

# **Syllabus based on NEP - 2020**

**for**

**B.A./B.Sc. (Hons.) in Geography and  
B.A./B.Sc. (Hons. with Research) in Geography**



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(w.e.f. ACADEMIC SESSION 2023-2024)**

# **B.A./B.Sc. (Hons.) in Geography/ B.A./ B.Sc. (Hons. with Research) in Geography**

## **1. Introduction to Undergraduate Degree course in Geography**

The Department of Geography offers three/four year (six/eight semester) undergraduate programme in Geography as per the recommendations of the Undergraduate Curriculum Framework 2022 (UGCFC 2022). The course is designed to provide in-depth knowledge of geography as an integrative science that acts as a bridge between natural and social sciences. Following a student-centric approach, the course includes both theoretical as well as practical training in both physical as well as human geography. The course offers a flexible programme structure while ensuring that the student gets a strong foundation in the subject and gains in-depth knowledge. Moreover, The structure of the course allows a student maximum flexibility in pursuing his/her studies at the undergraduate level to the extent of having the liberty to eventually design the degree with multiple exit options depending upon the needs and aspirations of the student in terms of his/her goals of life, without compromising on the teaching/learning component, both in qualitative and quantitative terms. This will suit the present day needs of students in terms of securing their paths towards higher studies or employment.

## **2. Courses of Study:**

Courses of the study indicate pursuance of study in a particular discipline. Every discipline shall offer four categories of courses of study, viz. Discipline Specific Core (DSC) courses, Discipline Specific Electives (DSEs) courses, Skill Enhancement Courses (SECs) and Generic Electives (GEs) courses. Besides these four courses, a student will select Ability Enhancement Courses (AECs) and Value-Added Courses (VACs) from the respective pool of courses offered by the University.

- a) **Discipline Specific Core (DSC):** Discipline Specific Core is a course of study, which should be pursued by a student as a mandatory requirement of his/her programme of study. In B.A./B.Sc. (Hons.) Geography programme, DSCs are the core credit courses of Geography which will be appropriately graded and arranged across the semesters of study, being undertaken by the student, with multiple exit options as per NEP 2020.
- b) **Discipline Specific Elective (DSE):** The Discipline Specific Electives (DSEs) are a pool of credit courses of Geography from which a student will choose to study based on his/ her interest.
- c) **Generic Elective (GE):** Generic Electives is a pool of courses offered by various disciplines of study (excluding the GEs offered by the parent discipline) which is meant to provide multidisciplinary or interdisciplinary education to students. In case a student opts for DSEs beyond his/ her discipline specific course(s) of study, such DSEs shall be treated as GEs for that student.
- d) **Ability Enhancement course (AEC), Skill Enhancement Course (SEC) and Value Addition Course (VAC):**

These three courses are a pool of courses offered by all the Departments in groups of odd and even semesters from which a student can choose.

- i. **AEC:** AEC courses are the courses based upon the content that leads to knowledge enhancement through various areas of study. They are based on Language and Literature, and Environmental Science which are mandatory for all disciplines.
- ii. **SEC:** SECs are skill-based courses in all disciplines and are aimed at providing hands-on training, competencies, proficiency and skills to students. SEC courses may be chosen from a pool of courses designed to provide skill-based instruction.
- iii. **VAC:** VACs are common pool of courses offered by different disciplines and aimed towards personality building, embedding ethical, cultural and constitutional values; promote critical thinking, Indian knowledge systems, scientific temperament, communication skills, creative writing, presentation skills, sports and physical education and team work which will help in all round development of students.

### 3. Programme Duration and Exit Options:

The minimum credit to be earned by a student per semester is 22 credits. The mandatory number of credits which have to be secured for the purpose of award of Undergraduate Certificate/ Undergraduate Diploma/Appropriate Bachelor's Degree in Geography are listed in the following Table 1.

*Table 1: Qualification Type and Credit Requirements*

S. No.	Type of Award	Stage of Exit	Mandatory Credits to be Secured for the Award
1.	Undergraduate Certificate in Geography	After successful completion of Semester II	44
2.	Undergraduate Diploma in Geography	After successful completion of Semester IV	88
3.	Bachelor of Arts/Bachelor of Science (Hons.) in Geography	After successful completion of Semester VI	132
4.	Bachelor of Arts/Bachelor of Science (Hons. with Research) in Geography (Major) and Discipline - 2 (Minor)	After successful completion of Semester VIII with minimum 28 GE credits in Discipline - 2 (Minor)	176

a) **Major Discipline (Geography):** A student pursuing four-year undergraduate

programme in Geography (Core course) shall be awarded B.A./B.Sc. Honours degree with Major in Geography on completion of VIII Semester, if he/she secures in Geography at least 50% of the total credits i.e., at least 88 credits in Geography out of the total of 176 credits. He/she shall study 20 DSCs and at least 2 DSEs of Geography in eight semesters.

- b) **Minor Discipline (Discipline - 2):** A student of B.A./B.Sc. (Hons.) in Geography may be awarded Minor in a discipline, other than Geography, on completion of VIII Semester, if he/she earns minimum 28 credits from seven GE courses of that discipline.

#### **4. Programme Objectives:**

The undergraduate degree course in Geography aims to provide:

- a) In-depth knowledge in Geography through understanding of key geographical concepts, principles, theories and their applications.
- b) inculcate strong interest in learning Geography,
- c) Provide a holistic understanding of Geography through general and specialised courses in both physical and human geography
- d) Enable students to understand the role of geography as a bridge between natural and social sciences
- e) enable learners/students to apply the knowledge and skills acquired by them during the programme to understand and solve real world problems like climate change, global warming, hazards, disasters, solid waste management etc.
- f) provide students with sufficient knowledge and skills that enable them to undertake further studies in Geography and related disciplines,
- g) Provide sufficient subject matter competence and enable students to prepare for various competitive examinations such as GRE, UGC NET/JRF and Civil Services Examinations etc.

#### **5. Programme Outcomes:**

The learning outcomes of the undergraduate degree course in Geography are as follows:

- A. This course will provide students, the basic concepts of Physical & Human Geography
- B. It will communicate Geography effectively by Theoretical and practical means.
- C. Students will be able to analyze the problems of present physical as well as cultural world and they will try to find out the possible measures to solve those problems.
- D. Students will be able to understand applied and interdisciplinary aspects of Geography. .
- E. Students will be able to learn how Geography acts as a bridge between natural and social sciences.
- F. Students will learn how to use various surveying instruments in the field.
- G. Students will be equipped with various statistical techniques and their uses.
- H. Students will learn how to prepare maps based on toposheets as well as GIS.
- I. As a spatial science subject will train students to employ in the sectors of geospatial analysis, regional planning and development, tourism, mapping and surveying etc.
- J. Students will be able to relate and use geographical knowledge and its applied aspects in their practical life.

