

**UNIVERSITY OF MYSORE**  
Established: 1916

Vishwavidyanilaya Karyasoudha  
Crawford Hall, Mysore-570 005

No.AC.2(S)/151/2021-22

Dated: 18.08.2021

**NOTIFICATION**

**Sub:** Modification of syllabus for M.Sc Geography Program and the same has been recommended to implement from the academic year 2021-22.

- Ref:** 1. Decision of Board of Studies in Geography (PG) meeting held on 09.12.2020.  
2. Decision of the Faculty of Science & Technology Meeting held on 08.02.2021.  
3. Decision of the Academic Council meeting held on 07.04.2021.

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The Board of Studies in Geography (PG) which met on 09.12.2020 has approved the Modified syllabus for M.Sc Geography Program and the same has been recommended to implement in Geography (PG) from the academic year 2021-22.

The Faculty of Science and Technology and Academic Council meeting held on 08.02.2021 and 07.04.2021 respectively have approved the above said proposal and the same is hereby notified.

The detailed Syllabus Geography (PG) course is annexed. The contents may be downloaded from the University Website i.e., [www.uni-mysore.ac.in](http://www.uni-mysore.ac.in).

**DRAFT APPROVED BY THE REGISTRAR**

*18/8*  
**DEPUTY REGISTRAR (ACADEMIC)**  
**Deputy Registrar (Academic)**  
**University of Mysore**  
**Mysore-570 005**

**To:**

1. The Registrar (Evaluation), University of Mysore, Mysore.
2. The Dean, Faculty of Science & Technology, DoS in Psychology, MGM.
3. The Chairperson, DoS in Geography (PG), Manasagangotri, Mysore.
4. The Deputy/Assistant Registrar/Superintendent, AB and EB, UOM, Mysore.
5. The P.A. to the Vice-Chancellor/Registrar/Registrar (Evaluation), UOM, Mysore.
6. Office file.

ANNEXURE –I

**Details of Course Patterns for M.Sc. Degree Course  
(CBCS) (Modified)**

Paper	Title of the Paper	L:T:P	Type
<b>I Semester</b>			
H.C-1.1	Conceptual Development in Geography	2:1:0	HC
H.C-1.2	Principles of Geomorphology and Geology	2:0:2	HC
H.C-1.3	Principle of Remote sensing	2:1:0	HC
S.C-1.1	Tourism Geography	2:1:0	SC
S.C-1.2	Natural Resources Management	2:1:0	SC
S.C-1.3	Political Geography	2:1:0	SC
S.C-1.4	Social Geography	2:1:0	SC
S.C-1.5	Water Resources Management	2:1:0	SC
S.C-1.6	Geography of Settlements	2:1:0	SC
<b>II Semester</b>			
H.C-2.1	Remote sensing Analysis –( Practical )	0:0:3	HC
H.C-2.2	Principles of GIS	3:0:0	HC
H.C-2.3	Techniques of analysis in Human Geography	0:0:3	HC
S.C-2.1	Concepts in Geomorphology	2:1:0	SC
S.C-2.2	Research Methods in Geography	2:1:0	SC
S.C-2.3	Agricultural Geography	2:1:0	SC
S.C-2.4	Geography of Population Dynamics	2:1:0	SC
S.C-2.5	Bio Geography	2:1:0	SC
S.C-2.6	Thematic Cartography	2:1:0	SC
O.E-2.1	GIS & Remote Sensing	3:1:0	OE
O.E-2.2	Geography of Karnataka	3:1:0	OE
<b>III Semester</b>			

H.C-3.1	Geo-Spatial analysis (GIS- Practical)	0:0:3	HC
H.C-3.2	Methods of Regional Analysis	2:2:0	HC
H.C-3.3	Advanced Surveying	0:0:3	HC
S.C-3.1	Transportation Geography	2:1:0	SC
S.C-3.2	Monsoon Climatology	2:1:0	SC
S.C-3.3	Environmental Geography	2:1:0	SC
S.C-3.4	Population Resources and Development	2:1:0	SC
S.C-3.5	Urban Geography	2:1:0	SC
S.C-3.6	Fluvial Geomorphology	2:1:0	SC
O.E-3.1	Human Geography	3:1:0	OE
O.E-3.2	Physical Geography	3:1:0	OE
<b>IV semester</b>			
H.C-4.1	Economic Geography	3:1:0	HC
H.C-4.2	Multivariate Statistics	2:1:1	HC
H.C-4.3	Dissertation	0:0:5	HC
S.C-4.1	Disaster Management	1:1:0	SC
S.C-4.2	Regional Development Planning in India	1:1:0	SC
S.C-4.3	Medical Geography	1:1:0	SC
S.C-4.4	Applied Climatology	1:1:0	SC
S.C-4.5	Applied Geomorphology	1:1:0	SC
O.E-4.1	Geography of India	3:1:0	OE

**ANNEXURE-I****Details of Course Patterns for M.Sc. Degree Course  
(CBCS) (OLD)**

<b>Paper</b>	<b>Title of the Paper</b>	<b>L:T:P</b>	<b>Type</b>
17811	Conceptual Development in Geography	2:1:0	HC
17812	Principles of Geomorphology and Geology	2:1:0	HC
99999	Techniques of Analysis in Physical Geography	0:0:3	HC
30853	Tourism Geography	2:1:0	SC
30854	Natural Resources Management	2:1:0	SC
17813	Political Geography	2:1:0	SC
17814	Social Geography	2:1:0	SC
30587	Water Resources Management	2:1:0	SC
30858	Geography of Settlements	2:1:0	SC
17821	Applied Climatology	2:1:0	HC
30851	Geographical Information System	2:0:1	HC
99999	Techniques of analysis in Human Geography	0:0:3	HC
30852	Concepts in Geomorphology	2:1:0	SC
17823	Research Methods in Geography	2:1:0	SC
30865	Agricultural Geography	2:1:0	SC
30866	Geography of Population Dynamics	2:1:0	SC
17867	Bio Geography	2:1:0	SC
17806	Thematic Cartography	2:1:0	SC
17828	GIS & Remote Sensing	3:1:0	OE
30870	Physical Geography	3:1:0	OE
30871	Geography of Karnataka	3:1:0	OE
17841	Introduction to Remote Sensing	2:1:1	HC

17842	Methods of Regional Analysis	2:2:0	HC
99999	Advanced Surveying	0:0:3	HC
30883	Transportation Geography	2:1:0	SC
30884	Monsoon Climatology	2:1:0	SC
30885	Environmental Geography	2:1:0	SC
30886	Population Resources and Development	2:1:0	SC
30887	Urban Geography	2:1:0	SC
17847	Fluvial Geomorphology	2:1:0	SC
30888	Human Geography	3:1:0	OE
17861	Economic Geography	3:1:0	HC
17862	Multivariate Statistics	2:1:1	HC
11111	Dissertation	0:0:5	HC
17865	Disaster Management	1:1:0	SC
17866	Regional Development Planning in India	1:1:0	SC
17830	Medical Geography	1:1:0	SC
17868	Advanced applications in Remote Sensing	1:0:1	SC
17869	Geography of India	3:1:0	OE
17904	Applied Geomorphology	1:0:1	SC

### Annexure -III

Abstract of Modifications recommended in the Syllabus of M.Sc Geography

Paper Code	Existing Title of the Course	L:T:P	Type	Modifications Recommended
<b>I semester</b>				
17811	Conceptual Development in Geography	2:1:0	HC	
17812	Principles of Geomorphology and Geology	2:1:0	HC	Credit pattern of this course is changed to 2-0-2 by adding practical component from "Techniques of Analysis in Physical Geography".
99999	Techniques of Analysis in Physical Geography	0:0:3	HC	This course is merged with Principles of "Geomorphology and geology" course as practical component and in its place "Principles of remote sensing" is introduced for 3 credits( 2-1-0)
30853	Tourism Geography	2:1:0	SC	
30854	Natural Resources Management	2:1:0	SC	
17813	Political Geography	2:1:0	SC	
17814	Social Geography	2:1:0	SC	
30587	Water Resources Management	2:1:0	SC	
30858	Geography of Settlements	2:1:0	SC	
<b>II Semester</b>				
17821	Applied Climatology	2:1:0	HC	This course is shifted to IV semester as one of the soft core course. In its place "Remote sensing Analysis" a Practical course is introduced for 3 credits 0-0-3
30851	Geographical Information System	2:0:1	HC	This course is replaced by another course "Principles of GIS" for 3 credits.(3-0-0)
99999	Techniques of analysis in Human Geography	0:0:3	HC	

30852	Concepts in Geomorphology	2:1:0	SC	
17823	Research Methods in Geography	2:1:0	SC	
30865	Agricultural Geography	2:1:0	SC	
30866	Geography of Population Dynamics	2:1:0	SC	
17867	Bio Geography	2:1:0	SC	
17806	Thematic Cartography	2:1:0	SC	
17828	GIS & Remote Sensing	3:1:0	OE	
30870	Physical Geography	3:1:0	OE	This Open Elective (OE) course is shifted to third semester as an OE course.
30871	Geography of Karnataka	3:1:0	OE	
<b>III Semester</b>				
17841	Introduction to Remote Sensing	2:1:1	HC	This hard core course is replaced by "Geo-spatial Analysis" GIS Practical for 3 credits (0-0-3)

17842	Methods of Regional Analysis	2:2:0	HC	
99999	Advanced Surveying	0:0:3	HC	
30883	Transportation Geography	2:1:0	SC	
30884	Monsoon Climatology	2:1:0	SC	
30885	Environmental Geography	2:1:0	SC	
30886	Population Resources and Development	2:1:0	SC	
30887	Urban Geography	2:1:0	SC	
17847	Fluvial Geomorphology	2:1:0	SC	
30888	Human Geography	3:1:0	OE	
				Recommended to introduce one more Open Elective course" Physical Geography" for 3 credits (2-1-0) which was in Second semester earlier.

**IV Semester**

17861	Economic Geography	3:1:0	HC	
17862	Multivariate Statistics	2:1:1	HC	
11111	Dissertation	0:0:5	HC	
17865	Disaster Management	1:1:0	SC	
17866	Regional Development Planning in India	1:1:0	SC	
17830	Medical Geography	1:1:0	SC	
17868	Advanced applications in Remote Sensing	1:0:1	SC	This course is replaced by a soft core course "Applied Climatology" with 2 credits (1-1-0)
17869	Geography of India	3:1:0	OE	
17904	Applied Geomorphology	1:0:1	SC	



**ANNEXURE- III**

**Revised Syllabus**



# **Department of Studies in Geography**

**Manasagangotri, Mysuru-570006**

**Regulations and Syllabus**

**Master of Geography (M.Sc.)**

**(Two-year semester scheme)**

**Under Choice Based Credit System (CBCS)**

## **GUIDELINES AND REGULATIONS LEADING TO MASTER OF SCIENCE IN GEOGRAPHY (TWO YEARS- SEMESTER SCHEME UNDER CBCS)**

### **Programme Details**

<b>Name of the Department</b>	: Department of Studies in Geography
<b>Subject</b>	: Geography
<b>Faculty</b>	: Science and Technology
<b>Name of the Course</b>	: Master of Science in Geography (M.Sc.)
<b>Duration of the Course</b>	: 2 years- divided into 4 semesters

### **Programme Outcomes**

**On successful completion of this programme, each student will be able to:**

- Demonstrate a proficiency in the knowledge of important concepts of physical and human geography.
- Describe human-environment and nature-society interactions as well as global and environmental issues.
- Identify and explain the planet's human and physical characteristics and processes from global to regional and local scales.
- Demonstrate proficiency in using geographical tools including cartography, advanced surveying, remote sensing, GIS and GPS and Multivariate statistics.
- Identify, interpret and analyse geographic problems and processes.
- Evaluate the impacts of human activities on natural environment.
- Formulate a research methodology and execute a student led research project.
- Defend and communicate facts, ideas and research results through written, oral, graphical and quantitative outlets.
- Show an awareness and responsibility for the environment.

## **Programme Specific Outcome**

- design and conduct independent research in the discipline
- Demonstrate knowledge of concepts, methods, and theories designed to enhance understanding of the natural world and human society.
- Communicate the results and significance of their research in both written and oral for
- Evaluate how historical events have been influenced by, and have influenced, physical and human geographic factors in local, regional, national, and global settings.
- Examine social and environmental processes, with a particular focus on space and place, critical theory, practical application, analysis and intervention in chosen field within the discipline of Geography
- Evaluate causes, consequences, and possible solutions to persistent, contemporary, and emerging global issues.
- Follow established ethical guidelines for research and teaching
- Classify processes of environmental change and evaluate the relationship between human beings and their surroundings, bringing to bear knowledge from many disciplines.

