and Parson,E.A.(2009):The Science and Politics of Global Climate Change – A Guide to the Debate, Cambridge University Press, Cambridge, 190pp.
2. IPCC 5th Assessment report on Climate Change :http://www.ipcc.ch/report/ar5/11.
3. IPCC 6th Assessment report on Climate Change :https://www.ipcc.ch/assessment-report/ar6/
4. Khan,M.Z.A.,and Gangawala,S.(2011): Global Climate Change– Causes and Consequences, Rawat Publications, Jaipur, 298pp
5. Ruddiman,W.F.(2008):Earth's Climate–Pasta nd Future,W.H.Freeman,NewYork, 388pp.
6. Adger,W.N.2006.Vulnerability,Global Environmental Change, 16(3),268-281

7. Barros, Vicente R. (eds.), 2014. Climate Change 2014. Impacts, Adaptation and Vulnerability: Global and Sectoral Aspects. Fifth Assessment Report of the Intergovernmental Panel on Climate Change (PartB;Regional Aspect),Cambridge University Press, New York.
8. Barry,R.G.and Chorley, R.J.2003.Atmosphere,Weather and Climate,Routledge, London
9. Brewster,E.N.2010. Climate Change Adaptation: Steps for a Vulnerable Planet, New York, Nova Science
10. Critchfield,H.J. 1983.General Climatology. Prentice Hall India Ltd(2010 Reprint)
11. IPCC, 2013. Climate Change 2013: The Physical Science Basis, the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)].Cambridge University Press, Cambridge,United Kingdom and New York, NY, USA,
12. John E Hobbs,2016. Applied climatology: A study of Atmospheric Resources, Elsevier, London

Suggested Readings:

1. OECD. (2008). Climate Change Mitigation: What do we do? (Organization and Economic Co-operation and Development).
2. UNEP. (2007). Global Environment Outlook: GEO4: Environment for Development. Nairobi, Kenya: United Nations Environment Programme.
3. Reddy M.A, Vijay Lakshmi T "Climate Change:Vulnerability and Adaptation"
4. Trevor. M. Letcher(edited) 2009: Climate Change: Observed impacts on Planet Earth
5. Narain.S 2021: Climate Change Science and Politics. Centre for Science and Environment
6. Sarah L. Burch and Sara E. Harris: Understanding Climate Change: Science, Policy and Practice
7. Sen, Roy, S., and Singh, R.B., (2002). Climate Variability, Extreme Events and Agricultural Productivity in Mountain Regions. Delhi, India: Oxford & IBH Pub.
8. Pachori RK 2015:Dealing with Climate Change: Setting a Global agenda for Mitigation and Adaptation

Assessment Rubrics:

Evaluation Type		Marks
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper - 1	10
b)	Test Paper - 2	
c)	Assignment	10
d)	Seminar	
e)	Book/Article Review	10
f)	Viva-Voce	
g)	Field Report	
Total		**100**

KU8 DSE GEO422 Cultural Geography - An Indian Context

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
VIII	DSE (Minor)	400-499	KU8 DSE GEO422	4	4

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE(Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	1	30	70	100	2

Course Description:

Social and cultural geography investigates the interaction between human societies and their environments, unraveling the spatial dimensions of social and cultural phenomena. The paper by introducing students to the geographies of social and cultural phenomena in a globalizing world will take to a case study of one of the most complex cultural landscape- India.

The paper sets the social and cultural geography of India as a captivating journey through time and space, unveiling the intricate connections between geography, history, and societal structures. The nation's diversity, shaped by religious, linguistic, and economic factors, creates a unique tapestry that continues to evolve .By equipping students with the understanding of the complexities of India's social and cultural geography, the course offers insights for policy formulation for a vast and diverse nation like India.

Course Prerequisite: NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	To learn the concept of culture and its intersections with Geography	U
2	To acquaint the students to the unique social geography of India	A
3	To allow students to appreciate the roles of geographic factors in socio-cultural regionalization of India.	An

****Remember(R), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C)***

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓	✓					
CO 2			✓			✓	
CO 3		✓				✓	

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Culture and Geography**	14
	1	Culture as a Geographical Process: Carl O Sauer and The Berkeley School, Cultural Turn and New Cultural Geography	
	2	Cultural Hearths and Diffusion Gender and sexuality	
	3	Identity and Space: Gender, Sexuality and (Dis)ability	
	4	Power and Place: Citizenship and Nationalism	
2		**Culture and Globalization**	14
	1	Cultural politics, Hegemony, and Ideology	
	2	Culture, consumption, and globalization	
	3	Role of global capital, media, and technology	
	4	Deterritorialization of identities and places Hybrid identities	
3		**Social Geography of India**	14
	1	Social Geography and Social Space	
	2	Indian society – a study in unity and diversity	
	3	Centripetal and centrifugal forces in India's socio-regional structures	
	4	Socio cultural regionalization of India-Continuity and Change	
		Regional Dynamics of Social Structure	
4	1	Spatial patterning of language in India	14
	2	Religious diversity and regional identity	
	3	Caste Regions: Varna and jati-pan Indian structure and regional specificity	

	4	Tribes in India: Tribal regions, dominance and dispersion of tribal Population	
5	**Teacher Specific Module**		
	Directions		
	Following activity may be conducted: • Movie/documentary screening • Literature review • Identify a social problem in the locality and develop a research proposal on the same.		4

Essential Readings:

1. Ahmed,A.1999. Social Geography, Rawat publications, Jaipur.
2. Anderson,Jon (2010). Understanding Cultural Geography: Places and Traces. Routledge: London and New York
3. Blunt Alisonetall.(eds)(2003). Cultural Geography in Practice. Hodder Education, Great Britain.
4. Fellmann J.D.,GetisA.and GetisJ.(2007) Human geography ,Landscapes of Human activities. Mcgraw-Hill International edition: New York
5. ValentineGill.(2001) Social Geographies: Space and Society.

