MOTHER TERESA WOMEN'S UNIVERSITY

KODAIKANAL – 624102

SYLLABUS (2021-2022)

B.Sc GEOGRAPHY
(CHOICE BASED CREDIT SYSTEM)
(Full Time)

SYLLABUS, REGULATION AND SCHEME OF EVALUATION

Mother Teresa Women's University, Kodaikanal

Department of Geography

Choice Based Credit System (CBCS)

(2021-2022 onwards)

B.Sc. Geography

About the Programme

The CBCS provides an opportunity for the students to choose courses from the prescribed courses comprising core and elective courses. The courses are evaluated following the grading system, which provides uniformity in the evaluation and computation of the Cumulative Grade Point Average (CGPA) based on student's performance in examinations which enables the student to move across institutions of higher learning. The uniformity in evaluation system also enables the potential employers in assessing the performance of the candidates. BSc Geography or Bachelor in Science in Geography is an undergraduate degree with an emphasis on Geography for 3 years. It is the study of the Earth and its many properties, characteristics, people and phenomena, in addition to the map and geographical image-interpretation. There are a broad range of careers open to a geography graduate. If students pursue higher studies or gain some work experience, students can get jobs in MNCs and abroad. Graduates can also do certificate **courses** or gain higher education to increase their chances of getting a job abroad. There are many job opportunities available abroad for **B.Sc Geography** graduates. This syllabus will follow from academic year 2021-2022 onwards.

PROGRAMME OBJECTIVES:

- Students will be able to define geography and be able to describe in good detail the major subdivisions of the field of geography; explain what geographers do; and how geography relates to a variety of real-world jobs (all majors).
- Students will gain factual knowledge about the world and its regions focusing on the diversity of natural and cultural landscape features, and they will know some basic principles, definitions, and themes in the subject matter of geography (all majors).
- Students will attain increased global awareness and become more geographically informed people.

- Students will know the history and development of urbanization in recent times. Students will be familiar with the variety of issues and problems studied by urban and regional planners and how they apply their expertise to resolve these issues and problems in modern urban America (Environmental Studies and Sustainability).
- Students will be able to apply their understanding of land use and planning principles in a manner that will allow them to elicit and formulate an effective plan.
- Students will be able to effectively articulate their proposals both written and orally and be capable of advocating on behalf of their plan, as well as to negotiate with those who may oppose their plan (Environmental Studies and Sustainability).
- Students will have a basic knowledge of the theoretical and applied realms of geographic information science (GIS).

Eligibility:

For admission to the B.Sc degree in Geography course, students need to fulfill all the eligibility criteria. B.Sc Geography eligibility includes students must complete their 10+2 from a recognized board. The minimum age to apply for the course is 17 years. The admission for the course is given based on merit in the direct admission. Students can apply for admission by visiting either the college's website or the admission office.

General Guidelines for PG Programme:

Duration:

The duration of the course will be three consecutive academic years under semester system.

Medium of Instruction: English and Tamil

Evaluation:

Evaluation of the candidates shall be through internal and external assessment. The ratio of formative and summative assessment should be 25:75 for Core and elective papers.

1. Maximum marks for theory is 100 each
2. The Minimum passing mark for Internal Exam 13 out of 25 marks and for External Exam 38 out of 75 marks.
3. The University examination will be conducted at the each semester for the duration of three hours per paper.

Evaluation Pattern

	Theory		**Practical**	
	Min	**Max**	**Min**	**Max**
Internal	**10**	**25**	**10**	**25**
External	**30**	**75**	**30**	**75**

- **Internal (Theory): Test (15) + Assignment (5) + Seminar/Quiz (5) = 25**
- **External Theory: 75**

4. **Question paper in External examination for core and elective papers carrying 75 marks will be in the format below: (3 hours)**

Part	**Type**	**Number of questions to be answered**	**Marks**
A	Objective Type / Multiple Choice	10 questions, 2 questions from each unit, each carrying 1 mark	10 (10*1)
B	Paragraph (about 1-1 ½ pages)	5 questions, From each Unit Either or Choice, each carrying 5 marks	20 (5*4)
C	Essay type (about 3 pages)	Any 3 out of 5 questions, Open choice, One question from each unit, each question carrying 15 marks	45 (3*15)
Total			**75**

Minimum credits required to pass - 156.

Classification of Successful candidate:

% of Marks scored	**Division**
50 – 59	Second class
60 – 74	First class
75 and above	First class with Distinction

5. Attendance

Students must have earned 75% of attendance in each course for appearing for the examination, Students who have earned 74% to 71% of attendance to be applied for condonation in the prescribed form with the prescribed fee. Students who have earned 70% to 65% of attendance to be applied for condonation in the prescribed form with the prescribed fee along with the Medical Certificate. Students who have attended below 65% are not eligible to appear for the examination and they shall re-do the semester(s) after completion of the course, with the prior permission of the Controller of the Examination, and The Registrar of the University.

6. Any Other Information:

In addition to the above regulations, any other common regulations pertaining to the UG Programmes are also applicable for this programme.

Maternity Leave – The student who avails maternity leave may be considered to appear for the examination with the approval of Staff i/c, Head of the Department, Controller of Examination and The Registrar.

UG Geography Curriculum

Paper No.	Paper Code	Course Title	Credits	Hours L/P	Continuous Internal Assessment (CIA)	End Semester Exam (ESE)	Total
SEMESTER – I							
1	U21LTA11	Tamil – I	3	6/0	25	75	100
2	U21LEN11	English – I	3	6/0	25	75	100
3	U21GET11	Core – I – Geomorphology – 1	4	5/0	25	75	100
4	U21GEP11	Core – II – Practical – I – Fundamentals of Map Making and Relief Representation	4	0/6	25	75	100
5	U21PHA11/ U21BOA11	Allied – I – Physics / Botany Theory	4	5/0	25	75	100
6	U21EVS11	Environmental Studies	2	2/0	25	75	100
7	U21PEPS11	Professional English – I	4	6/0	25	75	100
		TOTAL	**24**	**36**	**-**	**-**	**700**
SEMESTER – II							
8	U21LTA22	Tamil – II	3	6/0	25	75	100
9	U21LEN22	English – II	3	6/0	25	75	100
10	U21GET21	Core – III – Geomorphology – II	4	5/0	25	75	100
11	U21GET22	Core – IV – Cartography	4	5/0	25	75	100
12	U21PHA22/ U21BOA22	Allied – II – Physics / Botany Practical – I	4	0/6	25	75	100
13	U21VAE21	Value Education	3	3/0	25	75	100
14	U21PEPS22	Professional English - II	4	6/0	25	75	100
		TOTAL	**25**	**37**	**-**	**-**	**700**
SEMESTER – III							
15	U21LTA33	Tamil – III	3	6/0	25	75	100
16	U21LEN33	English – III	3	6/0	25	75	100
17	U21GET31	Core – V – Climatology – I	4	5/0	25	75	100
18	U21STA33	Allied – III – Statistics Theory – II	4	5/0	25	75	100
19	U21GEE311/ U21GEE312/ U21GEE313	Elective – I – Basics of Remote Sensing and GIS / Regional Geography of Asia / Climatic change – Vulnerability and Adaptation	3	4/0	25	75	100
20	U21MSS31	SBE I-Managerial Skills	2	2/0			
21	U21GEN311/ U21GEN312	Non-Major Elective – I – Principles of Remote Sensing / Social and Cultural Geography	2	2/0	25	75	100
		TOTAL	**21**	**30**	**-**	**-**	**700**
SEMESTER – IV							
22	U21LTA44	Tamil – IV	3	6/0	25	75	100
23	U21LEN44	English – IV	3	6/0	25	75	100
24	U21GET41	Core – VI – Oceanography	4	4/0	25	75	100
25	U21GET42	Core – VII – Climatology – II	4	4/0	25	75	100

26	U21STA44	Allied – III – Statistics – Practical – II	4	0/6	25	75	100
27	U21GEE421/ U21GEE422/ U21GEE423	Elective – II – Geography of Tamil Nadu / Political Geography / Sustainable Development	3	0/4	25	75	100
28	U21CSS42	SBE II-Computer Skills for Office Management	2	3/0	25	75	100
29	U21GEN421 / U21GEN422	Non – Major Elective – II – Geographical Information System / Natural Regions of the World	2	2/0	25	75	100
		TOTAL	**25**	**35**	**-**	**-**	**800**
SEMESTER – V							
30	U21GEP52	Core – VIII – Practical – II – Climatic Diagrams and Weather Map	4	0/6	25	75	100
31	U21GET51	Core – IX – Geography of Resource – I	4	5/0	25	75	100
32	U21GET52	Core – X – World Regional Geography	4	5/0	25	75	100
33	U21GET53	Core – XI – Human Geography	4	5/0	25	75	100
34	U21GET54	Core – XII – Geography of India	4	5/0	25	75	100
35	U21GEE531/ U21GEE532/ U21GEE533	Elective – III – Biogeography / Industrial Geography / Disaster Studies.	3	3/0	25	75	100
36	U21GES53	SBE III – Practical – Applications of Statistical Methods in Geography	2	0/2	25	75	100
		TOTAL	**25**	**31**	**-**	**-**	**700**
SEMESTER – VI							
37	U21GET61	Core – XIII – Geography of Resource – II	4	5/0	25	75	100
38	U21GET62	Core – XIV – Geographical Thought	4	5/0	25	75	100
39	U21GEP63	Core – XV – Practical – Socio Economic data Analysis and Image Interpretation	4	0/6	25	75	100
40	U21GEP64	Core – XVI – Fundamentals of Map Projections	4	0/6	25	75	100
41	U21GEP64	Cure-XVII – Regional Geography of North America	4	5/0	25	75	100
42	U21GEE641/ U21GEE642/ U21GEE643	Elective – IV – Travel and Tourism / Ecology of the world / Regional Geography of Health	3	4/0	25	75	100
43	U21GES64	SBE –IV Practical – Principles of Surveying	2	0/2	25	75	100
44	U21EAS61	Extension Activities	3	0/2	25	75	100
		TOTAL	**28**	**35**	**-**	**-**	**800**
		Grand Total	**148**	**201**	**-**	**-**	**4400**

Non Major Elective

The candidates, who have joined the UG Programme, can also undergo Non Major Elective offered by other Departments.

Non Major Elective (NME) offered by ------:

Code	NME Paper
U21GEN311 / U21GEN312	NME-I - Principles of Remote Sensing / Social and Cultural Geography
U21GEN411/U21GEN412	NME-II - Geographical Information System / Natural Regions of the World

- **Professional English –Add on Course with extra 4 Credits – 5 Hours**
- **U21PHO31 - Online Course – III Semester**
- **U21PHI41 - Internship – IV Semester**
- **U21PHV51 - Value added course – V Semester: Field Work and Research Methodology**

Each carries 2 Credits to be included as additional credit courses.

PROGRAM OUTCOMES:

After completing B.Sc Programme in Geography, students will be able to

PO.1. Demonstrate knowledge of physical and cultural features of the earth and locate them on a map.

PO.2. Know about the basic disciplines of Geography and its sub branches.

PO.3. Know the basic concepts and terminologies used in Geography like interior of the earth, plate tectonic, sea floor spreading, population growth, disasters, composition and structure of atmosphere, hydrosphere, etc.

PO.4. Differentiate between minerals and rocks, weather and climate, interior of the earth, basic industries, farming etc.

PO.5. Get information about the causes and effects of local, national and international problems like global warming, acid rain, ozone depletion, soil degradation, deforestation etc.

PROGRAMME SPECIFIC OUTCOMES:

PSO.1. Students learn about formation of landforms and identify various landforms around them.

PSO.2. Students learn about various economic activities of man and their spatial temporal distribution.

PSO.3. Students acquire knowledge of basic surveying and map making.

PSO.4. Students know about disasters, their causes and managing disasters.

PSO.5. Students come to know about geographical, socio-economic and political background of India.

PSO.6. Students apply geographical knowledge in their day to day life like being alert about disasters, weather and climate data.

SEMESTER – I

SEMESTER – I

GEOMORPHOLOGY – I

Credit: 4 **Course Code: U21GET11** **Hours: 5**

Learning Objective:

- Students will understand the concept of place and how it is connected to people's sense of belonging to the physical environment, landscape and culture.
- The students will have a basic knowledge about the premises of origin of the solar system and the earth.
- Students can acquire an overall knowledge regarding the various processes and forms that operate in our physical environment, it may include river processes, mountain building processes, theories related to plate tectonics, mass balance, dynamics, hydrology, earthquakes, etc.
- Describing human-environment and nature-society interactions as well as global human and environmental issues.
- Identifying and explaining the planet's human and physical characteristics and processes, from global to local scales.

UNIT I **THEORIES AND PROCESSES:** Definition of geomorphology – Origin of the earth – Gaseous Hypothesis of Immanuel Kant – Nebular theory of Laplace – Tidal hypothesis of James Jeans and Modification by Jeffrey – Binary star theory of Russell – Structure of the earth's interior – Crust – mantle – core – Rocks – classification of rocks – igneous, sedimentary and metamorphic rocks.

UNIT II **EARTH MOVEMENTS:** Endogenetic forces – sudden forces and movements – diastrophic forces and movements – epeirogenetic movements – orogenetic movements – folds – faults – rift valleys – exogenetic forces.

UNIT III **ENDOGENIC PROCESS AND DRIFT THEORY:** Volcanoes – components of volcanoes – classification of volcanoes – volcanic materials – world distribution of volcanoes – hazardous effects of volcanism – earthquakes – causes of earthquakes – types and world distribution distribution– hazardous effects of earthquake – Wegner's Continental drift theory – Isostasy.

UNIT IV **MAJOR LANDFORMS:** Mountains – classification – plateaus – classification – plains – classification.

UNIT V **GEOMORPHIC PROCESSES:** Weathering – Meaning – controlling factors – types – physical – chemical and biological weathering – geomorphic importance of weathering – mass movement – concept – classification –

resultant features – Soil – formation of soil – characteristics, types and distribution – soil profile.

TEXT BOOKS:

1. *Dayal, P., A Text book Geomorphology, Shukla Book Depot, Patna, India, 1990*
2. *Thornbury, W. D. Principles of Geomorphology, John Wiley and Sons, New York, I960*
3. *Kale, V. S. and Gupta, A. Introduction to Geomorphology, Orient Longman, Calcutta, 2010*
4. *Singh, Savindra, Geomorphology, Prayag PustakBhawan, Allahabad, 2002.*

REFERENCE BOOKS:

1. *Balbir Singh Negi, Physical Geography, S.J Publications Meerut, 1993*
2. *Das Gupta, A., and Kapoor, A.N, Principles of Physical Geography, S.C. Chand & Company Ltd, 2001.*
3. *Lobeck. A.K., An Introduction to the study of Landscapes, McGraw –Hill Book company, 1939*
4. *Thorn Bury.D., - Principles of Geomorphology, Wiley Eastern Ltd, New Delhi, 1984*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	After this lesson, the students will have acquired knowledge about the relationship of physical geography with other branches of earth science and divisions of physical geography.	K2
CO2	Students will understand an overview of the structure of the earth, origin, composition and interior of the earth.	K2
CO3	Students will have basic concepts about relief features of plateaus, hills, foothills, valleys, plains and flood plains.	K2
CO4	Students will understand the endogenic and exogenetic movements of the earth.	K2
CO5	Students will learn about the effects of hazardous	K4

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**2**	**2**	**3**
CO2	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**2**	**2**	**3**
CO3	**3**	**2**	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**2**	**2**
CO4	**3**	**2**	**3**	**2**	**2**	**2**	**3**	**3**	**2**	**2**	**2**
CO5	**3**	**3**	**3**	**3**	**2**	**2**	**3**	**3**	**2**	**2**	**2**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – I

PRACTICAL – I – FUNDAMENTALS OF MAPMAKING AND RELIEF REPRESENTATION

Credit: 4 **Course Code: U21GEP11** **Hours: 6**

Learning Objectives:

- Explaining of scales, type, construction of plain scales and comparative and diagonal scales
- Calculating the basic map the refusing triangle method and enlarging and reduction with instrument.
- Identifying the map direction and hearing measurements of distance-using thread and rotometer.
- Describing the measurement of area by square, linear and plain meter methods.
- Explaining the Contours, contour interval and representation of relief features by contours.

UNIT I **SCALES:** Definition – types – conversion of scales – construction of Palin scales – comparative and diagonal scales – time scale.

UNIT II **ENLARGEMENT AND REDUCTION METHOD:** Enlargement and reduction by square – similar triangle method – Enlargement and reduction with instruments.

UNIT III **DIRECTIONS AND BEARINGS:** Map direction and bearing – Measurements of Distance – using Thread, Divider and Rotometer.

UNIT IV **MEASUREMENT OF AREA:** Measurement of area by square, linear and by planimeter methods.

UNIT V **RELIEF FEATURES:** Representation of relief features by hachures – hill shading – layer tinting – spot heights – and bench marks – Contours – contour interval – gradient – representation of relief features by contours.

TEXT BOOKS:

1. *Gopal Singh, Map Work and Practical Geography, (4th Edition), Vikas PublishingHouse, Ahmedabad, 1998*
2. *ZamirAlvi, A Text Book of Practical Geography, Vikas Publishing house*

Pvtltd, 1994

3. *Zulfequar Ahmad Khan. M.D., Text boom of Practical Geography, Concept Publishing Company, New Delhi, 1998.*
4. *Singh R.L & Rana P.B. Singh, Elements of Practical geography, Kalyani, Publishers, 2005.*
5. *Siya Ram Sharma, Practical Geography, Murali Lal & Sons Pvt.Ltd, 2008*

REFERENCE BOOKS:

1. *F.J. Monkhouse and H.R Wilkinson, Maps and Diagrams, B.I. Publications, Madras, 1952*
2. *V.P. Subrahmanyam and Subramaniam,A.R. Application of water balance concept for a climatic study of droughts in south India, 1964*
3. *M.D.Zulfequar Ahamad Khan, Text Book of Practical Geography, Concept Publishing Company, New Delhi, 1998.*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	After this paper, basic knowledge of scales and measurements.	K2
CO2	Students will be understand and knowledge use of instruments.	K3
CO3	Students will learn practically explain the rotometer.	K3
CO4	Student shall know how to measurement of area by square and plain meters methods.	K4
CO5	Students will be acquiring knowledge about the base level of the features of the maps.	K5

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**2**	**3**	**2**
CO2	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**2**
CO3	**3**	**2**	**3**	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**2**
CO4	**3**	**2**	**3**	**2**	**3**	**2**	**3**	**3**	**2**	**3**	**3**
CO5	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**3**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – I

PROFESSIONAL ENGLISH - I

Credit: 4 **Course Code: U21PEPS11** **Hours: 5**

Learning Objectives:

- To develop the language skills of students by offering adequate practice in professional contexts.
- To enhance the lexical, grammatical and socio-linguistic and communicative competence of first year physical sciences students
- To focus on developing students' knowledge of domain specific registers and the required language skills.
- To develop strategic competence that will help in efficient communication
- To sharpen students' critical thinking skills and make students culturally aware of the target situation.

Learning Outcomes:

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

1. Recognise their own ability to improve their own competence in using the language
2. Use language for speaking with confidence in an intelligible and acceptable manner
3. Understand the importance of reading for life
4. Read independently unfamiliar texts with comprehension
5. Understand the importance of writing in academic life
6. Write simple sentences without committing error of spelling or grammar
7. (Outcomes based on guidelines in UGC LOCF – Generic Elective)

UNIT I **COMMUNICATION:** Listening – Listening to audio text and answering questions – Listening to Instructions – Speaking: Pair work and small group work – Reading: Comprehension passages – Differentiate between facts and opinion – Writing: Developing a story with pictures – Vocabulary: Register specific – Incorporated into the LSRW tasks

UNIT II **DESCRIPTION:** Listening: Listening to process description – Drawing a flow chart – Speaking: Role play (formal context) – Reading: Skimming / Scanning – Reading passages on products, equipment and gadgets – Writing: Process Description – Compare and Contrast – Paragraph – Sentence Definition and Extended definition – Free Writing – Vocabulary: Register

specific –Incorporated into the LSRW tasks.