## 6. Programme Structure:

The detailed framework of undergraduate degree programme in Geography is provided in Table 2

Table 2: Structure of Undergraduate Programme in Geography Under UGCF – 2022

Semester	Discipline Specific Core Course	Discipline Specific Elective (DSE)/ Generic Elective(GE)	Ability Enhancement Course (AEC)	Skill Enhancement Course(SEC)/ Project/ Dissertation	Value Addition Course (VAC)	Total Credits earned
I	DSC-1	GE-1	AEC-1	SEC-1	VAC-1	22
	DSC-2					
	DSC-3					
II	DSC-4	GE-2	AEC-2	SEC-2	VAC-2	22
	DSC-5					
	DSC-6					
III	DSC-7	DSE1/GE-3	AEC-3	SEC-3	VAC-3	22
	DSC-8					
	DSC-9					
IV	DSC-10	DSE2 / GE-4	AEC-4	SEC-4	VAC-4	22
	DSC-11					
	DSC-12					
V	DSC-13	One DSE-3 and- One GE-5		Internship/ Apprenticeship /Project/Community-Out-reach (2-Credits)		22
	DSC-14					
	DSC-15					
VI	DSC-16	One DSE-4 and- One GE-6		Internship/Apprenticeship/Project/Community Outreach (2- Credits)		22
	DSC-17					
	DSC-18					
VII	DSC-19	DSE-5 / GE-7		Dissertation/AcademicProject (6-Credits)		22
		DSE-6 / GE-8				
		DSE-7/GE-9				
VIII	DSC-20	DSE-8/ GE-10		Dissertation/AcademicProject (6-Credits)		22

		DSE -9/ GE- 11			
		DSE-10/ GE- 12			

### 1. Semester-wise Distribution of Discipline Specific Core (DSC) Courses:

A student will study three Discipline Specific Core Courses each in Semesters I to VI and one core course each in semesters VII and VIII. The semester wise distribution of DSC courses over eight semesters is listed in Table 3.

*Table 3: Semester-wise Distribution of Discipline Specific Core (DSC) Courses*

Semester	Course Code	Name Of The Course	Credits			Total Credit
			L	T	P	
I	GGC-101	Physical Geography	3	1	0	4
I	GGC-102	Human Geography	3	1	0	4
I	GGC-103	Fundamentals of Cartography	2	0	2	4
II	GGC-151	Climatology	3	1	0	4
II	GGC-152	Population and Settlement	3	1	0	4
II	GGC-153	Statistical Techniques for Geography	2	0	2	4
III	GGC-201	World Regional Geography	3	1	0	4
III	GGC-202	Social and Cultural Geography	3	1	0	4
III	GGC-203	Surveying and Mapping Techniques	2	0	2	4
IV	GGC-251	Regional Geography of India	3	1	0	4
IV	GGC-252	Natural Resource Management And Sustainable Development	3	1	0	4
IV	GGC-253	Map Projections	2	0	2	4
V	GGC-301	Geographical Thought	3	1	0	4

V	GGC-302	Regional Planning and Development	3	1	0	4
V	GGC-303	Fundamentals of Remote Sensing and GIS	2	0	2	4
VI	GGC-351	Environmental Geography	3	1	0	4

VI	GGC-352	Natural Hazards and Disaster Management	3	1	0	4
VI	GGC-353	Application of Surveying Techniques	2	0	2	4
VII	GGC-401	Principles, Techniques and Methods of Geographic Research	3	1	0	4
VII I	GGC-451	Spatial Economics	3	1	0	4

## 2. Details of Discipline Specific Elective (DSE) Courses:

The Discipline Specific Electives (DSEs) are a pool of credit courses of Geography from which a student will choose to study based on his/ her interest. A student of Bachelor of Arts/ Bachelor of Science (Hons.) Geography gets an option of choosing one DSE of Geography in each of the semesters III to VI, while the student has an option of choosing a maximum of three DSE courses of Geography in semesters VII and VIII. The semester wise distribution of DSE courses over six semesters is listed in Table 4.

*Table 4: Semester-wise Distribution of Discipline Specific Elective (DSE) Courses*

Discipline Specific Elective Courses (4 Credits each)		Contact Hours			Credit
Course Code	Name Of The Course	L	T	P	
GGE-101	Geomorphology	3	1	0	4
GGE-102	Oceanography	3	1	0	4
GGE-103	Geo-Hydrology and Water Resource Management	3	1	0	4
GGE-104	Climate Change Vulnerability Impact & Adaptation	3	1	0	4
GGE-105	Ecological Approach in Geography	3	1	0	4
GGE-106	Advanced Statistics for Spatial Science	3	1	0	4
GGE-107	Advanced Remote Sensing and GIS	2	0	2	4
GGE-108	Contemporary Human Geography	3	1	0	4
GGE-109	Economic Geography	3	1	0	4
GGE-110	Political Geography	3	1	0	4
GGE-111	Tourism Geography	3	1	0	4

GGE-112	Gender Perspectives in Disaster Management	3	1	0	4
GGE-113	Rural Development and Planning	3	1	0	4
GGE-114	Urban Development and Planning	3	1	0	4
GGE-115	Regional Geography of the Himalayas	3	1	0	4
GGE-116	Mountain Development with Special Reference to the Indian Himalayas	3	1	0	4

In addition to the above proposed courses, students may select courses from the **Swayam.org** asMOOCs courses upto the permissible limit.

### 3. Details of Skill Enhancement Courses (SECs):

To enhance the skills required for advanced studies, research and employability of students various Skill Enhancement Courses will be offered to students as listed in Table 5.

*Table 5 : Details of Skill Enhancement Courses*

Skill Enhancement Courses (2 Credits each)		Credit
Course Code	Name Of The Course	
GGS-101	Traditional Knowledge System in Resource Management	2
GGS-102	Innovative Techniques of Resource Conservation and Management	2
GGS-103	Methods and Techniques Towards Disaster Risk Management	2
GGS-104	Bio Medical Waste Management: Methods, Techniques and Practices	2
GGS-105	Hydrological Mapping and Surveying Techniques	2
GGS-106	Plastic Waste Recycling and Management	2

In addition to the above proposed courses, students may select courses from the **Swayam.org** asMOOCs courses upto the permissible limit.

### 4. Details of Generic Elective (GE) Courses:

Generic Elective courses provide multidisciplinary or interdisciplinary education to students. Various GE courses offered by the Geography Department are listed below in Table 6.