**Scheme of Examination and Details of Course Patterns for M.Sc. Degree Course (CBCS)**

<b>Paper code</b>	<b>Title of the Paper</b>	<b>L:T:P</b>	<b>Type</b>
<b>I Semester</b>			
H.C-1.1	Conceptual Development in Geography	2:1:0	HC
H.C-1.2	Principles of Geomorphology and Geology	2:0:2	HC
H.C-1.3	Principle of Remote sensing	2:1:0	HC
S.C-1.1	Tourism Geography	2:1:0	SC
S.C-1.2	Natural Resources Management	2:1:0	SC
S.C-1.3	Political Geography	2:1:0	SC
S.C-1.4	Social Geography	2:1:0	SC
S.C-1.5	Water Resources Management	2:1:0	SC
S.C-1.6	Geography of Settlements	2:1:0	SC
<b>II Semester</b>			
H.C-2.1	Remote sensing Analysis –( Practical )	0:0:3	HC
H.C-2.2	Principles of GIS	3:0:0	HC
H.C-2.3	Techniques of analysis in Human Geography	0:0:3	HC
S.C-2.1	Concepts in Geomorphology	2:1:0	SC
S.C-2.2	Research Methods in Geography	2:1:0	SC
S.C-2.3	Agricultural Geography	2:1:0	SC
S.C-2.4	Geography of Population Dynamics	2:1:0	SC
S.C-2.5	Bio Geography	2:1:0	SC
S.C-2.6	Thematic Cartography	2:1:0	SC
O.E-2.1	GIS & Remote Sensing	3:1:0	OE
O.E-2.2	Geography of Karnataka	3:1:0	OE

<b>III Semester</b>			
H.C-3.1	Geo-Spatial analysis (GIS- Practical)	0:0:3	HC
H.C-3.2	Methods of Regional Analysis	2:2:0	HC
H.C-3.3	Advanced Surveying	0:0:3	HC
S.C-3.1	Transportation Geography	2:1:0	SC
S.C-3.2	Monsoon Climatology	2:1:0	SC
S.C-3.3	Environmental Geography	2:1:0	SC
S.C-3.4	Population Resources and Development	2:1:0	SC
S.C-3.5	Urban Geography	2:1:0	SC
S.C-3.6	Fluvial Geomorphology	2:1:0	SC
O.E-3.1	Human Geography	3:1:0	OE
O.E-3.2	Physical Geography	3:1:0	OE
<b>IV semester</b>			
H.C-4.1	Economic Geography	3:1:0	HC
H.C-4.2	Multivariate Statistics	2:1:1	HC
H.C-4.3	Dissertation	0:0:5	HC
S.C-4.1	Disaster Management	1:1:0	SC
S.C-4.2	Regional Development Planning in India	1:1:0	SC
S.C-4.3	Medical Geography	1:1:0	SC
S.C-4.4	Applied Climatology	1:1:0	SC
S.C-4.5	Applied Geomorphology	1:0:1	SC
O.E-4.1	Geography of India	3:1:0	OE

## I SEMESTER – (HARD CORE)

### Course-H.C-1.1: CONCEPTUAL DEVELOPMENT IN GEOGRAPHY (2:1:0)3credits

#### Learning outcome: After successful completion of this course the students will

- Get an overview of the development of geography during different stages and they can appreciate the theoretical development in all the branches of the subject.
- Get an opportunity to learn all the important contributions of geographers, the important course of events occurred and influenced the subject, and the changes of themes and scope of the subjects.
- Be able to understand a broader perspective of the nature and direction of the subject.

#### PEDOGOGY

To enhance the learning outcome of the course the discussion and interaction method shall be used where the facilitator make connections to students lives.

#### COURSE CONTENT

##### UNIT-I. Growth of Geography as a systematic science

- i. Development of Geographical thought during pre and post - modern period – An overview:
- ii. Dualism in geography: Determinism V/S Possibilism; General Vs Particular; Quantitative vs qualitative

##### UNIT-II. Revolution in Geography:

###### a. Conceptual revolution:

- i) Philosophy of Space and distance in geography- Spatial implications and distance decay.
- ii) Spatial diffusion behavior and movements. Theory of diffusion.
- iii) Regional concepts and Regional methods in geography and regionalism

###### b. Quantitative revolution

1. Development of theories, Laws, models in geography
2. Paradigms in geography

### **UNIT-III. Contemporary issues in geography**

- A) Approaches in geography: Systems approach. Multi-disciplinary and inter disciplinary approach Ecological approach.
- B) Dimension in geography: Traditions in geography Global and local dimensions: Spatial dimensions:
- C) Contemporary themes in Geographical perspective: gender geography;

### **UNIT-IV Themes in geography**

Pragmatism; Positivism; functionalism; Existentialism; Idealism; Realism; Marxism; Radicalism; Behaviouralism; Humanism.

### **References**

1. Milton E. Harvey and Brian P. Holly: themes in geographical thought, Rawat publication.
2. Sharma Y.K. : geographical thoughts, Lakshmi NarainAgarwal.
3. Dikshit. R.D. Geographical thought:A contextual history of ideas eastern economy edition.
4. LalithRana: Geographical thought: A systematic record of evolution. Concept publications.
5. David Harvey: explanation in geography, Rawat Publication.
6. Majid Husain: Evolution of geographical thought, Rawat Publication.

**COURSE-H.C-1.2: PRINCIPLES OF GEOMORPHOLOGY AND GEOLOGY (2-0-2) 4 credits**

**Learning outcome: on successful completion of this course**

- Students are able to understand the Geological Time Scale and the age of the earth.
- Students will be in a position to distinguish between old and recent rock formations
- Student can analyze and recommend the different forms of Stratigraphy.
- Possible to identify the causes of Structural deformation of rocks through different laws of stratigraphy and Unconformity.
- Able to explain the cause of Plate Movement, Plate Tectonics and associated land deformations
- Can apply geological criteria in Ground Water Mapping, Flood analysis, Watershed Management and Different types of Disaster Management.
- Are expected to extract the relief characteristics of a place using different techniques.
- Are able to analyse the influence and interrelation of natural forces like the surface drainage and slope factors and the structural characteristics of the earth's interior on the physical construct of a place.

**PEDOGOGY:**

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project, discussion and laboratory methods shall be adopted.

**COURSE CONTENT**

**UNIT-I. A. Geological Time Scale**

- i) Era, Period and Epoch
- ii) Major events in Precambrian era
- iii) Major events in Carboniferous period
- iv) Mountain building activity
- v) Tertiary and quaternary geology

**B. Stratigraphy**

**1).Classification of rocks**

- i) Physical and chemical composition of rocks



ii) Factors effecting physical and chemical composition of rocks

iii) Hard and Soft rocks

iv) Weak and Strong rocks

## 2) Stratification

i. Layers

ii. Horizontal and vertical structure

iii. Structure Conformities and un-conformities

iv. Stratigraphic classification

### UNIT III.

**A. Profile Drawing:** Introduction, Uses, Types. Drawing and Extraction of Topographic profiles Serial Profiles, Superimposed profiles, projected profiles, Composite profiles.

**B. Techniques of terrain mapping:** Slope and Aspect map, Calculation of Gradient,

Expression of slope in different forms- per cent and Angle of the slope, conversion of slope values, construction of slope maps using grids: **Went worth's method**, **Dhurandhar's method** and **Smith's method**. Altimetry frequency analysis, Hypsometric analysis.

### UNIT-IV.

**A. Fluvial Analysis:** Morphometric analysis- Stream order analysis, Bifurcation Ratio Analysis, Sinuosity Index, Drainage density Analysis, Drainage Frequency Analysis, River flow analysis, Rainfall discharge relationship,

**B. Geological Maps :** Meaning, importance, important concepts like Dip – Direction and Angle of Dip, Plunge Lines, Strike Lines, Folds : cylindrical and non cylindrical folds, geometrical features of folds. Orientation of folds, **FAULTS:** Fault planes slip and separation, classification of faults based on slip. Unconformity : Types of unconformity – overstep and over lap unconformity.

### Reference

1. Structural Geology by Robert J. Twiss and Eldridge M. Moores (Hardcover - Dec 15, 2006)
2. Structural Geology of Rocks and Regions, 2nd Edition by George H. Davis and Stephen J. Reynolds (Hardcover - Jan 19, 1996)
3. Fundamentals of Structural Geology by David D. Pollard and Raymond C. Fletcher (Hardcover - Sep 19, 2005)
4. Basic Methods of Structural Geology by Stephen Marshak and Gautum Mitra (Paperback - April 4, 1988)

5. Earth Structure: An Introduction to Structural Geology and Tectonics (Second Edition) by Stephen Marshak and Ben A. van der Pluijm (Hardcover - Dec 29, 2003)
6. 3-D Structural Geology: A Practical Guide to Quantitative Surface and Subsurface Map Interpretation by Richard H. Jr. Groshong (Hardcover – Jul 24, 2008).
7. R.L Singh: Elements of practical Geography, Kalyani Publications. 2005
8. RP. Mishra: Fundamental Cartography, Concept publication, New Delhi. 2001
9. R.Hammond and P.Mecullagh: Quantitative techniques in Geography. Claredon press, oxford. 1975.
10. Anson R.W and Colour use guidelines for mapping and visualization “visualization in modern Geography” Oxford.

**COURSE-H.C-1.3: PRINCIPLES OF REMOTE SENSING- HARD CORE (2-1-0)  
3Credits**

**Learning outcome: At the end of this course the students will**

- Understand the principles and physics of remote sensing.
- Be familiarized with the current technology of data collection and the significance of the spatial data acquisition and analysis.
- Know about the various agencies which are involved in the remote sensing business, which kind of sensor systems and resolution of data is collected by each of these agencies, etc.
- Get practical exposure to some fundamental exercises involved in this course on some simple methods of spatial analysis.

**PEDOGOGY**

As this course is practical and lab oriented, it focuses on skill enhancement in addition to the conceptual base among the learners. Hence, the course shall adopt laboratory methods using the computer and some Remote sensing software. Each learner shall be made to handle RS software independently through hands on experience.

**COURSE CONTENT**

**UNIT-I. Energy system for remote sensing**

1. Sources of Energy used for Remote Sensing.
2. Energy interaction in the atmosphere,
  - a. Absorption and transmission
  - b. Atmospheric scattering
3. Energy interactions with earth surface features,
  - a. Spectral reflectance curves

**UNIT-II. Sensors and Platforms.**

1. Sensors: active sensors and passive sensors.
2. Platforms: Air borne remote sensing and space borne remote sensing.
3. Multispectral scanners
4. Remote sensing Resolution
5. Sensor Systems – Type and Characteristics of earth Resource satellite –
  - a. LANDSAT,
  - b. SPOT,
  - c. IRS,
  - d. IKONS

### **UNIT-III. Microwave Remote sensing**

1. Principles of Microwave Remote sensing-
2. Geometric properties of RADAR
3. Distortions in radar images.
4. Active and passive remote sensing systems, SAR and SLAR systems.
5. Sensor Systems – Type of radar satellite data
  - a. SRTM
  - b. MODIS
  - c. ASTER

### **UNIT-IV. Digital Image Processing**

1. Image rectification and restoration
2. Radiometric enhancement and Atmospheric correction.
3. Spectral enhancement.
4. Spatial enhancement.
5. Image classification.

### **Reference**

1. John R. Jensen: Remote sensing of the Environment. Pearson education publication
2. Jensen, John R., 2005, Introductory Digital Image Processing, 3rd Ed., Upper Saddle River, NJ: Prentice Hall, 526 pages.
3. Principles of Remote Sensing – An Introductory Textbook by W. H. Bakker et al.
4. Frontiers of Remote Sensing Information Processing. by: C. H. Chen

## **COURSE-S.C-1.1: TOURISM GEOGRAPHY (SOFT CORE-2:1:0=3Credits)**

**Learning outcome: At the end of this course the students are:**

- Able to acquaint with the concept, types and factors influence on tourism.
- in a position to understand the organizational structure of travel agencies and types of travel agents based on different criteria.
- will understand the components of tour package and its types along with the travel and accommodation.
- in a position to draw Comprehensive place specific sustainable tourism plans and policy without harming to the environment.

### **PEDOGOGY:**

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted.

### **COURSE CONTENT**

**UNIT – I.** Nature, Scope, Definition & importance of Tourism. Approaches to the study of Tourism. Types of Tourism , Types of Tourist. Factors affecting Tourism (Tourist attraction)

**UNIT-II.** Tourism Motivations, Tourist Behaviour, TravelAgencies, Types of travel agents& tour operators. Organizational structure of travel Agencies, Membership & Types, Organizational structure of IATA Rules & conditions for Recognition of Travel Agency.

**UNIT- III.** Tour packaging – Definition, Components, types of package tour & Tour package – Designing & Developing Process, Destination & Market & Demand & Dimensions of Tourism. Tourism and GPS.

**UNIT- IV.** Travel & accommodation: Structure of accommodation. Travel & Transport – Modes of Transport, Tourism Planning & Environment.

### **Reference**

1. Rana Pratap and Kamala Prasad (2003) “Tourism Geography” Shree Publishers and Distributors, New Delhi.
2. Krishan K.Kamra & Mohinder chan (2006) basics of Tourism theory, operatuion & practice, Kanishka publishers New Delhi.
3. Batta.N (2004), “Tourism and the Enronment” Indus Book, New Delhi.