UNIT III **NEGOTIATION STRATEGIES – LISTENING:** Listening to interviews of specialists / Inventors in fields (Subject specific) – Speaking: Brainstorming. (Mind mapping) – Small group discussions (Subject- Specific) – Reading: Longer Reading text – Writing: Essay Writing (250 words) – Vocabulary: Register specific – Incorporated into the LSRW tasks

UNIT IV **PRESENTATION SKILLS – LISTENING:** Listening to lectures – Speaking: Short talks – Reading: Reading Comprehension passages – Writing: Writing Recommendations, Interpreting Visuals inputs – Vocabulary: Register specific – Incorporated into the LSRW tasks

UNIT V **CRITICAL THINKING SKILLS – LISTENING:** Listening comprehension – Listening for information – Speaking: Making presentations (with PPT – practice) – Reading: Comprehension passages – Note making Comprehension: Motivational article on Professional Competence, Professional Ethics and Life Skills) – Writing: Problem and Solution essay – Creative writing –Summary writing – Vocabulary: Register specific – Incorporated into the LSRW tasks

SEMESTER – I

ALLIED – I

BOTANY THEORY

Credit: 4 **Course Code: U21BOA11** **Hours: 5**

Learning Objectives:

- To understand the taxonomy aspects of plants
- To learn the structure, reproduction & classification of lower plants
- To identify the plants as either monocotyledons or dicotyledons
- To gain knowledge for water absorption mechanism and photosynthesis

UNIT I **CHARACTERISTICS OF ALGAE AND FUNGI:** Classification of Algae, Structure and Reproduction of Algae- Oscillatoria, Sargassum. Economic importance of Algae. General characters of fungi, life cycle of Puccinia, Economic importance of Fungi ..

UNIT II **CRYPTOGAMS AND PHANEROGAMS:** Structure and life cycle of Bryophyte - Funaria Structure and life cycle of Pteridophyte -Lycopodium Structure and life cycle of Gymnosperm- Gnetum.

UNIT III **PLANT ANATOMY:** Types of tissues and Meristems. Primary structure, of Dicot and monocot stem, root. Structure of mature Anther and ovule, Fertilization and Dicot embryo..

UNIT IV General Outline of Benthem &Hooker's classification, Merits & Demerits. Floral Characters and Economic importance of Rubiaceae, Caesalpinaceae, Asclepidaceae and Poaceae.

UNIT V **PLANT PHYSIOLOGY:** Absorption of water and minerals, Transpiration-movement and loss of water in plants; Stomatal physiology, Photosynthesis; Photosynthetic pigments, light and Dark reaction (C3 cycle only). Photorespiration.

TEXT BOOKS:

1. *Pandey, P.B. College Botany - 1: Including Algae, Fungi, Lichens, Bacteria, Viruses, Plant Pathology, Industrial Microbiology and Bryophyta. Chand Publishing, New Delhi. 2014.*

2. *Bilgrami, K.S. A Textbook of Algae. CBS Publisher & Distributors, New Delhi, ISBN: 978-8123900490. 2010.*

REFERENCE BOOKS:

1. *Sharma, P. D. Microbiology, Rastogi& Co., Meerut. 2011.*
2. *Alexopoulos, C.J., C.M. Mims and M. BlackMell. Introductory Mycology. IV Edition. Miley India (P) Ltd., Daryaganj, New Delhi. 2007.*
3. *Vashishta, Sinha A.K, Adarsh Kumar.Bryophytes, S.Chand & Company ltd., New Delhi. 2011.*

E-REFERENCES

1. http://herba.msu.ru/shipunov/school/biol_154/textbook/intro_botany.pdf
2. http://www.survivorlibrary.com/library/strasburgers_text-book_of_botany_1921.pdf
3. https://biolympiads.com/wp-content/uploads/2018/09/1-Botany Basics.pdf

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	Acquire knowledge of classification of algae and fungi and its economic importance.	K1
CO2	Know the lifecycle of bryophtes, pteridophytes and gymnossperm.	K2
CO3	Compare and differentiate the dicot and monocot plants.	K3
CO4	Identify the Rubiaceae, Caesalpinaceae, Asclepidaceae and Poaceae family by using floral characters.	K3
CO5	Understand the transpiration, water absorption and photosynthesis	K2

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

CO	*PROGRAMME OUTCOMES (PO)*								PROGRAMME SPECIFIC OUTCOMES (PSO)				
	1	*2*	*3*	*4*	*5*	*6*	*7*	*8*	1	2	3	4	5
CO1	*S*	*S*	*S*	*S*	*M*	*S*	*S*	*M*	S	M	M	M	S
CO2	*S*	*S*	*S*	*S*	*M*	*S*	*S*	*S*	S	M	S	S	S
CO3	*S*	*S*	*S*	*S*	*S*	*M*	*S*	*S*	S	S	S	M	S
CO4	*S*	*S*	*S*	*S*	*S*	*S*	*M*	*S*	M	S	S	M	S
CO5	*S*	*S*	*S*	*S*	*S*	*S*	*S*	*M*	S	S	S	S	M
CO5	*S*	*S*	*S*	*S*	*S*	*S*	*S*	*M*	S	S	S	S	M

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – II

SEMESTER – II

GEOMORPHOLOGY – II

Credit: 4 **Course Code: U21GET21** **Hours: 5**

Learning Objectives:

- The course will provide an understanding of the conceptual and dynamic aspects of landform development.
- Students will be able to read and interpret information on different types of physical feature maps.
- Showing an awareness and responsibility for the environment.
- Students will be evaluating the fundamental models of cycle of erosion and function of the river and its landforms development process.
- Students will be evaluating the importance of fundamental geomorphic principles and finding to the wider academic community.

UNIT I **PROCESSES OF RIVER:** Drainage systems – sequent – insequent – drainage patterns - Work of running water (river) – types of fluvial erosion – erosional landforms – transportational work of rivers – depositional landforms – river development stages – river capture – Normal cycle of erosion by Davis.

UNIT II **GLACIAL PROCESSES:** Types and movement of glacier – Erosional work of glacier – Depositional landforms of glacier.

UNIT III **WORK OF WIND:** Erosional work of wind and erosional landforms – transportational work – depositional landforms in arid regions.

UNIT IV **PROCESSES OF UNDERGROUND WATER:** Underground water and karst topography – Geomorphic work of groundwater – erosional landforms developed in limestone regions – depositional landforms of karst region.

UNIT V **WORK OF WAVES:** Agents of coastal erosion – erosional land forms – transportational work – depositional landforms in arid regions – coast – Johnson's classification of coast.

TEXT BOOKS:

1. *Dayal, P., A Text book Geomorphology, Shukla Book Depot, Patna, India, 1990*
2. *Pitty,A.F., The Nature of Geomorphology, Methuen and Co. Ltd., London, 1982*

3. *Thornbury, W. D. Principles of Geomorphology, John Wiley and Sons, New York, I960*
4. *Singh, Savindra, Geomorphology, Prayag Pustak Bhawan, Allahabad, 2002*

REFERENCE BOOKS:

1. *Balbir Singh Negi, Physical Geography, S.J Publications Meerut, 1993*
2. *Das Gupta, A., and Kapoor, A.N, Principles of Physical Geography, S.C. Chand & Company Ltd, 2001*
3. *Lobeck. A.K., An Introduction to the study of Landscapes, McGraw – Hill Book company, 1939.*
4. *Thorn Bury.D., - Principles of Geomorphology, Wiley Eastern Ltd, New Delhi, 1984*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	Geomorphology produces an outcome, indicating that students should be able to work out a geomorphic process.	K2
CO2	Students will have acquired knowledge about the development of the earth's crust and methods of development of the major landforms.	K2
CO3	Students will be able to understand the processes by which transportation of earth material occurs through fluvial and gravitational processes.	K2
CO4	Students will be able to determine the physical, chemical and biological processes controlling the modern evolution of identified landforms.	K4
CO5	Students shall get to know about the formation of the earth's surface features, the role played by humans in changing the landscape and the significance of landforms in shaping the physical environment in an area.	K5

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**2**	**2**	**3**
CO2	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**2**	**2**	**3**
CO3	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**2**	**2**
CO4	**3**	**3**	**3**	**2**	**2**	**2**	**3**	**3**	**2**	**2**	**2**
CO5	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**2**	**2**	**3**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – II

CARTOGRAPHY

Credit: 4 **Course Code: U21GET22** **Hours: 5**

Learning Objectives:

- Students can able to understand the general classification of maps and their importance with relevant cartographic technique.
- Students will be able to think the position of earth and their dimensions using with geographic coordinate principles.
- Students can acquire knowledge of various map scales and the earth drawing projections.
- Students will be able to apply the map generalization layout principles with reference to SOI and NATMO.
- Understanding the techniques of constructing different types of cartographic symbols representing various geographical data

UNIT I **INTRODUCTION:** Nature, scope and content of cartography – maps – classification and uses – development of cartography – branches in cartography.

UNIT II **TOPOGRAPHICAL MAP:** Earth as a cartographic problem – shape, size and direction – dimension of the earth – plane, spherical and rectangular systems – latitudes, longitudes and time.

UNIT III **SCALES AND PROJECTIONS:** Map scale – types of scale – enlargement and reduction – map projection – basic principles of cylindrical, conical and zenithal projections.

UNIT IV **PROCESSES OF MAP MAKING:** Principles of map generalization – map design and layout – components of layout – map index with reference to SOI and NATMO maps.

UNIT V **MAP SYMBOLIZATION:** Point, line and area symbols – qualitative and quantitative symbols.

TEXT BOOKS:

1. *Robinson Arthur H et al, Elements of Cartography, 6th edition, Wiley India pvt. Ltd, 2010*
2. *Misra.R.P and A.Ramesh, Fundamentals of cartography, Concept Publishing*

Company, New Delhi, 2000.

3. *Erwin and Raisz, Principles of cartography, Mcgraw Hill book company1962*

REFERENCE BOOKS:

1. *Robinson.H., Elements of Cartography, John Wiley and Son INC,1960*
2. Rampal K K, Mapping and Compilation, Concept Publishing Company, New Delhi, 1993
3. *Monhouse, Map and diagrams, Methuan, 1971*
4. *RL Singh, Elements of practical geography, Students to friends Allahabad1968*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	Students will be aware the knowledge about the relationship of cartography with other branches of earth science and disciplines of geography.	K2
CO2	Students can identify the earth's dimensions relating the cartographic problems and their geographic coordinate system.	K2
CO3	Students can evaluate the techniques of scales and suitable projections of different maps.	K3
CO4	Students will understand the various map components with help of SOI and NATMO.	K4
CO5	After that they will get the capacity of map making with suitable cartographic symbols	K5

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**3**	**3**	**2**	**3**	**2**	**2**	**3**	**2**	**2**	**3**
CO2	**3**	**3**	**3**	**3**	**3**	**2**	**2**	**3**	**2**	**2**	**3**
CO3	**3**	**2**	**3**	**3**	**2**	**2**	**3**	**3**	**3**	**2**	**3**
CO4	**3**	**2**	**3**	**2**	**2**	**3**	**3**	**3**	**3**	**2**	**2**
CO5	**3**	**3**	**3**	**3**	**2**	**3**	**2**	**3**	**2**	**2**	**2**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – II

VALUE EDUCATION

Credit: 3 **Course Code: U21VAE21** **Hours: 3**

Learning Objectives:

- Acquire the knowledge of nature, concepts of Values
- Explain the aims and objectives of value education.
- Develop skill to integrate value education in the present curriculum.
- Understand the various sources of Values.
- Describe the role of various agencies in fostering values.
- Discuss the need for Value Education at the tertiary Level.

UNIT I **NATURE AND CONCEPT OF VALUES:** Values: Meaning and Definitions- Nature and Concept of Values-Classification of Values- Instrumental Values: Personal values, Social values, Family values, Cultural values, Democratic values, Aesthetic Values, institutional values, spiritual values and Spirituality Spiritual Self-sufficiency- Terminal values: Happiness, Self-Contentment, Self-Actualisation, Peace, Wisdom.

UNIT II **SOURCES OF VALUES:** Socio-Cultural Tradition: Demographic values, Values of Society and Culture-Religion: Hinduism, Christianity, Muslim and Jainism and Constitutional Values: Preamble of Indian Constitution, Democratic values, Secularism, Unity in Diversity-Universal Values: International Understanding, Universal Brotherhood, Eternal Bliss, Truth and Peace.

UNIT III **INDIVIDUAL AND COLLECTIVE VALUES:** Individual Values: Self-respect, Self-motivation, Self Confidence, Self-Motivation, Honesty, Integrity, regularity, punctuality and Truthfulness- Psychological Values: Understanding Self: Innate Self and Acquired Self and Powers of Self, Purity in thoughts/words/deeds, Self-esteem, self-Recognition, Emotional Intelligence, Cognitive Ability- Collective values: Societal Values, Social Responsibilities of Individuals- -Healthy Responsibilities-Corporate Social Responsibility-Environmental Values- Eradication of Child Labour and bonded Labour and Child Marriage.

UNIT IV **VALUE EDUCATION:** Aims and Objectives of Value Education- Comments of the Various Committees on Value Education- Need for Value Education at the Tertiary Level (HEI): Anti ragging, Anti- drug, Harassment and Violence against Women -Value Education in 21st Century: Humanistic values for the 21st century, secular, democratic, and pluralistic, familial and global.

UNIT V **ROLE OF VARIOUS AGENGIES IN FOSTERING VALUES:** Role of Parents- Role of Teachers: Personal Values and Code of Conduct for teachers- Role of Society- Role of Peer Group- Role of Religion- Role of Mass Media- Role of Voluntary Organizations- Role of Government.

PRACTICUM:

- Values though Dramatization,
- Practicing democratic and secular values through skit and dramas.

SUGGESTED REFERENCES:

TEXT BOOK:

1. *Dr. Kiruba Charles., & V.Arul SelviValue Education, Neel Kamal Publications PVT. LTD. Educational Publishers, New Delhi, 2012.*

REFERENCE BOOKS:

1. *Government of India, National Policy on Education (1968), New Delhi, 1968.*
2. *Atkin, J., Values and Beliefs about Learning to Principles and Practice, Seminar Series no. 54. Incorporated Association of Registered Teachers of Victoria, Melbourne, 1996.*
3. *Bhardwaj, I., Value-oriented Education, Journal of Value Education, Volume 5, Page 9-24, 2005.*
4. *Prof.S.P.Rubela & Prof.Raj Kumar Nayak, Value Education and Human Rights Education, Neel Kamal Publications PVT. LTD, New Delhi, 2011.*
5. *Dr. Sarojini - Biographical Values, Arasi Publishing House, Dindigul*
6. *Ananda Valli Mahadevan and Rs. Jaya Kothaipillai (Editors) - Feminism, Mother Teresa Women's University, Kodaikanal, 2004.*
7. *Ramathal,K.M. and Others, Protection of Women from Domestic Violence Act, 2005.*
8. *Elamadhi Jannakiraman.K, and Others, Tamil and World Unity, Subramania Bharathiar Tamil Field, University of New Delhi, Pondicherry,2006.*
9. *Eraianbu. Et. Al - Seventh Knowledge (Part 2), Thirst Publication, Chennai, 2002.*
10. *Sinivasan.N.A.,Microeconomics(Part 2), Meenakshi Publishing, Madurai, 1998*
11. *Saroja Pandian, Non-violent Resources and Ways of Violence in the Fourteenth Century, Pandian Publishing, Madurai, 2002.*
12. *Paul's Firsts, Spirituality - Falsehood and Truth, Published by St. Mary's Church, Dindigul, 2001.*
13. *Prema.R - Feminism, Tamil Bookshop, Chennai, 2005.*

SEMESTER – II

PROFESSIONAL ENGLISH – II

Credit: 4 **Course Code: U21PEPS22** **Hours: 5**

Learning Objectives:

- The Professional Communication Skills Course is intended to help Learners in Arts and Science colleges
- Develop their competence in the use of English with particular reference to the workplace situation.
- Enhance the creativity of the students, which will enable them to think of innovative ways to solve issues in the workplace.
- Help students with a research bent of mind develop their skills in writing reports
- Develop their competence and competitiveness and thereby improve their employability skills and research proposals.

UNIT I **COMMUNICATIVE COMPETENCE:** Listening – Listening to two talks / lectures by specialists on selected subject specific topics – (TED Talks) and answering comprehension exercises (inferential questions) – Speaking: Small group discussions (the discussions could be based on the listening and reading passages- open ended questions – Reading: Two subject-based reading texts followed by comprehension activities/exercises – Writing: Summary writing based on the reading passages.

UNIT II **PERSUASIVE COMMUNICATION:** Listening: listening to a product launch-sensitizing learners to the nuances of persuasive communication – Speaking: debates – Just-A Minute Activities – Reading: reading texts on advertisements (on products relevant to the subject areas) and answering inferential questions – Writing: dialogue writing- writing an argumentative / persuasive essay.

UNIT III **DIGITAL COMPETENCE:** Listening to interviews (subject related) – Speaking: Interviews with subject specialists (usingvideo conferencing skills) – Creating Vlogs (How to become a vlogger and use vlogging tonurture interests – subject related) – Reading: Selected sample of Web

Page (subject area) – Writing: Creating Web Pages – Reading Comprehension: Essay on Digital Competence for Academic and Professional Life – The essay will address all aspects of digital competence in relation to MS Office and how they can be utilized in relation to work in the subject area

UNIT IV **CREATIVITY AND IMAGINATION:** Listening to short (2 to 5 minutes) academic videos (prepared by EMRC/ other MOOC videos on Indian academic sites – E.g. https://www.youtube.com/watch?v=tpvicScuDy0) – Speaking: Making oral presentations through short films – subject based - Reading: Essay on Creativity and Imagination (subject based) – Writing – Basic Script Writing for short films (subject based) – Creating blogs, flyers and brochures (subject based) - Poster making – writing slogans/captions(subject based)

UNIT V **WORKPLACE COMMUNICATION& BASICS OF ACADEMIC WRITING:** – Speaking: Short academic presentation using PowerPoint – Reading & Writing: Product Profiles, Circulars, Minutes of Meeting – Writing an introduction, paraphrasing – Punctuation (period, question mark, exclamation point, comma, semicolon, colon, dash, hyphen, parentheses, brackets, braces, apostrophe, quotation marks, and ellipsis) – Capitalization (use of upper case)

Grammar and vocabulary exercises / tasks to be designed based on the discourse patterns of the listening and reading texts in the book. This is applicable for all the units.

SEMESTER – II

ALLIED – II

BOTANY PRACTICAL

Credit: 4 **Course Code: U21BOA22** **Hours: 6**

Learning Objectives:

- To learn sectioning and mounting skills
- To observe the morphological feature for understanding the taxonomy
- To know the structure, reproduction & classification of lower plants
- To identify the plants as either monocotyledons or dicotyledons
- To gain knowledge on internal structure of plants by sectioning

UNIT I **Algae -** Oscillatoria (Harmogonia) Sargassum (Morphology) Fungi - Puccinia (T.S of Wheat leaf uredospore Teleutospore) Bryophytes - Funnaria (Habit) Pteridophyte – Lycopodium (Morphology,T.s of Stem, L.S. of cone) Gymnosperm - Gentum (morphology, T.S. of Stem showing secondary growth, Gentum , male cone, Female cone.