*Table 6: Details of Generic Elective (GE) Courses*

Generic Elective (GE) Courses (4 Credits each)		Contact Hours			Credit
Course Code	Name Of The Course	L	T	P	



GGG-101	Geography as Science of Synthesis	3	1	0	4
GGG-102	Elements of Physical Geography	3	1	0	4
GGG-103	Principles of Human Geography	3	1	0	4
GGG-104	Natural Hazards and Disaster Management	3	1	0	4
GGG-105	Geomorphology	3	1	0	4
GGG-106	Oceanography	3	1	0	4
GGG-107	Geo-Hydrology and Water Resource Management	3	1	0	4
GGG-108	Climate Change Vulnerability Impact & Adaptation	3	1	0	4
GGG-109	Economic Geography	3	1	0	4
GGG-110	Political Geography	3	1	0	4
GGG-111	Tourism Geography	3	1	0	4
GGG-112	Gender Perspectives in Disaster Management	3	1	0	4
GGG-113	Rural Development and Planning	3	1	0	4
GGG-114	Urban Development and Planning	3	0	1	4
GGG-115	Regional Geography of the Himalays	3	1	0	0
GGG-116	Mountain Development with Special Reference to the Indian Himalayas	3	1	0	4

In addition to the above proposed courses, students may select courses from the **Swayam.org** as **MOOCs courses** upto the permissible limit.

A detailed information regarding different courses under DSC, DE, and GE is given in table 7 below:

Table 7: Distribution of Courses under DSC, DSE, GE

<b>BA/BSc Geography</b>			
<b>SEMESTERS</b>	<b>DSC (Discipline Specific Core) CREDIT -4</b>	<b>DSE (Discipline Specific Elective), CREDIT- 4</b>	<b>GE (General Elective) Credits- 4</b>
<b>Semester I</b>	<b>GGC-101: Physical Geography</b>	<b>GGE-101: Geomorphology</b>	<b>GGG-101: Geography as Science of Synthesis</b>
	<b>GGC-102: Human Geography</b>	<b>GGE-102: Oceanography</b>	<b>GGG-102: Elements of Physical Geography</b>
	<b>GGC-103: Fundamentals of Cartography</b>	<b>GGE-103: Geo-Hydrology and Water Resource Management</b>	<b>GGG-103: Principles of Human Geography</b>
<b>Semester II</b>	<b>GGC-151: Climatology</b>	<b>GGE-104: Climate Change, Vulnerability Impact &amp; Adaptation</b>	<b>GGG-104: Natural Hazards and Disaster Management</b>
	<b>GGC-152: Population and Settlement</b>	<b>GGE-105: Ecological Approach in Geography</b>	<b>GGG-105: Geomorphology</b>
	<b>GGC-153: Statistical Techniques for Geography</b>	<b>GGE-106: Advanced Statistics for Spatial Science</b>	<b>GGG-106: Climate Change, Vulnerability Impact &amp; Adaptation</b>
<b>Semester III</b>	<b>GGC-201: World Regional Geography</b>	<b>GGE-107: Advanced Remote Sensing and GIS</b>	<b>GGG-107: Oceanography</b>
	<b>GGC-202: Social and Cultural Geography</b>	<b>GGE-108: Contemporary Human Geography</b>	<b>GGG-108: Environmental Geography</b>
	<b>GGC-203: Surveying and Mapping Techniques</b>	<b>GGE-109: Economic Geography</b>	<b>GGG-109: Economic Geography</b>
<b>Semester IV</b>	<b>GGC-251: Regional Geography of India</b>	<b>GGE-110: Political Geography</b>	<b>GGG-110: Gender Perspectives in Disaster Management</b>
	<b>GGC-252: Geography of Natural Resource Management</b>	<b>GGE-111: Tourism Geography</b>	<b>GGG-111: Political Geography</b>
	<b>GGC-253: Map Projections</b>	<b>GGE-112: Gender, Perspectives in Disaster Management.</b>	<b>GGG-112: Tourism Geography</b>
<b>Semester V</b>	<b>GGC-301: Geographical Thought</b>	<b>GGE-113: Rural Development and Planning</b>	<b>GGG-113: Rural Development and Planning</b>
	<b>GGC-302: Regional Planning and Development</b>	<b>GGE-114: Urban Development and Planning</b>	<b>GGG-114: Urban Development and Planning</b>
	<b>GGC-303: Fundamentals of Remote Sensing and GIS</b>	<b>GGE-115: Regional Geography of the Himalayas</b>	<b>GGG-115: Regional Geography of the Himalayas</b>
<b>Semester VI</b>	<b>GGC-351: Environmental Geography</b>	<b>GGE-116: Mountain Development with Special Reference to the Indian Himalayas</b>	<b>GGG-116: Mountain Development with Special Reference to the Indian Himalayas</b>
	<b>GGC-352: Natural Hazards and Disaster Management</b>		
	<b>GGC-353: Application of Surveying Techniques</b>		
<b>Semester VII</b>	<b>GGC-401: Principles, Techniques and Methods of Geographic Research</b>		
<b>Semester VIII</b>	<b>GGC-451: Spatial Geography</b>		

## 7. Course Details with Course Specific Outcomes:

# Discipline Specific Core Course

## GGC-101: Physical Geography

### Course outcomes:

- a) To introduce the students to physical geography-its meaning, scope and subject matter.
- b) By the completion of the course the students will be able to explain the origin and de-velopment of different landforms on the surface of the earth.
- c) The students will learn about various earth movements and the movement of plates thatgive rise to continents and ocean basins.
- d) To explain the global climatic systems and climate change
- e) Understand the ocean systems of the world.
- f) The student should become well versed in biogeography and basic elements of vegetationand soil.

### Course Contents:

Unit 1: Meaning, scope and development of physical geography; origin of the earth – Theories of Kant, Laplace, Chamberlin, James Jeans; geological history of earth; interior of the earth; rocks. Origin of continents and ocean basin: plate tectonic and isostasy. Earth's movements - endogenetic and exogenetic, volcanoes and earthquakes; weathering and erosion; drainage pattern; landform development: river, arid, glacier, marine, and karst.

Unit 2: Structure and composition of the atmosphere; insolation; temperature; pressure belts and winds; planetary and local winds; monsoons; stability and instability of the atmosphere. Humidity and rainfall; fronts, frontogenesis, cyclones and anti-cyclones. Climatic regions of the world: Koeppen & Thonthwaite classification of world climates. Climate change, issues, challenges and policies.

Unit 3: Ocean bottom topography, ocean deposits, salinity, temperature, ocean currents, tides and coral reefs.