Suggested Readings:

1. AgnewJ.A.and DuncanJ.S.(2011) theWiley-Blackwell Companion to Human Geography. Blackwell publishing Ltd; UK
2. Schwartzberg,J.1978. A HistoricalAtlas of SouthAsia, University of Chicago Press, Chicago.
3. CraneRobert,I.1973.Regions and Regionalism in South Asian Studies:An Exploratory Study, Duke University Durham.
4. Jackson Peter(1989).Meaning of Maps.Routledge.London. This edition published in the Taylor and Francis e-library, 2003
5. Norton William (2007) Human Geography. Oxford University Press:New York
6. Oakes Timothy S. and Price Patricia L.(eds)(2008).The Cultural Geography Reader. Routledge,NewYork This edition published in theTaylor and Francise-library,2003
7. Rubenstein J.M (2010) Contemporary Human Geography. Pearson Education: New Jersey. Indian Edition published by Pearson India Education services Pvt .Ltd.2015.
8. Singh Rana P.B.etall.Places and Cultura lLandscapes.Springer.IGU-UGI

Assessment Rubrics:

Evaluation Type		Marks
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper - 1	10
b)	Test Paper - 2	
c)	Assignment	20
d)	Seminar	
e)	Book/Article Review	
f)	Viva-Voce	
g)	Field Report	
Total		**100**

KU8 DSE GEO423 Geography of Population and social well being

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
VIII	DSE (Minor)	400-499	KU8 DSE GEO423	4	4

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE(Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
4	0	0	30	70	100	2

Course Description:

This course provides a comprehensive exploration of the intersection between population dynamics and social welfare within geographic contexts. Students will gain an understanding of the demographic processes shaping human populations and their implications for the well-being of individuals and communities. The course will examine key theories, methodologies, and contemporary issues in both population and welfare geography.

Course Prerequisite: NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	To understand Fundamental Demographic Concepts	U
2	To introduce students to the changing approaches in population geography	U
3	To evaluate welfare dimensions of population	E
4	To analyse the spatial dimensions of Migration and displacement	An

****Remember(R), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create(C)***

Mapping of Course Outcomes to PSOs

PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
✓					✓	
✓	✓					
✓				✓		
				✓	✓	

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Introduction to Population Geography**	14
	1	Population studies: Nature and Scope, Historical evolution and contemporary trends of the discipline, Sources of Population data.	
	2	Key demographic concepts- population, birth rate, death rate, fertility rate, migration, life expectancy, population density and population growth	
	3	Theories of population geography-Optimum population, Malthus, Ricardo, and Marx, Demographic transition theory	
	4	Population resource regions; Population problems	

2	**Population distribution and migration**		14
	1	World population: Grwoth and Distribution; Attributes of population- age-sex composition	
	2	Fertility and Mortality- Determinants (reproduction, health and education)	
	3	Migration-Types, causes, consequences and models, Contemporary trends in developed and developing countries	
	4	Forced migration- Refugees in the world; Diaspora and identify crisis	
3	**Welfare Geography**		14
	1	Nature and development of welfare geography	
	2	Needs and wants and Quality of Life	
	3	Level of living and state of well-being	
	4	Economic development and inequality- international and intra-national	
4	**Dimensions of Social Well being**		14
	1	Indicators of social well being(education, employment, health, housing, security, environmental quality and political and social inclusion.	
	2	Geography of Poverty: Poverty line and Multidimensional Poverty Index (India and Kerala),policy measures for poverty alleviation in India and Kerala	
	3	Gender Dimensions of Wellbeing-Gender empowerment measures	
	4	Human Development Index, Environment and Sustainability	

5	**Teacher Specific Module**	
	Directions	
	Practical exercise using real world demographic data • Construct age-sex pyramid • Map population density and growth	4

Essential Readings:

1. Asha A Bhende and Tara Kanitkar: Principles of Population Studies ,Himalaya Publishing House
2. Clarke ,John I,(1971) Population Geography. McGraw Hill
3. Hassan,M.I.(2020).Population Geography: A Systematic Exposition. United Kingdom: Routledge.
4. Newbold,K.B.(2013).Population Geography: Tools and Issues. United States: Rowman & Littlefield Publishers.

Suggested Readings:

1. Rajesh Arora: Population Geography Sonal iPublications New Delhi
2. Qazi,S.A.(2010).Population Geography.India:APH Publishing Corporation.
3. Social Factors and Community Well-Being.(2016).Germany: Springer International Publishing.
4. Kulkarni,K.M.(1990).Geographical Patterns of Social Well-being:With Special Reference to Gujarat. India: Concept Publishing Company.
5. Fuller,S.(2016). Wellbeing and Place.United Kingdom:Taylor & Francis

Assessment Rubrics:

Evaluation Type		**Marks**
End Semester Evaluation		**70**
Continuous Evaluation		**30**
a)	Test Paper - 1	10
b)	Test Paper - 2	
c)	Assignment	20
d)	Seminar	
e)	Book/Article Review	
f)	Viva-Voce	
g)	Field Report	
Total		**100**

MULTI DISCIPLINARY COURSES (MDC)