UNIT II **Taxonomy -** Identification and description of the families those are included in the theory 1. Rubiaceae, 2. Caesalpinaceae, 3. Asclepidaceae & 4. Poaceae

UNIT III **Anatomy:** Study of Apical meristem (shoot apex) Tissues - Parenchyma, Collenchymas, Sclerenchyma, T.S of Dicot stem.

UNIT IV **Embryology:** General Outline of Benthem &Hooker's classification, Merits & Demerits. Floral Characters and Economic importance of Rubiaceae, Caesalpinaceae, Asclepidaceae and Poaceae.

UNIT V **PLANT PHYSIOLOGY:** Experiments to demonstrate i. Osmosis - Thistle funnel experiment, ii. Evolution of oxygen during photosynthesis, iii.Ganongs's light screen experiment

TEXT BOOKS:

1. *Sivakumar, K. Algae- A Practical Approach. MJP Publishers, Chennai, India. 2016.*
2. *Gupta, V.K., Tuohy, M.G., Ayyachamy, M., Turner, K.M. and O'Donovan, A. Laboratory Protocols in Fungal Biology: Current Methods in Fungal Biology. Springer, London, UK. 2013.*

3. *Chmielewski, J. G. and Krayesky, D. General Botany laboratory Manual. AuthorHouse, Bloomington, USA. 2013.*
4. *Bendre, A. M. A Text Book Of Practical Botany – Rastogi Publications, Meerut, India. 2010.*

REFERENCE BOOKS:

1. *Sharma, P. D. Microbiology, Rastogi& Co., Meerut. 2011.*
2. *Alexopoulos, C.J., C.M. Mims and M. BlackMell. Introductory Mycology. IV Edition. Miley India (P) Ltd., Daryaganj, New Delhi. 2007.*
3. *Vashishta, Sinha A.K, Adarsh Kumar.Bryophytes, S.Chand & Company ltd., New Delhi. 2011.*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	identify and differentiate algae, Fungi, Bryophytes and Pteridophytes	K3
CO2	Identify and classify the rubiaceae, caesalpinaceae , asclepidaceae & poaceae family plants	K3
CO3	Observe the various plant tissues and differentiate Monocot and Dicot plants through sectioning	K2
CO4	Understand the parts of plant embryo.	K2
CO5	Get practical knowledge on thistle funnel experiment and other physiological experiments	K1

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

CO	PROGRAMME OUTCOMES (PO)								PROGRAMME SPECIFIC OUTCOMES (PSO)				
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**1**	**2**	**3**	**4**	**5**
CO1	S	S	S	M	M	S	S	M	S	S	S	M	S
CO2	S	S	S	S	M	S	S	S	S	M	S	S	M
CO3	S	S	S	S	S	M	S	M	S	S	S	M	S
CO4	S	S	S	S	S	S	M	S	M	S	S	M	S
CO5	S	S	S	S	S	S	S	M	S	S	S	S	M
CO5	S	M	M	S	S	S	S	M	S	M	S	S	M

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – III

SEMESTER – III

CLIMATOLOGY – I

Credit: 4 **Course Code: U21GET31** **Hours: 5**

Learning Objectives:

- The broad objective of the course is to introduce to the students the atmosphere and climates are critical parts of the earth system.
- Identifying and explaining the concept of distribution of temperature over earth surface.
- The students will be able to explain the position of the atmosphere and its components.
- Students will be evaluating the classification of climate, climate change and recent issues.
- The students will have a basic knowledge of the controlling factors and distributional aspects of the atmosphere.

UNIT I **STRUCTURE AND COMPOSITION OF ATMOSPHERE:** Climatology – meaning – elements of weather and climate composition of atmosphere – structure of the atmosphere.

UNIT II **INSOLATION AND HEAT BUDGET:** Insolation – meaning – distribution of insolation – factors affecting the distribution – heat budget of the earth and the atmosphere.

UNIT III **TEMPERATURE:** Transfer of heat energy – heating of the atmosphere by conduction – convection – radiation – absorption – reflection and scattering – controlling factors of temperature distribution – diurnal – seasonal – horizontal and vertical – distribution of temperature – normal lapse rate – inversion of temperature.

UNIT IV **PRESSURE:** Definition – Pressure gradient – pressure types – variations in atmospheric pressure –horizontal distribution of pressure and pressure belts.

UNIT V **ATMOSPHERIC PRESSURE BELT AND WIND SYSTEM:** Atmospheric motion-pressure gradient and air circulation – coriolis force – frictional force – geostrophic winds – gradient winds – General circulation – Planetary wind belt – seasonal winds – monsoon – concepts of origin of monsoon wind (thermal and dynamic) – local winds – periodic local winds and non–periodic local winds – ElNino – LaNino.

TEXT BOOKS:

1. *Lal. D.S., Climatology, Chatianya Publishing House, Allahabad, 1998*
2. *Howard J. Chritchfield, General Climatology, Prentice, Hall of India Pvt Ltd, 1987*
3. *Glen. T. Trewartha and LyesH.Horn, An Introduction to Climate, International student Edition, McGraw Hill International Book Company, 1980.*
4. *Critchfield, H. J. General Climatology, Prentice Hall, Englewood Cliffs, 1998*

REFERENCE BOOKS:

1. *Trewartha, G.T., An Introduction to Climate, McGraw Hill Book Co., New York, 1968.*
2. *Woolridge and Morgan, Physical basis of Geography, Palala Press Indian Edition, 2015.*
3. *Ayoade, J.O. Introduction to Climatology for the Tropics, John Wiley and Sons Ltd., New York, 1983.*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	Students will understand the composition and structure of the atmosphere.	K2
CO2	The students will be able to explain the position of weather phenomena, winds, humidity, precipitation and heat budget.	K2
CO3	They will be able to understand the elements and processes of climates, different climatic types and climate change.	K2
CO4	Students will be understood the mean global atmospheric circulations and disturbances, world climate systems, climatic variability and change.	K4
CO5	Students will be able to identify of climatic differentiation and the consequences of human activities.	K4

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**3**	**3**	**2**	**3**	**3**	**2**	**2**	**2**	**2**	**3**
CO2	**3**	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**2**	**2**	**3**
CO3	**3**	**2**	**3**	**3**	**3**	**2**	**2**	**3**	**2**	**2**	**3**
CO4	**3**	**2**	**3**	**2**	**2**	**2**	**3**	**3**	**2**	**2**	**3**
CO5	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**2**	**2**	**3**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – III

ELECTIVE – I – BASICS OF REMOTE SENSING AND GIS

Credit: 3 **Course Code: U21GEE311** **Hours: 4**

Learning Objectives:

- The aim of this course is to introduce students to the interface of Remote Sensing and GIS
- Also introduce about to various aspects of Aerial photographs.
- It will be teach about the important elements of the Geospatial technology.
- To develop new insights among students on the relevance of geospatial studies within the field of geography.
- It gives the technical knowledge of satellite system.

UNIT I **INTRODUCTION:** Principles of remote sensing – History

UNIT II **REMOTE SENSING:** EMR – Electromagnetic spectrum – energy interactions with atmosphere and earth surface features – platforms – types of remotely sensed data.

UNIT III **AERIAL PHOTOGRAPHS:** Types, elements and uses of aerial photographs – photogrammetry.

UNIT IV **SATELLITE REMOTE SENSING:** Satellite imagery – Sensors – Multi spectral – Landsat – Thematic Mapper – LISS – Comparison of maps with aerial photographs and satellite imageries.

UNIT V **INTRODUCTION OF GIS**: Definition – history – components – DBMS – Geographic Database – Hardware and Software – Use of GIS – raster and vector – GPS – history – segments.

TEXT BOOKS:

1. *Campbell J. B., Introduction to Remote Sensing, Guildford Press, 2007.*
2. *Jensen J. R., Introductory Digital Image Processing: A Remote Sensing Perspective, Prentice Hall, 2004.*
3. *Joseph, G. Fundamentals of Remote Sensing, United Press India, 2005.*
4. *Nag P. and Kudra, M., Digital Remote Sensing, Concept, New Delhi, 1998.*
5. *Rees W. G., Physical Principles of Remote Sensing, Cambridge University Press, 2001.*

REFERENCE BOOKS:

1. *LanHeywod, Sarah Cornelines, An Introduction to Geographical Information System I Addison, Wesley, Longman Ltd, 2000*
2. *C.S.Agarwal & P.K.Grag, Text Book of Remote Sensing, Wheeler Publishing, 2000*
3. *Gampbell. James B.I Introduction to Remote Sensing, The Guild Press , New York, 2017*
4. *Curran, Fundamentals of Remote Sensing, Longman, London, 2006*
5. *Lillesend TM & Kiefer R.W, Remote Sensing & Image Interpretation, John Wiley & sons, New York, 2004.*
6. *Luedev D.R. Aerial Photographic Interpretation Mc. Graw Hill Company, New York, 2000.*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	Students will demonstrate knowledge of the foundations and theories of geographic information systems (GIS) and use the tools and methods of GIS.	K2
CO2	Students will demonstrate their knowledge of physical geography and the methods and techniques for observing, measuring, recording and reporting on geographic phenomena.	K2
CO3	Students will demonstrate their competence to work individually and as a team to develop and present a client-driven GIS solution.	K2
CO4	Student will be familiar with modern techniques in Geography.	K4
CO5	Students will be prepared to apply their skills in professional careers for UGC NET/SLET exams and other competitive exams including the civil services.	K5

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**3**	**3**	**2**	**2**	**3**	**3**	**2**	**2**	**2**	**3**
CO2	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**2**	**3**
CO3	**3**	**2**	**3**	**3**	**2**	**2**	**3**	**3**	**2**	**2**	**2**
CO4	**3**	**2**	**3**	**2**	**3**	**3**	**3**	**3**	**2**	**2**	**2**
CO5	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**2**	**2**	**2**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – III

ELECTIVE – I – REGIONAL GEOGRAPHY OF ASIA

Credit: 3 **Course Code: U21GEE312** **Hours: 4**

Learning Objectives:

- Students should learn about the geographic diversity within South, Southeast and East Asia
- Students understand how human geographers study this region of the world
- Write a substantial term project relating to the geography of Asia, exhibiting critical thinking skills
- Students will be expected to gain an appreciation for the inter-relations of Asia's physical, cultural, political and economic realms.
- To evaluate the essential differences between the various countries, the various sub- regions, and between realms of Asia and the West.

UNIT I **PHYSICAL SETTING:** Geographic Location and Extent – Locational Significance – Physical Divisions; Climate: Seasonal Pattern of Monsoons – Climatic Regions.

UNIT II **DRAINAGE SYSTEM AND NATURAL VEGETATION:** Drainage System – Soil – Natural Vegetation – Types and distribution

UNIT III **AGRICULTURE:** Farming Types – Major crops: Rice, Wheat, Cotton, Jute, Tea, Coffee and Rubber – Recent developments in Agriculture; Fishing – Inland and Marine.

UNIT IV **MINERAL RESOURCES & INDUSTRIES:** Distribution and Production of Iron ore, Manganese, Copper, Tin, Gold, Gypsum and Mica; Industries: Locational Factors – Textiles – Sugar – Iron and Steel.

UNIT V **CONTROLLING FACTORS:** Growth – Distribution and Density, Transport: Roadways – Railways – Airways – Waterways.

TEXT BOOKS:

1. *Ranjit Tirtha, Geography of Asia, Rawat Publications, Jaipur, 2001.*
2. *Negai. B.S, the continent of Asia, S. Chand and co. (Pvt) Ltd, New Delhi, 1986.*

3. *Stamp, L.D. Asia: A Regional and Economic Geography. B.I. Publication Ltd., New Delhi, 1967.*
4. *Shafi, M. Geography of South Asia. MacMillan and Co., Kolkata, 2000.*

REFERENCE BOOKS:

1. *Richard and Chorley, Introduction to Physical Hydrology, Methuen & CoLtd, 2009.*
2. *Manning, J.C, Applied Principles of Hydrology, CBS Publishers. NewDelhi, 1989.*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	They can know about their land formation, climate and natural vegetation.	K2
CO2	Understand climatic condition and seasons in Asia.	K2
CO3	Understand the irrigation and agricultural developments.	K2
CO4	They understand the economic resources of Asia	K2
CO5	Evaluating the impacts of human activities on natural environments special reference to Asia	K4

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**2**	**2**	**3**
CO2	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**3**	**2**	**2**	**3**
CO3	**3**	**2**	**3**	**3**	**3**	**3**	**3**	**3**	**2**	**2**	**2**
CO4	**3**	**2**	**2**	**2**	**3**	**2**	**3**	**3**	**2**	**2**	**3**
CO5	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**2**	**2**	**2**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – III

ELECTIVE – I

CLIMATE CHANGE: VULNERABILITY AND ADAPTATION

Credit: 3 **Course Code: U21GEE313** **Hours: 4**

Learning Objectives:

- To understand the foundational concepts of climate change and its impacts.
- To assess the human and environmental vulnerability to climate change.
- To learn the various adaptation and mitigation for reducing the impacts of climate change and national action plan.
- Students will be learn about climate change to impact on human health
- Explain the National Action Plan on Climate Change

UNIT I **SCIENCE OF CLIMATE CHANGE:** Understanding Climate Change; Green House Gases and Global Warming; Global Climatic Assessment – IPCC

UNIT II **CLIMATE CHANGE AND VULNERABILITY:** Physical Vulnerability; Economic Vulnerability; Social Vulnerability

UNIT III **IMPACT OF CLIMATE CHANGE:** Agriculture and Water; Flora and Fauna; Human Health

UNIT IV **ADAPTATION AND MITIGATION:** Global Initiatives with Particular Reference to South Asia.

UNIT V **ACTION PLAN ON CLIMATE CHANGE:** National Action Plan on Climate Change; Local Institutions (Urban Local Bodies, Panchayats)

TEXT BOOKS:

1. *Singh, M., Singh, R.B. and Hassan, M.I. (Eds.) Climate change and biodiversity: Proceedings of IGU Rohtak Conference, Volume 1. Advances in Geographical and Environmental Studies, Springer, 2014.*
2. *Sen Roy, S. and Singh, R.B. Climate Variability, Extreme Events and Agricultural Productivity in Mountain Regions, Oxford & IBH Pub., New Delhi, 2002.*
3. *OECD. Climate Change Mitigation: What Do we Do? Organisation and Economic Co-Operation and Development, 2008.*
4. *UNEP. Global Environment Outlook: GEO4: Environment for Development, United*

NationsEnvironment Programme, 2007.

REFERENCE BOOKS:

1. *IPCC. Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, 2007.*
2. *IPCC Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, 2014.*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	Understanding the foundational concepts of climate change and its impacts	K2
CO2	Assessing the human and environmental vulnerability to climate change	K3
CO3	Learning the various adaptation and mitigation for reducing the impacts of climate change and national action plan.	K2
CO4	Students will also have knowledge about climate change to impact on agriculture and water, flora and fauna and human health	K2
CO5	Students will be able to identify of climatic change differentiation and the consequences of human activities	K4

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**2**	**2**	**3**
CO2	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**3**	**2**	**2**	**3**
CO3	**3**	**3**	**2**	**3**	**2**	**2**	**3**	**3**	**2**	**2**	**3**
CO4	**3**	**3**	**3**	**2**	**2**	**2**	**3**	**3**	**2**	**2**	**2**
CO5	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**3**	**2**	**2**	**3**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – III

JOB ORIENTED COURSE – I

PRACTICAL – COMPUTER APPLICATION IN GEOGRAPHY

Credit: 2 **Course Code: U21MSS31** **Hours: 2**

Learning Objectives:

- Understand the fundamentals of computer
- Explaining the Representation of population data.
- Understand the Analysis of Agricultural data.
- Explaining the Representation of industrial data.
- Explaining the Representation of transport data.

UNIT I **INTRODUCTION TO COMPUTERS:** Hardware and Software – Operating Systems - Working with Microsoft Windows – File Management – Creation of Files and Folders – Moving, Cutting, Copying, Pasting and Deleting of Files and Folders.

UNIT II **INTRODUCTION TO MICROSOFT OFFICE PACKAGE:** Word, Excel, Power Point – Outlook and Access Working with Microsoft Word – Creation of New Files, Documents, Templates – Save, Edit, Format, Insert Table, Pictures, Pages – Adding Headers and Footers – Out–put Generation.

UNIT III **WORKING WITH MICROSOFT EXCEL:** Creation of New worksheet – Formatting of Cells – Statistical Analysis of Data – Creation of Charts – Formatting Charts – Output Generation.

UNIT IV **DATA ANALYSIS:** Analysis of agricultural data – distribution of crops – dot – choropleth –piechart.

UNIT V **REPRESENTATION OF INDUSTRIAL AND TRANSPORT DATA:** Triangular graph – traffic flow – connectivity measures and binary matrix.

TEXT BOOKS:

1. *Monkhouse F.J. and Wilkinson H.R. – Maps and Diagrams – Dirton Co., Newyork, 1999.*
2. *R.P.Mishra and A.Ramesh – Fundamentals of Cartography – Concept*

publishing Company,New Delhi, 1996.

3. *Robinson A.H. and R.D.Sale-Elements of Cartography-Hjohn Wiley and Sons, NewYork, 2011.*

REFERENCE BOOKS:

1. *Singh R.L. and P.K.Dutt-Elements of Practical Geography,1969.*
2. *M.D.Zulfequar ahamad Khan – Text Book of Practical Geography,Concept Publishing Company, NewDelhi, 2001.*

Learning Outcomes

CO	After the completion of the course, students will be able to	Remarks
CO1	Students will have a basic knowledge of the components of computer	K2
CO2	Students will learn and understand the line graphs, poly graphs and compound line graphs.	K2
CO3	Students will have an effectively Understand the dot, choropleth, pie chart.	K2
CO4	Students will have the knowledge of the triangular graph.	K3
CO5	Students will have an effectively Understand the traffic flow, connectivity measures and binary matrix.	K4

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**3**	**3**	**2**	**3**	**2**	**3**	**2**	**2**	**3**	**2**
CO2	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**2**
CO3	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**3**	**3**
CO4	**3**	**3**	**3**	**2**	**2**	**3**	**3**	**3**	**2**	**3**	**3**
CO5	**3**	**2**	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**3**	**2**

**Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0*

SEMESTER – III

Non – Major Elective – I

PRICIPLES OF REMOTE SENSING

Credit: 2 **Course Code: 21GEN311** **Hours: 2**

Learning Objectives:

- The aim of this course is to introduce students to the interface of Remote Sensing and GIS
- Also introduce about to various aspects of Aerial photographs.
- It will be teach about the important elements of the Geospatial technology.
- To develop new insights among students on the relevance of geospatial studies within the field of geography.
- It gives the technical knowledge of satellite system.

UNIT I **INTRODUCTION -** Principles of remote sensing – History

UNIT II **EMR** – Electromagnetic spectrum – Energy interactions with atmosphere and earth surface features

UNIT III **SATELLITE REMOTE SENSING** - Platforms – Sensors

UNIT IV **AERIAL PHOTOGRAPHS** – types – elements of interpretation and uses of aerial photographs

UNIT V **SATELLITE IMAGERY** – types – visual image interpretation – uses of satellite imageries.