Unit 4: Abiotic and biotic components of the biosphere; characteristics and types of ecosystem; biosphere as an ecosystem; biotic succession; Man and biosphere, distribution and dispersal of plants; biome types -equatorial rainforest, monsoon, savanna and temperate grassland biomes.

### Books Recommended

1. Barry, R.G. and Chorley, R.J. (1998). Atmosphere, Weather and Climate. Routledge, London..
2. Garrison T (1998). Oceanography. Wordsworth Cp, Bedmont.
3. Singh, S. (2003). Physical Geography (English and Hindi Editions) Prayag Pustak Bhawan,Allahabad.
4. Strahler, A.N. and Strahler A.M. (1992). Modern Physical Geography, John Wiley and Sons, New York Trewartha, GT and Horn, LA (1980): An Introduction to Climate, McGraw Hill and Co
5. Wyttts (1971). Principles of Biogeography, McGraw Hill & Co.

**Course Outcomes:****GGC-102: Human Geography**

This course will enable the students to:

- a) Learn Meaning, Concept, Nature, Scope and development of Human Geography.
- b) Learn the basics of economic geography of the world.
- c) Understand the distribution of various resources and industrial production.
- d) Be able to divide the world into agricultural regions.
- e) Understand the various cultures and cultural regions of the world

**Course Contents:**

Unit 1: Nature, scope and development of human geography; Branches of human geography; man and environment relationship - determinism, possibilism neodeterminism and probalism.

Unit 2: Population growth, distribution, migration problems and planning; ethnic groups and tribes: characteristics of tribes and their world distribution; rural and urban settlements –functional types, patterns and morphology.

Unit 3: Agriculture: Types of farming; agricultural regions of the world; distribution and production of iron ore, coal, petroleum and hydroelectricity; Industries: location and development of iron and steel, cotton textile and chemical industry; fishing; major oceanic and rail routes; pattern of world trade.

Unit 4: Cultural and social processes - social interactions, social groups and organization; diffusion of cultures; cultural hearths; major cultural realms, major religions of the world.

**Books Recommended**

1. Singh, L.R. (2005). Fundamentals of Human Geography. Sharda Pustak Bhawan, Allahabad..
2. Haggett, P. (2004). Geography: A Modern Synthesis. Harper & Row, New York.
3. Hussain, M. (1994): Human Geography. Rawat Publication, Jaipur.
4. Norton W. (1995). Human Geography. Oxford University Press, New York..
5. Singh, K. N. & Singh J. (2001). Manviya Bhoogol. Gyanodaya Prakashan, Gorakhpur.

# GGC-103: Fundamentals of Cartography

## Course Outcomes:

At the end of the course the students will be able to:

- a) Learn theme-based cartography.
- b) Able to represent geographical data of different types using diagrams, graphs and maps.
- c) Learn to make different types of maps like choropleth, isopleth etc.
- d) Understand the importance and use of cartographic representation techniques like dot method, proportional circle etc.

## Course Contents:

Unit 1: Cartography: Meaning, Rules and Methods of Geographical data representation, Types of Diagrams, Graph, Distribution maps and cartogram. Isopleth, choropleth, and chorochromatic maps.

Unit 2: Cartographic representation of geographical data by (a) dot method (b) proportional sphere method and circle method. Representation of economic data: Agricultural, land use, production and industrial data. Representation of population data: Growth, distribution and employment.

Unit 3: Representation of climatic data: Climatograph, Climograph and Hythergraph.

Unit 4: Interpretation of topographical maps: Significance of map. Index system, Grid reference, Map reading Component of topographical map- scale, direction, symbols, coordinates, direction, distance Identification of land forms. Interpretation of land use, drainage and settlements pattern Study of any two topographical sheets, one hill and one plain.

## Books Recommended:

1. Monkhouse, F.J. & Wilkinson, F.J. (1985) Maps and Diagrams. Methues, London
2. Raisz, E (1962) General Cartography. John Wiley & Sons, New York.
3. Sharma, J.P. (2001) Prayogik Bhoogol. Rastogi Pub, Meerut.
4. Singh R.L. & Singh, Rana P B (1993) Elements of Practical Geography (Hindi & English Editions), Kalyani Publishers, New Delhi.
5. Singh, L R (2006) Fundamentals of Practical Geography. Sharda Pustak Bhawan, Allahabad.

# GGC-151: Climatology.

## Course outcomes:

This course will enable the students to:

- a) Understand the basic principles of global climate.
- b) Learn about types and classes of cyclones.
- c) Be able to divide the world into different climatic types.
- d) Recognize the problems of climate change.
- e) Understand Indian monsoon and the forces that affect monsoon like Jet Stream, Walker Circulation, El Nino, La Nina etc..

## Course Contents:

Unit 1: Meaning and scope of Climatology; Origin, Composition and Structure of Atmosphere; Solar radiation and heat balance Solar radiation and EMR, Radiation Laws – Wave, Particle, Stefan-Boltzman & Weins Law; Solar Constant; Heat Budget, Distribution of Temperature on Earth, Temperature Inversion.

Unit 2: Air pressure and Atmospheric circulation: Air pressure and pressure belts, winds and wind circulation, Atmospheric circulation and Tricellular Meridional circulation, Upper air circulation and jet streams, Walker Circulation, Southern Oscillation. Origin of monsoons and related theories; Humidity and Precipitation- Humidity, atmospheric stability and instability, Fog, clouds, Rainfall- types and distribution.

Unit 3: Air masses, fronts and cyclones – Origin, growth, classification and distribution. Fronts and frontogenesis; Cyclones and anticyclones – Theories about the origin of cyclones; tornadoes, thunderstorms and anticyclones.

Unit 4: Climatic Classification of Koppen; Major climate types and biomes; Weather analysis and Weather forecasting; Weather and human behaviour; Weather modification. Climatic change – Causes and theories; Global warming – Evidences, causes and effects; Atmospheric Hazards and Disasters.

## Books Recommended

1. Ahrens, DC (2009). Meteorology Today, 9th Edition. Engage Learning
2. Critchfield, HJ (2008). General Climatology, Prentice Hall of India, New Delhi
3. Lal, DS (2011) Climatology, Sharda Pustak Bhawan, Allahabad
4. Renneboog, Richard (2018). Principles of Climatology. Salem Press
5. Singh, Savindra (2006) Climatology, Prayag Pustak Bhawan, Allahabad

# GGC-152: Population and Settlement

## Course Outcomes:

The course will enable the students to:

- a) Learn the basic concepts of population.
- b) Understand the demographic problems of developed and developing countries.
- c) Learn about the methods of population control in India
- d) Know the causes and pattern of migration
- e) Understand the morphology of urban settlements

## Course Contents:

Unit 1: Meaning and scope of population geography; population processes -- growth and demographic transition; pattern of population; structure and composition of population with special reference to India; migration of population -- causes and types; distribution and migration of population in India.