4. Bhatia A.K (2006) The business of Tourism concepts & strategies, sterling publishers prorate limited, New Delhi.
5. Bhardwaj, Kandan and Choudary (2004), "Domestic Tourism in India" Indus Books.
6. Bhatia A.K (2002) International Tourism management, sterling publishers prorate limited, New Delhi.
7. Pran Nath Seth & Sushma Seth Bha2006t An introduction to Travel & Tourism, sterling publishers prorate limited, New Delhi.

## **COURSE-S.C-1.2: NATURAL RESOURCES MANAGEMENT (Soft Core-2:1:0=3credits)**

**Learning outcome: At the end of the course, the students will:**

- Understand concepts of different natural resources, its use, overuse, with its solution by natural resource management methods.
- Appreciate the need for managing land and water resources for sustainable growth and development, managerial skills such as land evaluation and land classification.
- Also able to understand the causes and consequences of water stress and draw water conservation and management plans.

### **PEDOGOGY**

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted.

### **COURSE CONTENT**

**UNIT-I.** Concept of Resources- Meaning, Definition, importance and classification of Resources, Appraisal of Natural Resources, Natural Resources Economics, History of Conservation, need for conservation and Management of Natural Resources –Role of Government and NGO Agencies, Resource Creating Factors. Environmental Risk- types, wildlife, forest risk and its impact on environment and its management.

**UNIT- II.** Land Resources-Land Evaluation Methods, Land classification Methods, Land use and Land cover Mapping changes. Issue related to land use change –Land use and population, Land use pattern in the world. Land source at stress, land use planning and development. Soil erosion, soil degradation, methods of conservation.

**UNIT-III.** Water Resources- Importance of water, Recent trends in water use in the world and in India, water crises, (stress) causes and consequences of water stress or crises , methods of water conservation, watershed management, coastal and ocean Resources management, Fisheries Management.

**UNIT-IV.** Minerals Resources: types of minerals, classifications of Major Minerals, their distribution and production. Such as Petroleum, Coal, Iron ore, Bauxite and Copper etc, and its uses. Mineral exploration methods, Mining and its effects on environment. Minerals conservation and mining policy

### **Reference:**

1. Dr.Alka Gautham: Geography of Resources: Exploitation, Conservation and Mangement, Sharada Pustak Bhavan, Allahabad.
2. Dr.P.S.Negi: Geography of Resources: Kedarnath Ramnath Publishers, New Delhi

3. Dr.Rajashekara Shetty(2009): An Analysis of World Resources with reference to India, Sarala Raj, Ria Publishers, Mysore
4. Khanna K.K and Gupta V.K.(1993): Economic and Commercial Geography, Sultan Chand, New Delhi
5. Prof. Zimmerwan – World Resources and Industries
6. Roy, P.R(2001) Economic Geography – A Study of Resources, New Central Book Agency, Calcutta.



## **COURSE-S.C-1.3: POLITICAL GEOGRAPHY(Soft Core-2:1:0=3Credits)**

### **Learning outcome: After successful completion of this course the students**

- will be knowing the role of geography in the global politics
- will be able to analyze the present global political situation
- will be able to differentiate the State, Nation and Nation State.
- will be in a position to carry on research Strategies compatible to the present technological development.

### **PEDOGOGY**

In order to enhance the learning outcome this course shall adopt project and discussion methods. The observation method through print and electronic media shall be adopted .

### **COURSE CONTENT**

**UNIT-I.** Concept of nation and state 1) Spatial factor of state 2) Frontiers and Boundary, 3) Space and formation of state, 4)Space and power.

**UNIT-II.** Concepts of geo-politics and models of geo-politics i) Rim land ii) Heart land theory model iii) Sea Pointer nodal iv) Territorial Sea and Maritime Boundaries

**UNIT-III.** Geo – politics and world organization i) UNO ii) WHO iii) IMF iv) ADB v) WB vi) FAO

**UNIT- IV.** Global politics and global strategy i) Pre – world war period ii) Post – world war period iii) Post – communist downfall geopolitics iv) Post – global economic change geopolitics

### **Reference**

1. Australia and the Insular Imagination: Beaches, Borders, Boats, and Bodies by Suvendrini Perera (Hardcover - Oct 27, 2009)
2. States of Emergency: The Object of American Studies by Russ Castronovo and Susan Gillman (Hardcover - Nov 15, 2009)
3. The Impact of 9/11 on the Media, Arts, and Entertainment: The Day that Changed Everything? by Matthew J. Morgan and Rory Stewart (Hardcover - Nov 24, 2009)
4. The 2008 Presidential Elections: A Story in Four Acts by Erik Jones and Salvatore

## **COURSE-S.C-1.4: SOCIAL GEOGRAPHY (Soft core-2:1:0=3Credits)**

### **Learning outcome: After completion of the course the students will**

- Understand various Philosophical basis of social Geography and are able to identify the philosophical background in each argument of social concepts.
- get knowledge about different tribes, languages, religions from spatial and social perspective.
- be able to differentiate space types and appreciate the social relations and Interactions in society.
- Understand about various social structures and social segregation.

### **PEDOGOGY**

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted.

### **COURSE CONTENT**

**UNIT-I.** Nature, scope and development of social Geography, Social structure, Social process and Elements of Social Geography: ethnicity, tribe, dialect, language, caste and religion.

**UNIT-II.** Conceptual and methodological approaches in Social Geography, Philosophical basis of Social Geography Positivism, Humanism, Idealism, Phenaminalism, Existentialism, Structuralism and Radicalism. .

**UNIT-III.** Space and Society, Individual's space, Intimate, PersonalPublic and social space Spatial Interaction and Social relations, Theoretical space organic, perspective and symbolic space,Interaction and social relations.

**UNIT-IV.** Social Groups, Primary and Secondary Groups, Social Structure, Models of Assimination and Segregation. Social Wellbeing, Concepts, Components and Indicators of measurement of social wellbeing. Patterns of social wellbeing in world and India.

### **References:**

1. Anand Aijazuddin(1999) : Social Geography, Rawat publications, New Delhi.
2. Bulsara J.F( 1970) : patterns of social life in metropolitan areas , Popular Prakashan Bombay.
3. Orang Mike (1998) Cultural Geography,Routledge Publication London.
4. Dubey, S.C (1991) Indian Socity, National bank Trust, New Delhi.

5. Gergom. D and Lassy J (1985): Social relations and spatial structure Mcmillan .
6. Messey D et all (Eds) 1999: Human Geography today, policy press Combridge .
7. Herbert D.T and Smith D.M (1979): Socia problems and city Geographical erspective Oxford

## **COURSE-S.C-1.5: WATER RESOURCES MANAGEMENT (Soft Core-2:1:0) =3Credits**

### **Learning output: After successful completion of this course the students will**

- Understand the linkage between the Atmospheric and hydrological system and water conservation strategies.
- be able to assess the critical relation between surface and subsurface discharge and recharge of water and its relation with water table.
- be able to know various water shed management strategies through applying different techniques and Approaches.
- gain knowledge on the impact of irrigation, Industrialisation and urbanization on water resources and contemporary water crisis.

### **PEDOGOGY:**

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted.

### **COURSE CONTENT**

**UNIT-I.** Sources of water, Atmospheric relationship of water: rainfall and temperature, evapo-transpiration, rainfall and runoff relationship, hydrological cycle. Rain harvesting as strategies of water resource conservation, other strategies of water conservation; water recycling.

**UNIT-II.** Hydrological, hydromorphological and hydro-pedagogical assessment. Assessment of surface and sub surface (ground water) discharge and recharge condition and water table relationship. Measurement of soil moisture, soil classification and water quality; Water logging and salinization, floods and droughts.

**UNIT-III.** Watershed management; concept of watershed; morphological units, morphogenetic classification, morphometric analysis, importance of watershed protection and approaches to watershed protection, watershed management.

**UNIT-IV.** Impact of modern development on water resource: - need of water for domestic and non-domestic use. Irrigation development and water resource management, Big and Small irrigation project and their impact on water resource, Tank and Well irrigation and their impact on water resource. Industrialization and its impact on water resource, Urbanization and its impact on water resource. Demand and supply position of water resource, contemporary water crisis.

### **Reference**

1. Bruce J.P. & R.H. Clerk, Introduction to hydrometeorology, pergamon press, Oxford, 1996.

2. David Keith todd, Ground water hydrology, John Willy and sons, New York, 1959.
3. Robert J. Reimold, watershed management, practice, policies and co-Ordination, McGraw-Hill, New Delhi, 1998.
4. B.D.Dhawan, Indian water resource management for Irrigation : Issues Critiques reiews, Commonwealth publishers, New Delhi, 1993.
5. Ravi Misra, Fresh water Environment, Anmol publication pvt.LTD, New Delhi, 2002.
6. Ramaswamy R. Iyer, water perspective, Issues, concerns, SAGE publications, New Delhi, 2003.

## **COURSE-S.C-1.6: GEOGRAPHY OF SETTLEMENTS (Soft core-2:1:0=3Credits)**

### **Learning outcome: After completion of this course the students**

- will be able to acquaint with the spatial and structural characteristics of human settlement system
- under varied environmental conditions.
- are able to distinguish the morphological, structural and functional characteristics between
- rural and urban settlements both in Indian and western perspectives.

### **PEDOGOGY**

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted.

### **COURSE CONTENT**

**UNIT-I.** Concept of rural and urban settlements; Nature, Scope, Significance and Recent Trends in Settlement Geography. Evolution of Settlements Origin and Growth of Towns; Basic and Non-Basic Concepts in Settlement formation. Distribution of Settlements, Spacing of Settlements– Application of Models of Christaller and Losch.

**UNIT-II.** Rural Settlements Types & patterns : Rural settlement types and Patterns, House Types, Morphology and Functions of Rural Settlements; Rural Service Centers and their function. Indian Rural Settlements in Different Micro-Environmental Conditions: (a) Mountains (b) Desert Region (c) In the vicinity of Urban Centers.

**UNIT-III.** Urban Settlements: Urban morphology, sphere of urban influence, Classification of Urban Places, Non-Functional and Functional. Morphology of Indian Cities and Its Comparison with Western Cities; Functional Relation between Urban Settlements and their uplands. Settlement systems- primate city, rank- size rule, settlement hierarchy.

**UNIT-IV.** Theories in Settlement Geography –CBD, Centrifugal and centripetal forces theory, Urban Fringe, Urban structures theories. Rank size relationship, Urban development in India.

### **References**

1. Hudson, F. S. (1976) Geography of Settlements, Macdonald, London.
2. Northam Ray, M. (1979). Urban Geography, JohnWiley and Sons, New York.
3. Ambrose, Peter, 1970: Concepts in Geography, Vol.-I, Settlement Pattern, Longman.

4. Baskin, C., (Translator) 1996: Central Places in Southern Germany, Prentice-Hall Inc. Englewood Cliffs New Jersey.
5. Haggett, Peter, Andrew D. Cliff and Allen Frey (Ed.) 1979: Locational Models Arnold Heinemann.
6. King, Leslie, J., 1986: Central Place Theory, Saga Publications, New Delhi.
7. Mayer, M. Harold and Clyde F. Kohn (Ed.) 1967 Readings in urban Geography, Central Book Depot, Allahabad.
8. Mitra, Asok, Mukherjee S and Bose, R., 1980: Indian Cities Abhinav Publications, New Delhi.
9. Nangia, Sudesh, 1976: Delhi Metropolitan Region, K.B. Publications, New Delhi.
10. Prakasa, Rao, V. L. S., 1992: Urbanisation in India: Spatial Dimensions, Concept Publishing Co., New Delhi.
11. Ramachandran, R., 1992: Urbanisation and Urban Systems in India, Oxford University Press, New Delhi.
12. Singh, R. L. and Kashi Nath Singh (Ed.) 1975: Readings in Rural Settlement Geography, National Geographical Society of India, Varanasi.

## II SEMESTER

### **COURSE-H.C-2.1 : REMOTE SENSING ANALYSIS (HARD CORE -PRACTICAL-0:0:3=3Credits**

**Objective:** Remote Sensing Technology is applied to problems and issues in sustainable development. Remotely sensed data are manipulated for feature extraction, spatial analysis and raster based GIS modelling.

**Unit I: Data Acquisition:** Obtaining multi-spectral data, microwave data, thermal data from various satellites sensors like Landsat, IRS, SPOT, MODIS Terra/Aqua, NOAA; obtaining elevation data from Cartosat - I, SRTM, ASTER, Topographical Maps and GEBCO, study of histograms and layer information's.

**Unit.2;Data Preprocessing:** Atmospheric Correction – Haze Removal - Image enhancement - contrast manipulation, density slicing, and color coding, image rectification: noise removal, radiometric correction, spatial correction, spectral correction, pan sharpening; geometric correction; image registration, subset, mosaic of side lap and overlap images.

**Unit 3;Classification and Delineation:** Determination of land use classes and various classification scheme; Unsupervised – K Means, ISODATA; Supervised classification – training sets, Parametric and Non-Parametric rules; Object based classification; Visual Image Interpretation; Accuracy assessment – Confusion matrix, Kappa – coefficient, thematic mapping.