TEXT BOOKS:

1. *Campbell J. B., Introduction to Remote Sensing, Guildford Press, 2007.*
2. *Jensen J. R., Introductory Digital Image Processing: A Remote Sensing Perspective, Prentice Hall, 2004.*
3. *Joseph, G. Fundamentals of Remote Sensing, United Press India, 2005.*
4. *Nag P. and Kudra, M., Digital Remote Sensing, Concept, New Delhi, 1998.*
5. *Rees W. G., Physical Principles of Remote Sensing, Cambridge University Press, 2001.*

REFERENCE BOOKS:

1. *LanHeywod, Sarah Cornelines, An Introduction to Geographical Information System I Addison, Wesley, Longman Ltd, 2000*
2. *C.S.Agarwal & P.K.Grag, Text Book of Remote Sensing, Wheeler Publishing, 2000*
3. *Gampbell. James B.I Introduction to Remote Sensing, The Guild Press , New York, 2017*

4. *Curran, Fundamentals of Remote Sensing, Longman, London, 2006*
5. *Lillesend TM & Kiefer R.W, Remote Sensing & Image Interpretation, John Wiley & sons, New York, 2004.*
6. *Luedev D.R. Aerial Photographic Interpretation Mc. Graw Hill Company, New York, 2000.*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	Students will demonstrate knowledge of the foundations and theories of geographic information systems (GIS) and use the tools and methods of GIS.	K2
CO2	Students will demonstrate their knowledge of physical geography and the methods and techniques for observing, measuring, recording and reporting on geographic phenomena.	K2
CO3	Students will demonstrate their competence to work individually and as a team to develop and present a client-driven GIS solution.	K2
CO4	Student will be familiar with modern techniques in Geography.	K4
CO5	Students will be prepared to apply their skills in professional careers for UGC NET/SLET exams and other competitive exams including the civil services.	K5

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**3**	**3**	**2**	**2**	**3**	**3**	**2**	**2**	**2**	**3**
CO2	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**2**	**3**
CO3	**3**	**2**	**3**	**3**	**2**	**2**	**3**	**3**	**2**	**2**	**2**
CO4	**3**	**2**	**3**	**2**	**3**	**3**	**3**	**3**	**2**	**2**	**2**
CO5	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**2**	**2**	**2**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – III

Non – Major Elective – I

SOCIAL AND CULTURAL GEOGRAPHY

Credit: 2 **Course Code: U21GEN312** **Hours: 2**

Learning Objectives:

- Understanding the concept of space and place, religions and language groups.
- Explaining the Human health and Health care planning.
- Explaining the concept of culture, cultural regions and cultural imperialism.
- Recognize the difference between boundary and land boundary.
- Understanding the connection between Hartland theory and Rimland theory and contemporary politics.

UNIT I **Introduction** - Social Geography – Nature and scope – social structure and processes – concept of space and place –social wellbeing – quality of life – social exclusion, derivation and discrimination issues relating to under privileged groups–spatial distribution of social groups in India, tribes, castes, religions and language groups.

UNIT II **Concept of Culture And Cultural Regions in World** - Concept of culture, culture complex, culture areas and cultural regions, cultural heritage, cultural interactions, cultural diffusion and cultural ecology – cultural imperialism.

UNIT III **Health Factors** - Health – factors affecting human health – nutritional status, diseases – etiological condition, classification and distribution patterns, – Health care planning and policies in India, prospects of medical tourism in India.

UNIT IV **Development of Political Geography** - Concept of boundaries and frontiers, heart land and rim land theories – conflicts – resource, regional and ethnic human rights and conflicts resolution – recent trends and development in Political Geography.

UNIT V **Geo-Politics of World** - Geopolitics of climatic change, geopolitics of World Resources – regional organizations of cooperation (SAARC, ASEAN, OPEC, EU)

TEXT BOOKS:

1. Majid Husain – Human Geography – Rawat Publications 1994.
2. GillianC.Morgan –Human and Economic Geography, Oxford University Publications 1999.

REFERENCE BOOKS:

1. AimeVincentPerpillou-Human Geography, Longman Group limited London 1977.
2. C.Daryll Forde-Habitat, Economy and Society, Methuen Publishers 1977.
3. Chandna – Population Geography, Kalyani Publishers, 2015.

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	After this lesson, the students will have acquired Knowledge about the spatial distribution of social groups, religions and language groups.	K2
CO2	Students will understand an overview of the culture complex, cultural heritage and cultural imperialism.	K2
CO3	Students will understand the factors affecting human health, disease and Planning.	K3
CO4	Students will have basic concepts about boundaries and frontiers.	K2
CO5	Students will learn about the political geography.	K2

***K1**– Remember, **K2**– Understand, **K3**– Apply, **K4** – Analyze, **K5**– Evaluate

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	3	3	3	3	2	3	2
CO2	3	3	3	2	3	3	3	3	3	3	3
CO3	3	2	3	2	3	3	2	3	3	3	2
CO4	3	3	3	3	3	3	3	3	2	3	3
CO5	2	3	2	2	3	2	3	3	3	3	3

***Strongly Correlating – 3** **Moderately Correlating – 2**
Weekly Correlating – 1 **No Correlation – 0**

SEMESTER – III

ALLIED – III

STATISTICS THEORY - I

Credit: 4 **Course Code: U21STA33** **Hours: 5**

Learning Objectives:

- To make the students aware of different type of data sets and their graphical representations introducing of descriptive statistical measures, including those for two variables.
- To study the introduction of frequency distribution, graphs, histograms, frequency curve, ogives and problems of frequency
- Distinguish among different scales of measurement and their implications;
- Interpret data displayed in tables and graphically; Apply concepts of sample space and probability;
- Calculate measures of central tendency and variation for a given data set;

UNIT I **INTRODUCTION -** Meaning, Scope and Limitations of Statistics – Primary and Secondary Data – Methods of Collecting Primary Data – Sources of Secondary Data – Classification and Tabulation of Data.

UNIT II **FREQUENCY DISTRIBUTION -** Formation of Frequency Distribution – Presentation of Data – Diagrams: Bar Diagrams and Pie Diagram - Graphs: Histogram, Frequency Polygon, Frequency Curve and Ogives - Simple problems.

UNIT III **MEASURES OF CENTRAL TENDENCY -** Mean, Median, Mode, Geometric Mean and Harmonic Mean –Merits and Demerits – Properties of a Good Measure –Simple problems.

UNIT IV **MEASURES OF DISPERSION -** Range, Quartile Deviation, Mean Deviation, Standard Deviation and Co- efficient of Variation - Skewness: Meaning – Measures of Skewness – Karl Pearson's Co-efficient of Skewness and Bowley's Co-efficient of Skewness - Simple problems.

UNIT V **CONCEPT OF PROBABILITY** – Basic Concepts – Events – Equally Likely and Mutually Exclusive Events – Mathematical, Statistical Definitions of Probability – Addition and Multiplication Theorems (Without Proof) – Simple Problems.

TEXT BOOKS:

1. Rohatgi V. K. and Saleh A. K. Md. E., An Introduction to probability and Statistics. John Wiley & Sons (Asia).
2. Mukhopadhyay, P., Mathematical Statistics, new Central Book Agency Pvt. Ltd.,

Calcutta.
3. Hoel P. G., Introduction to Mathematical Statistics, Asia Publishing House.
4. Meyer P. L., Introductory Probability and Statistical Applications, Addision Wesley.
5. J.N. Kapur and H.C. Saxena, "Mathematical Statistics", S. Chand and Co.

REFERENCE BOOKS:

1. Gupta, C.B.(1978): An introduction to Statistical Methods, Vikas Pub.House, New Delhi.
2. Elhance, D.N. (1972): Fundamentals of Statistics, Kitab Mahal, Allahabad.
3. Burt, J.E., Barber, G.M., and Rigby, D.L. (2009): Elementary Statistics for Geographers (3rd Ed.), The Guilford Press.
4. A.M. Gun, M.K. Gupta and B. Dasgupta : Fundamentals of Statistics (Vol. 1) World Press Publication
5. S.C.Gupta, V.K.Kapoor : Fundamentals of Mathematical Statistics Pustakkosh Publication.
6. Hogg and Craig: Introduction to Mathematical Statistics,Pearson Publication.
7. B. L. Agrawal, "Basic Statistics", New Age Publication.

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	Demonstrate the background of statistics and its scopes, applications and limitations	K2
CO2	Identify the relevant population, sample, study units (subjects), variables, data.	K2
CO3	Produce and interpret graphical summaries of data and its proper application.	K3
CO4	Describe basic characteristics of the data distribution, including shape, center, spread, and outliers.	K2
CO5	Calculate and interpret numerical summary statistics as well as to have knowledge of important properties of different measurements.	K2

***K1**– Remember, **K2**– Understand, **K3**– Apply, **K4** – Analyze, **K5**– Evaluate

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	3	3	3	3	2	3	2
CO2	3	3	3	2	3	3	3	3	3	3	3
CO3	3	2	3	2	3	3	2	3	3	3	2
CO4	3	3	3	3	3	3	3	3	2	3	3
CO5	2	3	2	2	3	2	3	3	3	3	3

***Strongly Correlating – 3** **Moderately Correlating – 2**
Weekly Correlating – 1 **No Correlation – 0**

SEMESTER – IV

SEMESTER – IV

OCEANOGRAPHY

Credit: 4 **Course Code: U21GET41** **Hours: 4**

Learning Objectives:

- The main objective of the course is to introduce students to basic concepts of oceanography and stimulate students interest and curiosity in the many and varied sciences used in the study of the oceans
- To introduce students to the basic principles underlying physical processes in the ocean.
- Explain the distribution of sea surface temperature, pressure and salinity
- Explain the main factors that determine surface and deep ocean currents
- Students will able to the significance of marine resources and conservations.

UNIT I **INTRODUCTION OF OCEAN & TOPOGRAPHY:** Oceanography – meaning – scope and branches of oceanography – Distribution of continents and ocean – Bottom topography of Indian, Atlantic and Pacific Ocean.

UNIT II **OCEAN TEMPERATURE & SALINITY:** Temperature – Process of Heating and Cooling – distribution of temperature – horizontal and vertical – Salinity – Sources – Controlling factors – distribution of salinity – horizontal and vertical.

UNIT III **OCEAN CURRENTS:** Surface Currents – origin - Factors controlling currents – types of currents – Currents of Indian, Atlantic and Pacific Oceans – Waves and Tides.

UNIT IV **MARINE RESOURCES:** Classification – coral reef – conditions of growth types and distribution of coral reefs.

UNIT V **MARINE DEPOSITS:** Sources and types – Classification – Marine Sediments – Distribution of Sediments.

TEXT BOOKS:

1. *Sharma, R.C. and Vatal, M., Oceanography for Geographers, Chaitanya Publishing House, Allahabad, 1970.*
2. *Thurman, H.V. and Trujillo, A. P. Introductory Oceanography, Prentice Hall, New Jersey, 1997.*
3. *Pinet, P.R. Invitation to Oceanography, Jones and Bartlett Publishers, Boston, 2009.*

4. *Joseph, W.S. and Parish, H.I. Introductory Oceanography, McGraw Hill, Tokyo, 1974.*
5. *Gross, G.M. Oceanography, Macmillan Publication, New York, 1990.*

REFERENCE BOOKS:

1. *Christopherson, R. W. and Birkeland, G. H. Geosystems: An Introduction to Physical, Geography (8thEdition), Pearson Education, New Jersey, 2012.*
2. *Strahler, A.H. and Strahler, A.N. Modern Physical Geography (4/E), John Wiley and Sons, Inc., New York, 2001.*
3. *4. Khullar, D.R. Physical Geography, Kalyani Publishers, New Delhi, 2012.*
4. *Das Gupta, A.andKapoor, A.N. Principles of Physical Geography, S.C. Chand and Company Ltd. New Delhi, 2001.*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	After this lesson the students will become able to acquaint themselves with nature and scope of oceanography and distribution pattern of land, sea and oceans.	K2
CO2	Students will have knowledge about specific concepts of oceanography into a multidisciplinary analysis of the Earth	K2
CO3	Students will also have knowledge about ocean resources, their types and distribution and their influences upon mankind.	K2
CO4	Students will be learning about the principles involved in the generation of waves and tides and evaluate their effects on coastal processes and marine ecosystems.	K4
CO5	Students will be learning about how the oceans are connected to and drive major earth processes, such as atmospheric and oceanic circulation, climate and weather, plate tectonics, marine resources and sustainability of humans.	K2

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**2**	**2**	**2**	**2**
CO2	**3**	**3**	**2**	**3**	**2**	**3**	**3**	**3**	**2**	**2**	**2**
CO3	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**3**	**2**	**2**	**2**
CO4	**3**	**3**	**3**	**2**	**2**	**3**	**3**	**3**	**2**	**2**	**3**
CO5	**3**	**2**	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**2**	**3**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – IV

CLIMATOLOGY – II

Credit: 4 **Course Code: U21GET42** **Hours: 4**

Learning Objectives:

- To understand the dynamics of the atmosphere, the ocean and the overall climatologically system.
- Students can acquire an overall knowledge about elements and factors influencing climate.
- Students will be able to understand the process of weather and climate, Climate Change & global warming.
- Students shall get to know about the different climatic systems found in the world.
- Examine the significance of air masses and associate their relationships and also human influence on climate.

UNIT I **HUMIDITY:** Water vapor – evaporation – latent heat - types of humidity – measurement of humidity – Evaporation – evapotranspiration – Condensation – forms of condensation - fog- classification of fogs.

UNIT II **CLOUDS:** Classification and characteristic features of clouds – Precipitations – forms – types and distribution of precipitation.

UNIT III **ATMOSPHERIC CIRCULATION:** Air mass – characteristics – source region – classification of air masses – fronts – concepts – classification – cyclones – origin and distribution of tropical and temperate cyclones – anti cyclones – thunderstorms- tornado – Jet streams.

UNIT IV **CLIMATIC CLASSIFICATION:** Koppen's and Thronthwaite's classifications.

UNIT V **WEATHER FORECASTING:** Meaning and importance – procedures for forecasting – tools in weather forecasting – types of weather forecasting – benefits of weather forecasting.

TEXT BOOKS:

1. *Lal. D.S., Climatology, Chatianya Publishing House, Allahabad, 1998*
2. *Howard J. Chritchfield, General Climatology, Prentice, Hall of India Pvt Ltd, 1987*
3. *Glen. T. Trewartha and LyesH.Horn, An Introduction to Climate, International student*

Edition, McGraw Hill International Book Company, 1980.

4. *Critchfield, H. J. General Climatology, Prentice Hall, Englewood Cliffs, 1998*
5. *Smith, K., Principles of Applied Climatology, McGraw Hill Book Co., London, 1975.*

REFERENCE BOOKS:

1. *Trewartha, G.T., An Introduction to Climate, McGraw Hill Book Co., New York, 1968.*
2. *Woolridge and Morgan, Physical basis of Geography, Palala Press Indian Edition, 2015.*
3. *Ayoade, J.O. Introduction to Climatology for the Tropics, John Wiley and Sons Ltd., New York, 1983.*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	Students will be able to basic concepts about the structure and composition of the atmosphere and the elements of the hydrological cycle.	K2
CO2	They will learn how atmosphere and climate are a critical part of the earth system and climatic variability and change are central to the issue of current and future global environmental change.	K2
CO3	Understand the physical basis of the natural greenhouse effect, including the meaning of the term radioactive forcing.	K2
CO4	The students will be able to apply the knowledge about the process of weather and climate, Climate Change & global warming through human activities.	K4
CO5	Students will be able to develop a scientific understanding of climates and their characteristics.	K2

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**3**	**3**	**2**	**3**	**2**	**3**	**2**	**2**	**2**	**3**
CO2	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**2**	**2**	**3**
CO3	**3**	**2**	**3**	**3**	**2**	**2**	**3**	**3**	**2**	**3**	**3**
CO4	**3**	**2**	**3**	**2**	**2**	**2**	**3**	**3**	**2**	**3**	**2**
CO5	**3**	**3**	**3**	**3**	**2**	**2**	**3**	**3**	**2**	**2**	**3**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – IV

ELECTIVE – II – GEOGRAPHY OF TAMILNADU

Credit: 3 **Course Code: U21GEE421** **Hours: 4**

Learning Objectives:

- To understanding the general idea of location and physical aspects of Tamil Nadu State
- To learn the status of water and their irrigation types with their usage
- Students will be able to identify the different crop types and cultivating regions
- Students can acquire knowledge of different types of minerals with their relationship of industries
- Students will have a general understanding of human population patterns and various influencing factors.

UNIT I **PHYSICAL SETTINGS:** Location – relief – Drainage – Climate – soil and Natural Vegetation.

UNIT II **IRRIGATION AND RIVER VALLEY PROJECTS:** Irrigation types – multipurpose projects

UNIT III **AGRICULTURE:** Rice – Cotton – Sugarcane – Coffee Tea – Agricultural regions.

UNIT IV **RESOURCES & MAJOR INDUSTRIES:** Minerals – Iron – Coal – Bauxite; Industries – textile Industries – sugar Industry – cement Industry – Industrial regions.

UNIT V **POPULATION:** Growth, distribution, density and problems; Transport and Trade.

TEXT BOOKS:

1. *R.L. Singh, India Regional Geography – VBS publishers and Distributors Ltd.,NewDelhi, 1995.*
2. *Dr. A. Ramesh and P.S. Tiwari, Basic Resource Atlas Tamil Nadu, University of Madras, 1983*
3. *Poduval R.N, Foodgrain Economy of Tamil Nadu Problems and Prospects, Emerald Publishers, Chennai, 1987.*

4. *Spate, O.H.K. and Learmonth, A.T.A. India and Pakistan: A General and Regional Geography, Methuen Publications, London, 1967.*

REFERENCE BOOKS:

1. *Velappan D, Economic Development of TamilNadu, Emeral Publishers, Chennai, 1986.*
2. *Ranjet Tirtha & Gopala Krishnan, Geography of India, Rawat Publications, Jaipur, 1996.*
3. *Prithvish Nag & Smitha Sengupta, Geography of India, Concept publishing company, NewDelhi, 1999.*
4. *SHBoTN. Statistical Hand Book of Tamil Nadu, Department of Economics and Statistics, Government of Tamil Nadu, Chennai, 2004.*
5. *TNEA. Tamil Nadu, An Economic Appraisal 2011-12 to 2013- 14. Department of Evaluation and Applied Research, Chennai, 2014.*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	Students can understand about the various physical features, climate and natural vegetation.	K2
CO2	To identify the nature of irrigation types and various multipurpose projects with help of agricultural activity	K4
CO3	Students will be identifying the different types of crops and their cultivated regions.	K2
CO4	Students will be able to understanding the location of industries and their availability of mineral resources.	K4
CO5	Students will have a fair knowledge about various population characteristics in relation to transport and trade	K4

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**3**	**2**	**2**	**3**	**2**	**3**	**2**	**3**	**3**	**3**
CO2	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**3**
CO3	**3**	**2**	**2**	**3**	**2**	**2**	**3**	**3**	**3**	**3**	**3**
CO4	**3**	**2**	**3**	**2**	**2**	**2**	**3**	**3**	**2**	**2**	**2**
CO5	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**3**	**2**	**2**	**3**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – IV

ELECTIVE – II – POLITICAL GEOGRAPHY

Credit: 3 **Course Code: U21GEE422** **Hours: 4**

Learning Objectives:

- To understand the development of group identities such as nations and examine the linkages between these identities and the political organization of territory.
- To examine states emergence with an emphasis on how internal and external forces work centripetally and centripetally on the integrity of state territories.
- To develop an appreciation for the effects of boundaries on economic, political, and social processes.
- To study in relevant details theoretical concepts and challenges underpinning the study of geography and politics.
- To identity the political, economic, and environmental forces that are undermining the modern nation-state system.

UNIT I **POLITICAL GEOGRAPHY:** Definition, scope, content and development – Geopolitics – State: Powers and functions of the state – Categories of the state – Nations and Nationalism.