Unit 2: Population problems - over population, under population; optimum population; population and resources; population -- resource regions; population problems in India; population planning and control -- theories of population; measures of population control in India. Population policy in India.

Unit 3: Meaning and scope of settlement geography; evolution and types of settlements; rural settlements - types and patterns, size, spacing and morphology; distribution of rural settlements in Ganga plain; urban settlements -- types and patterns, size, spacing and morphology, classification of towns.

Unit 4: Hierarchy of towns, central place theory; urbanization processes; trends of urbanization in the world and in India; problems of urbanization in India; Urban slums and Urban pollution in India; urban fields, suburbs and small towns; rural-urban fringe; problems and planning of urban settlements; Urban policy in India.

## Books Recommended

1. Carter, H. (1995). The Study of Urban Geography. Hodder Arnold Publisher.
2. Chandana, R.C. (2015). Geography of Population. Kalyani Publishers. New Delhi
3. Ghosh, Sumita (1998). Settlement Geography. Orient Blackswan. New Delhi
4. Maurya, SD. (2017). Population Geography. Pravilika Publishers. Allahabad
5. Singh, Surender and Saroha, Jitender (2021). Urban Geography. Pearson, New Delhi.

# GGC-153: Statistical Techniques for Geography

## Course Outcomes:

The course will enable the students to:

- a) Understand the importance of statistical methods in Geographical studies.
- b) Learn data collection, tabulation, analysis and prediction.
- c) Analyze settlements for various town planning methods.
- d) Analyse different elements of relief.
- e) Learn to perform statistical tests.

## Course Contents:

Unit 1: Data: Meaning, and Types, Collection of data, Sampling Techniques and Methods, Measures of central tendency: Mean, Mode, and Median.

Unit 2: Measures of dispersion; Mean Deviation, Quartile Deviation and Standard deviation, Correlation: Karl Pearson's and Spearman's methods.

Unit 3: Analysis of Settlement- mean centre, standard distance, quadrat count method, nearest neighbour method. Analysis of relief, profiles, area-height diagram, relative relief, slope analysis, altimetric and hypsometric analysis.

Unit 4: Inferential statistics-parametric and non parametric tests, the null hypothesis, level of significance, one and two tailed tests, chi-square test, student's T test, variance test ( F test)

## Books Recommended

1. Birch, T.W. (1976). Maps : Topographical and Statistical. Oxford University Press. London.
2. Downie, N.M and Heath, R.W. Basic Statistical Methods (1970). Harper and Row. New York
3. Gregory, S (2014). Statistical Methods and the Geographer. Taylor and Francis. London.
4. Singh, L. R. (2006). Fundamentals of Practical Geography. Sharda Pustak Bhawan, Allahabad.
5. Singh, R.L. & Singh, Rana P.B.(1993). Elements of Practical Geography (Hindi & English Editions), Kalyani Publishers, New Delhi.



# GGC-201: World Regional Geography

## Course Outcomes:

This course will enable the students to:

- a) Have a rigorous understanding of the concept of regions.
- b) Differentiate between formal and functional regions.
- c) Be able to recognise and delimit regions on natural, cultural, economic and political basis.
- d) Have extensive knowledge of natural, demographic, and economic characteristics of all the major continents and countries of the world.

## Course Content:

Unit 1: Concept of region in geography; systematic vs regional geography, types and classification of regions (formal and functional), criteria of delimitation and characteristics of natural, cultural, economic and political regions.

Unit 2: Asia in the context of world; structure; relief; drainage; climate; natural vegetation and soils; spatial distribution of population; economic base; Regional studies of south, south-east, east and west Asia.

Unit 3: Europe and Africa: Physical, economic and demographic characteristics; Regional studies of British Isles, Eastern, Western and Mediterranean realm.

Unit 4: North /South America and Oceania: Physical, economic and demographic set up; Regional studies of USA, Canada, Brazil and Australia

## Books Recommended:

1. Clawson & Fisher (2003). World Regional Geography: A Development Approach. Pearson College Division. New York
2. Gautam, A (2015). Regional Geography of the World. Sharda Pustak Bhawan. Allahabad
3. Hussain, M (2016). World Geography. Rawat Publications. Jaipur
4. Manku, DS (2017). A Regional Geography of the World. Kalyani Publishers. New Delhi
5. Maurya, SD (2015). World Regional Geography. Pravalika Publications. Allahabad

# GGC-202: Social and Cultural Geography

## Course Outcomes:

This course will enable the students to:

- a) Understand the social categories that together constitute a society.
- b) Have an in-depth knowledge of welfare and wellbeing in a society.
- c) Know the forms and processes of exclusion of communities.
- d) Understand the epistemological changes that have occurred in geography over the importance and role of culture.
- e) Study the world distribution of cultures and various cultural traits like language and religion.

## Course Content:

Unit 1: Concept, origin, nature, and scope of Social Geography. Social Elements: caste, religion, race, and gender and their spatial distribution.

Unit 2: Geographies of welfare and wellbeing: geographies of healthcare, housing, and education. Geographies of social inclusion and exclusion: slums, gated communities, crime.

Unit 3: Cultural Geography: meaning and concepts; Cultural area; cultural entity; Diffusion of Culture; cultural identity; Carl Sauer: Cultural Theory; the Morphology of Landscape; its critique and the birth of New Cultural Geography; Postmodernism and the Cultural Turn.

Unit 4: Cultural regionalization: cultural regions of the world and cultural realms. Major Religions and Cultural groups. World distribution of languages ; Major linguistic cultural groups.

## Books Recommended:

1. Ahmed, A (1999). Social Geography. Rawat Publications, Jaipur
2. Cater, J and Jones, T (2000). Social Geography: An Introduction to Contemporary Issues. HodderArnold, London.
3. Smith, DM (1994). Geography and Social Justice. Blackwell, Oxford.
4. Crang, M (1998). Cultural Geography, Routledge, London
5. Robertson, I and Penny, R (2003). Studying Cultural Landscapes. Oxford University Press, London.

# GGC-203: Surveying and Mapping Techniques

## Course Outcomes:

The course will enable the students to:

- a) Understand the importance of surveying in Geography.
- b) Learn to make basic maps of any space using methods like plane table survey and prismatic com-pass.
- c) Know the importance and use of Indian Clinometer for calculation of spot heights.
- d) Become proficient in the use of GPS instruments.

## Course Contents:

Unit 1: Fundamentals of Surveying: Objects, Primary divisions of survey and their classification.