**Unit 4:Modelling** – Change Detection, terrain modelling and analysis, indices modelling - DVI, NDVI, SAVI, MSI, NDBI, NDWI; building of model using model maker – Tasseled Cap Transformation (Brightness, Wetness and Greenness), land surface temperature.

### **References**

1. Introduction to Remote sensing and Image interpretation- Lillesand and Keifer
2. Introductory Remote Sensing- Paul. J. Gibson
3. Fundamentals of Remote Sensing and Air Photo Interpretation -Avery, T.E.
4. Introduction to Remote Sensing -James B. Campbell
5. Remote Sensing and Image Interpretation -Lillesand, T.M. &R.W.Kiefer.



## **COURSE –H.C-2.2: PRINCIPLES OF GEOGRAPHIC INFORMATION SCIENCE (GIS)**

**(HARD CORE :3-0-0=3Credits)**

**Objective:** The concepts of GIS, components of GIS and application areas of GIS are comprehensively understood. Students will go beyond the conventional fundamentals in GIS and GPS and move forward into modelling and applications, including specialized GPS surveys for planning studies.

**Unit 1:Introduction:** Concepts, history and development of GIS, components of GIS, applications of GIS; Coordinate Systems –datum's, latitudes, longitudes, Geographical Coordinate Systems, WGS84, Projected Coordinate System and UTM; Geospatial data - data input-existing GIS data, creating new data; Query: Spatial and Non Spatial data query, Boolean algebra.

**Unit 2:Data Models and Management:** Data format: Raster and Vector data formats; Spatial Data Models –Vector and Raster data models, Non- Spatial Data Models, Topology models, Grid model, TIN model, Network model, applications; Data collection, capture and Geo processing: Sources, input methods, editing, re-projection, geometric transformation, map scale, precision and accuracy.

**Unit 3:GIS Modelling and analysis:** Basic elements of GIS modeling; Coupling- Loose, Tight coupling; Spatial interpolation: elements, sampling schemes, global-local methods, comparison of spatial interpolation methods; Vector data analysis: buffering, overlay; raster data analysis– local operations, neighborhood operations, zonal operations; terrain mapping and analysis- DEM and TIN, contour, hill shading, slope and aspect.

**Unit 4:GNSS and RNSS:** definition, history, components; types, working principles and application of GPS, GLONASS, GALILEO, COMPASS; system segmentation – control segment, user segment, space segment, types of receivers; GNSS: different GNSS, GNSS Augmentation; RNSS - IRNSS, WAAS, EGNOS, MSAS, QZSS, SNAS, SDCM and WAGE; advantages and disadvantages; Role of DGPS and RTK receivers for surveying applications.

### **References:**

- 1 An Introduction to Geographical Information Systems - Ian Heywood
- 2 Geographic Information Systems: A Management Perspective - Aronoff, S.
- 3 GIS - Fundamentals, Applications and Implementations - Elangovan, K.
- 4 Introduction to Geographical Information Systems - Chang, Kang-Tsung

- 5 Remote Sensing and GIS - Bhatta, B.
- 6 Geographical Information Systems - Maguire, David J.
- 7 Mathematical Modeling in Geographical Information System, Global Positioning System and Digital Cartography - Sharma, H.S.

## **COURSE-H.C-2.3: TECHNIQUES OF ANALYSIS IN HUMAN GEOGRAPHY (Hard Core Practical:0-0-3=3Credits)**

**Learning Outcomes** – After successful completion of the course students will

- Be able to know and apply different methods of geographical analysis like- Nearest Neighbour Analysis, Rank Size Rule, Gravity model, Detour index etc- which will help them to understand the applicability of the subject apart from theoretical knowledge.
- Be able to make use of Different measures of dispersion with the help of- Lorenz curve, Gini-coefficient, location Quotient etc.
- Able to estimate the amount of disparity in physical and social aspects with different methods like Kendall's method, Bhatia's method which help students to learn more about economic disparity in society.
- Be able to identify Different types of connectivity index like Alpha index, Beta index and Gama index which helps in the study of traffic flow and connectivity.
- Know the concept of accessibility in Geography.

### **PEDOGOGY**

As this course is practical and lab oriented, it focuses on skill enhancement in addition to the conceptual base among the learners. Hence, the course shall adopt observation method through field studies and laboratory methods shall be adopted.

### **COURSE CONTENT**

**UNIT-I.** Nature of Geographical Data. Need for quantitative techniques in geography and limitations of these techniques. Measures of point distribution – centrality index, Central location- Median Centre, Mean Centre, Central location by formula method. Measures of dispersion of point, Dispersion about the median or mean center, Dispersion about some other specific location, Dispersion of point in relation to each other. (Barthelme, Demangeon and Deboures methods of dispersion analysis)

**UNIT-II.** Nearest neighbor analysis, Rank size Rule, Gravity model. Measures of line distribution, Accessibility of nodes. Route density, Route sinuosity, Detour index, shortest path and shortest distance analysis, Traffic flow, Measure of connectivity- Beta index, Connectivity, Gama index, Cyclomatic number, Alpha index, Eta index.

**UNIT-III.** Measures of Area Distribution. Lorenze curve, Gini-coefficient, Index of dissimilarities and Similarities, Location Quotient, Index of concentration, Gibbs Martin index, shift-share analysis

**UNIT-IV.** Measures of Disparities – Kendall’s method, Bhatia’s method.  
Combinational analysis - Weaver’s method, Ternary diagram.

**References**

1. Aslam Mahmood (2007) – Statistical Methods in Geographical studies, Rajesh Publications, New Delhi.
2. R.B. Mandal (2005) – Introduction to Rural Settlement, Concept Publishing Company, New Delhi.
3. R. Hammand and P. Mcchllagh (1975) – Quantitative Techniques in Geography, Clarendon press, Oxford.
4. J.P. Cole and C.A.M. King (1968) – Quantitative Geography, John Willey & sons Ltd, London.

## **COURSE-S.C-2.1: CONCEPTS IN GEOMORPHOLOGY(Soft Core-2-1-0=3Credits)**

**Learning outcome: on successful completion of this course students are**

- capable of interpreting as well as analyzing various landforms in accordance to its location and situation
- capable to design urban planning, agriculture planning, disaster Management and regional planning
- in a position to identify underground water points
- capable of building paleo climates using Geomorphologic Signatures
- Have good command on water resource management

### **PEDOGOGY**

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project, discussion and laboratory methods shall be adopted.

### **COURSE CONTENT**

**UNIT-I:** Fundamental Concepts of Geomorphology:

- a. Ten Concepts of Thornbury
- b. Principle of Uniformitarianism
- c. Cycle concepts, Views of W.M.Davis, Penck and L.C.King.

**UNIT-II:** Isostasy

- a. Views of Prat, Airy and Bowie
- b. Concepts of Earth's Equilibrium and Gravity Anomaly

**UNIT-III:** Crustal Deformation theories and principles:

- a. Tetrahedron, Wegner's Continental Drift Theory.
- b. Holmes Convection Current Theory.
- c. Joly's Radio Activity Theory
- d. Daly's Subsidence Hypothesis

**UNIT-IV:** Plate Tectonics:

- a. Development of Plate Tectonic theory.
- b. Major and Minor Plates
- c. Plate Movement and Forces:

- i. Convectional current
  - ii. Inner core current
  - iii. Thermal Flumes
  - iv. Paleo Magnetism
- d. Plate Margins and Associated Landforms - validation of Plate tectonics.

#### **REFERENCES**

1. Thornbury William., 1954, "Principles of Geomorphology", Wiley Eastern Limited, New Delhi.
2. Dogulas W.Burbank and Robert S. Anderson., 2001, "Tectonic Geomorphology", Backwell, Science Inc., USA.
2. John R.Hails., 1977, "Applied Geomorphology" Elsevier Scientific Publishing Company, New York 10017.
3. Tikka , Physical Geography.

## **COURSE-S.C-2.2: RESEARCH METHODS IN GEOGRAPHY(SOFT CORE-2-1-0=3Credits)**

**Learning Outcome: After successful completion of this course the students are expected to**

- Define research problem and Interpret as well as analyze various physical and social issues in
- Geographical research perspective.
- Prepare research and sampling design and gather, analyse varieties of data.
- be in a position to handle independent research and case studies
- Conduct fieldwork with special emphasis on interviews and observations.

### **PEDOGOGY**

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project, discussion and laboratory methods shall be adopted.

### **COURSE CONTENT**

**UNIT-I. Research Methodology:** Meaning –Need for Scientific research Type of research-Approaches to geographical research: Defining the Research problem Ethics in Scientific Research Role Information Technologies in Research.

**UNIT-II. Research design:** Concepts relating to research design, Different type of Research design. Experimental and Non-Experimental Research Designs Sampling design: Need for Sampling Methods, Size of Sampling; Measurement and Scaling Techniques,

**UNIT-III. Data Acquisition and Analysis;** collection of data- sources of data- primary and secondary-Processing-editing, Coding, Classification and Tabulation, Analysis- data transformation-SPSS package in data analysis Data Display: Tables, Graphs, Maps, Visualizations

**UNIT-IV. Interpretation and Report Writing:** meaning, techniques and significance of report writing- Drafting of the thesis-First, Second and Final- Writing of abstracts, Research papers for seminar and conferences, Journal Publications, case studies.

### **References**

1. Anderson, J. Durston, B.H. and Poole, M,(1970) Thesis and Assignment Writing, Wiley Eastern Ltd, New Delhi.
2. Cooray, P.G (1992) Guide to Scientific and Technical Writing, Handagala, Srilanka

3. Davis J.C. (1986) *Statistics and data Analysis*, John Wiley and Sons NY.
4. Fitz Gerald, B.P. Ed (1974) *Science in Geography*, Series 1, 2, 3,4,5,6. Oxford University press, London
5. Hang, L.L. and Lounsbury, J.F. (1971) *Research Methods in Geography*, Brown company Publishers, Iowa
6. Kothari, C.R. (2015) *Research methodology: methods and Techniques*, Vishwaprakashana, New Delhi.



### **COURSE-S.C-2.3: AGRICULTURAL GEOGRAPHY(Soft core-2-1-0=3Credits)**

**Learning outcome:** At the end of this course the students are expected to

- Understand origin, diffusion and classification of agriculture at the global scale.
- Familiarize with a variety of factors influence agriculture and agricultural models
- Acquire different tools and techniques of agricultural regionalization based on crop combination,
- crop concentration and crop diversification methods

### **PEDOGOGY**

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project, discussion and Regional methods shall be adopted.

### **COURSE CONTENT**

**UNIT- I.** Nature, Scope & Significance of Agricultural Geography, Origin and Diffusion of agriculture and approaches to the study of agriculture geography .World classification of agriculture bases for the whittlesey.

**UNIT- II.** Determinants of agriculture:

1). Physical 2). Economic 3). Social 4). Institutional 5).Technological, Green Revolution, White Revolution Blue Revolution.

**UNIT- III.** Models in Agricultural Geography – Nature and Need of models, Significance of Agricultural models, Limitation of models, Classification of models, Input, output/Decision making/Diffusion/Von Tunen"s, Olof Jonasson"s model and Game Theory.

**UNIT- IV.** Agricultural Regionalization: Delimitation of Agricultural regions, Empirical/single Element/Multi-Element or statistical/Quantitative-cum- Qualitative Technique, Methodology for agricultural regionalization Cropping Pattern/Crop concentration, Crop combination Crop Diversification & Agricultural productivity.

### **Reference**

1. Majid Hssain, (2002)" Systematic Agricultural Geography" Rawat Publication, Jaipur& New Delhi.
2. Noor Mohammed, "Perspectives in Agricultural Geography", Vol. I to II, concept publishing company, New Delhi.
3. Sing and Dhillin, (2000) "Agricultural Geography", Tata Mcgrow – Hill publishing company ltd, New Delhi.

4. Jasbir Sing, “Agricultural Geography”
- 5 . M.Shafi,(2006) “Agricultural Geography” Dorling Kindersly (India) pvt, ltd, Licensees of Pearson Education in South Asia. New Delhi.

## **COURSE-S.C-2.4: GEOGRAPHY OF POPULATION DYNAMICS (Soft Core-2-1-0=3Credits)**

**Learning Outcome:** At the end of the course, each candidate is able to

- understand different components of population dynamics such as Fertility and Mortality
- Get idea about Life Table construction, migration types and its issues such as Brain drain etc.
- Apply the theory of Demographic Transition and identify the stages of different regions of the world and its implications on them.
- understand population policies of LDC's and MDC's comparing India and neighboring China.

### **PEDOGOGY**

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project, discussion and Regional methods shall be adopted.

### **COURSE CONTENT**

**UNIT-I.** Population dynamics and components of population dynamics. Fecundity and fertility. Measures of fertility determinants of fertility, world's pattern and trend. Theories of fertility. Fertility in India, trend and spatial patterns.