UNIT II **CORE AREAS:** Types, Capitals – Types, Morphological classification, Factors of development, Federal capitals – New and neutral capitals – Capitals in post – 1945 federations.

UNIT III **BOUNDARIES AND FRONTIERS:** Definition, boundary classification, Genetic and functional, Morphological classification (Buffer zone – Land locked countries) – Border disputes.

UNIT IV **ELECTORAL GEOGRAPHY:** Geography of elections – Geography of campaigning, Voting pattern, Voters participation – Opinion poll – Gerry Mandering – Election Commission.

UNIT V **POLITICAL GEOGRAPHY OF INDIA:** Integration of Indian states – Integration of Sikkim – India's bilateral relationship with China, Pakistan and Sri Lanka – SAARC countries - India's foreign policy.

TEXT BOOKS:

1. *Adhikari, Sudeepta, Political Geography of India, Sharda Pustak Bhawan, Allahabad, 2008.*

2. *Bose, Sugata and Ayesha Jalal (eds.), Nationalism, Democracy and Development, Oxford University Press. New Delhi, 1998.*
3. *Brass, Paul, Politics of India since Independence, Cambridge University Press. Cambridge, 1992.*
4. *Cohen Sayl, B., Geography and Politics in a divided world, OUP, New York, 1973.*
5. *De Blij Harm, J., Systematic Political Geography, John Wiley and sons, New York, 1980.*

REFERENCE BOOKS:

1. *Dikshit, R.D., Political Geography of Federalism: An Inquiry into Origins and Stability, Macmillan publication. New Delhi, 1975.*
2. *Dikshit, R.D. Political Geography: A contemporary perspective, McGraw Hill Publishing co., New Delhi, 1982.*
3. *Muir, R., Modern Political Geography, Macmillan, London, 1981.*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	Students will be able to trace the connection between historical process of state formation and modern developments	K2
CO2	To be able to analyse and interpret the key stages in the formation of the modern nation-state	K2
CO3	To understand the origins of political systems and be able to draw on the examples of different regions to explain the diversity of world orders today	K2
CO4	To be able to apply geopolitical theory to analysing the phenomenon of failed states and its implications for the international politics	K3
CO5	To understand the politics of integration and be able to articulate potential challenges to the conventional understanding of sovereignty	K2

K1 – Remember, **K2 – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**3**	**2**	**3**	**2**	**2**	**3**	**2**	**2**	**2**	**3**
CO2	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**3**
CO3	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**3**
CO4	**3**	**3**	**2**	**2**	**2**	**2**	**3**	**3**	**2**	**2**	**2**
CO5	**3**	**2**	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**2**	**2**

****Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0***

SEMESTER – IV

ELECTIVE – II – SUSTAINABLE DEVELOPMENT

Credit: 3 **Course Code: U21GEE423** **Hours: 4**

Learning Objectives:

- Students will be able to define sustainability and identify major sustainability challenges.
- Students will have an understanding of the carrying capacity of ecosystems as related to providing for human needs.
- Students will be able to apply concepts of sustainable development to address sustainability challenges in a global context.
- Students will identify, act on, and evaluate their professional and personal actions with the knowledge and appreciation
- Interconnections among economic, environmental, and social perspectives

UNIT I **SUSTAINABLE DEVELOPMENT:** Definition, Components, Limitations and Historical Background.

UNIT II **THE MILLENNIUM DEVELOPMENT GOALS:** National Strategies and International Experiences

UNIT III **SUSTAINABLE REGIONAL DEVELOPMENT:** Need and examples from different Ecosystems.

UNIT IV **INCLUSIVE DEVELOPMENT:** Education, Health; Climate Change: The role of higher education in sustainable development; The human right to health; Poverty and disease; The Challenges of Universal Health Coverage; Policies and Global Cooperation for Climate Change

UNIT V **SUSTAINABLE DEVELOPMENT POLICIES AND PROGRAMMES:** The proposal for SDGs at Rio+20; Illustrative SDGs; Goal-Based Development; Financing for Sustainable Development; Principles of Good Governance; National Environmental Policy, CDM.

TEXT BOOKS:

1. *Osorio, Leonardo et al, "Debates on sustainable development: towards a holistic view of reality".Environment, Development and Sustainability 7: 501-518, 2005.*
2. *Robbins, Paul, Political Ecology: A Critical Introduction. Blackwell Publishing, 2004.*

3. *Ayers, Jessica and David Dodman, "Climate change adaptation and development I: the state of thedebate". Progress in Development Studies 10 (2): 161-168, 2010.*
4. *Baker, Susan, Sustainable Development. Milton Park, Abingdon, Oxon; New York, N.Y.: Routledge. (Chapter 2, "The concept of sustainable development"), 2006.*

REFERENCE BOOKS:

1. *Agyeman, Julian, Robert D. Bullard and Bob Evans (Eds.), Just Sustainabilities: Development in anUnequal World. London: Earthscan, 2003.*
2. *Brosius, Peter, "Endangered forest, endangered people: Environmentalist representations ofindigenous knowledge", Human Ecology 25: 47-69, 1997.*
3. *Lohman, Larry, "Re-imagining the population debate". Corner House Briefing 28, 2003.*
4. *Martínez-Alier, Joan et al, "Sustainable de-growth: Mapping the context, criticisms and future prospects of an emergent paradigm" Ecological Economics 69: 1741-1747, 2010.*
5. *Merchant, Carolyn (Ed.) Ecology. Atlantic Highlands, N.J: Humanities Press. (Introduction, pp 1-25.), 1994.*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	Students will have acquired Knowledge about the sustainable development of components, limitations and historical background.	K2
CO2	Students will understand an overview of the millennium development goals of the national strategies and international experiences	K2
CO3	Students will understand the different ecosystems.	K2
CO4	Students will have basic concepts about challenges of universal health coverage, policies and global cooperation for climate change	K4
CO5	Students will learn about the good governance.	K2

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**2**	**3**	**2**	**3**	**2**	**3**	**2**	**2**	**3**	**2**
CO2	**3**	**2**	**3**	**3**	**2**	**2**	**3**	**3**	**2**	**3**	**2**
CO3	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**3**	**2**	**2**	**3**
CO4	**3**	**3**	**3**	**2**	**2**	**3**	**3**	**3**	**2**	**2**	**2**
CO5	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**3**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – IV

SBE – II – COMPUTER SKILLS FOR OFFICE MANAGEMENT

Credit: 2 **Course Code: U21CSS42** **Hours: 3**

Learning Objectives:

- Learn to basic information about desktop/laptop.
- Learn to create, edit, file management using MS-Word and MS-Excel.
- Working knowledge in MS-Powerpoint.
- Will get knowledge in Introduction to access and Power point.
- To equip Internet and advanced Communication.

Learning Outcomes:

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

1. Understand to create document and prepare formatted reports with precision and accuracy.
2. Apply the knowledge of mathematical formulae and make the calculation easier for enormous data
3. To study about in Introduction to access and Power point and prepare Power point for their relevant topic
4. Understand Internet and advanced Communication
5. Apply, analysis and evaluate to handle desktop/taptop, MS-Word, MS-Excel, MS-Powerpoint, access internet and communication

UNIT I **DEFINITION OF OPERATING SYSTEM:** Functions of OS - Types of OS: Single user, Multi-User, multi-task, RTOS, Single-user, Multi-tasking – Windows Desk top

UNIT II **INTRODUCTION TO OFFICE - OPEN OFFICE – WRITER:** Word - Working with Documents--Open Office writer-formatting documents-Creating Tables- Table settings, Borders, Alignments, Insertion, deletion, Merging, Splitting, Sorting, and Formula, Insertion of Objects: Equation Editor, Organizational Chart, Drawing - Inserting ClipArts, Pictures/Files etc., Tools – Word Completion, Spell Checks, Mail merge, Templates, Creating contents for books, Creating Letter/Faxes, Creating Web pages, Using Wizards, Tracking Changes, Security, Digital Signature. Printing Documents – Shortcut keys

UNIT III **INTRODUCTION TO EXCEL:** Spread Sheet & its Applications, Opening Spreadsheet, Menus - main menu, Formula Editing, Formatting, Toolbars, Using Icons, Using help, Shortcuts, Spreadsheet types. Working with Spreadsheets- Formatting Spreadsheets-OpenOffice-Calc - Introduction – Introduction to Spreadsheets, Overview of a Worksheet, Creating Worksheet & Workbooks, Organizing files, Managing files & workbooks, Functions & Formulas, Working with Multiple sheets, Creating Charts & Printing Charts – Operating with Excel documents, which are already created and saved in Excel

UNIT IV **INTRODUCTION TO ACCESS AND POWER POINT:** Access: Introduction, Planning a Database, Starting Access, Access Screen, Creating a New Database, Creating Tables, Working with Forms, Creating queries, Finding Information in Databases, Creating Reports, Types of Reports- Power point: Introduction to presentation – Opening new presentation, Different presentation templates, Setting backgrounds, Selecting presentation layouts. Creating a presentation - Setting Presentation style, Adding text to the Presentation.

UNIT V **INTERNET AND ADVANCED COMMUNICATION:** Internet and Web Browsers-internet browsing, searching - Search Engines - Portals - Social Networking sites- Blogs - viewing a webpage, downloading and uploading the website; Creating an email-ID, e-mail reading, saving, printing, forwarding and deleting the mails, checking the mails, viewing and running file attachments, addressing with cc and bcc-Introduction to various devices & Applications: Other than the computers, (electronic gadgets), which are widely using by executives in the Offices – Tablet, Smart Phone – concept of mobile phone and Tablet and their uses – Various applications using by Tablets and Smart Phones such as UC browser, WhatsApp, Maps, Skype, e payments.

TEXT BOOKS:

1. *Sathish Jain, M.Geetha, Karthika, "MS-Office 2010 – Training Guide", BPB Publications, 2010.*
2. *Bittu Kumar, "Mastering MS-Office: Computer Skill Development: be Future Ready", BPB Publications, 2017.*

SEMESTER – IV

NME – II – GEOGRAPHICAL INFORMATION SYSTEM

Credit: 2 **Course Code: U21GEN411** **Hours: 2**

Learning Objectives:

- They can know about concept and components of Geographical Information System.
- Know about GIS data structures.
- Students will able to an idea about GIS Data Analysis.
- They understand the satellite remote sensing
- Students understand the Global Positioning System.

UNIT I **INTRODUCTION:** GIS – Definition – history – components – hardware – software – data – people

UNIT II **GIS DATA TYPES:** Geographic data – point, line and area – spatial data and non spatial data

UNIT III **GIS DATA STRUCTURES:** Data model – raster and vector – data conversation – digitization – errors

UNIT IV **GIS DATA ANALYSIS:** Database Management System (DBMS) – use of GIS

UNIT V **INTRODUCTION Of GPS:** GPS - Definition – history – segments – uses

TEXT BOOKS:

1. *Campbell J. B., Introduction to Remote Sensing, Guildford Press, 2007.*
2. *Jensen J. R., Introductory Digital Image Processing: A Remote Sensing Perspective, Prentice Hall, 2004.*
3. *Joseph, G. Fundamentals of Remote Sensing, United Press India, 2005.*
4. *Nag P. and Kudra, M., Digital Remote Sensing, Concept, New Delhi, 1998.*
5. *Rees W. G., Physical Principles of Remote Sensing, Cambridge University Press, 2001.*

REFERENCE BOOKS:

1. *C.S.Agarwal & P.K.Grag, Text Book of Remote Sensing, Wheeler Publishing, 2000*
2. *Gampbell. James B.I Introduction to Remote Sensing, The Guild Press , New York, 2017*
3. *Curran, Fundamentals of Remote Sensing, Longman, London, 2006*

4. *Lillesend TM & Kiefer R.W, Remote Sensing & Image Interpretation, John Wiley & sons, New York, 2004.*
5. *Luedev D.R. Aerial Photographic Interpretation Mc. Graw Hill Company, New York, 2000*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	Students will acquire knowledge regarding the use of modern tools and technology like GPS, GIS in geographical studies and can apply this knowledge in any field of study.	K3
CO2	They can know about concepts, components, development, and types of GIS	K2
CO3	Students can acquire a broad knowledge regarding GIS and can developed idea about aerial photographs, satellite imagery etc.	K4
CO4	They understand about Aerial photography and Satellite Remote Sensing.	K2
CO5	Develop an idea about interpretation and application of GIS	K4

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**2**	**3**	**2**
CO2	**3**	**3**	**2**	**3**	**2**	**3**	**3**	**3**	**3**	**2**	**3**
CO3	**3**	**2**	**2**	**2**	**2**	**3**	**3**	**2**	**2**	**3**	**2**
CO4	**3**	**2**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**2**	**3**
CO5	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**2**	**2**	**2**	**2**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – IV

NME – II – NATURAL REGIONS OF THE WOLRD

Credit: 2 **Course Code: U21GEN412** **Hours: 2**

Learning Objectives:

- They can know about concept and components of Geographical Information System.
- Know about Natural Regions of the World.
- Students will able to an idea Tropical Monsoon Region.
- They understand the World Deserts
- Students understand the Climate, Natural Vegetation, Animal life, Human life and Economic Development.

UNIT I **INTRODUCTION:** Definition – Natural Regions of the World – Equatorial Region: Situation and extent, Climate, Natural Vegetation, Animal life, Human life and Economic Development.

UNIT II **TROPICAL REGION:** Tropical Monsoon Region – Tropical Savanna – Climate – Soil – Vegetation – Life in Tropics – Economic Activity.

UNIT III **ARID REGION:** World Deserts – Hot Deserts – Cold Deserts – Climate – Soil – Vegetation – Life in Deserts – Economic Activity.

UNIT IV **TEMPERATE REGION:** World Grasslands – (Prairies – Pampas – Downs – Valdes – Canterbury) Climate – Soils – Life in Temperate Regions – Economic activity.

UNIT V **TUNDRA REGION:** Arctic Region – Climate – Vegetation – Life in Tundra Region - Economic Activity.

TEXT BOOKS:

1. *Heintzelman, O.H. and Highsmith R.M. World Regional Geography, Prentice Hall Ltd., New Delhi, 1973.*
2. *Hussain, M. World Geography. Rawat Publication, New Delhi, 2004.*
3. *Robinson, H. Monsoon Asia. McDonald and Evans Ltd., Plymouth, 1977.*

REFERENCE BOOKS:

1. *Stamp, L.D. Asia: A Regional and Economic Geography. B.I. Publication Ltd., New Delhi, 1967.*

2. *Tirtha, R. Geography of Asia. Rawat Publication, New Delhi, 2005.*
3. *Wheeler, J., Kostabade, R. and Thoman, R.S. Regional Geography of the World. Holt Rinehart and Winston, New York, 1969.*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	Students will acquire knowledge regarding the Equatorial Region	K2
CO2	They can know about Tropical Monsoon Region, Tropical Savanna, Climate, Soil, Vegetation, Life in Tropics and Economic Activity	K2
CO3	Students can acquire a broad knowledge regarding World Grasslands	K2
CO4	They understand about Arid Region.	K2
CO5	To help Students learn more about their local area and describe how places make them feel.	K3

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**2**	**3**	**2**	**3**
CO2	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**2**	**2**
CO3	**3**	**2**	**2**	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**3**
CO4	**3**	**2**	**3**	**2**	**3**	**2**	**3**	**3**	**2**	**2**	**2**
CO5	**3**	**3**	**3**	**2**	**2**	**3**	**3**	**3**	**3**	**2**	**2**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – IV

ALLIED – IV

STATISTICS THEORY - II

Credit: 4 **Course Code: U21STA44** **Hours: 5**

Learning Objectives:

- To study the concept of random sample from a distribution, sampling distribution of a statistic, standard errors of important estimates such as mean and proportions.
- To study about important inferential aspects such as point estimation, test of hypotheses and associated concepts,
- To study about inferences from Binomial, Poisson and Normal distributions as illustrations,
- To study about order statistics and associated distributions,
- To study the concept about non-parametric method and some important non-parametric tests.

UNIT I **INTRODUCTION -** Correlation – Scatter Diagram - Karl Pearson's Co-efficient of Correlation - Spearman's Rank Correlation – Regression – Construction of regression equations - Difference between Correlation and Regression – Simple Problems

UNIT II **SAMPLING METHODS** – Advantages and Limitations – Sampling and Non-Sampling Errors – Random sampling methods - Simple Random, Systematic and Stratified Sampling Methods – Non-Radom sampling methods (No Derivations, Only Concepts).

UNIT III **SAMPLING DISTRIBUTION** – Standard Error – Tests of Significance – Null and Alternative Hypotheses – Type I and Type II Errors – Large Sample Tests – Test for Single Mean, Difference of Means, Single Proportion and Difference of Proportions – Simple Problems.

UNIT IV **SMALL SAMPLE TESTS -** Student's' test – Test for Single Mean and Difference of Means(independent and paired samples) – Chi-Square Test –Test for Independence of Attributes and Goodness of Fit – F- test for Equality of Two Variances.

UNIT V **ANALYSIS OF VARIANCE** – Assumptions – One way and Two way Classifications (No Derivations) – Simple Problems.

TEXT BOOKS:

1. Rohatgi V. K. and Saleh A. K. Md. E., An Introduction to probability and Statistics. John Wiley & Sons (Asia).
2. Mukhopadhyay, P., Mathematical Statistics, new Central Book Agency Pvt. Ltd., Calcutta.

3. Hoel P. G., Introduction to Mathematical Statistics, Asia Publishing House.
4. Meyer P. L., Introductory Probability and Statistical Applications, Addision Wesley.
5. J.N. Kapur and H.C. Saxena, "Mathematical Statistics", S. Chand and Co.

REFERENCE BOOKS:

1. Gupta, C.B.(1978): An introduction to Statistical Methods, Vikas Pub.House, New Delhi.
2. Elhance, D.N. (1972): Fundamentals of Statistics, Kitab Mahal, Allahabad.
3. Burt, J.E., Barber, G.M., and Rigby, D.L. (2009): Elementary Statistics for Geographers (3rd Ed.), The Guilford Press.
4. A.M. Gun, M.K. Gupta and B. Dasgupta : Fundamentals of Statistics (Vol. 1) World Press Publication
5. S.C.Gupta, V.K.Kapoor : Fundamentals of Mathematical Statistics Pustakkosh Publication.
6. Hogg and Craig: Introduction to Mathematical Statistics,Pearson Publication.
7. B. L. Agrawal, "Basic Statistics", New Age Publication.

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	After this lesson, the students will have acquired Knowledge about the concept of random sample from a distribution, sampling distribution of a statistic, standard error of important estimates such as mean and proportions	K2
CO2	Students knowledge about important inferential aspects such as point estimation, test of hypotheses and associated concepts.	K2
CO3	Students will understand about inferences from Binomial, Poisson and Normal distributions as illustrations.	K3
CO4	Students will have basic knowledge about order statistics and associated distributions.	K2
CO5	Concept about non-parametric method and some important non-parametric tests.	K2

***K1**– Remember, **K2**– Understand, **K3**– Apply, **K4** – Analyze, **K5**– Evaluate

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	3	3	3	3	3	3	3	2	3	2
CO2	3	3	3	2	3	3	3	3	3	3	3
CO3	3	2	3	2	3	3	2	3	3	3	2
CO4	3	3	3	3	3	3	3	3	2	3	3
CO5	2	3	2	2	3	2	3	3	3	3	3

***Strongly Correlating – 3** **Moderately Correlating – 2**
Weekly Correlating – 1 **No Correlation – 0**

SEMESTER – V

SEMESTER – V

PRACTICAL – II – CLIMATIC DIAGRAM AND WEATHER MAP INTERPRETATION

Credit: 4 **Course Code: U21GEP52** **Hours: 6**

Learning Objectives:

- Diagrammatic data presentation makes it easier for a student to understand the data
- To draw graphs, using suitable axes and scales draw, interpret and compare line graph, Dispersion Diagram, frequency diagrams and climate graph.
- To identify and explain differing weather symbols and the uses and purposes of weather symbols.
- Explain the list of the some instruments that meteorologists use to collect weather data.
- To identify and describe the main human and physical features of your local area.