KU1 MDC GEO101 Introduction to Geosystems: Planet and People

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
I	MDC	100-199	KU1 MDC GEO101	3	3

Learning Approach (Hours/Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
3	0	0	25	50	75	1 Hr 30 mnts

Course Description:

The course serves as an introductory exploration into the realm of geosystems by offering a comprehensive understanding of Earth's dynamic processes and systems. Geosystems encompass the intricate interactions between Earth's lithosphere, hydrosphere, atmosphere, and biosphere, shaping the physical landscape and influencing natural phenomena. Through a blend of theoretical concepts and practical applications, students will embark on a journey to unravel the mysteries of our planet's geological, hydrological, atmospheric, and ecological systems. This course is designed to provide a solid foundation for further study in geography, as well as to cultivate an appreciation for the interconnectedness of the natural world and human societies.

Course Prerequisite: NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
CO 1	Understand fundamental concepts in Geography.	U
CO 2	Thorough knowledge about earth and the solar system.	R
CO 3	Analytically learn how earth's movement shape the landforms on the earth's surface	An
CO 4	Evaluate major global environments and their problems and prospects.	E

Remember(R), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create (C)

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓	✓					
CO 2	✓	✓					
CO 3			✓			✓	
CO 4						✓	

COURSE CONTENTS

Contents for Class room Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Nature and Scope of Geography**	10
	1	Nature of Geography	
	2	Brief history and importance of geographic understanding in the contemporary world	
	3	Five Themes: space, place, interaction, movement, and region	
	4	Geography's interaction with other natural and social sciences	
2		**Earth in the Solar System**	10
	1	Solar System	
	2	Shape of the Earth and Evidence of the Earth's Sphericity	
	3	The Earth's Movements: Rotation (Day and Night) and Revolution (Seasons)	
	4	Earth Systems: Lithosphere, Atmosphere, Hydrosphere, Cryosphere and Biosphere	
3		**Dynamic Earth**	10
	1	Continental drift and formation of continents and oceans	
	2	Earth's Movement: Endogenic and Exogenic forces	
	3	Landforms and Classification	
	4	Distribution of landform in the world	

	Global Environment		
4	1	Equatorial environments (Factors affecting climates and their impact on the distribution of tropical Environments; Life and Livelihood)	10
	2	Tropical environments (Factors affecting climates and their impact on the distribution of temperate Environments; Life and Livelihood)	
	3	Temperate environments (Factors affecting climates and their impact on the distribution of temperate Environments; Life and Livelihood)	
	4	Taiga and Tundra Environments (Factors affecting climates and their impact on the distribution of frigid Environments; Life and Livelihood)	
5	**Teacher Specific Module**		
	Directions		
	Practical exercises on the theme "Geography in everyday life"		5

Essential Readings:

1. Christopherson, R. W. and Birkeland, G. H. (2012). Geosystems: An Introduction to Physical Geography (8th edition). New Jersey, USA: Pearson Education.
2. Dikshit, R. D. 2003. The Art and Science of Geography: Integrated Readings. Prentice-Hall of India, New Delhi.
3. Leong, G. C. (2019). Certificate Physical Human Geography. Oxford University Press.
4. Strahler, A. H. and Strahler, A N. (2001): Modern Physical Geography (4/E). New York, U.S.A.: John Wiley and Sons, Inc.
5. Fouberg, E.H., and Moseley, W.G. 2017. Understanding World Regional Geography. John Wiley & Sons.

Suggested Readings:

1. Bonnett A., 2008: What is Geography? Sage.
2. John Agnew, David N. Livingstone (2011) The SAGE Handbook of Geographical Knowledge; Sage Publications Ltd.
3. John A. Matthews, David T. Herbert (2008) Geography: A Very Short Introduction; Oxford University Press, USA.
4. Dahlman, C.T., & Renwick, W.H 2011. Introduction to Geography. Wiley.

Assessment Rubrics:

Evaluation Type	Marks
End Semester Evaluation	**50**
Continuous Evaluation	**25**
a) TestPaper-1	10
b) TestPaper-2	
c) Assignment	15
d) Seminar	
e) Book/Article Review	
f) Viva-Voce	
g) Field Report	
Total	**75**

KU2 MDC GEO102 Fundamentals of Mapping

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
II	MDC	100-199	KU2 MDC GEO102	3	3

Learning Approach (Hours/Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
3	0	0	25	50	75	1 Hr 30 mnts

Course Description:

This course is designed to provide the knowledge and skills for understanding the process of map making. This course covers the design, purpose, use, and proper development of maps. provides a general introduction to Cartography, broadly defined as the art, science, and ethics of mapmaking and map use.

Course Pre requisite: NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	Understand the types of maps and importance of maps	U
2	Learn about the history of map making	R
3	Understand the different methods to represent earth-map relations	A
4	Understand the methods of representation of geographical data	A

**Remember(R), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create (C)*

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓						
CO 2	✓						
CO 3					✓		
CO 4					✓	✓	

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Maps**	10
	1	Definition of a Map	
	2	Essentials of a Good Map	
	3	Classification of maps	
	4	Importance of Maps	
2		**History of Maps**	10
	1	Ancient Period	
	2	Medieval Period	
	3	Modern Period	
	4	History of changing technology in map making	