**UNIT-II.** Mortality – morbidity. Measures, determinants world's pattern and trend. Mortality in India-trend and pattern. Life table construction. Migration- measures, theories of migration. International migration – past and present trend. Migration in India, trend and pattern, problem of Brain drain and impact

**UNIT-III.** Population growth stepped and exponential growth and demographic transition. Population growth and Boserup theory, Malthusian trop. India and demographic transition. Economic implications of Demographic transition with reference to India. Current demographic status in MDCs and LDCs.

**UNIT-IV.** Population policies and population projections. Population policies – importance, various aspects of population policy. Policies in LDCs and MDCs. India's population policy, China's policy. Methods of population projections.

### **Reference**

1. Asha A.Bhende & Tara Kanitkar – Principles of population studies, Himalayan publishing House, New delhi.

2. R.C.Chadana (2017) a geography of population, Kalyani publisher, New Delhi.
3. Mohammad Izhar Hassan (2005)- population geography, Rawat publication, Jaipur.
4. R.K.Tripati (2000)-population geography, commonwealth publisher, New Delhi.
5. Hornby & Jones (1983)-An introduction to principle Geography, Cambridge University press, London.
6. Majid Husain (1994)-Human Geography, Rawat Publication, Jaipur.
7. Dina Nath Verma (1992)-population patterns, Jaitosh Prakashan, Lucknow.

## **COURSE-S.C-2.5: BIO GEOGRAPHY(Soft Core-2-1-0=3Credits)**

**Learning outcome:** This paper helps students to

- 1 Understand the interplay between the physical and biotic environment and its role on dispersal of organisms.
- 2 Learn various aspects of adaptation of organisms, abundance, rarity of community of species and
- Ecosystems interaction in a geographical space based on various parameters.
- 3 Appreciate the importance of the concept of Bio diversity and causes for bio diversity loss.

### **PEDOGOGY**

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project, discussion and Regional methods shall be adopted.

### **COURSE CONTENT**

**UNIT-I.** Nature, scope and significance, Branches of Bio Geography, Historical Development, Approaches to Bio Geography, Plant Geography and Zoo Geography, Eco-system structure function and development of Eco- system.

**UNIT-II.** Geography of Animals communities, classification origin and Evolution of Animals, Dispersal of animals, Zoo Geographical Regions of the World, Environmental adaptations of animals. Factors influencing world distributions of Animals, anthropogenic effects in animals.

**UNIT-III.** Geography of plant community, classification, origin, Evolution, Dispersal and distribution of plants. Major biomes of the world, Classification of soils, soil profiles, soil erosion, Degradation, world distribution of plants, causes and Adverse effects of deforestation and conservation measures, anthropogenic effects on plants.

**UNIT-IV.** Marine Ecology: Meaning and concept and Factors of Marine Ecology, Adaptation of Phytoplanktons to marine environment, Trophic level and energy flow in marine ecosystem, Bio diversity :- Bio-Diversity- meaning, importance, and types of biodiversity, hotspots, causes of bio-diversity loss, conservation and management.

### **Reference**

1. Bhattacharya N.N.(2005): Bio-Geography, Rajesh Publications, New Delhi.
2. Cox. C.D and Moore P.D (1993): Biogeography : An Ecological and Evolutionary Approach
3. Darlington P.J. (1990): Zoogeography: The Geographic Distribution of Animals, Wiley and Sons, New York.
4. Huggett R.J. (2004): Fundamentals of Biogeography, Routledge

5. Husain M. (1994): Biogeography, Anmol Publication, New Delhi.
6. Lies .J (1974): Introduction to Zoo Geography, McMillan, London.
7. Mathur, H.S (1998): Essentials of Biogeography, Pointer Publishers, Jaipur
8. Pears Nigel (1985): Basic Biogeography, Longman, London, New York
9. Savindra Singh (2010): Biogeography, Prayag Pustak Bhavan, Allahabad.
10. Simmon I.G(1974): Biogeography, Natural and Cultural, Longman, London, 1985
11. Simmons T.G (1974): Biogeography: Natural and Cultural, Arnold Heinmann, London
12. Tivy Joy(1992): BioGeography, A Study of Plants in the ecosphere, oliver and Boyd, Edinburg.

## **COURSE-S.C-2.6: THEMATIC CARTOGRAPHY(SoftCore-2-1-0=3Credits)**

### **Learning outcome: After successful completion of this course the students will**

- Acquire professional skill to cater to the current trend where spatial knowledge is overwhelmingly preferred on maps and able to appreciate the Spatial visualization especially through complex and 3D maps.
- Create professionals who will qualify to produce significantly efficient spatial maps via different mapping programs and technologies such as geographic information systems (GIS).
- The professionals will get training on the basic skills which teach on the psychological perception, behavior, printing skills and psychological response of map user with different combination of colors, patterns and symbology on the map.

### **PEDOGOGY**

In order to enhance the learning outcome this course shall adopt the project, discussion and laboratory methods which helps the learners to acquire the fundamental aspects of map making skills.

### **COURSE CONTENT**

#### **UNIT-I. Nature of cartography**

- a. Meaning of maps b. Forms of representation
- c. Categories of maps: classed by scale, classed by function, classed by subject matter.
- d. Impact of changing technology on cartography
- e. Cartography as a science of human communication f. Collection of data- Physical and cultural details.

#### **UNIT-II. Map Making Process**

- a) Scale, Reference and coordinate system b) Elements of generalization,
- c) Measurement of geographical variables (nominal. Ordinal, interval, ratio, )
- d) Thematic and complex mapping.

#### **UNIT III Symbolization**

- a) Principles-Theory of Visual Perception
- b) Symbolizing: qualitative, quantitative, continuous and discrete data.
- c) Perceptual considerations - i. Graphic elements ii. Visual variables iii. Classes of symbols

d) Mapping feature attributes using point, line and area ii. Point features - dot maps, iii. Line features - hatchures, profiles, oblique traces, isarithmic iv. Area features - choropleth mapping; dasymetric mapping v. Perspective features - Morphometric maps.

#### **UNIT-IV. Map design and Layout**

- a) Objective of Map design b) Elements of map design
- c) Design principles: i) Legibility ii) Visual contrast iii) Figure – ground organization iv) Hierarchical organisation.
- d) Controls of map design (Purpose, Reality Available data Map scale Audience )
- e) Computer cartography- hardware and software,
- f) Toponymy and map reproduction: planning and process related to duplicating,
- g) Printing and latest methods.

#### **References**

1. Misra R.P. and Ramesh.(1989) Fundamentals of Cartography, concept publishing Co. New Delhi.
2. Nag, P. ed., (1992) Cartography and Remote Sensing concept Publishing Co. New Delhi
3. Robinson, A H, Sale AH. Morrison JL and Muerake (1985) Elements of Cartography, John wiles and sons
4. NY. Burrough P.A. (1986) Principles of GIS for land assessment.University press London.
5. Jones Emrys(1975): Readings in social Geography oxford University press London.
6. Knoy P.L (1978): Social Wellbeing a Spatial Perspective, oxford University press London.



## **COURSE-O.E-2.1: GIS & REMOTE SENSING (Open Elective-3-1-0=4Credits)**

**Learning outcome:** After the completion of this course it paves the way for non-geographers

- To learn the basics of remote sensing and GIS.
- To apply the basic concepts and practice of the course for their interest.

### **PEDOGOGY**

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted.

### **COURSE CONTENT**

#### **UNIT-I.** Introduction to remote sensing-principles of remote sensing

- Electro-magnetic radiation (EMR)
- Electro magnet spectrum
- Energy interactions with atmosphere
- Energy interactions with earth-surface features.

#### **UNIT-II.** Satellites and sensors

- Microwave remote sensing
- SAR and SLAR
- Imaging interpretation and analysis

#### **UNIT-III.** Introduction to GIS

- definition, concepts and components of GIS - Geographical entities

#### **UNIT-IV.** Sources of spatial data

- data encoding-spatial data modeling-raster-vector data models
- Data management system: Relational and hierarchical modes
- GIS applications.

### **Reference**

1. Borrough P.A (1986), "Principles of Geographic information system for land resources," Clarendon press, Oxford
2. Chrisman N.R. (1997), "Remote sensing and Geographical information systems"

3. Sabbins.F.F (1987), "Remote sensing: principles and interpretations", W.H.Freeman and Co, New York
4. Haywood.L, Comelius.S and S. Carver (1988), "An introduction to Geographical information system", Addistion Willey, New York.

## **COURSE-O.E-2.2: GEOGRAPHY OF KARNATAKA (Open Elective-3-1-0=4Credits)**

**Learning outcome:** The students will be able to

- Understand the physical, economic and socio-demographic aspects of Karnataka state in a broader sense.
- Understand the resource base of the state I.e, forests, soils, minerals, water and climate, and its impact on the socio-demographic and economic development of different regions of Karnataka in terms of agriculture, industries, transportation and other fields of human activities.
- Understand the development of irrigational projects and industrial projects and special Economic zones(SEZ's).

### **PEDOGOGY**

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project, discussion and Regional methods shall be adopted.

### **COURSE CONTENT**

**UNIT-I.** Location , Administrative divisions and Physiographic divisions of the Karnataka. Geology, Rivers, Climate, Soils, vegetation, Social forestry and National Parks and Birds sanctuaries.

**UNIT-II.** Development of Irrigation in Karnataka, Major Multipurpose river valley Projects, Krishna and Caveri water dispute. Agriculture : Distribution of crops, Rice, Jowar, Ragi, Bajara, Maize, Wheat, Tur, Oil Seeds ,Sugarcane ,cotton, Tobacco, Coffee, Mango, Coconut, Areca nut, Pepper, Cardamom , Coriander and Sericulture.

**UNIT-III.** Mineral resources: Distribution of Iron ore, Manganese, Bauxite, Copper, Gold. Major power Projects, Hydel power Projects, Thermal Power Plants and Atomic Energy centers. Industries: growth and Distribution of Cotton textile, Silk textile, Sugar, Iron and Steel, Cement and Paper Industries in Karnataka. Industrial Regions and Special Economic Zones in Karnataka.

**UNIT-IV.** Transportation : Development and distribution of Roads, Railway, Water way Ports and

Harbors and Airways. Population: growth Distribution, Density and Composition of Population in

Karnataka. Tourism: major Historical and geographical Places in Karnataka.

### **Reference**

1. R.P.Misra (1973) :Geography of Mysore.
2. N.B.K.Reddy &G.S.Murthy(1967); Regional Geography of Mysore State.
3. P.Mallappa(2008): Geography of Karnataka.

4. Ranganath: Geography of Karnataka
5. Karnataka State Gazetteer.
6. Karnataka: Directorate of Information and Tourism, Govt, of Karnataka.
7. Karnataka Wikipedia

### III SEMESTER

#### **COURSE-H.C-3.1: GEO-SPATIAL ANALYSIS (GIS-Practical) (Hard Core-0-0-3=3Credits)**

**Objective:** This is a practical course offering theme based, problem solving techniques of GIS methodology from data creation to advanced GIS and GPS analysis for student's analytical skill development.

**Unit 1:Data capture and Management:** Scanning of hardcopy maps, georeferencing and projection, data encoding, feature and geodatabase creation (point, line and area), digitization, topology, annotations; attribute data – joining, editing and integration, field calculation, spatial and non- spatial queries; symbolization and thematic mapping.

**Unit 2:Geo-processing and Modelling:** Vector- raster manipulation and analysis; proximity analysis; Topographical modelling, 3D visualization and analysis; Sampling and Spatial Interpolation, accuracy assessment of interpolation techniques; Watershed analysis, Morphometric analysis, network analysis;

**Unit 3:Spatial Statistical Modeling:** Identification of Central feature, directional distribution, mean center, median center, linear directional mean, standard distance, hot-spot analysis, correlation, raster calculator and Boolean operation. Exploring spatial relations using Ordinary least square (OLS), Geographical weighted regression (GWR), spatial autocorrelation;

**Unit 4:GNSS/GPS Survey:** Collection of Ground Control Points (GCP), precision, vertical and horizontal accuracy of collection; Waypoints, tracks, and transformation of GNSS/GPS data into GIS; Ground Truth Verification (GTV) of GPS data; Mobile based survey using Open data kit (form building, XML generation, data collection, and mapping)

#### **References:**

1. An Introduction to Geographical Information Systems – Ian Heywood
2. Spatial analysis and Location-Allocation Models - Ghosh, A. and G. Rushton
3. Geographic Information Systems and Cartographic Modelling - Tomlin, C.D.
4. Geographic Information Systems and Science - Paul A. Longley, et. al.
5. Geographic Information Systems and Environmental Modeling - Clarke, C., K.
6. Introduction to Geographic Information Systems - Tsung Chang Kang

## **COURSE-H.C-3.2: METHODS OF REGIONAL ANALYSIS (Hard Core-2-2-0=4 Credits)**

### **Learning outcome: At the end of this course the students**

- Will be familiar with the basic concepts of Region and regionalism
- Will understand the theories and models on regional growth and spatial diffusion
- Will be able to understand the concepts like growth pole and growth centre and modifications which are very critical aspects in regional analysis.
- Are able to understand the concept and factors of disparity in regional growth and development are able to measure level and extent of regional development to understand the disparity.