UNIT I **CLIMATIC DATA ANALYSIS:** Diagrammatic representation of Climatic data – Hyther graph – Climograph – Wind Rose diagram and Ergo graph.

UNIT II **REPRESENTATION OF CLIMATIC DATA:** Temperature and rainfall – Line graphs – Dispersion diagram – Isopleth maps – uses, merits and demerits – Isotherm, Isobars and Isohyets

UNIT III **INDIAN WEATHER MAP INTERPRETATION:** Weather symbols, station model – Weather map interpretation.

UNIT IV **METEOROLOGICAL INSTRUMENTS:** Maximum and minimum Thermometer, Dry and Wet Bulb Thermometer, Fortin's Barometer, Aneroid Barometer, Rain Gauge, Wind Vane, Anemometer.

UNIT V **FIELD WORK OR LOCAL GEOGRAPHY:** Field work and local geography.

TEXT BOOKS:

1. *M. Ishtiaq- Practical Geography-published by Jawahar publishers and Distributors-1994.*

2. *F.J. Monkhouse and H.R. Wilkinson – Maps and Diagrams - B.I Publications - 1952.*
3. *MD.Zulfequar Ahmad Khan-Text Book of Practical Geography - Concept Publishing Company, New Delhi-1998.*
4. *Gopalsingh - Map work and practical geography - Vikas publishing House pvt.Ltd-1996.*
5. *R.L Singh – Elements of Practical Geography, Kalyani publishers,1979*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	Diagrammatic representation can be used for both the educated section and uneducated section of the society.	K2
CO2	Students will able to the graph like Hyther Graph, Climograph, and Ergo graph and difference between the Temperature and Rainfall data analysis.	K4
CO3	Describe how these instruments are used to collect weather data from many geographic locations and many altitudes.	K4
CO4	The role of satellites and computers in modern weather forecasting and meteorologists develop accurate weather forecasts	K3
CO5	To help Students learn more about their local area and describe how places make them feel.	K5

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**3**	**2**	**2**	**3**	**3**	**3**	**2**	**3**	**3**	**3**
CO2	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**2**	**2**
CO3	**3**	**3**	**3**	**3**	**2**	**2**	**3**	**2**	**2**	**3**	**2**
CO4	**3**	**2**	**2**	**2**	**3**	**3**	**3**	**3**	**3**	**3**	**2**
CO5	**3**	**3**	**3**	**3**	**2**	**2**	**3**	**2**	**2**	**2**	**3**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – V

GEOGRAPHY OF RESOURCES – I

Credit: 4 **Course Code: U21GET51** **Hours: 5**

Learning Objectives:

- The course will provide knowledge about the concepts of different types of resources.
- It's also give knowledge about natural resource processes.
- Conservation and management of resources for sustainable development.
- Students will be able to read and interpret information on different types of physical features maps.
- Students shall get to know about the Grass land types and livestock distribution

UNIT I **INTRODUCTION:** Resource – Meaning – Concept of resources – functional – dynamic concepts – Classification of resources – renewable – nonrenewable resources.

UNIT II **LAND RESOURCES:** Land as a resource – land use types and conservation; soil as a resource – erosion and conservation; man as a resource.

UNIT III **WATER RESOURCES:** Water as a resource – uses – irrigation – transport – problems – conservation – fisheries – major fishing grounds of the world – problems.

UNIT IV **NATURAL VEGETATION:** Forest – types – products and conservation.

UNIT V **GRASSLANDS OF WORLD:** Grassland types – livestock distribution.

TEXT BOOKS:

1. *Leong G C, Morgan G C, 'Human and Economic Geography', Oxford University Press, the U.K, 2009.*
2. *Roy Prithwish, 'Economic Geography: A Study of Resources', New Central, Book Agency Pvt. Ltd, 2001.*
3. *Alka Goutham, Geography of Resources, Exploration, Conservation and Management, Sharada Pusthak Bhavan, New Delhi, 2013.*
4. *Khanna K. K. and Gupta, V. K., Economic & Commercial Geography, Sultan Chand & Sons, 1996.*

REFERENCE BOOKS:

1. *Prithvish Roy & Somnathmukerjee – Economic geography an appraisal of resources, new central book agency, culcutta, 2009.*
2. *V.K. Gupta – Economic and Commercial Geography, Sultan Chand and Sons, 1977.*
3. *S.K. Sadhukhan – Economic Geography an Appraisal of resources, S.Chandand company Ltd. – 1982.*
4. *A.Das Gupta – Economic and Commercial Geography, Mukhrjee and Co. Pvt.Ltd. 1978.*
5. *M.C.Agarwal – Commercial Geography, Himalaya Publishing House, 1981.*
6. *B.S.Negi – Economic and Commercial Geography of the World, S.Chand andCo.Ltd. 1980.*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	Students will become sensitized the classification of resources.	K2
CO2	Students will be learning conservation methods and techniques.	K2
CO3	Understanding the basic concept of resource and its various types and their utilities	K2
CO4	Acquiring basic information about potentials and management of resources like land, water, forest and power in global context.	K4
CO5	Understanding the prevailing natural resource potential and problems of management.	K2

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**2**	**3**	**2**	**3**	**3**	**3**	**2**	**3**	**2**	**3**
CO2	**3**	**3**	**2**	**3**	**2**	**2**	**3**	**3**	**2**	**3**	**3**
CO3	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**2**	**3**	**2**	**2**
CO4	**3**	**2**	**3**	**2**	**2**	**3**	**3**	**3**	**2**	**3**	**3**
CO5	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**2**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – V

WORLD REGIONAL GEOGRAPHY

Credit: 4 **Course Code: U21GET52** **Hours: 5**

Learning Objectives:

- Describe what Geography and world Regional Geography are.
- Locate and define the Natural Region of the World.
- Understand the Warm temperate regions and temperate desert region.
- Explain the Cold temperate regions.
- Briefly Explain Cold regions.

UNIT I **INTRODUCTION:** Region – Definition – evolution of regional concept – characteristics of region – Types of region – Generic regions – Major generic regions – Formal – Functional – specific region.

UNIT II **NATURAL REGION OF THE WORLD:** Meaning – Criteria of delimitation of natural regions – Tropical Regions – Equatorial region – savanna region or Sudan type – tropical monsoon region – tropical deserts or Sahara type region.

UNIT III **WARM TEMPERATE REGIONS:** Mediterranean region – temperate desert region – China type region.

UNIT IV **COLD TEMPERATE REGION:** prairie type region – west European region – St.Lawrence type region

UNIT V **COLD REGIONS:** Taiga type – Tundra type – high mountain regions.

TEXT BOOKS:

1. *Heintzelman and Highsmith – World Regional Geography Prentice – Hall, India – 1965.*
2. *Don R.Hoy – Geography and Development a World Regional Approach, Collier Mac Millan Publisher – 1978.*

REFERENCE BOOKS:

1. *Goh – Cheng leong – Certificate Human and Economic Geography – Oxford University Publications – 1995.*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	After this Lesson, the students will have acquired knowledge about the characteristics of region, Types of region, Formal, Functional and Specific region.	K2
CO2	Students will have Knowledge of the Tropical Regions, Equatorial region, Savanna region, tropical monsoon region and tropical deserts.	K2
CO3	Students will gain a better understanding of Mediterranean region, temperate desert region and chinna type region.	K3
CO4	Students will have an effective understand the Prairie type region and West European region.	K2
CO5	Students will gain Knowledge about the Taiga type, Tundra type and high mountain regions.	K2

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**2**	**3**	**2**	**2**	**3**	**3**	**2**	**2**	**2**	**2**
CO2	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**2**	**2**	**3**
CO3	**3**	**2**	**2**	**2**	**3**	**2**	**3**	**3**	**2**	**2**	**2**
CO4	**3**	**2**	**3**	**2**	**3**	**3**	**3**	**3**	**2**	**3**	**3**
CO5	**3**	**3**	**3**	**3**	**2**	**2**	**3**	**3**	**2**	**3**	**3**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – V

HUMAN GEOGRAPHY

Credit: 4 **Course Code: U21GET53** **Hours: 5**

Learning Objectives:

- This paper gives an overall idea about human environment relationship in different environmental condition
- To develop an idea about the world population distribution and the factors that lead to uneven distribution of the population.
- It also focuses on the problem that is likely to arise due to an increase in the world population.
- Students will be able to locate on a map major physical features, cultural regions, and individual states and urban centers.
- Students will understand global and regional patterns of cultural, political and economic institutions, and their effects on the preservation.

UNIT I **NATURE AND PRINCIPLES:** Scope and content, definition – different viewpoints – concept of determinism, Possibilism and Probabilism – Recent trends in human geography – branches in human geography.

UNIT II **SPACE AND SOCIETY:** World cultural regions – Food gatherers – Semang and Sakai; Hunters – Bushmen – Cultivators – People of the Malabar coast – Nomads- Masai and levels of culture in twentieth century.

UNIT III **HUMAN RACE IN WORLD:** Human Races – Classification – Distribution – Religion – Major types and distribution.

UNIT IV **POPULATION:** Spatial pattern of distribution – growth – problems of over population and under population – population Theory – Malthus and optimum theory – Migration – Causes – consequences and problems.

UNIT V **SETTLEMENTS:** Rural and Urban settlement – factors – types – growth – Urban morphology and functional classification of towns – Urbanization – Trend, level, – World , India.

TEXT BOOKS:

1. *Majid Husain, Human Geography, Rawat Publications, 1994.*
2. *Gillian C.Morgan, Human and Economics Geography, Oxford University Publications 1999.*

3. *Aime Vincent Perpillou, Human Geography, Longman Group limited London 1977.*
4. *C.Daryll Forde, Habitat, Economy and Society, Methuen Publishers 1977.*
5. *Ray M.Northam, Urban Geography, John Wiley and sons Publications, 1979.*

REFERENCE BOOKS:

1. *S.K.Shelar, Human geography, Chandralok Prakashan, 2012.*
2. *Amal Datta, Human Migration a social phenomenon, Mittal publication, 2003.*
3. *K.Chakraworthy, Population Geography, Mohit Publication, 2006.*
4. *R.Jagannathan, Human Geography, Dominant Publishers and Distributers, 2012*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	The students will be aware of the scope and contents of human geography.	K2
CO2	Students will acquire an understanding regarding the relationship between prevailing geographic environment and cultural practices of human being.	K2
CO3	This paper tries to build an idea among students regarding the role that geography play in community engagement.	K2
CO4	Students will have a general understanding of global human population patterns, and human impacts on the physical environment.	K3
CO5	Students will have a general understanding of how the physical environment, human societies, and local and global economic systems are integral to the principles of sustainable development.	K2

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**3**	**2**	**2**	**2**	**3**	**3**	**3**	**3**	**3**	**3**
CO2	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**3**	**3**
CO3	**3**	**2**	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**2**	**2**
CO4	**3**	**2**	**3**	**2**	**2**	**2**	**3**	**2**	**2**	**2**	**2**
CO5	**3**	**3**	**2**	**3**	**2**	**2**	**3**	**3**	**2**	**3**	**2**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – V

GOEGRAPHY OF INDIA

Credit: 4 **Course Code: U21GET54** **Hours: 5**

Learning Objectives:

- This course provides an insight into different aspects of physiography, climate, regional variability and culture in India.
- Describing the Importance of the value of Regional and Regionalization of Indian.
- Students can acquire an overall knowledge of agriculture, region, industry, transport and trade of India.
- Students will understand the social distribution of population and transportation network of their country.
- They understand the economic resources of India.

UNIT I **PHYSICAL:** Location – Continent of unity in diversity – Relief – drainage – climate – soil – types and distribution – Natural vegetation – types and distribution.

UNIT II **IRRIGATION:** Need for Irrigation – Types – canal – tank – well – Multipurpose projects.

UNIT III **AGRICULTURE:** Types – Major crops – rice, wheat, millets, cotton, oilseeds, tea, coffee and jute – Agricultural regions – problems – Animal husbandry.

UNIT IV **RESOURCES & INDUSTRIES:** Minerals – coal, oil, iron ore, manganese, bauxite, copper – Power resources – Hydel, thermal and atomic – Industries – Iron and Steel, Cement, Textile, Sugar, Paper, Shipbuilding – Small scale and Cottage Industries.

UNIT V **POPULATION:** Population Growth – distribution – density and problems – Transport and trade.

TEXT BOOKS:

1. *Gopal Singh, Geography of India, Atma Ram, India, 1976.*
2. *Nag, P. and Roy, P., Geography of India, Concept Publications, New Delhi, 1998.*
3. *Tirtha, R., Geography of India, Rawat Publications, Jaipur, 1996.*

4. *Majid Hussain, Geography of India, McGraw, 2009.*
5. *Hill India Rajaram K, Geography Of India, Spectrum Books (P) Ltd, 2015.*

REFERENCE BOOKS:

1. *Ranjit Tirtha and Gopal Krishnan, Geography of India Rawat publications, Jaipur, New Delhi, 1996.*
2. *Prithvish Nag and Smita Sengupta, Geography of India, Concept Publishing Company, New Delhi, 1999.*
3. *C.B. Mamoria, Geography of India, Shivalal Agarwala & Company, Agra, 1975.*
4. *R.L. Singh, India A Regional Geography, National Geographical Society of India, 1971.*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	The student will get familiarized with the geographic dimensions of India in terms of its political and administrative characteristics; aspects of its regional vitality; and formation of regions.	K2
CO2	The student will understand climatic condition and seasons in India.	K3
CO3	They understand globalization and Indian economy and also understand the regional distribution of resource.	K2
CO4	They understand the population problems in India. Access the population policies and reaction the countries.	K3
CO5	Applying the knowledge of global issues to a unique scientific problem.	K4

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**3**	**3**	**3**
CO2	**3**	**3**	**2**	**3**	**2**	**2**	**3**	**3**	**2**	**3**	**2**
CO3	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**2**
CO4	**3**	**2**	**3**	**2**	**2**	**2**	**3**	**3**	**2**	**2**	**3**
CO5	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**2**	**2**	**2**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – V

ELECTIVE – III – BIO GEOGRAPHY

Credit: 3 **Course Code: U21GEE531** **Hours: 3**

Learning Objectives:

- The broad objective of the course is to introduce to the students the concept of biogeography.
- Students will also learn the components, interpretation and application of biogeography.
- Interaction between living organisms and non-living organisms.
- The students will have a basic knowledge of Living organisms with climate and physical environment.
- Students will be evaluating the biogeochemical cycle and biodiversity conservation measures in India.

UNIT I **BASIC CONCEPTS:** Definition, scope and significance of biogeography – basic ecological concepts and principles – ecosystem – types of ecosystems – components of ecosystem – functioning of ecosystem – concepts of biome – types, ecotone and community – bio diversity.

UNIT II **EVOLUTION OF LIFE ON EARTH THROUGH GEOLOGICAL TIME:** Origin of fauna and flora – plant and animal evolution through geological times – distribution of plant life on earth and its relation to soil types – climates and human practices.

UNIT III **EXTINCTION OF FLORA AND FAUNA:** Problem of extinction of plant and animal life – habitat decay and their conservation – process of desertification – its consequences and its management principles.

UNIT IV **INDUSTRIES EFFLUENTS SPECIAL REFERENCE OF RIVERS IN INDIA:** Industrial effluent and its effect on fresh water biology – management practices (special reference to India)

UNIT V **STUDY OF ECOLOGICAL REGIONS IN INDIA:** Study of ecological regions of Himalayas and Western Ghats in relations to their plant and animal life, their Interrelations, problems – conservation and management measures.

TEXT BOOKS:

1. *MacDonald, G., Biogeography: Introduction to space, time and life. Wiley, 2001.*
2. *Eugene Pleasants Odum, Basic Ecology. Saunders College Pub; and digital edition, 2011, The University of Michigan, 1983.*
3. *G. Tyler Miller and Scott Spoolma. Essentials of Ecology. Cengage Learning, 2014.*
4. *Swarnim K, Climate, Forest, Biodiversity and Desert, Surendra Publications, New Delhi, 2012.*
5. *Gerald G Marten., Human Ecology: Basic Concepts for Sustainable Development. Taylor and Francis. USA, 2008.*

REFERENCE BOOKS:

1. *Robinson, Biogeography, ELBS Mc Donald and Evans London, 1982*
2. *L.G. Simons, Biogeographically process, Allen and Unwell, London.*
3. *C Barry, Cox, Black Well, Biographical An Ecological Evolutionary Approach, Oxford 1977.*
4. *B. Seddon, Biogeography, Duck worth, London, 1971.*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	Students will be learning about the concept and relevance of biogeography, ecosystem and ecology responsible for the global trend.	K2
CO2	Students will be able to biodiversity, types of biodiversity, the role of humans in ecological disturbances and conservation issues and identify ecological aspects of the environment.	K3
CO3	Able to Geography converging and forming our biosphere.	K2
CO4	Students will be able to discuss the basics of ecosystem services and the consequences of ecosystems.	K4
CO5	Able to apply interaction of biotic and abiotic resources.	K4

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**2**	**3**	**2**	**2**	**3**	**3**	**2**	**3**	**3**	**2**
CO2	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**3**	**2**	**2**	**2**
CO3	**3**	**2**	**2**	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**3**
CO4	**3**	**2**	**3**	**2**	**2**	**2**	**3**	**2**	**2**	**2**	**3**
CO5	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**3**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – V

ELECTIVE – III – INDUSTRIAL GEOGRAPHY

Credit: 3 **Course Code: U21GEE532** **Hours: 3**

Learning Objectives:

- They can know about their nature and scope of industrial geography.
- They understand the industrial location
- Students understanding the general idea of coal and iron based industries
- Students can acquire knowledge of different types of minerals with their relationship of industries
- Students will have a general understanding of industrial patterns and various influencing factors.