Unit 2: Plane Table Surveying: Radiation, Intersection, Close Traverse, Open Traverse, Resection by two point and three-point problems. Measurement of height and depth by Indian Pattern Clinometer.

Unit 3: Surveying by Prismatic Compass: Close Traverse, Open Traverse, and Correction of bearing, Dumpy Level survey.

Unit 4: Use and Applications of GPS in surveying. Interpretation of Geological maps: Types of Dips, Strike line, Geological cross section, Drainage ordering, slope analysis: Wentworth's and Smith's methods.

## Books Recommended

1. Monkhouse, F.J. & Wilkinson, F.J. (1985) Maps and Diagrams. Methues, London
2. Raisz, E (1962) General Cartography. John Wiley & Sons, New York.
3. Sharma, J.P. (2001) Prayogik Bhoogol. Rastogi Pub, Meerut.
4. Singh R.L. & Singh, Rana P B (1993) Elements of Practical Geography (Hindi & English Editions), Kalyani Publishers, New Delhi.
5. Singh, L R (2006) Fundamentals of Practical Geography. Sharda Pustak Bhawan, Allahabad.

# GGC-251: Regional Geography of India

## Course Outcomes:

The course will enable the students to:

- a) Help students to know the Uniqueness of India in the world.
- b) Learn about the physical and cultural diversities and interrelationships of India.
- c) Understand India as a mosaic of unity in diversity
- d) Understand the agricultural, industrial and trade aspects of India.
- e) Understand the multi-modal transportation network of India.

## Course Contents:

Unit 1: India- A subcontinent, Physical features, Geologic structure, Drainage system, Climate, Natural vegetation, Soils, Natural regions.

Unit 2: Agriculture, Crops (Food, plantation and commercial), Agriculture production, Agriculture regions, Irrigation, Livestock raising and Fishery. Industries: Metallurgical, Textile, Engineering, Chemical, Food, Leather, Forest and Agro-industries, Industrial regions, Minerals and Power resources.

Unit 3: Population (density, distribution and urbanization), Multipurpose projects. Regional development and planning, Regional disparities, Five-year plans, Integrated rural development programme, Panchayati raj, Command area and watershed management.

Unit 4: Transportation: Roads and railways, air transportation and pipeline transportation. Trade: Internal and External (Trend, composition and direction); SEZ (Special Economic Zones).

## Books Recommended

1. Hussain, Majid (2015) Geography of India, McGraw Hill Education, New Delhi.
2. Khullar, DR. (2020). India: A Comprehensive Geography. Kalyani Publisher. New Delhi
3. Sharma, Y.K. (2009) Geography of India, Lakshmi Narayan, Agra.
4. Singh R. L. (1993) Regional Geography of India, National Geographic Society of India, Varanasi.
5. Tiwari, R.C. (2019). Geography of India. 11th Edition. Pravalika Publication. Allahabad

# **GGC-252: Geography of Natural Resource Management**

## **Course outcomes:**

- (a) Students should develop awareness about resource availability, accessibility, utilization, its use and misuse.
- (b) The students should learn importance of natural resources.
- (c) After the completion of the course, the students are expected to have knowledge of resource conservation methods and awareness about community participation.
- (d) The students should get a complete idea of national and international efforts to mitigate resource problems.

## **Course Contents:**

Unit 1: Basic framework : concept , definition , classification of natural resources , concept of natural resources by Zimmermann , process of natural resource development , use and mis-use of natural resources.

Unit 2: Natural Resource Management : Concept and Approaches of Natural Resource Management, Community Based Natural Resource Management; Participatory; Natural Resources Management.

Unit 3: Sustainable Development: Concepts of Sustainable Development; Need of Sustainable Development, challenges of Sustainable development.

Unit 4: Sustainable development in Himalayan region: concept of mountain and sustainable development , Approaches to sustainable development ; Sustainable Mountain Agriculture and Livelihood.

## **Books Recommended**

1. Berkes, F. (ed.), 1989. Common Property Resources: Ecology and Community Based Sustainable Development, Belhaven Press London
2. Mitchell B. 1988. Geography and Resources Analysis, 2nd edition, Longman, London.
3. Newson, M.D. 1991. Land, Water and Development: River Basin Systems and Management, Routledge, London
4. Pandey, B. W. (ed.) 2000. Natural Resource Management, Mittal Publication, New Delhi.
5. Rees, J. 1990. Natural Resources: Allocation, Economics and Policy, Routledge, London.

**Course Outcomes:****GGC-253: Map Projection**

The course will enable the students to:

- a) Understand the need of projection for representing curved surface on plane paper.
- b) Know about different types of projection.
- c) Understand the concepts like equal area, equal-distance etc and know which to use when.
- d) Learn the construction of different projections based on the need and necessity.

**Course Contents:**

Unit 1: Definition, Necessity and Classification of map projection, Geodetic datum, Mathematical method of drawing projections.

Unit 2: Classification of map projection. Construction of map projections: Simple-conical projection with one and two standard parallels, Bonne's projection, Polyconic projection. Interrupted Sinusoidal and Interrupted Mollweide's Projection

Unit 3: Cylindrical projections: Equidistant and Equal area cylindrical projections, Mercator's, Gall's stereographic projection and Universal Transverse Mercator (UTM) Projection.

Unit 4: Zenithal Projections: Polar zenithal equidistant, Equatorial zenithal equidistant, Polar zenithal equal-area, Equatorial zenithal equal-area.

**Books Recommended**

1. Monkhouse, F.J. & Wilkinson, F.J. (1985) Maps and Diagrams. Methuen, London
2. Raisz, E (1962) General Cartography. John Wiley & Sons, New York.
3. Sharma, J.P. (2001) Prayogik Bhoogol. Rastogi Pub, Meerut.
4. Singh R.L. & Singh, Rana P B (1993) Elements of Practical Geography (Hindi & English Editions), Kalyani Publishers, New Delhi.
5. Singh, L R (2006) Fundamentals of Practical Geography. Sharda Pustak Bhawan, Allahabad.

**Course Outcome:****GGC-301: Geographical Thought**

The course will enable the students to:

- a) Understand the development of Geography as a scientific discipline.
- b) Learn the basic concepts of Geography.
- c) Know the impact of expedition, discoveries and exploration on Geographical knowl-edge.
- d) Contributions of Indian, Arab, Greek, Roman, and modern geographers.

**Course Contents:**

Unit 1: Meaning and scope of geography; Changing philosophy of geography; Geography as an interdisciplinary science; Geography as social science; Geography as a synthesizing science; Explanations in Geography.