### **PEDOGOGY**

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project, discussion and Regional methods shall be adopted.

### **COURSE CONTENT**

**UNIT-I.** Regional concept and regional methods. Types of regions characteristics of different regions. Delineation of regions and methods of delineation. Regionalism v/s Sectionalism. Regional consciousness and contemporary regional movements in India-Telangana, Gorkaland, Kodagu etc.

**UNIT-II.** Analysis of regional growth and diffusion. Sector and Stage theory of Regional growth, Export base theory of Douglesic, North, economic base theory, convergence and divergence growth, multi plier effect. Analysis of spatial diffusion at local and regional level. Simulation analysis.

**UNIT-III.** Growth pole and growth centers in regional analysis. Growth pole theory perrolux, Mydral, Hermensons views. Limitations of the growth pole, modifications - R.P.Mishra"s growth foci. growth poles and regional development. Input and output analysis in general and regional context.

**UNIT-IV.** Analysis of Regional disparities – Balanced and unbalanced growth, Williamson's views on region inequality, causes for disparities in regional growth causes and consequences. Measures of disparities. Extent of disparities in India and Karnataka.

### **References**

1. Abler, Adams and Gould (1971) – Spatial Organization, Prentice – Hall, Englewood Cliffs, New Jersey
2. R.P. Mishra (1992) – Regional Planning, Concept Publishing Company, New Delhi.

3. Jayasri Ray Chaudhuri – An Introduction to Development and Regional Planning, Orient Longman Ltd, Kolkata.
4. John Glasson (1975) – An Introduction to Regional Planning, Hutchinson Prakashan, Meerat.
5. Walter Isard (1960) – Methods of Regional Analysis: an introduction to Regional Science, Published by, The Massachusetts institute of Technology & John Wiley & sons, Inc, New York.

### **COURSE-H.C3.3: ADVANCED SURVEYING (Practical) (Hard Core-0-0-3=3 Credits)**

**Course outcome: After Successful completion of this course the students will**

- Understand the basic principles of surveying such as the preparation of sketch, concepts of scales, common errors occur and field note taking and its importance etc.
- Learn the modern methods of surveying using the digital and satellite based GPS surveying.
- Be in a position to handle variety of survey instruments in different situations and able to prepare the map of the surveyed area, depicting the ground objects and other technical details on it.

#### **PEDOGOGY**

As this course is practical and lab oriented, it focuses on skill enhancement in addition to the conceptual base among the learners. Hence, the course shall adopt both observation method in the field and laboratory methods. Each learner shall be made to handle GPS software independently through hands on experience.

#### **COURSE CONTENT**

**UNIT- I.** Basic Principles of surveying, Defition , Classification of Surveys, Planning of Maps, Scales, Units of Measurements, Errors of surveying , Field Work, Booking Field Notes.

**UNIT- II.** Modern Methods of Surveying, Application of Remote Sensing, Application of GIS, Application of Satellite-based Global Positioning System .

**UNIT- III.** Earth linear measurement Theodolite and Total Station, Mapping the ground object, Locating the ground object from the map, Area computation-Triangle methods, Square method, Trapezium method, Ordanence method, Mechanical method, Measurement of vertical angle Theodolite and Total staion.

**UNIT- IV.** GPS Survey

- 
- i) Mapping the ground object
- ii) Locating the ground objects from the maps

#### **Reference**

1. R. Subramanian, Surveying and Levelling , Oxford University Press
2. P.C. Punmia, Surveying, laxmi Publications, New Delhi-2005.
3. R.P. Mishra, Fundamental Catography, Concept publication, New Delhi, 2005.



### **COURSE-S.C-3.1: TRANSPORTATION GEOGRAPHY(Soft Core-2-1-0=3 Credits)**

**Course outcome: At the end of this course the students will be**

- Able to know the spatial organization of different modes of transportation and understand the basic elements of transport network such as nodes, links, topology and measures of transport network.
- Able to appreciate the linkage between the places, functions and transport linkages over space.
- In a position to analyze the urban transport system and assess its problems and suggest solutions as a transport planner with the use of both theoretical as well as the technological background.
- Able to understand the transport policy with reference to India and sustainable transport planning.

#### **PEDOGOGY**

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted.

#### **COURSE CONTENT**

**UNIT-I.** Historical evolution of transportation, Transportation and spatial organization. Modes of Transport, Basic elements of transport network-Nodes & links, Topology of Network, Measures of Transport Network.

**UNIT-II.** Types of Movement and Causes of Movement, Spatial interaction and gravity model, spatial choices; destinations, modes & routes.

**UNIT-III.** Urban transportation; urban land use and urban transportation, urban Road classification, urban mobility, urban transport problems and its planning, land use modeling, Impact of Telecommuting onTransportation.

**UNIT-IV.** Transport planning & Policy: The nature of transport policies, the policy process, Transport policy in India ,Transport Planning, Geographic Information Systems in transport (GIS-T), Transport impact analysis and Sustainable Transportation

#### **Reference**

1. G.Gaile and C.Willmott (eds). "Transportation Geography" in Geography in American at the Dawn of the 21<sup>st</sup> century. New York. Oxford University press, 2004.

2. H.Dimitriou (ed) Transport planning for Third world cities. London. Routledge, 1990.
3. Jean – Paul, The geography of Transport system.
4. Saxena H.M (2005) “Transportation Geography”
5. William A Black-Transportation A Geographical Analysis. The Guilford Press, 2003
6. Bimal Dhawan-Transport Geography- Random Publications .2014
7. Moonis Raza (1999) Transportation Geography of India, Concept publishing, company, New Delhi

## **COURSE-S.C-3.2: MONSOON CLIMATOLOGY (Soft Core-2-1-0=3 Credits)**

**Learning outcome: At the end of the course the students are**

- able to identify the significant characteristics of the Monsoon Climate
- able to differentiate between South West Monsoon and North East Monsoon regions
- in a position to Classify the climatic zones at micro and at regional level
- in a position to analyze the Global air circulation and its impact on Monsoon
- in a position to analyze the Sea Surface Temperature of Indian ocean Arabian Sea and Bay
- Candidate can work for various types of Land use and agriculture based planning institutes and companies

### **PEDOGOGY**

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted.

### **COURSE CONTENT**

**UNIT-I:** Introduction, Meaning of Monsoon, Areas of Monsoon Climate in the World, Summer Monsoon, Post Monsoon and Winter Monsoon, Nature of the Variability of the Indian Summer Monsoon. Atmospheric Rotating Systems, Convection and Rainfall in tropics, instability, Active and Weak Spells, Breaks in the Monsoon.

**UNIT-II:** Basis of the Monsoon Climate, Tropical Convergence Zones(TCZs) and the Indian Monsoon. Variations in the convective rainfall over the Oceans and land. Heat lows and Monsoon regions of the world.

**UNIT- III:** Seasonal Transitions (onset and retreat) and Climate Clusters, Intra seasonal Variation and Intra seasonal Oscillation, Study of Tropical Oceans, El Nino and Southern Oscillation. Indian Ocean and the Indian Monsoon.

**UNIT- IV:** Inter annual Variation of the Indian Summer Monsoon, rainfall links to events over the Indian and Pacific Ocean, Monsoon Variability, Agriculture and Economy, Monsoon Prediction, Problems and Prospects.

### **REFERENCES**

- 1) Ramage C.S. : 1971: Monsoon Meteorology, Vol-15, San Diego.
- 2) Rao Y.P. : 1976 : South West Monsoon: IMD: New-Delhi.

- 3) Riehl H.: 1979: Climate and Weather in Tropic Academic Press, San Diego, New-York.
- 4) Chang C.P. and T.N. Krishnamurty (ed) 1987: Monsoon Meteorology, Oxford University Press.
- 5) Fein J.S. and P.L. Stephens (Ed): 1987: Monsoons: John Wiley: New-York.
- 6) Wang B. (Ed):2006: Asian Monsoon: Springer: Praxis.
- 7) Chang C.P.Y. Ding, N.C. Lau, R.H. Johnson, B.Wang and T. Yasunari: 2011: The Global Monsoon System World Scientific.

### **COURSE-S.C-3.3: ENVIRONMENTAL GEOGRAPHY (Soft Core-2-1-0=3 Credits)**

#### **Learning outcome: At the end of this course the students**

- Will have a knowledge and understanding of the dynamic nature of man-environment relation.
- Will be able to understand the concept and different forms of ecosystem and their mutual relation in the form of energy flow, food chain and food web and food pyramid etc.
- Are able to realize the human ecological adaptation and the influence of human on environment both at global as well as regional scales with reference to different forms of pollution and environmental degradation.
- Are able to understand the need, methods and efforts at global and national level in order to mitigate the environmental degradation through various planning strategies for sustainable development.

#### **PEDAGOGY:**

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted.

#### **COURSE CONTENT**

**UNIT-I.** Definition, Nature, scope and importance, Environment Geography and Related sciences, Environmental Perception, Levels of Environmental perception and environmental society, Ecological Approaches, Man and Environment, Historical Perspective of ecological changes.

**UNIT-II.** Concept of Ecosystem, structure, functioning and development of ecosystem, Food chain and food web, food pyramid, energy flow in an ecosystem, energy loss in an Ecosystem, Major ecosystems, and historical development of ecology, principles of ecology, Human Ecological adaptations, Influence of Man on Environment global and regional ecological changes.

**UNIT-III.** Pollution and Environment Degradation, Meaning and concept-environmental degradation and pollution, sources, types, effects and measures of pollution in Air, Water, land, soil. Natural hazards and its impact on environment, Types of Environmental degradation, Processes, causes of Environmental degradation, population growth and environment, Agriculture development and Environmental degradation, deforestation and Environmental degradation, urbanization and Environmental degradation, industrial development and Environmental degradation.

**UNIT-IV.** Environmental Planning and Management, Meaning, Importance, needs of EIA and Emerging Issues, UN processes and procedures for EIA, Global Environmental Issues, Environmental conservation, management and its approaches to environmental management, wild life Management, solid waste Management, Environmental Planning. Concept of sustainable development Environmental education and legislation.

**Reference**

1. Dr.Alka Gautam(2013): Environmental Geography, Sharada Pustak Bhavan,Aallahabad
2. Environmental Impact Assessment: A New Dimension in Decision Making, 2 Ed.
3. H.M.Saxena (1999): “ Environmental Geography”, Rawat Publications, Jaipur.
4. Prof. P.R.Trivedi(2011): Environment Impact Assessment, APH Publication Corp. New Delhi
5. R.R.Barthwal(2002): Environment Impact Assessment, New Age International Publishers. Bangalore.
6. Savindra Singh: Environmental Geography, Prayag Pustak Bhawan, Allahabad.

## **COURSE-S.C3.4: POPULATION RESOURCES AND DEVELOPMENT**

**(Soft Core-2-1-0=3 Credits)**

**Learning outcome: After the completion of this course the students will**

- Understand different problems of population on environment and ecology.
- be able to learn about population resource nexus and carrying capacity
- be able to understand the relationship of population with economy in terms of development.
- be able to analyse the main problems behind some emerging demographic issues like Ageing, demographic dividend etc.

### **PEDOGOGY**

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted.

### **COURSE CONTENT**

**UNIT-I.** Population Resource Nexus, limits to growth, optimum, over and under population. Population equilibrium, Concept of carrying capacity of the earth. Population pressure. Impact of population pressure on energy, water and other resources. Population and food security / supply. Hunger, health and malnutrition. Population – resource regions of the world.

**UNIT-II.** Population growth and its environmental implications. Direct and indirect impact on environment. Impact on lithosphere, Atmosphere, Hydrosphere, Biosphere. Other implications.

**UNIT-III.** Population and development relationship. Concept, content and measure of development. Human development Index and its spatial analysis. Population and development - Experiences of the western countries and third world countries. Impact of population on economic development with reference to India. Quality v/s quantity of population.

**UNIT-IV.** Emerging demographic issues. Demographic dividend, Ageing process, Gender issues Quality of life, Demographic regions.

### **References**

1. Lester R. Brown (1976) – In the Human Interest, A Strategy to stabilize world population, affiliated east– West Press, New Delhi.
2. B.N. Ghosh (1998) – Population Theories and Demographic Analysis, Meenakshi Prakashan, Meerat.

3. H.M. Saxena (1999) – Environmental Geography, Rawat Publication, Jaipur.
4. Nauhminimal Singh (2002) – Population and Poverty, Mittal Publication, New Delhi.
5. Liebid and Iruday Rajan (2005) – An Ageing in India: Perspective, Prospects and Policies, Rawat Publication, Jaipur.



## **COURSE-S.C-3.5: URBAN GEOGRAPHY (Soft Core-2-1-0=3 Credits)**

**Learning outcome: after the completion of the course the students are**

- Able to understand the concept and process of urbanization.
- Familiar with the aspects of urban structure, linkages between urban and rural settlements.
- Able to understand contemporary urban issues such as migration, slums, squatter settlements, environmental quality, urban land value and urban transport.
- also understand needs and methods of urban planning and urban development programs in Indian context.