3	**Earth-Map relations**		10
	1	Geographical Co-ordinates and Direction	
	2	Scale	
	3	Map Projections	
	4	Surveying and Remote Sensing Techniques	
4	**Representation of features on a map**		10
	1	Methods of mapping and representation of terrain on a map	
	2	Mapping the weather and climatic data	
	3	Thematic and complex mapping	
	4	Map reproduction	
5	**Teacher Specific Module**		
	Directions		
	Drawing exercises • Scales- Plain, Comparative and Diagonal		5
	• Map Projection- Polar Zenithal Stereographic, Conical with One Standard Parallel, Simple Cylindrical Projection		

Essential Readings:

1. Ashish Sarkar : Practical Geography-A systematic approach, Orient Blackswan Pvt. Ltd
2. Bangulia A.M : Practical Geography, Anmol Publishers Pvt. Ltd
3. Gopal Singh : Map work and Practical Geography, Vikas Publishing Pvt. Ltd
4. Monkhouse and Wilkinson : Maps and Diagrams, Metheun and Company
5. Saha P and Basu P : A Practical Geography, Books and Allied Ltd. Kolkata
6. Singh R L and Rana P B Singh, Elements of Practical Geography, Kalyani Publishers
7. Siya Ram Sharma : Practical Geography, Murali Lal & Sons Pvt. Ltd.
8. Zulfequar Ahmad Khan M D Text book of Practical Geography, Concept Publishing Company

Suggested Readings:

1. Gupta K K and Tyagi V C : Working with Map, Survey of India, DST, New Delhi
2. Mishra R P and Ramesh A, : Fundamentals of Cartography, Concept Pub. New Delhi
3. Robinson A H, Elements of Cartography, John Wiley and Sons, New York
4. Sarkar A : Practical Geography: A systematic Approach, Orient Black Swan Pvt. Ltd, New Delhi.

Assessment Rubrics:

Evaluation Type		**Marks**
End Semester Evaluation		**50**
Continuous Evaluation		**25**
a)	TestPaper-1	10
b)	TestPaper-2	
c)	Assignment	15
d)	Seminar	
e)	Book/Article Review	
f)	Viva-Voce	
g)	Field Report	
Total		**75**

SKILL ENHANCEMENT COURSES (SEC)

KU4 SEC GEO301 Application of GIS

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
IV	SEC	200-299	KU4 SEC GEO301	3	3

Learning Approach (Hours/Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
0	6	0	25	50	75	1 Hr 30 mnts

Course Description:

The Application of Geographic Information Systems (GIS) course is designed to equip students with practical skills and theoretical understanding necessary for harnessing the power of GIS technology in geographical analysis and decision-making. GIS is a powerful tool that allows users to visualize, analyze, and interpret spatial data, making it an indispensable tool across various disciplines including geography, environmental science, urban planning, and beyond.
Through a combination of lectures and hands-on exercises, students will gain a solid foundation in GIS principles and techniques, enabling them to effectively utilize spatial data to solve complex geographical problems. Whether pursuing further studies or entering the workforce, students will be well-equipped to leverage GIS tools to make informed decisions and solve spatial problems in a variety of professional contexts.

Course Prerequisite: NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	Develop basic understanding and hands-on on GIS software.	U
2	Understand GIS Data Structures and GIS Data Analysis.	An
3	To do analysis and application of geographical data in real world projects.	A

****Remember(R), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create (C)***

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓					✓	
CO 2	✓			✓			
CO 3				✓			✓

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Introduction to GIS**	20
	1	Definition and Components	
	2	Evolution of advanced cartography and GIS	
	3	Terrestrial Data Structure (Coordinates, Datum, Projection)	
2		**Data Structures**	20
	1	GIS Software, Open-source GIS, Web GIS	
	2	Spatial and Non-spatial data; Raster and Vector Data Structure	
	3	Methods of data input in GIS platform	
3		**GIS Data Analysis and Data Display**	20
	1	Geo-Referencing	
	2	Vectorization, Data editing, Topological error correction	
	3	Mapping Layout	
4		**Preparing Thematic Maps**	20
	1	Data collection and sorting	
	2	Data joining and Thematic Map layout	
	3	Land Use Mapping	
5		**Teacher Specific Module**	
		Directions	
		A project file consisting of 5 exercises on using any GIS Software on above mentioned themes.	10

Essential Readings:

1. Ashish Sarkar (2009) Practical Geography – A systematic approach, Orient Black Swan, Kolkata.
2. Bolstad, P., 2016: GIS Fundamentals: A first text on geographic information systems, Eider Press.
3. Burrough, P.A., and McDonnell, R.A. (2000). Principles of Geographical Information System-Spatial Information System and Geo-statistics. UK: Oxford University Press.
4. Chang, K-T., 2017: Introduction to Geographic Information Systems. McGraw-Hill.
5. Dent, B. D. (1985). Principles of thematic map design. Massachusetts: Addision-Wesley Publishing Co.
6. Heywoods, I., Cornelius, S and Carver, S. 2006: An Introduction to Geographical Information System. Prentice Hall.
7. Konecny, G., 2014: Geoinformation Remote Sensing, Photogrammetry, and Geographic Information Systems, CRP Press.
8. Saha, Pijushkanti (2017) Advanced Practical Cartography, Books and Allied, Kolkata.

Suggested Readings:

1. Gomarasca, M. A. (2009). Basics of Geomatics. NY, USA: Springer Science.
2. Gupta K K and Tyagi V C : Working with Map, Survey of India, DST, New Delhi
3. Mishra R P and Ramesh A, : Fundamentals of Cartography, Concept Pub. New Delhi
4. Robinson A H, Elements of Cartography, John Wiley and Sons, New York
5. Sarkar A : Practical Geography: A systematic Approach, Orient Black Swan Pvt. Ltd, New Delhi.