UNIT I **INTRODUCTION:** Nature and Scope of Industrial Geography

UNIT II **INDUSTRIES:** Types, Geographical Characteristics and Location of Industries (Weber's Theory): Small and Medium Industries, Heavy Industries: Coal and Iron based industries, Rural based Industries, Footloose Industry

UNIT III **MEGA INDUSTRIAL COMPLEXES:** National Capital Region, Mumbai – Pune Industrial Region, Bengaluru-Chennai Industrial Region and Chota Nagpur Industrial Region

UNIT IV **IMPACT OF INDUSTRIALIZATION IN INDIA:** Environmental; Social and Economic

UNIT V **INDUSTRIAL POLICY:** Industrial Policy of India

TEXT BOOKS:

1. *Alexander J.W. Economic Geography, Printice Hall of India Pvt. Ltd., New Delhi, 1979.*
2. *Goh Cheng Leong. "Human and economic geography", Oxford University Press, New York, 1997.*
3. *Thoman, R.S., Conkling E.C. and Yeates, M.H. Geography of Economic Activity, McGrawHill Book Company, 1968, 1968.*

4. *Miller, E. Geography of Manufacturing Printice Hall - Englewood Cliff, New Jersey, 1962.*
5. *Tiwari, R.C. Geography of India. Prayag Pustak Bhawan, Allahabad, 2007.*

REFERENCE BOOKS:

1. *Gunnar Alexandersson "Geography of Manufacturing, Prentice Hall, New Jersey Truman, 1967.*
2. *A. Harishorn, John W. Alexander " Economic Geography", Prentice Hall of India Ltd., New Delhi, 2000.*
3. *Singh, Jagdish India - A Comprehensive & Systematic Geography, Gyanodaya Prakashan,Gorakhpur, 2003.*
4. *Pathak, C. R. Spatial Structure and Processes of Development in India. Regional ScienceAssoc., Kolkata, 2003.*
5. *Sharma, T.C. Economic Geography of India. Rawat Publication, 2013.*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	Students will be able to identify the different industrial regions in India	K2
CO2	Students will gain knowledge about the Weber's Theory	K3
CO3	Students will be learning the significance of various industries.	K2
CO4	Evaluating the impacts of industrialization growth on natural environments, social and economic special reference to India	K4
CO5	After complete the lesson students got the appropriate awareness about Industrial Policy of India	K5

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**2**	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**2**	**3**
CO2	**3**	**3**	**2**	**2**	**2**	**2**	**3**	**3**	**2**	**3**	**2**
CO3	**3**	**2**	**3**	**3**	**2**	**2**	**2**	**3**	**3**	**3**	**2**
CO4	**3**	**3**	**2**	**2**	**3**	**2**	**3**	**2**	**2**	**3**	**3**
CO5	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**2**	**2**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – V

ELECTIVE – III – DISASTER STUDIES

Credit: 3 **Course Code: U21GEE533** **Hours: 3**

Learning Objectives:

- To understand basic concepts in Disaster Management
- To Understand Definitions and Terminologies used in Disaster management
- To Understand Types and Categories of Disasters
- To Understand the Challenges posed by Disasters
- To understand Impacts of Disasters

UNIT I **DISASTER:** Meaning and classification – Concepts of disaster – Hazard – Catastrophe – Risk and vulnerability – Disaster zones of India.

UNIT II **GEOLOGICAL HAZARDS:** Earthquakes - Scale of measurement - Intensity and magnitude - Earthquake prone zones - Volcanic hazards - Landslides and Tsunami.

UNIT III **CLIMATIC DISASTERS:** Cyclones – Flood – Drought – Avalanche and Frost - Forest fire.

UNIT IV **HUMAN INDUCED:** Thermal, Nuclear and chemical disaster – Health hazard, Global warming – Ground water depletion and deforestation.

UNIT V **DISASTER MANAGEMENT ORGANIZATIONS:** International – National – State and Local level - NGO - Disaster Cycle – Preparatory phase – Emergency phase, Rehabilitation and Reconstruction process – Mitigation and management. NROM – NIDM – SDMC.

TEXT BOOKS:

1. *Abbott, P.L. Natural Disasters, Wm. C. Brown Publishing Co., New York, 1996.*
2. *Agarwal Gurcharan Singh S.K., and Inderjeet Sethi, The Degrading Environment(cause of Concern) Commonwealth Publication, New Delhi, 1993.*
3. *Agarwal, S.K. Global Warming and Climate Change, A.P.H. Publications, New Delhi, 2004.*
4. *Ghosh G.K. Disaster Management, A.P.H. Publishing Corporation, New Delhi, 2008.*

5. *Goel, S. L. Disaster Management. Deep & Deep Publication Pvt.Ltd, New Delhi, 2008.*

REFERENCE BOOKS:

1. *Kumaraswamy. K, GIS for Natural Resources and Disaster Management, Union offsetprinters, Tiruchirappalli, 2009.*
2. *Narayan, B. Disaster Management. A.P.H. Publishing Corporation, New Delhi, 2009.*
3. *Nicholas, K. Geohazards, Natural and human, Prentice hall of India, Delhi, 1995.*
4. *Saxena, H.M. Natural Disasters, Wm. C. Brown Publishing Co., New York, 1996.*
5. *Singh, R. B. Disaster Management, Rawat Publications. New Delhi, 2008.*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	Describe Definitions and Terminologies used in Disaster Management, Types and Categories of Disasters	K2
CO2	Students will be able to challenges posed by Disasters and Impacts of Disasters	K2
CO3	Describe various disasters that India is vulnerable to, and the hazard maps that enable them to visualize their vulnerabilities	K3
CO4	To understand about the Natural Disasters its Causes and Consequences	K4
CO5	To learn about Disaster Management and Mitigation.	K2

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**2**	**3**	**2**	**2**	**3**	**3**	**2**	**2**	**2**	**3**
CO2	**3**	**3**	**3**	**3**	**2**	**3**	**2**	**3**	**3**	**3**	**2**
CO3	**3**	**2**	**2**	**3**	**3**	**2**	**3**	**3**	**2**	**2**	**3**
CO4	**3**	**2**	**3**	**2**	**3**	**2**	**2**	**3**	**3**	**3**	**3**
CO5	**3**	**3**	**2**	**3**	**2**	**3**	**3**	**3**	**2**	**2**	**2**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – V

SBE - PRACTICAL – III

APPLICATION OF STATISTICAL METHODS IN GEOGRAPHY

Credit: 2 **Course Code: U21GES53** **Hours: 2**

Learning Objectives:

- Understanding for the student on statistical concepts to include measurements of location and dispersion, sampling, estimation, hypothesis testing, regression, and correlation analysis, multiple regression analysis.
- Students will be understood the statistical methods are applied in geography in order to make precise statements.
- Keeping the nature of data and purpose of study, students would be able to make a rational choice amongst listed various statistical methods.
- Perform Test of Hypothesis as well as calculate confidence interval for a population parameter for single sample and two sample cases.
- Compute and interpret the results of Multivariate Regression and Correlation Analysis, for forecasting.

UNIT I **BASIC CONCEPTS:** Data – Data sources and types of data raw data – variables – class – class limits – class boundaries – class width – class – class mark – class frequencies.

UNIT II **FREQUENCY DISTRIBUTION AND GRAPHS:** Frequency distribution – cumulative frequency – graphical representation of frequency distribution.

UNIT III **MEASURES OF FREQUENCY DISTRIBUTION:** Histogram – frequency curve – frequency polygon – cumulative frequency polygon – cumulative frequency curve.

UNIT IV **MEASURES OF CENTRAL TENDENCY:** Mean – median – mode – Skewness and Kurtosis – Selection of class intervals for mapping.

UNIT V **MEASURES OF DISPERSION:** Mean Deviation, Standard Deviation, Quartile Deviation and Coefficient Variation, Quartiles, Deciles and Percentiles

TEXT BOOKS:

1. *Ebdon D., Statistics in Geography: A Practical Approach, 1977.*
2. *Hammond P. and McCullagh P. S., Quantitative Techniques in Geography: An Introduction, Oxford University Press, 1978.*
3. *King L. S., Statistical Analysis in Geography, Prentice-Hall, 1969.*
4. *Mahmood A., Statistical Methods in Geographical Studies, Concept Pub. Co, 1977.*
5. *Pal S. K., Statistics for Geoscientists, Tata McGraw Hill, New Delhi, 1998.*

REFERENCE BOOKS:

1. *V.P. Subrahmanyam and Subramaniam, A.R. Application of water balance concept for a climatic study of droughts in south India, 1964*
2. *Sarkar, A. Quantitative geography: techniques and presentations. Orient, 2013.*
3. *Silk J., Statistical Concepts in Geography, Allen and Unwin, London, 1979.*
4. *Yeats M., An Introduction to Quantitative Analysis in Human Geography, McGraw Hill, New York, 1974.*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	Keeping in view the nature of data and purpose of study, students would be able to make a rational choice amongst listed various statistical methods.	K2
CO2	Demonstrate understanding of basic concepts of probability and statistics embedded in their courses.	K3
CO3	Students will be able to how to apply discrete and continuous probability distribution to various business problems.	K3
CO4	Show proficiency in basic statistical skills embedded in their courses.	K4
CO5	Students shall know how to organize, manage, and present data.	K5

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**2**	**3**	**2**	**2**
CO2	**3**	**3**	**3**	**2**	**3**	**2**	**3**	**3**	**2**	**3**	**2**
CO3	**3**	**2**	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**3**	**2**
CO4	**3**	**2**	**2**	**2**	**2**	**2**	**3**	**3**	**3**	**2**	**3**
CO5	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**3**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – V

VALUE ADDED COURSE

FIELD WORK AND RESEARCH METHODOLOGY (PRACTICAL)

Credit: 2

Learning Objectives:

- This paper is a field based paper where students developed their field based knowledge
- Examine the introduction of Research, motivation in research, types of research, significance of research, research process and criteria of good research.
- Students able to tackle or face any problem while conducting a research project.
- To understand meed, features, development of research and sampling design and its basis types.
- Understand interpretation and report-writing techniques, mechanics of writing of Report.

UNIT I **FIELD WORK IN GEOGRAPHICAL STUDIES:** Role, Value, Data and Ethics of Field-Work

UNIT II **A CASE STUDY:** Defining the Field and Identifying the Case Study – Rural / Urban / Physical / Human / Environmental.

UNIT III **METHOD OF COLLECTION OF DATA:** Field Techniques – Merits, Demerits and Selection of the Appropriate Technique; Observation (Participant / Non Participant), Questionnaires (Open/ Closed / Structured / Non-Structured); Interview with Special Focus on Focused Group Discussions; Space Survey (Transects and Quadrants, Constructing a Sketch)

UNIT IV **QUANTITATIVE TECHNIQUE IN GEOGRAPHY:** Use of Field Tools – Collection of Material for Physical and Socio-Economic Surveys.

UNIT V **RESEARCH DESIGN:** Designing the Field Report – Aims and Objectives, Methodology, Analysis, Interpretation and Writing the Report.

PRACTICAL RECORD

1. Each student will prepare an individual report based on primary and secondary data collected duringfield work.

2. The duration of the field work should not exceed 10 days.
3. The word count of the report should be about **8000 to 12,000** excluding figures, tables, photographs,maps, references and appendices.
4. One copy of the report on A 4 size paper should be submitted in soft binding.

TEXT BOOKS:

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

REFERENCE BOOKS:

1. *Mukherjee, Neela. Participatory Learning and Action: with 100 Field Methods. Concept Publs.Co., New Delhi, 2002.*
2. *Special Issue on "Doing Fieldwork" The Geographical Review 91:1-2, 2001.*
3. *Stoddard R. H., Field Techniques and Research Methods in Geography, Kendall/Hunt, 1982.*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	Students should understand the link between quantitative research questions and data collection	K2
CO2	Learn the significance of field work in geographical studies.	K2
CO3	Understand the meaning of field and identifying the case study.	K2
CO4	Know about different types of field techniques.	K4
CO5	Develop an idea about research problems.	K5

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**3**	**2**	**2**	**3**	**3**	**3**	**2**	**3**	**3**	**3**
CO2	**3**	**3**	**2**	**3**	**3**	**2**	**2**	**2**	**3**	**2**	**2**
CO3	**3**	**2**	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**3**	**3**
CO4	**3**	**2**	**3**	**2**	**3**	**2**	**2**	**3**	**2**	**2**	**3**
CO5	**3**	**3**	**3**	**3**	**2**	**2**	**3**	**3**	**2**	**2**	**2**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – VI

SEMESTER – VI

GEOGRAPHY OF RESOURCES – II

Credit: 4 **Course Code: U21GET61** **Hours: 5**

Learning Objectives:

- It is an introductory course of resource geography which is aimed at providing knowledge about the concept of resource and its classification, and the distribution, utilization and management of land, water, forest and energy resources.
- It also focuses on the natural resource and its problems of conservation and management.
- Besides, it also provides basic idea about sustainable development of resources.
- They understand the concept of different types of resources
- They learn about use and misuse of resources.

UNIT I **AGRICULTURE:** Types – intensive, extensive, wet and dry, mixed farming, subsistence farming, commercial farming and plantation agriculture.

UNIT II **RESOURCE:** Energy as a resource – coal, oil, water and a nuclear power, – non conventional – solar and wind.

UNIT III **MINERALS:** Ferrous, non – ferrous – iron ore, manganese, mica, copper and bauxite.

UNIT IV **MAJOR INDUSTRIES:** Location factors, iron and steel, automobile, shipbuilding and textile industries.

UNIT V **TRANSPORT:** Land, water and air – trade – internal and international.

TEXT BOOKS:

1. *Leong G C, Morgan G C, 'Human and Economic Geography', Oxford University Press, the U.K, 2009.*
2. *Roy Prithwish, 'Economic Geography: A Study of Resources', New Central, Book Agency Pvt. Ltd, 2001.*
3. *Alka Goutham, Geography of Resources, Exploration, Conservation and Management, Sharada Pusthak Bhavan, New Delhi, 2013.*

4. *Khanna K. K. and Gupta, V. K., Economic & Commercial Geography, Sultan Chand & Sons, 1996.*

REFERENCE BOOKS:

1. *Prithvish Roy & Somnath mukerjee, Economic geography an appraisal of resources, new central book agency, Culcutta, 2009.*
2. *V.K. Gupta, Economic and Commercial Geography, Sultan Chand and Sons, 1977.*
3. *S.K. Sadhukhan, Economic Geography an Appraisal of resources, S.Chandand company Ltd. – 1982.*
4. *A.Das Gupta, Economic and Commercial Geography, Mukhrjee and Co. Pvt.Ltd. 1978.*
5. *M.C.Agarwal, Commercial Geography, Himalaya Publishing House, 1981.*
6. *B.S.Negi, Economic and Commercial Geography of the World, S.Chand and Co.Ltd. 1980.*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	Students will become sensitized to concept and classification of resources, use or misuse and will learn conservation methods and techniques.	K2
CO2	Develop an idea about resource.	K3
CO3	Understand the agricultural recourses	K2
CO4	Acquire knowledge about different types of Mineral and power resources.	K2
CO5	Showing an awareness and responsibility for the environment.	K4

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**3**	**2**	**2**	**3**	**3**	**3**	**2**	**2**	**3**	**2**
CO2	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**2**	**3**
CO3	**3**	**2**	**3**	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**3**
CO4	**3**	**2**	**3**	**2**	**2**	**2**	**3**	**3**	**2**	**2**	**2**
CO5	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**2**	**2**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – VI

GEOGRAPHICAL THOUGHT

Credit: 4 **Course Code: U21GET62** **Hours: 5**

Learning Objectives:

- This paper is a core paper that intends to introduce students to philosophical and methodological issues in the development of the discipline of geography.
- To assess the nature and trend of ancient, modern and post-modern trends in the field of geography
- Explain the pre-history of geographical ideas in different dimension form Greek, Roman and impact of explorations and discoveries.
- Students will be evaluating the fundamental concepts in geography these are general geography was regional geography, determinism/possibilism.
- Student will be learn about the trend of Indian Geography in Colonial and postcolonial period.

UNIT I **PREHISTORY OF GEOGRAPHICAL IDEAS:** Greek, Roman, Arab – impact of exploration and discoveries.

UNIT II **MODERN GEOGRAPHICAL THOUGHT:** American, British, German, French – development of geography of India.

UNIT III **PERSPECTIVES IN GEOGRAPHY:** Dualism and dichotomy in Geography – physical Vs human, determinism Vs possibilism, qualitative Vs quantitative,

UNIT IV **RECENT TRENDS IN GEOGRAPHY:** Tradition in geography – quantitative revolutions – regional concepts.

UNIT V **NEW SYNTHESIS IN GEOGRAPHY:** Multi disciplinary approach – role of remote sensing – GPS and GIS.

TEXT BOOKS:

1. *Dikshit R. D., Geographical Thought: A Contextual History of Ideas, Prentice–Hall India, 1997.*
2. *Hartshone R., Perspectives of Nature of Geography, Rand MacNally and Co, 1959.*
3. *Holt-Jensen A., Geography: History and Its Concepts: A Students Guide, SAGE, 2011.*

4. *Johnston R. J., Geography and Geographers, Anglo-American Human Geography since 1945, Arnold, London, 1997.*
5. *Kapur A., Indian Geography: Voice of Concern, Concept Publications.*

REFERENCE BOOKS:

1. *Negi B.S. Geographical thought – Karinath Ramnathmeerat 1994.*
2. *Freeman. R. Hundred Years of geography – Hutchinson London 1970*
3. *Martin Geoffrey J., 2005: All Possible Worlds: A History of Geographical Ideas, Oxford, 2001.*
4. *Soja, Edward, Post-Modern Geographies, Verso, London. Rawat Publ., Jaipur and New Delhi, 1997.*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	The paper will be useful for students in understanding perspectives on the development and contemporary trends in geography and its systematic study.	K2
CO2	Students will demonstrate an advanced understanding of the historical development of geographical thought.	K2
CO3	Develop an idea about evolution of geographical thinking and disciplinary trends in Germany, France, Britain, and United States of America.	K2
CO4	Build an idea about between environmental determinism and possibillism, systematic and regional.	K2
CO5	Know about the modern geographical thoughts and contribution of geography.	K4

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**3**	**2**	**2**	**2**	**3**	**3**	**2**	**3**	**3**	**3**
CO2	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**2**	**2**	**2**	**3**
CO3	**3**	**2**	**3**	**3**	**3**	**2**	**3**	**3**	**2**	**2**	**2**
CO4	**3**	**2**	**3**	**2**	**3**	**2**	**3**	**3**	**3**	**2**	**2**
CO5	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**2**	**3**	**2**	**3**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – VI

PRACTICAL – SOCIO ECONOMIC DATA ANALYSIS AND IMAGE INTERPRETATION

Credit: 4 **Course Code: U21GEP63** **Hours: 6**

Learning Objectives:

- Understanding Population data.
- Explaining Transport analysis.
- Understand Agricultural data analysis
- Briefly Explain Index of industrial Diversification.
- Understand Nelson's and Rafiullah's methods.

UNIT I **DIAGRAMMATIC REPRESENTATION OF DATA:** Line, Bar, Isopleths

UNIT II **REPRESENTATION OF AREA DATA:** Dots and spheres, proportional circles and Choropleth

UNIT III **CONVENTIONAL SIGN AND SYMBOLS:** Conventional signs and symbols in topographical maps – NATMO maps and ordinance survey maps

UNIT IV **INTERPRETATION OF TOPOGRAPHICAL MAP:** Interpretation of SOI Topographic sheets – Relief features, land use, settlement and transportation and vegetation type

UNIT V **INTERPRETATION OF ORDNANCE SURVEY MAP:** Interpretation of Ordinance survey maps – Interpretation of aerial photographs and satellite images.

TEXT BOOKS:

1. *Dr.M. Kudrat – Digital Remote Sensing concept publishing company, NewDelhi – 1998.*
2. *K.K. Rampal – Handbook of Aerial Photography and Interpretation – concept publishing company, NewDelhi-1999.*
3. *R.K.BanerjeeBireswar Banerjee – Remote Sensing Techniques for Regional Development – Ashok Kumar Mittal Concept publishing Company – 2000.*
4. *F.J.Monkhouse and H.R Wilkinson, Maps and Diagrams, B.I. Publications, Madras, 2003.*

REFERENCE BOOKS:

1. *R.P.Misra, A. Ramesh – Fundamentals of cartography – concept publishing company – 2000.*
2. *R.L.Singh Elements of Practical Geography, Kalyani Publishres, NewDelhi, 2003.*
3. *Gopal Singh, Map work and Practical Geography, Vikas publishing house Ltd, 1986.*
4. *M.D.ZulfequarahamadKhan, Text Book of Practical Geography, Concept Publishing Company, NewDelhi, 1991.*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	Students will learn about the Simple line graph, Semi log - log log graph, Age and Sex Pyramid, Triangular graph and Population potential map.	K3
CO2	Students will learn and understand the Connectivity measures, Alpha, Beta and Gamma indices and Accessibility measures Binary matrix.	K3
CO3	Students will know the Index of Industrial Diversification.	K3
CO4	Students will have the knowledge of the Crop Combination analysis, Weaver's, Doiand Rafiullah's methods, Crop diversification Bhatia's method.	K4
CO5	Students will gain knowledge about the Nelson's and Rafiullah's method.	K5

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**2**	**3**	**2**	**3**	**3**	**3**	**2**	**3**	**3**	**3**
CO2	**3**	**3**	**3**	**2**	**2**	**3**	**3**	**3**	**2**	**3**	**3**
CO3	**3**	**2**	**2**	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**3**
CO4	**3**	**3**	**3**	**2**	**2**	**2**	**3**	**2**	**2**	**2**	**2**
CO5	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**3**	**2**	**2**	**2**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – VI

PRACTICAL – FUNDAMENTALS OF MAP PROJECTIONS

Credit: 4 **Course Code: U21GEP64** **Hours: 6**

Learning Objectives:

- To understanding the general idea of maps and projections.
- To learn the graphical and polar case projection types with their usage
- Students will be able to identify the different forms of projection
- Students can acquire knowledge of how the three dimension earth drawn into two dimensional representations in a paper or sheet.
- At the end of the lesson students can get a clear idea about cartographic techniques and GIS based software's.