### **.PEDOGOGY**

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted.

### **COURSE CONTENT**

**UNIT-I.** Urbanization Concepts and process: meaning of urban settlements and Urbanization. Criteria used to distinguish urban settlements, Behavioral structural and demographic concept of Urbanization, distribution and evolution of cities through historical times, Urbanization curve.

**UNIT-II.** Urban Morphology- Models of Urban structure: Park and Burgess Model.Homer And Hoyt model, Harris and Ullman model. Rural- Urban fringe: Meaning, characteristics, Suburbanization, Concepts of conurbation, megalopolis, Satellite towns. Factorial ecology and social area analysis.

**UNIT-III.** City and its region, Contemporary Urban issues: Concepts of city region, Characteristics and demarcation, Nature of Urban influence. Contemporary Urban issues: Price of land and vertical and horizontal growth of cities, Urban sprawl, Scarcity of housing and growth of slums, problems of civic amenities, urban transport problem, Environmental pollution.

**UNIT-IV.** Urban policy and planning with special reference to India: Policies of Urban development: Smart cities, AMRUT,(Atal Mission for Rejuvenation and Urban Transformation) PMAY (Pradhan Mantri Awaz yojana) DAY (Deen Dayal Antyodaya Yojana) RAY (Rajiv Gandhi Awaz Yojna) JNNURM ( Jawaharlal Nehru National Urban Renewal Mission) SBM-U (Swatch Bhart Mission – Urban) Urban regeneration, City Planning; Need and elements of city planning, Master plans of towns. The concept of sustainable cities and Sustainable Urban growth.

### **References**

1. Roberts, Brian K. (1996): Landscapes of settlement: Prehistory to the Present, Routledge, London.

2. Gates, Richard and stout, Fredric (2000): The city Reader, Rout ledge (London and New York)
3. **O'sullivan, A.** (2000): Urban Economies, 4th Edition, Me Graw Hill, Boston
4. Knox, Paul and Pinch Steven (1996): Urban Social Geography: An Introduction
5. Carter (1972): The study of urban geography, Edward Arnold, London.
6. Kundu.A (1992): Urban development and urban research in India, Khanna Publications
7. Hall P (1992): Urban and regional planning, Rout ledge, London
8. Tim Hall: Urban Geography
9. K Siddhartha and S Mukherji: Cities, Urbanizations and urban systems.
10. Shah Manzoor Alam: Urbanization in developing countries.

## **COURSE-S.C-3.6: FLUVIAL GEOMORPHOLOGY (Soft Core-2-1-0=3 Credits)**

### **Learning outcome: At the end of this course students will**

- get to know the relevance of Rivers and its action over land.
- come to know how the river reacts to the internal disturbances of the earth
- understand the relationship between the different drainage pattern and geology.
- understand the inter relationship between the different stream orders and the cropping pattern

### **PEDOGOGY**

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted.

### **COURSE CONTENT**

#### **UNIT-I. The Application of GIS and Remote Sensing In Study of Fluvial Geomorphology**

#### **UNIT-II. Tectonic modification of Rivers**

- i) Co- seismic modification of River system
- ii) Gradual change of river system
- iii) Longitudinal profiles
- iv) River pattern sinuosity
- v) Bed rock channel path river
- vi) Alluvial channel path river
- vii) Integrated models of tectonic adjustment of rivers

#### **UNIT-III. Ground Fluvial Hydrology**

- i) drainage network and drainage pattern
- ii) open channel hydraulics'
  - a) Types of flow
  - b) Regimes
  - c) Stream density
  - d) Gradient geological structure

**UNIT-IV:** Fluvial geomorphology with reference to Cauvery river basin

The applied geomorphology and ground water studies

Watershed Management in Cauvery basin.

**Reference**

1. Fundamentals of Fluvial Geomorphology by Charlton Ro (Paperback - Dec 26, 2007)
2. Fluvial Processes in Geomorphology by Luna B. Leopold, M. Gordon Wolman, and John P. Miller (Paperback - Jun 28, 1995)
3. Tools in Fluvial Geomorphology by G. Mathias Kondolf and Hervé Piégay (Hardcover - April 11, 2002)
4. Fluvial Forms and Processes: A New Perspective by David Knighton (Paperback- April 1998)
5. Rivers and Floodplains: Forms, Processes, and Sedimentary Record by John S. Bridge (Paperback - April 25, 2003)

### **COURSE-O.E-3.1: HUMAN GEOGRAPHY (Open Elective-3-1-0=4 Credits)**

**Learning outcome: After the completion of this course the students are able to**

- Understand the concepts, contributions of different schools and traditions of human geography.
- critically think the impact of physical forces on the distribution and diffusion of cultural elements like language, religion, race and tribes.
- understand the spatial pattern of natural resource base and human development, global and regional population growth and distribution and demographic characteristics.

### **PEDOGOGY**

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted.

### **COURSE CONTENT**

**UNIT-I.** Field and Scope of Human Geography. Branches of Human Geography. Approaches - Nomethetic and Idiographic. Development of Human Geography – Germans, French and American contribution.

**UNIT-II.** Cultural Diversities – Race, Religion and Language. Major tribes of the World.

**UNIT-III.** Survey of World Resources – Concept and Types of Resources. Forest resources, Mineral and Power resources – Iran, Manganese, Bauxite, Gold, Coal, Petroleum, Atomic and Hydro. Agricultural region of the World.

**UNIT-IV.** Population of the World – Density and Distribution, Growth and Composition. Human Migration – types, Causes and Consequences.

### **References**

1. Majid Husain (2002) -Human Geography, Rawat Publication, Jaipur.
2. Rubenstein and Baoon (1990)- The cultural Landscape: An Introduction to Human Geography, Prentice – Hall of India Ltd., New Delhi.
3. Brek and Webb (1968) – A Geography of Mankind, McGraw – Hill Book Company, New York.
4. Peter Hagget (1972) – Geography: A modern Synthesis, Harper & Row Publishers, New York.

## **COURSE-O.E-3.2: PHYSICAL GEOGRAPHY (Open Elective-3-1-0=4Credits)**

**Learning outcome: After successful completion of this course the students are**

- get clarity about the natural laws and its function and its applications
- come to know the various forms of denudational agents and its role in forming new landforms
- be in a position to evaluate the nature of land and its origin
- be in a position to undertake research to understand the local function
- be in a position to classify the natural regions and its positive and negative characteristics

### **PEDOGOGY**

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project, discussion and Regional methods shall be adopted.

### **COURSE CONTENT**

**UNIT-I.** Solar system – shape & size of the earth, Movement of the earth- Rotation & Revolution Effects of the movement – Earth coordinates – Latitude Longitude & Time.

**UNIT – II.** Composition of the Earth's Interior, Rocks, –Minerals – Classification and rocks – Igneous rocks sedimentary rocks, Metamorphic rocks, Weathering – Mechanical, Chemical and Biological Work of Running Water and Glaciers.

**UNIT – III.** Composition of Atmosphere, Weather and Climate Factors affecting the Distribution of Temperature, Insulation, Horizontal and Vertical Distribution of Temperature-seasonal variation in the general distribution of Temperature pressure and winds, Rainfall – Types of rainfall.

**UNIT – IV.** Distribution of Land & Sea – submarine relief, surface relief of the ocean vertical distribution of Temperature, Salinity – Factors controlling Salinity, Distribution of the salinity, ocean currents, tides & Types of tides.

### **Reference**

1. B.S.Negi (1993) "Physical Geography" S.J Publication. Meerat.
2. R.N.Tikka (2002)"Physical Geography" Kedar nath ram nath & co. Meerat.
3. K.Siddhartha (2001) "Atmosphere, wheather and climate", Kisalaya publication, New Delhi.
4. William D. Thornbury (1997) "Principle of Geomorphology", New Age International (P) Limited, New Delhi.
5. D.S Lal (1998). "climatology" Chaitanya publishing house, Allahabad.

## IV SEMESTER

### **COURSE-HC-4.1: ECONOMIC GEOGRAPHY (Hard Core-3-1-0=4Credits)**

#### **Learning outcome: At the end of the course the students are able to**

- Understand the basic aspects of spatial structure of economy and human interaction
- Understand the process of decision making in economy where they are going to know how the time and space effects on decision making.
- Understand the theories and model relating to the location of industries considering various aspects of location such as transport cost, resources cost, land rent and labour cost etc.
- Understand the consumer behavior, spatial variation in consumer consumption and location, origin and characteristics of market centers and also know movement of commodities, people and information.

#### **PEDOGOGY**

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted.

#### **COURSE CONTENT**

**UNIT I.** Meaning, nature, scope and importance of Economic Geography. Simple model of the Economy, spatial structure of the Economy, Environmental relations of the economy. The Economy and Economic Geography, spatial and systematic Approaches.

**UNIT-II.** Decisions making in the economy: Types and mechanics of decision making, Effect of time and space on price formation, government intervention in price mechanism. Firms, functions of firms, decision making and the process of production, choice of output choice of technique.

**UNIT-III.** Theories of Industrial location:- Factors of industrial Location Geographical , Social , Economic, Environment , historical and political, types of industries, Resource based and foot loose industries. Industrial growth and its impact on environment and remedial measures, problem and prospects of industrialization. Theories of industrial location:- Least cost school, Transport cost school, market area school, marginal location school, and Behavioral school.

**UNIT-IV.** Consumer's behavior and the economy- Analysis of consumer's behavior, spatial variation in consumption, consumer behavior in space. Market centres- origin and types periodic and daily markets, sequential development. Movement, the generation of movement between areas, spatial and non-spatial factors. The Distribution of Movement.

#### **Reference**

1. David M.Smith(1984) – Human Geography, A Welfare approach, Arnold Heinemann, London

2. Dr.Alka Gautham(2013) – Advance Economic Geography, Sharada Pustak Bhavan, Alahabad
3. Hodder and Lee (1982) – Economic Geograpy, Methuen and Co, London
4. John W.Alexander and Gibson (1979) – Economic Geography, Prentice – Hall of India Private Limited, New Delhi.
5. K.Siddhartha (2000) – Economic Geography, Kisalaya Publications, New Delhi.
6. Prithwish Roy(2005) – Economic Geography, New Central Book Agency, Kolkatta.
7. Smith (1978) Industrial Location, Prentice Hall, Englewood Cliffs, N.J.
8. Truman A. Hartshorn and John W.Alexander – Economic Geography



## **COURSE-H.C-4.2: MULTIVARIATE STATISTICS (Hard Core-2-1-1=4 Credits)**

**Learning Outcomes** – At the end of the course students will

- get to know about the use of basic statistical measures and its use in Geography.
- be able to understand different central tendency measures like Mean, Median, Correlation Coefficient, Regression and its application in Geography.
- be familiarised with different data collection methods with the help of different types of sampling and its limitations.
- Know the use of SPSS software and its use in Geography for analysing geographical data.

### **PEDOGOGY**

As this course is practical and lab oriented, it focuses on skill enhancement in addition to the conceptual base among the learners. Hence, the course shall adopt observation method through field studies and laboratory methods shall be adopted.

### **COURSE CONTENT**

**UNIT-I.** Significance of Statistics in Geography, Review of basic statistical measures. Measures of Central tendencies, Measures of variation, Analysis of Variance (ANOVA),

**UNIT-II.** Basic Multi Variate Analysis. Correlation Analysis - Correlation coefficient for grouped and Uni grouped data, Rank Correlation. Regression Analysis – Simple Linear regression, Residual Analysis, Multiple Regression.

**UNIT-III.** Theory of Sampling and Testing of Hypotheses: Types of Sampling, Sampling distribution and standard error. Testing of Hypotheses – t test, f test and Chi-square Test.

**UNIT-IV.** Advanced Multivariate Analysis: Introduction, Factor Analysis and its methods, Centroid method, Principal Component Method, Use of SPSS in Statistical Analysis.

### **References**

1. R.Pannervselvam- Research methodology, Prentice hall India, New Delhi, 2008.
2. C.K Kothari - Research methodology, New Age International publishers, New Delhi, 2007.
3. Aslam Mohammad – Statistical methods in Geographical Studies. Rajesh Publishers, New
4. RSN Pillai and Bhagavathi – Statistics –Theory and Practice, S Chand and Co.Ltd. New Delhi. 2007.

### **Course-H.C-4.3: DISSERTATION ( Hard Core-0-0-5=5 Credits)**

M.Sc Geography Programme Students are assigned to take up dissertation work of local and regional relevance to make them exposed to real situation and come out with appropriate strategies using both theoretical and practical skills. Each student shall take up the field study at least for 2 weeks relating to their investigation and have to submit a report duly certified by the supervisor during dissertation viva-voce. Each student shall choose the dissertation topic before the end of Third semester and they have to do review of literature on their respective topic. Every student shall present review of literature and dissertation proposal before the panel of teachers and this shall be considered for assessing Internal assessment marks.