Assessment Rubrics:

Evaluation Type		**Marks**
End Semester Evaluation		**75**
Continuous Evaluation		**25**
a)	Test Paper-1	10
b)	Test Paper-2	
c)	Assignment/Practical File	15
d)	Seminar	
e)	Book/Article Review	
f)	Viva-Voce	
g)	Field Report	
Total		**75**

KU5 SEC GEO 302 Introduction to Surveying Techniques

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
V	SEC	300-399	KU5 SEC GEO302	3	6

Learning Approach (Hours/Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
0	6	0	25	50	75	1 Hr 30 mnts

Course Description:

"Introduction to Surveying Techniques" is a skill enhancement practical course designed to provide students with a comprehensive understanding of fundamental land surveying methods and tools. Through hands-on training and practical fieldwork, this course covers fundamental surveying principles, modern instruments, and techniques used in the industry. The course highlights various job opportunities and career paths available in the field of land surveying, helping students develop the practical skills and industry knowledge needed to excel and unlock a wide range of career opportunities.

Course Prerequisite: NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	To differentiate between different methods of field survey and inter-relationship between them	U
2	Observation of filed realities; Processing and Analysis of Field data	A
3	Mastering the advanced techniques of Filed survey and mapping	E

Remember(R), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create (C)

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓					✓	
CO 2			✓	✓			
CO 3			✓	✓			

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1	**Introduction**		20
	1	Land surveying: definitions, history, and importance	
	2	Land Survey- Classification, instruments used; basic principles	
	3	Field book and Field Notes; Preparation of plans	
	4	Occupational safety and health while surveying	
2	**Chain & Compass**		20
	1	Introduction to Chain & Tape Survey- instruments and uses	
	2	Procedure for Chaininning; Measurement of distance by a chain and chaining; Open Traverse and Closed Traverse Chain Survey; Obstacles in chain surveying	
	3	Prismatic Compass Survey: Identification and parts of instruments in compass survey	
	4	Prismatic Compass Survey – Open & Closed traverse (Procedures); Conduct survey using- Radiation and Intersection Method; Elimination of Errors	
3	**Plane Table and Clinometer**		20
	1	Plane Table Survey- principles and equipment used	
	2	Plane table survey: Procedures and Methods of Surveying	
	3	Conduct of Plane Table Survey using- Radiation and Intersection Methods	
	4	Indian Clinometer – Calculation of Height	

	Modern Land Surveying		
4	1	Dumpy Level: Instruments Used for Levelling and Preparation of contours	20
	2	Theodolite: uses, types; Set up and perform centering of the instrument	
	3	Theodolite Survey: Finding heights of accessible and inaccessible points	
	4	Total Station- characteristics, development and advantages, Procedures of Surveying using Total Station and Robotic Total Station (Video Demonstration) DGPS- GPS versus DGPS; mechanisms and procedures (Video Demonstration)	
5	**Teacher Specific Module**		
	Directions		
	Following practical exercises may be conducted. A Record File containing plates of each activity to be prepared. 1. Chain and Tape: Calculate the areas of an irregular field - Apply geometrical formula for calculating the area. 2. Chain Survey- Open and Closed Traverse 3. Prismatic Compass: Radiation and Intersection Method 4. Plane Table Survey: Radiation and Intersection Method 5. Indian Clinometer: Calculation of Height 6. Dumpy Level: Levelling and Preparation of contours 7. Theodolite: Finding heights of accessible and inaccessible points 8. Total Station and Indian DGPS: identify instruments and procedures and steps (theory only)		10

Essential Readings:

1. Zulfequar Ahmad Khan M.D (1998), Text book of Practical Geography, Concept Pubishing company
2. Siya Ram Sharma (2008), Practical Geography, Murali Lal & Sons Pvt.Ltd
3. Singh L.R (2009), Fundamentals of Practical Geography, Sharda Pustak Bhavan
4. Gopal Singh (1998) Map Work and Practical Geography (4th Edition), Vikas Publishing House, Ahmedabad.
5. Singh R.L & Rana P.B. Singh(2005, Elements of Practical geography, Kalyani Publishers
6. Bangulia A.M. (2006), Practical Geography, Anmol publishers Pvt Ltd 27
7. Ashish Sarkar (2009), Practical Geography - A systematic approach. Orient Blackswan Pvt Ltd
8. Monk House, F.J. & Wilkinson, H.R. (1973) Maps and Diagrams, Methuen & Co Ltd, London.
9. Saha, P. &Basu, P. (2014) Advanced Practical Geography, Books and Allied Ltd., Kolkatta.

Assessment Rubrics:

Evaluation Type		Marks
End Semester Evaluation		**50**
Continuous Evaluation		**25**
a)	Test Paper-1	10
b)	Test Paper-2	
c)	Assignment/Practical Record	15
d)	Seminar	
e)	Book/Article Review	
f)	Viva-Voce	
g)	Field Report	
Total		**75**

KU6 SEC GEO303 Advanced Geospatial Techniques

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
VI	SEC	300-399	KU6 SEC GEO303	3	3

Learning Approach (Hours/Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
0	6	0	25	50	75	1 Hr 30 mnts

Course Description:

This course is designed to provide students with hands-on experience in applying advanced geospatial techniques to address complex spatial challenges. Through a combination of theoretical understanding and practical exercises, students will explore cutting-edge tools in spatial analysis, remote sensing, and Geographic Information Systems (GIS). Emphasis will be placed on real-world applications, enabling students to develop practical skills that are essential for careers in fields such as environmental science, urban planning, and geospatial technology.