Unit 2: Development of Geography in the ancient classical period; Contributions of Greek, Roman, Indian and Chinese scholars; Geography in the dark ages –contributions of Arab geographers; Period of renaissance age of explorations and discoveries and their impacts.

Unit 3: Development of Geography in the modern classical period; Rise of philosophical and scientific analysis in geography; Contributions of German, French, British, American and Russian schools of thought.

Unit 4: Dichotomies in geography: physical vs human, systematic vs regional etc. Different approaches to the study of geography – areal differentiation, landscape, ecological and locational. Development of geography in the first half of the 20th century; fundamental concepts in physical, human, economic and settlement geography.

**Books Recommended**

1. Adhikari, S (2015). Fundamentals of Geographical Thought. Orient Blackswan, New Delhi
2. Hussain, M (2014). Evolution of Geographical Thought. Rawat Publications, Jaipur.
3. Johnston, RJ and Sidway, J (2016). Geography and Geographers. Routledge. New York
4. Johnston, RJ (1983). Philosophy and Human Geography. Edward Arnold, London.
5. Martin, G and James, P (2005). All Possible Worlds: A History of Geographical Ideas. OUP, USA

# **GGC-302: Regional Planning and Development**

## **Course Outcomes:**

The course will enable the students to:

- a) Understand the process and applications of planning in general and India in particular.
- b) Learn about indicators of development and their data sources.
- c) Compare types of planning like multi level planning, regional planning, concentration vs dispersal strategy planning etc..
- d) Know the theories and models of regional planning.
- e) Know about the application of modern geographical techniques like Remote Sensing and GIS in planning process

## **Course Contents:**

Unit 1: Regional concept in geography: Concept, Scope & purpose of regional planning. Planning process - sectoral, temporal and spatial dimensions; short-term and long-term perspective planning, Indicators of development and their data sources, measuring levels for regional development and disparities, Planning for regional development and multi regional planning in national context.

Unit 2: Regional development strategies: Concentration vs. dispersal, Case studies for plans of developed and developing countries, Regional planning and development in India through Five year plans, problems and prospects, Regional disparities: causes and consequences.

Unit 3: Concept of Multi-level planning: Decentralized planning; peoples participation in the planning process, Landscape ecology and sustainable development, Application of remote sensing and Geographic Information System in Development Planning.

Unit 4: Theories and Models for Regional Planning: Growth Pole Model of Perroux; cumulative-causation model of Myrdal, Rostow and Friedmann models. Dependency Theory.

## **Books Recommended**

1. Chand, M. and Puri, V.K. (2004) Regional planning in India; Allied Publishers, New Delhi.
2. Chandana, R. C. (2005) Regional Development and Planning. Kalyani Publishers, New Delhi.
3. . Mishra, R.P, Sundaram, K.V., and Prakasarao, V.L.S. (1976) Regional Development Planning in India, Vikas Publishers., New Delhi.
4. Mishra, R.P. (2002) Regional Planning, Concepts, Techniques, Policies and Case Studies, Concept Publishing Company, New Delhi.
5. Sundaram, K.V. (1977) Urban and Regional Planning in India, Vikas Publishers. New Delhi.



# GGC-303: Fundamentals of Remote Sensing and GIS

## Course Outcomes:

This course will enable the students to:

- a) Understand the meaning and importance of Remote Sensing and GIS.
- b) Learn the method and use of Supervised and Unsupervised classification
- c) Learn to map making by using RS and GIS.
- d) Learn to use GIS for various analysis techniques like Overlay Analysis, Spatial Analysis etc.

## Course Contents:

Unit 1: Remote Sensing: principles, historical development, Electromagnetic radiation principles; interaction mechanism with atmosphere and earth surfaces; spectral responses of earth surface features, satellite and sensors, concept of resolution, photography vs. image, GPS applications. Aerial photography: stereoscopy, principles of aerial photo interpretation.

Unit 2: Remote Sensing: Thermal and Radar Remote Sensing; Image Processing Techniques: Visual and Digital, Classification: Supervised and Unsupervised. Visual interpretation of satellite images.

Unit 3: GIS: Definition and Applications; Components and Elements of GIS; Development of GIS technology; Geographic objects: point, line and area; analog and digital maps; theoretical models and framework for GIS, representation of geographic data-base; GPS, coordinate systems, georeferencing, and map projections.

Unit 4: Data Input, Storage and Editing: Nature of geographic data: Spatial and Attribute Data, Concept of vector and raster based models; data input devices: Digitization; external data bases; storage and manipulation of GIS data bases. GIS and Spatial Analysis: Neighbourhood analysis; Proximity analysis and buffers; Overlays Analysis – raster and vector based overlay and their applications; Presentation of GIS output.

## Books Recommended

1. Campell, J. B. (2003): Introduction to Remote Sensing. 4th edition. Taylor and Francis, London.
2. Chang, K.,(2006) : Introduction to Geographic Information Systems, Tata McGraw-Hill
3. Chaunial, D. D. (2004): Remote Sensing and Geographical Information System (in Hindi), ShardaPustak Bhawan, Allahabad
4. Heywood, I. et al. (2004) : An Introduction to Geographic Information Systems, Pearson
5. Lillesand, T.M. and Kiefer, R.W. (2000): Remote Sensing and Image Interpretation. John Wiley and Sons, New York

# GGC-351: Environmental Geography

## Course Outcomes:

The course will enable the students to:

1. Understand the environment and concept of environment.
2. Learn about man - environment relation.
3. Analyse ecosystem and its functioning
4. Learn environment pollution , hazards and conservation and planning

## Course Contents:

Unit 1: Basic frame work : Definition, scope of environment geography , Concept of environmental geography , Man and environment relation.

Unit 2: Ecosystem: concept and services , food chain , tropic level, energy flow , bio geo chemical cycle, ecological footprint.

Unit 3: Biomes : concept , classification , problems , biodiversity loss and impact.

Unit 4: Environment degradation , environmental pollution , environment event and hazard, environment conservation and policies.

## Books Recommended

1. Botkin, D B and Keller E A (1982) Environmental Studies. Bell & Howell Co, London
2. Garrels T A (1975) Chemical Cycle and the Global Environment. William Kaufmann, California
3. Prasad, G & Nautiyal R (2006) Paryavarn Bhugol. Sharda Putak Bhawan, Allahabad
4. Cunningham, W. P. and Cunningham, M. A. (2004). Principals of Environmental Science: Inquiry and Applications. Delhi: Tata Macgraw Hill
5. Singh Savindra, 2015. Environmental Geography. Pravalika Publications, Allahabad

# GGC-352: Natural Hazards and Disaster Management

## Course Outcomes:

After studying this course the student will be able to:

- a) Learn about the different types of hazards.
- b) Know the difference between hazards and disasters.
- c) Understand the impact of hazards and disasters on various spheres of human life.
- d) Analyse the role of humans in mitigating the impacts of different hazards.
- e) Understand key concepts in hazard and disaster studies like vulnerability, risk, response, re-silience and recovery.