#### **Learning outcome: After successful completion of this course the students are**

- Able to Handle research projects independently and confidently.
- able use different and appropriate analytical tools as per the topic and methodology
- in a position to generate Maps Charts and data Tables
- in a position to interpret the data and draw inferences and conclusions.

#### **PEDOGOGY:**

As this course is mandatory the learners are encouraged to take up observation through field studies and use of both conceptual and practical knowledge acquired during the earlier courses. The methods and techniques are case specific but it is expected to make use of practical and lab which shall be able to reveal the level of skill elopement and ability to apply them in different situations in addition to the conceptual understanding. Hence, the course shall adopt observation method through field studies and laboratory methods shall be adopted.

## **COURSE-S.C-4.1: DISASTER MANAGEMENT(Soft Core- 1-1-0)**

### **Learning outcome: At the end of this course the students**

- Will able to create awareness about different forms of disaster its and impact and consequences.
- will know which are the striking variable to be considered to extract the Susceptibility zones
- will able to identify the Susceptibility areas and zone such as Flood, Forest Fire, Cyclone, Landslide and Earthquake mapping,
- will be in a position to Manage a Disaster event successfully

### **PEDOGOGY**

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted.

### **COURSE CONTENT**

**UNIT –I.** Disasters: Definition and Concepts: Hazards, Disasters; Risk and Vulnerability; Classification

**UNIT- II .** Types of Environmental hazards & Disasters: Natural hazards and Disasters, Man induced hazards & Disaster-Earthquake, Tsunami, Landslides, Cyclones, Floods, Drought, Desertification Distribution and Mapping

**UNIT -III.**Manmade disasters: Causes, Impact, Distribution and Mapping, Response and

Mitigation to Disasters: Mitigation and Preparedness, NDMA and NIDM; Indigenous Knowledge and Community-Based Disaster Management; Do"s and Don"ts During and Post Disasters

**UNIT-IV.** Harnessing Information and Technology: Application of GIS.GPS and Remote Sensing in Disaster Management.

### **References**

1. R.B. Singh(Ed) Environmental Geography, Heritage Publishers New Delhi,1990
2. Savinder Singh Environmental Geography, Prayag Pustak Bhawan,1997
3. Kates,B.I & White. G.F. The Enviornment as Hazards, Oxford, New York, 1978
4. R.B.Singh(Ed) Disaster Management, Rawat Publication, New Delhi, 2000.
5. H.K.Gupta(Ed) Disaster Management, University Press, India, 2003.

6. A.S.Arya Action Plan for Earthquake, Disaster, Mitigation in V.K.Sharma(Ed)
7. Disaster Management IIPA Publication New Delhi, 1994
8. R.K.Bhandani An overview on Natural & Manmade Disaster & their Reduction, CSIR, New Delhi.
9. M.C.Gupta Manuals on Natural Disaster Management in India, National Centre for Disastr Management, IIPA, New Delhi,2001
10. Global Environment Outlook (2002) UNEP Earth Scan Publications Ltd, London.

**COURSE-S.C-4.2: REGIONAL DEVELOPMENT PLANNING IN INDIA**  
**(Soft Core-1-1-0=2 Credits)**

**Learning Outcome: At the end of this course the students are able to**

- Know about different types of approaches in planning in India to shape our nation.
- Know about tribal, drought prone area development as well as metropolitan area development.
- Will know about different poverty allevation programmes launched in India like  
NAREGA.
- learn about different case studies of different regions like bastar, DVC, terai region etc.

**PEDOGOGY:**

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted.

**UNIT-I.** Planning – types, need for regional approach in planning- regional planning – nature and principles Top-down and bottom up strategies in planning. Multi – level planning, Block and district level planning. Approaches to Regional Planning, Total regional approach, selective regional approach and target group approach. Social and environmental issues in planning.

**UNIT-II.** Regional development policies and programmes in Indian five year plans – Regionalization process in India, A review. Backward area development programmes. Tribal area development programmes, Drought prone area development programmes, Hilly area development programmes, Command area development programmes, Metropolitan area development programmes.

**UNIT-III.** Rural development in India process and objectives – major rural development programmes in India- pre-independence efforts. A brief study of various rural development programmes during different five year plans up to NAREGA. Urban development programmes in India – A review.

**UNIT-IV.** Case study of regional development programmes in India. NCR region, Tungabhadra command area, Terai region, Baster region, Dandakaranya Region, Damodar Valley region.

**References**

1. Hemalata Rao (1984) – Regional Disparities and Developmant in India, Ashish Publishing House, New Delhi.

2. Mahesh Chan and Puri (1997) – Regional Planning in India, Allied Publishers limited, New Delhi.
3. Mahapatra and Routray (1998) Regional Development and Planning, Rawat Publications, Jaipur.
4. Sudhanshu Shekar (2004) – Regional Planning in India, Anmol Publication, New Delhi.
5. T.N.A. Rao (1993) – Regional Development – Levels of Development of Karnataka, Printed by impressions, Belgaum.

## **COURSE-S.C-4.3: MEDICAL GEOGRAPHY (Soft Core-1-1-0=2 Credits)**

### **Course outcome: At the end of this course students are**

- Able to understand the growth and importance of the medical geography as a sub branch in human geography.
- They can critically think the dynamic human-environment interaction and human health outcome, social environment and health, population dynamics and epidemiological transitions and changing disease risk factors.
- They will understand the factors responsible in the global health care inequality and introduced to health policies and programmes in different development blocks in the world.

### **PEDOGOGY:**

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted.

### **COURSE CONTENT**

**UNIT-I.** Concepts and Traditions: Definition, scope, elements, Growth of medical Geography Methods and techniques.

**UNIT-II.** Human-Environment Interaction: Health and environment-concept of health, Geographical approaches of health, Natural environment and health- Inorganic and organic, Social environment and health : Food intake, Perception of diseases, Treatment of diseases, Socio-economic conditions and health.

**UNIT-III.** Modernization, Population change and health: Disease classification- Genetic, Communicable, communicable, Occupational, deficiency diseases, WHO Classification of diseases. Diseases Diffusion: non-Meaning, factors/barriers, Phases, Types of diffusion. Epidemiological Transition-The theory of epidemiological transition (Omran theory) factors of transition- Demographic, Changes in risk factors, Practices of modern medicine. Indicators.

**UNIT-IV.** Global Inequalities in Health care: Concept of health care, levels of health care, health care accessibility and utilization, Health care delivery system worldwide, health care services in India, health care policy in India.

### **Reference**

- a. Husain Majid (1994): „Medical Geography“, Amol Publication Pvt.Ltd. New Delhi
- b. Learmonth A T A (1978): „Patterns of diseases and hunger“, a case study in Medical Geography, David and Charles, Victoria

- c. May J M (1970): „The world atlas of diseases“ National Book Trust, New Delhi
- d. Mc. Glashan N.D (1972): „Medical Geography, Methuen, London
- e. Misra R P (1970): „Medical Geography“ National Book Trust, New Delhi
- f. Rais A S Learmonth A T A (1990): „Geographical aspects of health and diseases in India“ rawat Publication, Jaipur
- g. Stamp L. D.(1964): „Some aspects of Medical **geography**“, Oxford University Press Oxford
- h. M.S.Meade and R.J. Erickson (2005), Medical Geography Guilford press.



## **Course-S.C-4.4: APPLIED CLIMATOLOGY(Soft Core-1-1-0=2 Credits)**

**Learning outcome:** The students are expected to

- Know various methods and techniques of weather data acquisition, processing, analysis and forecasting at different scales.
- Be aware of its application in different fields of human activities.
- Critically understand the natural and human factors influence on climate change and its impact at local and global scale in different dimensions.

### **PEDOGOGY**

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project and discussion methods shall be adopted.

### **COURSE CONTENT**

**Unit- I:** Nature and Scope, History, Development and Importance of Applied Climatology, Weather Analysis: Data Acquisition and Dissemination, Weather Instruments: Use and Functions.

**Unit- II:** Weather Forecasting Methods, Types and Accuracy, Medium Range and Long Range Forecasts, Role of Satellites in Weather Analysis and Forecasting; Relationships between Climate and Ocean; El-Nino, La-Nino effects.

**Unit- III:** Climate Change: Meaning, causes:Natural- Plate Tectonics, Volcanic Activity, Orbital Variations, Solar Variability, Global Warming, Ozone Depletion, Anthropologic causes, Impact: economic and social impacts.

**Unit- IV:** Vulnerability and Disaster mitigation: Risk, Vulnerability, Adaptation and Mitigation measures to climate change.Application of Geospatial technology in climate studies and research.

### **REFERENCES**

- 1) Thompson Russel D: 1997: Applied Climatology, John Wiley, New York.
- 2) Berry and Perry: Synoptic Climatology.
- 3) Mather J.R.: 1974: Climatology Fundamentals and Applications.
- 4) Stinger: Techniques in Climatology.
- 5) Lal D.S.: 2014: Climatology.
- 6) Trewartha G.T.: An Introduction to Climate
- 7) Davis R.J.A: 1986: Oceanography; An Introduction to Marine Environments, Winc-Brown Publication, Iowa
- 8) Patterson: Introduction to Meteorology.
- 9) Critchfield H.J.: 1975: General Climatology, Prentice Hall, New-Jersey.

## **COURSE-S.C-4.5: APPLIED GEOMORPHOLOGY (Soft Core-1-1-0=2 Credits)**

**Learning outcome: At the end of this course the students will**

- Perform how to map the earthquake susceptibility zone
- will perform how to identify the ground water potential zone
- will be able to perform the crop suitability analysis
- able to perform flood zone mapping
- able to create Urban Land use Planning based on Geomorphological Principles

### **PEDAGOGY**

As this course is practical and lab oriented, it focuses on skill enhancement in addition to the conceptual base among the learners. Hence, the course shall adopt laboratory methods.

### **COURSE CONTENT**

**UNIT-1:** Basic Concepts in applied Geomorphology: Application of Geomorphic mapping and GIS, Terrain evaluation, Classification and its application.

**UNIT-II:** Applications of Geomorphology in Urban Planning:

- i. Urban Geomorphology
- ii. Geomorphic impacts on urbanization
- iii. Geomorphology and Habitat characteristics
- iv. Geomorphic controls in Urban expansion
- v. Geomorphology and Urban water supply and road construction.
- vi. Remote sensing application in Urban Geomorphology

**UNIT-III:** Applications of Geomorphology in Groundwater prospecting and watershed management

**UNIT-IV:** Application of Geomorphology in Regional Planning and Disaster Management.

### **Reference**

- a. Singh R.L.: Elements of practical Geography, Kalyani Publications (2005).
- b. Misra R.P. : Fundamentals of Cartography, Concept Publication, New Delhi (2001)
- c. Hammond R and Mecullagh P : Quantitative techniques in Geography, Claredon Press, Oxford (1975).
- d. Anson R.W and Colour use guidelines for mapping and Visualization “Visualization in Modern Geography”, Oxford.

## **COURSE-O.E-4.1: GEOGRAPHY OF INDIA (Open Elective-3-1-0=4 Credits)**

**Learning outcome:** After successful completion of this course the students are

- As this course is prescribed for non-geography students, the students of other disciplines opt this course.
- Able to understand the physical background such as the geographical position, size, physical characteristics and boundaries of India.
- Will be familiar with the climate and factors influencing on it and they are able to know the resource base of the country like forest, soil, water, minerals etc.
- Able to establish the relation between the Industrial concentration, its development, Transport development and locational aspects with the natural resources base in the country.

### **PEDOGOGY**

In order to enhance the learning outcome this course shall adopt observation method through field studies and case studies. In addition, the project, discussion and Regional methods shall be adopted.

### **COURSE CONTENT**

**UNIT-I.** Geographical location of India, Economic Position of India in relation to world, salient features of geological structures of India. Main Physiographic divisions: Northern Mountains, North Indian Plains, Peninsular Plateau ,Costal lowlands and islands, Drainage system of India, East flowing and West flowing rivers.

**UNIT-II.** Climate seasons and Climatic Regions: various seasons and associated weather conditions, mechanism of Monsoon, majors climatic regions of the India. Soils, types and their distribution , soil degradation and conservation. Forest, types and their distribution in India, deforestation and conservation of forest.

**UNIT-III.** Minerals and Power Resources ,distribution of Ironore, Manganese, Bauxite ,coal ,Petroleum and Natural gas , Major power projects in India(Hydro, Thermal, Atomic) Agriculture, Distribution of Major Crops, Rice, Wheat, Cotton, Sugarcane, and Maize. Green revolution in India.

**UNIT-IV.** Major Industries and Industrial development in India. Distribution of Industries, Cotton textile, Iron and Steel Sugar, Chemical fertilizers and engineering . Industrial Regions of the India. Transportation: Road, Railway, Airway and Inland Water transportation systems in India. Population growth , distribution and composition in India.

### **Reference**

1. Chopra S.N : India an area study.
2. Dubey and Negi: Economic Geography of India.
3. Gopal Singh: Geography of India.
4. Khulhar: Regional geography of India.