Course Pre requisite: NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	Apply advanced spatial analysis techniques to analyze and interpret complex spatial patterns and relationships.	A
2	Process and interpret various types of remote sensing data for accurate land cover classification and change detection.	An
3	Create and analyze spatial models using GIS tools to simulate and understand complex spatial processes.	C
4	Develop and present interactive maps using web GIS technologies to effectively communicate geospatial information.	C

****Remember(R), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create (C)***

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓			✓			
CO 2				✓	✓		
CO 3				✓	✓		✓
CO 4				✓	✓	✓	
CO 5							

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1			20
	1	Introduction to Advanced Geospatial Techniques	
	2	Spatial Data Management	
	3	GIS Modeling	
	4	Integrating Geospatial Techniques	

2	1	Raster surface preparation using various interpolation methods	20
	2	Density analysis	
	3	Hydrological analysis	
	4	Image Classification Techniques	
3			20
	1	Web GIS	
	2	3D data preparation	
	3	Build 3D earth model	
	4	Terrain analysis	
4			20
	1	Suitable site analysis	
	2	Weighted overlay analysis techniques	
	3	Network analysis	
	4	Change detection	
5	**Teacher Specific Module**		
	Directions		
	A project file consisting of 5 exercises on using any GIS Software on above mentioned themes.		10

Essential Readings:

1. M. Anji Reddy (2008) Textbook of Remote sensing and Geographical information systems, BS Publications, Hyderabad
2. Basudeb Bhatta (2021) Remote sensing and GIS, Oxford University Press, New Delhi Ian
3. Heywood et.al (2002) An Introduction to Geographical Information System, Pearson Education Private Limited, Delhi.
4. Kang Tsung Chang (2008) Introduction to Geographic Information Systems, Tata Mc Graw Hill Publishing Company Ltd, New Delhi.
5. Loo C P and Albert K W Y (2004) Concepts and Techniques of Geographic Information Systems, Prentice Hall of India, New Delhi.

Suggested Readings:

1. Verbyla D. L. (2003) Practical GIS analysis. Taylor & Francis, London, 305
2. Mitchell, Andy (2001). ESRI Guide to GIS Analysis, Volume 1. Geographic Patterns & Relationships. ESRI Press
3. Lillisand, T.M. And P.W.Kiefer, 1986: Remote Sensing And Image Interpretation,John Wiley & Sons, New York.
4. Michael F. Goodchild (2009) Geographic information systems and science: today and tomorrow, Annals of GIS, 15:1, 3-9, DOI: 10.1080/19475680903250715.

Assessment Rubrics:

Evaluation Type	Marks
End Semester Evaluation	**50**
Continuous Evaluation	**25**
a) Test Paper-1	10
b) Test Paper-2	
c) Assignment	15
d) Seminar	
e) Book/Article Review	
f) Viva-Voce	
g) Field Report	
Total	**75**

VALUE ADDITION COURSES (VAC)

KU3 VAC GEO201 Western Ghat: Ecology and Culture

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
III	VAC	200-299	KU3 VAC GEO201	3	3

Learning Approach (Hours/Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
3	0	0	25	50	75	1 Hr 30 mnts

Course Description:

The "Western Ghats: Ecology and Culture" course offers a unique exploration of one of India's most biodiverse and culturally rich regions. Situated along the western coast of India, the Western Ghats are renowned for their stunning landscapes, rich biodiversity, and vibrant cultural heritage. This course delves into the intricate connections between the ecology and culture of the Western Ghats, offering students a holistic understanding of this remarkable biodiversity hotspot.

Course Prerequisite: NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	Understanding the Biodiversity of the Western Ghats.	U
2	Analyzing Ecological Systems and Conservation Efforts.	An
3	Exploring Cultural and Historical Significance.	An
4	Investigating Human Impact and Sustainable Practices	E

****Remember(R), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create (C)***

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓	✓					
CO 2		✓				✓	
CO 3		✓					✓
CO 4			✓			✓	

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Physical Settings**	10
	1	Western Ghats – location, physiography and origin	
	2	Natural vegetation and biodiversity, National parks and wildlife sanctuaries.	
	3	Western Ghats as a water tower - drainage system, lakes, waterfalls	
	4	Significance of Western Ghats in regional climate	
2		**People and Economy**	10
	1	Demography – distribution, density and growth of population, migration streams.	
	2	Indigenous communities, life style and culture, displacement and marginalization	
	3	Economy – Pattern and prospects of agriculture, tourism, mining and power projects	
	4	Urbanization and transportation – development and related issues	
3		**Spaces of Vulnerability**	10
	1	Natural hazards and disasters- causes and impacts	
	2	Environmental degradation and its causes and impacts – land use land cover changes, forest degradation, pollution	
	3	Climate change and variability	

	4	Disaster management – preparedness and mitigation, Case study on Great Flood 2018.	
	Development and Sustainability		
	1	Development and sustainability – Debates on human nature interaction, human and wildlife conflicts	
4	2	Resource management and utilization	10
	3	Conservation strategies- Expert Committees on Western Ghats.	
	4	Community based conservation – Laws and legislation	
	Teacher Specific Module		
	Directions		
5	Conduct a field survey in one of the vulnerable localities in the Western Ghat to map the biological diversity and human environment interaction in the locality.		5

Essential Readings:

1. The Ministry of Environment and Forest, (MoEF) Government of India (2010) The report of Western Ghats ecology expert panel. http://www.moef.nic.in/downloads/public-information/wg-23052012.pdf.
2. Pascal, J. P. (1940). Bioclimate maps of the Western Ghats (Vol. 829). French Institute of Pondichery: Pondichery. Tropical Conservation Science| ISSN.
3. Kadur, S., & Bawa, K. S. (2005). Sahyadris, India's Western Ghats, a Vanishing Heritage. Atree.
4. Johnsingh, A. J. T. (2015). Walking the Western Ghats. Bombay Natural History Society and Oxford University Press.
5. Kapadia, H. (2004). Trek the Sahyadris. Indus Publishing.
6. Sundararaju, V. (2020). Ecological Harmony. Notion Press.
7. Kasthurirangan K (2013): "Report of the High-Level Working Group on Western Ghats", Ministry of Environment and Forest, Government of India.
8. Preetha N, Oommen V Ommen (2016): "Public Participation in Land-Use Planning of Western Ghats", Kerala land use board, Thiruananthapuram.

Suggested Readings:

1. Viju, B. (2019). Flood and fury: ecological devastation in the Western Ghats. Penguin Random House India Private Limited.
2. D'Souza, R. V. (2020). India's Emerging Ecological Public and the Western Ghats: The Gadgil Committee Report and the Responses of Contiguous States. In Universities and Sustainable Communities: Meeting the Goals of the Agenda 2030 (pp. 417-430). Springer International Publishing.
3. Chattopadhyay, S. 2017. Geomorphological Field Guide Book on Laterites and Backwaters of Kerala (Edited by AmalKar). Indian Institute of Geomorphologists, Allahabad.
4. Chandran, M. S. (1997). On the ecological history of the Western Ghats. Current science, 146-155.
5. Gadgil, M. (1996). Western Ghats: a lifescape. Journal of the Indian Institute of Science, 76(3), 495-504.

Assessment Rubrics:

Evaluation Type		Marks
End Semester Evaluation		**50**
Continuous Evaluation		**25**
a)	Test Paper-1	15
b)	Test Paper-2	
c)	Assignment	
d)	Seminar	
e)	Book/Article Review	
f)	Viva-Voce	
g)	Field Report	10
Total		**75**

KU4 VAC GEO202 Environment and Sustainability

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
IV	VDC	200-299	KU4 VAC GEO202	3	3

Learning Approach (Hours/Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
3	0	0	25	50	75	1 Hr 30 mnts

Course Description:

As we step into an era marked by unprecedented environmental challenges, the need for sustainable practices and responsible stewardship of our planet has never been more critical. This course is designed to equip students with the knowledge and skills necessary to understand and address these pressing issues, fostering a deep appreciation for the intricate balance between human activities and the natural world.

Course Prerequisite: NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
CO 1	Gain in-depth knowledge on natural processes and resources that sustain life and govern economy.	U
CO 2	Critically examine the relationship between the environment and society	An
CO 3	Develop critical thinking for shaping strategies for environmental protection, conservation of biodiversity, environmental equity, and sustainable development.	E
CO 4	Adopt and propagate sustainability as a practice in life, society, and industry.	C

****Remember(R), Understand(U), Apply(A), Analyse(An), Evaluate(E), Create (C)***

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓	✓					
CO 2	✓	✓					
CO 3			✓			✓	
CO 4						✓	

COURSE CONTENTS

Contents for Class room Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1	**Ecosystems**		10
	1	Definition, structure and function of ecosystem	
	2	Energy flow in an ecosystem (food chains, food webs and ecological succession)	
	3	Case studies of the following ecosystems (Forest ecosystem, Aquatic ecosystems)	

2	**Natural Resources**		10
	1	Land and Soil	
	2	Natural Vegetation	
	3	Energy resources (renewable and non-renewable resources)	
3	**Sustainability**		
	1	Biological diversity and threats to biodiversity (Habitat loss, poaching of wildlife, human-wildlife conflicts, biological invasions)	10
	2	Environmental pollution: types, causes, effects and controls	
	3	Sustainable Development: Concept and Components; Measures of Sustainability: SDG	
4	**Field Work**		10
	1	Visit to an area to document environmental assets: river/ forest/ flora/fauna, etc.	
	2	Visit to a local polluted site-Urban/Rural/Industrial/Agricultural.	
	3	Study of simple ecosystems-pond, river, coastal regions etc.	
5	**Teacher Specific Module**		
	Directions		
	Writing field report based on the activity conducted as part of Module 4.		5

Essential Readings:

1. Odum, E.P., Odum, H.T. & Andrews, J. 1971. Fundamentals of Ecology. Philadelphia: Saunders.
2. World Commission on Environment and Development. 1987. Our Common Future. Oxford University Press.
3. Cunningham W. P. and Cunningham M. A., 2004: Principles of EnvironmentalScience: Inquiry and Applications, Tata Mcgraw Hill, New Delhi.
4. Goudie A., 2001: The Nature of the Environment, Blackwell, Oxford.
5. Miller G. T., 2004: Environmental Science: Working with the Earth, Thomson BrooksCole, Singapore.

Suggested Readings:

1. Ioris, A.A.R. ed., 2021. Environment and Development: Challenges, Policies and Practices. Springer Nature.
2. Gadgil, M. and Guha, R. (1993). This Fissured Land: An Ecological History of India. University of California Press, Berkeley, USA.
3. Raven, P.H, Hassenzahl, D.M., Hager, M.C, Gift, N.Y. and Berg, L.R. (2015). Environment, 9th Edition. Wiley Publishing, USA.