UNIT I **INTRODUCTION:** Properties of the maps and globe; Map Projection: General principles and classification of Projections: Construction, Properties, limitations and uses of projections.

UNIT II **ZENITHAL PROJECTIONS:** Gnomonic, Stereographic and Orthographic (Polar cases) – characteristics and their uses.

UNIT III **CONICAL PROJECTIONS:** One standard parallel, Two standard parallels, Bonne's and Polyconic projection – characteristics and their uses.

UNIT IV **CYLINDRICAL PROJECTIONS:** Simple cylindrical, Equal area cylindrical – characteristics and uses.

UNIT V **SINUSOIDAL AND MOLLWEIDE'S PROJECTIONS:** Sinusoidal and Mollweide's projections – choice of projections.

TEXT BOOKS:

1. *Zulfequar Ahmad Khan M.D, Text book of Practical Geography, concept*
2. *Pubishing Company, 1998.*
3. *Siya Ram Sharma, Practical Geography, Murali Lal & Sons Pvt.Ltd, 2008.*
4. *Singh L.R, Fundamentals of Practical Geography, Sharda Pustak Bhavan, 2009.*
5. *Gopal Singh, Map Work and Practical Geography (4th Edition), Vikas Publishing House, Ahmedabad, 1998.*

REFERENCE BOOKS:

1. *M. Ishtiaq- Practical Geography-published by Jawahar publishers and Distributors-1994.*
2. *F.J. Monkhouse and H.R. Wilkinson-Maps and Diagrams – B.I.Publications-1952.*
3. *MD.Zulfequar Ahmad Khan-Text Book of Practical Geography – Concept Publishing Company, New Delhi-1998.*
4. *R.L Singh – Elements of Practical Geography, Kalyani publishers, 1979*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	Students can be trained the basic principles of geographic coordinate systems in relation to the earth shape.	K2
CO2	Students will be able to identify how to drawn our earth surface in a suitable projection in our place	K3
CO3	Students will be able to identifying the different forms of projections in relation to the surface of the earth transformed into a flat surface drawn by plain paper.	K3
CO4	Students will develop a solid understanding of the distortion of various map projection on the earth surface	K2
CO5	After complete the lesson students got the appropriate awareness of coordinate system of projection in various countries of the world.	K5

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**3**	**3**	**2**	**2**	**2**	**3**	**3**	**3**	**3**	**3**
CO2	**3**	**3**	**2**	**3**	**3**	**2**	**2**	**3**	**2**	**2**	**2**
CO3	**3**	**3**	**3**	**3**	**2**	**2**	**3**	**3**	**3**	**2**	**2**
CO4	**3**	**2**	**3**	**2**	**3**	**2**	**2**	**3**	**2**	**3**	**2**
CO5	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**3**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – VI

REGIONAL GEOGRAPHY OF NORTH AMERICA

Credit: 4 **Course Code: U21GET63** **Hours: 5**

Learning Objectives:

- Students understanding the general idea of location and physical aspects of North America
- Understand climatic condition and seasons in North America
- Students will be able to identify the different crop types and cultivating regions
- Students can acquire knowledge of different types of minerals with their relationship of industries
- Students will have a general understanding of human population patterns and various influencing factors.

UNIT I **PHYSICAL SETTINGS**: Relief – The Canadian shield – Western mountains – interior plains – Appalachian mountains – coastal plains – drainage – The Artic – Pacific – Atlantic and Inland drainage systems – climate – Winter – Summer – climatic regions – soil – Major types – natural vegetation – major natural vegetation zones of North America.

UNIT II **AGRICULTURE:** Main crops – wheat – rice corn – cotton – tobacco – sugarcane- sugar beet – Agricultural regions of North America.

UNIT III **MINERAL AND POWER RESOURCES:** Iron ore, – copper – zinc – lead – gold – coal – petroleum – natural gas – hydroelectricity – Industries – iron and steel – cotton textile – woollen – automobile – ship building – air craft – chemical industries.

UNIT IV **POPULATION:** Distribution – density – problems – urbanization

UNIT V **TRANSPORT:** Land, water and air – Trade.

TEXT BOOKS:

1. *Jone S and Briyan – North America – Methuen. – 1963*
2. *Paterson – North America – Oxford University Press – 1984*
3. *White C – Regional Geography of Anglo America, Methuen -1979*

REFERENCE BOOKS:

1. *B.S. Negi – Economic and Commercial Geography of the World, S. Chand and Company Ltd., - 1982.*
2. *S.K. Sadhukhan – Economic Geography and appraisal of resources Chand S and company Ltd., - 1982.*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	They can know about their land formation, climate and natural vegetation in North America	K2
CO2	They understand the economic resources of region.	K2
CO3	Students will be identifying the different types of crops and their cultivated regions.	K2
CO4	Students will be able to understanding the location of industries and their availability of mineral resources.	K2
CO5	Students will have a fair knowledge about various population characteristics in relation to transport and trade	K2

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**3**	**2**	**3**	**2**	**3**	**3**	**2**	**3**	**2**	**2**
CO2	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**2**	**2**
CO3	**3**	**2**	**2**	**3**	**3**	**3**	**2**	**2**	**2**	**2**	**3**
CO4	**3**	**2**	**3**	**2**	**2**	**2**	**3**	**3**	**2**	**2**	**3**
CO5	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**2**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – VI

ELECTIVE – IV – TRAVEL AND TOURISM

Credit: 3 **Course Code: U21GEE641** **Hours: 4**

Learning Objectives:

- Understanding the concept of tourism, leisure, history of tourism and type of tourism.
- Explaining determinants and motivation tourism.
- Describing elements of tourism, socio economic impact on tourism development.
- Students will be able to travel formalities, travel, facilities visa, passport, etc.
- Students will understand tourism planning and problem to Tamil Nadu.

UNIT I **BASIC CONCEPTS AND TYPES OF TOURISM:** Concepts of tourism and leisure – principles and purpose of geography of tourism – history of tourism – ancient – medieval – modern – Types of tourism.

UNIT II **DETERMINANTS OF TOURISM:** Determinants and motivation of tourism – measurement of tourism

UNIT III **ELEMENTS OF TOURISM:** Attraction, accommodation and accessibility Socio economic impact on tourism development

UNIT IV **TRAVEL FORMALITIES:** Tour Itinerary – Travel Agencies – International Concessions – Travel abroad- facilities- Visa, Passport, Bank restrictions – Traveler's Cheques.

UNIT V **TOURISM AND ENVIRONMENT:** Tourism and planning and development in India with Special reference to Tamil Nadu – Tourist potential – problems – planning – medical tourism

TEXT BOOKS:

1. *Robinson, H. A Geography of Tourism. Mcdonald and Evans, London, 1976.*
2. *Seth, P.N. and Bhat, S.S. An Introduction to Travel and Tourism. Sterling Publishers Private Ltd., New Delhi, 2012.*
3. *Ghosh, B. Tourism and Travel Management (2nd Edition). Vikas Publishing House Pvt. Limited. New Delhi, 2009.*

4. *Singh, A.P. Himalayan Environment and Tourism. Chugh Publications, Allahabad, 1989.*
5. *Kaul, R.N. Dynamics if Tourism: A Trilogy. Sterling Publishers Pvt. Limited, New Delhi, 1985.*
6. *Bhatia, A.K. Tourism Development: Principles and Practices. Sterling Publishers Pvt. Limited, New Delhi, 2002.*

REFERENCE BOOKS:

1. *Singh, S.N. Geography of Tourism and Recreation with Special Reference to Varanasi. Inter India Publication, New Delhi, 1985.*
2. *Das, M. India, a Tourist Paradise: Introducing a Wonderful Land and a Wonderful People. Sterling Publishers Pvt. Limited, New Delhi, 1983.*
3. *Kaul R.N., Dynamics of Tourism, NewDelhi, Sterling Publishers, 1985.*
4. *Francois Vellas and Lionel B'echerel, Greate Britain, Antony Raw Ltd., 1995.*
5. *Bhatia A.K. – Tourism Development Bangalore sterling Publishers (p) Ltd. 1999.*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	After this lesson students will have acquired about tourism and history of tourism.	K2
CO2	Students will have understood the tourism development.	K2
CO3	Student under the element of tourism and socio economic tourism.	K3
CO4	Acquire knowledge about the tourism potential and different tourism organizations in India.	K3
CO5	Students will be able to apply the principles of tourism to a local, regional or national community to develop a tourism policy and plan based on tourism parameters	K3

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**3**	**3**	**3**	**2**	**2**	**3**	**2**	**3**	**2**	**3**
CO2	**3**	**2**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**3**	**3**
CO3	**3**	**2**	**2**	**2**	**3**	**2**	**2**	**3**	**2**	**3**	**3**
CO4	**3**	**3**	**3**	**2**	**2**	**2**	**3**	**3**	**2**	**2**	**2**
CO5	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**2**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – VI

ELECTIVE – IV – ECOLOGY OF THE WORLD

Credit: 3 **Course Code: U21GEE642** **Hours: 4**

Learning Objectives:

- Define the basic rules and concepts of the ecology science.
- Define the ecology of individual, population, community and ecosystem.
- Define the concepts that are the ambient, environment, biome, biosphere, ecosphere, ecological relationship and factors, and homeostasis.
- To understand about regional studies of the world.
- To learn about Equatorial, Tropical, Temperate and Polar Regions.

UNIT I **EQUATORIAL REGIONS:** Amazon type and Equator type: Situation, Extent, Climate, Natural vegetation, Flora and fauna, Natural resources, Human life and economic development.

UNIT II **TROPICAL REGIONS:** Monsoon, Sudan, Sahara and Caribbean – Situation, Extent, Climate, Natural vegetation Flora and fauna, Natural resources, Human life and Economic development.

UNIT III **WARM TEMPERATE REGIONS:** Mediterranean, China and Steppe - Situation, Extent, Climate, Natural vegetation, Flora and fauna, Natural resources, Human life and Economic development.

UNIT IV **COOL TEMPERATE REGIONS:** West European, Lawrence, Prairie – Situation, Extent, Climate, Natural vegetation, Flora and fauna, Natural resources, Human life and Economic development.

UNIT V **COOL TEMPERATE POLAR REGIONS:** Taiga and Tundra – Situation, Extent, Climate, Natural vegetation, Flora and fauna, Natural resources, Human life and Economic development.

TEXT BOOKS:

1. *Cole, J. A Geography of the World's Major Regions, Routledge, London, 1996.*
2. *Darshan singh manku, A Regional Geography of the world, kalyani publishers, New Delhi, 1998.*
3. *Deblij, H.J. Geography: Regions and Concepts, John Wiley, New York, 1994.*

4. *Dudley Stamp, Asia – A regional and economic Geography, Orient B.I. publisher's Pvt Limited, New Delhi, 1979.*
5. *Dudley Stamp, The World Regional Geography, Orient Longman Limited, New Delhi, 1979.*

REFERENCE BOOKS:

1. *Goh Cheng Leong, Human & Economic Geography, Oxford University Press, New York, 1982.*
2. *Khanna, K.K. and Gupta, V.K., Economic and Commercial geography, Sultan Chand and Sons, New Delhi, 1988.*
3. *Singh, R.L., India: A Regional Geography, NGSI, Varanasi, 1971.*
4. *Dudley Stamp, The World Regional Geography, Orient Longman Limited, New Delhi, 1979.*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	After this lesson the students will become able to demonstrate a history of social and environmental processes that have influenced forming of the world's major cultural regions.	K2
CO2	Will become able to compare evolutionary processes of human societies under different historical, cultural and environmental perspectives.	K2
CO3	Will acquire knowledge of major regions of the world with cultural and physical features.	K2
CO4	Know about different types of region in the world	K2
CO5	Students can acquire knowledge regarding developed, underdeveloped and developing regions of the world.	K4

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**3**	**3**	**2**	**3**	**2**	**3**	**2**	**3**	**2**	**2**
CO2	**3**	**3**	**2**	**3**	**2**	**2**	**2**	**3**	**2**	**2**	**2**
CO3	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**3**	**3**	**3**
CO4	**3**	**2**	**3**	**2**	**2**	**2**	**2**	**3**	**2**	**3**	**3**
CO5	**3**	**3**	**2**	**3**	**3**	**2**	**3**	**3**	**2**	**2**	**3**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – VI

ELECTIVE – IV – GEOGRAPHY OF HEALTH

Credit: 3 **Course Code: U21GEE643** **Hours: 4**

Learning Objectives:

- Students understanding the general idea of nature, scope, significance and development of geography of health
- Understand climatic condition and seasonal diseases
- Students will be able to identify the climatic change in human health
- Students can acquire knowledge of different types of health risks
- Students will have a general understanding of human health and various influencing factors.

UNIT I **GEOGRAPHY OF HEALTH**: Nature, Scope, Significance and development.

UNIT II **GEOGRAPHICAL FACTORS AFFECTING HUMAN HEALTH:** Physical – Social and environmental Factors

UNIT III **EXPOSURE AND HEALTH RISKS:** Air pollution; household wastes; water; housing; workplace.

UNIT IV **REGIONAL PATTERN OF HEALTH AND DISEASE:** Health and Disease Pattern in Environmental Context with special reference to India, Types of Diseases and their regional pattern – Geographical perspectives of Communicable and Non communicable diseases.

UNIT V **CLIMATE CHANGE AND HUMAN HEALTH:** Changes in climate system – heat and cold; Biological disease agents; food production and nutrition.

TEXT BOOKS:

1. *Akhtar Rais (Ed.), Environment and Health Themes in Medical Geography, Ashish, Publishing House, New Delhi, 1990.*
2. *Avon Joan L. and Jonathan A Patzed. Ecosystem Changes and Public Health,Baltimin, John Hopling Unit Press(ed), 2001.*
3. *Bradley,D., Water, Wastes and Health in Hot Climates, John Wiley Chichesten, 1977.*

4. *Christaler George and Hristopoles Dionissios, Spatio Temporal Environment Health Modelling , Boston Kluwer Academic Press, 1998.*
5. *Cliff, A.D. and Peter,H., Atlas of Disease Distributions, Blackwell Publishers, Oxford, 1988.*

REFERENCE BOOKS:

1. *Murray C. and A. Lopez, The Global Burden of Disease, Harvard University Press, 1996.*
2. *Moeller Dade wed., Environmental Health, Cambridge, Harward Univ. Press, 1993.*
3. *Phillips, D.and Verhasselt, Y., Health and Development, Routledge, London, 1994.*
4. *Tromp, S., Biometeorology: The Impact of Weather and Climate on Humans and their Environment, Heydon and Son, 1980.*
5. *Gatrell, A.,and Loytonen, GIS and Health, Taylor and Francis Ltd, London, 1998.*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	They can know about their Geographical factors affecting in human health	K2
CO2	They understand the health risks of region.	K2
CO3	Students will be identifying the different types of diseases.	K3
CO4	Students will be able to understanding the Climate Change and Human Health.	K4
CO5	Students will have a fair knowledge about various communicable and non – communicable diseases in relation to Geographical perspectives	K2

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**2**	**3**	**3**	**3**	**3**	**2**	**3**	**2**	**3**	**2**
CO2	**3**	**3**	**2**	**3**	**2**	**2**	**3**	**3**	**3**	**2**	**3**
CO3	**3**	**3**	**3**	**2**	**3**	**2**	**3**	**2**	**2**	**3**	**2**
CO4	**3**	**2**	**3**	**2**	**3**	**2**	**2**	**3**	**3**	**2**	**3**
CO5	**3**	**3**	**2**	**3**	**2**	**3**	**3**	**2**	**2**	**3**	**3**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0

SEMESTER – VI

SBE – PRACTICAL – PRINCIPLES OF SURVEYING

Credit: 2 **Course Code: U21GES64** **Hours: 2**

Learning Objectives:

- Anyone have a basic, practical understanding of the survey techniques and survey related instruments are necessary in the present context
- To learn the basic survey methods like chain survey in the field study
- Students will be able to get the knowledge about simple graphical survey methods using some traditional survey method
- Students can acquire knowledge of traditional Indian survey methods
- At the end of the lesson students can get a clear idea about cartographic techniques and GIS based software's.

UNIT I **BASIC CONCEPTS OF SURVEYING AND SURVEY EQUIPMENT:** Chain

UNIT II **BASIC CONCEPTS OF SURVEYING AND SURVEY EQUIPMENT:** Prismatic Campas

UNIT III **BASIC CONCEPTS OF SURVEYING AND SURVEY EQUIPMENT:** Plane Table

UNIT IV **BASIC CONCEPTS OF SURVEYING AND SURVEY EQUIPMENT:** Dumby Level

UNIT V **BASIC CONCEPTS OF SURVEYING AND SURVEY EQUIPMENT:** Indian Clinometer

TEXT BOOKS:

1. *R.L. Singh _ Elements of Practical Geography, Kalyani Publishres, New Delhi, 1999*
2. *F.J. Monkhouse and H.R Wilkinson, Maps and Diagrams, B.I. Publications, Madras, 2005.*
3. *Gopal Singh – Map work and Practical Geography, Vikas publishing house Ltd, 1992.*

REFERENCE BOOKS:

1. *V.P. Subrahmanyam and Subramaniam,A.R. Application of water balance concept for a climatic study of droughts in south India, 1964*

2. *M.D.Zulfequar ahamad Khan –Text Book of Practical Geography, Concept Publishing Company, NewDelhi, 1996.*

Learning Outcomes:

CO	After the completion of the course, students will be able to	Remarks
CO1	Students can learn the basic principles of survey in relation to their survey instruments.	K2
CO2	They got the capability of handling the survey instruments with direct field knowledge	K3
CO3	Students can be able to do the field work using various instruments like graphical survey methods	K4
CO4	Students will be able to demonstrate an understanding to the direction related measuring survey equipment's	K4
CO5	After complete the lesson they got the appropriate knowledge of handling different survey methods	K5

***K1** – Remember, **K2** – Understand, **K3** – Apply, **K4** – Analyze, **K5** – Evaluate*

Outcome Mapping:

PO/CO	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	**3**	**2**	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**2**
CO2	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**3**	**3**
CO3	**3**	**3**	**2**	**3**	**3**	**3**	**2**	**2**	**3**	**3**	**3**
CO4	**3**	**2**	**3**	**2**	**3**	**3**	**2**	**3**	**2**	**3**	**2**
CO5	**3**	**3**	**3**	**3**	**2**	**2**	**3**	**2**	**3**	**3**	**2**

Strongly Correlating – 3, Moderately Correlating – 2, Weekly Correlating – 1, No Correlation – 0