Assessment Rubrics:

Evaluation Type		Marks
End Semester Evaluation		**50**
Continuous Evaluation		**25**
a)	TestPaper-1	15
b)	TestPaper-2	
c)	Assignment	10
d)	Seminar	
e)	Book/Article Review	
f)	Viva-Voce	
g)	Field Report	
Total		**75**

KU4 VAC GEO203 Kerala : Environment and Development

Semester	Course Type	Course Level	Course Code	Credits	Total Hours
IV	VAC	200 -299	KU4 VAC GEO203	3	3

Learning Approach (Hours/ Week)			Marks Distribution			Duration of ESE (Hours)
Lecture	Practical/ Internship	Tutorial	CE	ESE	Total	
3	0	0	25	50	75	1 Hr 30 mnts

Course Description

Kerala is renowned for its unique blend of rich natural landscapes, diverse ecosystems, and progressive socio-economic development. This course delves into the intricate relationship between Kerala's environment and its development trajectory, offering insights into how this southern Indian state has managed to achieve significant progress while maintaining a commitment to environmental sustainability.

Course Prerequisite: NIL

Course Outcomes:

CO No.	Expected Outcome	Learning Domains
1	To analyse the salient features of bio-physical setting of Kerala	An
2	To provide students with understanding of current state of environment of Kerala.	U
3	To equip students with an understanding of intersections of environmental issues with the process of development.	E
4	Examine the socio-cultural and economic base of Kerala and evaluate the approaches of development in Kerala context	E

****Remember (R), Understand (U), Apply (A), Analyse (An), Evaluate (E), Create (C)***

Mapping of Course Outcomes to PSOs

	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5	PSO 6	PSO 7
CO 1	✓	✓					
CO 2		✓			✓		
CO 3			✓				✓
CO 4			✓			✓	

COURSE CONTENTS

Contents for Classroom Transaction:

MODULE	UNIT	DESCRIPTION	HOURS
1		**Kerala: Physical setting**	10
	1	Locational setting and Physiographic system	
	2	Geology, drainage, vegetation types, WLS and national parks	
	3	Climatic characteristics, soil, agriculture, land utilization, agro-climatic zones,	
	4	Tourism in Kerala	

2	**State of Environment**		10
	1	The Western Ghats and Foothills -Ecological history and significance, Major conservation sites; Western Ghats protection reports	
	2	Environmental issues – human intervention and impacts – land use change, mining, soil erosion, pollution;	
	3	Status of rivers and Wetlands –Environmental significance,	
	4	Dimensions of human intervention on natural setting and impacts	
3	**Environmental Movements and Policy**		10
	1	Salient Valley movement of Palakkad, Anti Coco Cola Movement of Plachimada	
	2	Anti Endosulfan movement of Kasargod, Anti Nitta Gellatin movement of Kathikudam	
	3	Western Ghat conservation and Anti Quarrying movements	
	4	Status of Environmental policy in Kerala	
4	**Rebuild Kerala**		10
	1	Demographic scenario-migration- socio-economic as well as cultural back up of Kerala	
	2	State of Trends of Urbanization	
	3	Kerala Model of development	
	4	Disaster management in Kerala, Sustainable development - Rebuild Kerala initiative	
5	**Teacher Specific Module**		
	Directions		
	Map the experiences of Kerala Model of Development and Rebuild Kerala Mission.		5

Essential Readings:

1. Chandrasekharan C., Forest as resource-perspectives in The Natural Resources of Kerala, WWF, Thiruvananthapuram, 1997, pp. 422-423.
2. Chattopadhyay, S. 2017. Geomorphological Field Guide Book on Laterites and Backwaters of Kerala (Edited by AmalKar). Indian Institute of Geomorphologists, Allahabad.
3. Cooke, R. U. and Doornkamp, J.C., (1974). Geomorphology in Environmental
4. Government of Kerala. Urban policy and Action Plan for Kerala. Available from http://www.kerala.gov.in/annualprofile/urban.htm.

5. Human Development Report,(2005) State Planning Board Government of Kerala.
6. Jadhav, H & Bhosale, V.M. 1995. Environmental Protection and Laws. Himalaya Pub. House, Delhi 284 p.
7. Kamalakshan Kokkal, Environmental Problems of Kerala. (Malayalam, Keralathile Paristhithi Prashnangal), Thiruvananthapuram, STEC, 2002, pp. 3 1-32. Management- A Introduction, Clarendon Press, Oxford.

Suggested Readings:

1. Nair, K. K (.2007) Quaternary geology and geomorphology of coastal plains of Kerala, Geological Survey of India.
2. Prasannakumar, V. (2007) Geomorphology, International Centre for Kerala Studies, University of Kerala.
3. State of Environment Report Kerala, (2007). Land environments, Wetlands of Kerala and Environmental Health. Vol I.
4. State of Environment Report Kerala, (2007). Natural Hazards. Vol I. KSCSTE, Government of Kerala.
5. State Planning Board, Thiruvananthapuram (2017). Economic Review.
6. The Ministry of Environment and Forests Government of India,(2011).Report of the Western Ghats Ecology Expert Panel Part I.

Assessment Rubrics:

Evaluation Type		**Marks**
End Semester Evaluation		**50**
Continuous Evaluation		**25**
a)	Test Paper- 1	15
b)	Test Paper-2	
c)	Assignment	10
d)	Seminar	
e)	Book/ Article Review	
f)	Viva-Voce	
g)	Field Report	
Total		**75**