## Course Contents:

Unit 1: Meaning, concept and scope of natural hazard and Disaster. Types of disasters. Risk and Vulnerability. Hazard classification. Hazard and disaster scenario in the Himalayas with special reference to Uttarakhand.

Unit 2: Mitigation and management techniques: prevention and preparedness measures. Disaster legislatures (international, national and state), disaster management plans and cycles.

Unit 3: Disaster Response: Search, rescue, and evacuation. Logistics in disaster management: Incident command System. Community response and resilience: coping mechanism, capacity building, institutional strengthening.

Unit 4: Recovery: Post disaster review and damage assessment. Relief, Rehabilitation and Restructuring. Case Studies in Himalayan context.

## Books Recommended:

1. Kapur, A. (2010) Vulnerable India: A Geographical Study of Disasters, Sage Publication, New Delhi.
2. Modh, S. (2010) Managing Natural Disaster: Hydrological, Marine and Geological Disasters, Macmillan, Delhi.
3. Sinha, A. (2001). Disaster Management: Lessons Drawn and Strategies for Future, New United Press, New Delhi.
4. Stoltman, J.P. et al. (2004) International Perspectives on Natural Disasters, Kluwer Academic Publications. Dordrecht.
5. Singh Jagbir (2007) "Disaster Management Future Challenges and Opportunities", I.K. International Pvt. Ltd, New Delhi

# GGC-353: Application of Surveying Techniques

## Course Outcomes:

This course will enable the students to:

- a) Learn about the importance of fieldwork and survey in Geography.
- b) Apply the techniques learned in previous semesters for surveying.
- c) Select a proper study area and identify research problems to prepare a dissertation.

## Course Contents:

The sixth semester students of the department will be required to select a study area and a research problem with the help of a supervisor allotted to them by the department. The research area should be in Uttarakhand, preferably in and around Dehradun to make fieldwork more convenient. The student will then conduct an extensive fieldwork by applying the methods learned in previous semesters on surveying techniques. Final report of the survey in the form of a dissertation must be submitted to the Department one week before the commencement of the theory examinations. The size of the Dissertation normally ranges between 60 and 70 pages. The Dissertation will be evaluated by a committee comprising of both external as well as internal examiners. The viva voce examination and presentation will be conducted in the presence of both the examiners. The external examiner will be appointed by the Departmental Committee of the Department of Geography, Dr Nitya Nand Himalayan Research and Study Center, Doon University, Dehradun.

## Books Recommended

1. Agarwal, C and Sharma, V (2022). Research Methodology in Geography. Arjun Publications. New Delhi
2. Krishna, G and Singh, N (2019). Researching Geography: The Indian Context. Taylor and Francis
3. Mahmood, A (1999). Statistical Methods in Geographical Studies. Rajesh Publisher. New Delhi
4. Murthy, N (2014). Research Methodology in Geography. Concept Publishing House. New Delhi
5. Shetty, R.K. (2021). Research Methods and Techniques in Geography. Academic Aspirations. New Delhi

# **GGC-401: Principles, Techniques and Methods of Geographic Research**

## **Course Outcomes:**

After studying this course the student will be able to:

- a) Understand social science research philosophy with special reference to geography.
- b) Use the knowledge gained in geography to generalise and extend concepts to real world problems.
- c) It is expected that the critical reasoning ability will be further enhanced and sharpened at the end of the course.
- d) Students completing this course will be able to present Geography clearly and precisely, and make vague ideas precise.

## **Course Contents:**

Unit 1: Philosophy of Social Science Research: Ontology, Epistemology and Methodology. Positivism and Logical Positivism. Deductive, inductive, qualitative and quantitative research.

Unit 2: Research Design: Formulation of research problem, review of literature, definition, characteristics and significance of hypothesis, formulation and testing of hypothesis. Research problems in Geography.

Unit 3: Sampling and Data Collection: Meaning, methods and types of sampling. Selection of sampling for geographical research. Primary and secondary data. Methods of primary data collection: Questionnaire, interview schedule, focussed group discussion, participant observation. Tabulation of data.

Unit 4: Statistical and Spatial Tools: SPSS, GIS and Remote Sensing for data analysis.

## **Books Recommended:**

1. Agarwal, C and Sharma, V (2022). Research Methodology in Geography. Arjun Publications. New Delhi
2. Krishna, G and Singh, N (2019). Researching Geography: The Indian Context. Taylor and Francis
3. Mahmood, A (1999). Statistical Methods in Geographical Studies. Rajesh Publisher. New Delhi
4. Murthy, N (2014). Research Methodology in Geography. Concept Publishing House. New Delhi
5. Shetty, R.K. (2021). Research Methods and Techniques in Geography. Academic Aspirations. New Delhi

# **GGC-451: Spatial Economics**

## **Course Outcomes:**

After studying this course the student will be able to:

- a) Familiarize with different types of economic and political system in the world.
- b) Understand development paradigms from all perspectives.
- c) Have an in-depth understanding of the process, importance, and problems of globalisation.
- d) Understand the need for and importance of new regional geography.
- e) Know the environmental concepts and costs of development and alternative growth models.

## **Course Contents:**

Unit 1: Economic systems: Economic systems: capitalist, socialist and mixed economies. Economic grouping and typology of countries, stages of development of productive forces, the post colonial states and the geography of world economy.

Unit 2: Development in Marxist Thought: Factors of production, relations of production, historical materialism and dialectical materialism. Development in Capitalist Thought: Rostow's stages of development, and Non-Communist Manifesto. Industrial Development: location of industries, models of Weber and Losch

Unit 3: Global Capitalism: Free market economy: Neo-liberalism, globalisation and post-colonial dependency. Critique of global capitalism: Regionalisation, new regional geography, and resistance movements.

Unit 4: Limits to growth and alternative growth models: Environmental movements and critique of everlasting growth: Club of Rome, Limits to Growth, Sustainable Development, Rio Earth Summit, Conference of Parties. Human Development: HDI and inequality adjusted HDI.

## **Books Recommended:**

1. Bery, B.J.L., Conkling, E.C. and Ray, D.M. 1993. The Global Economy: Resource Use, Locational Choice and International Trade, Englewood Cliffs, N.J.: Prentice Hall.
2. Gilpin, R. 2011. Global political economy: Understanding the international economic order, Princeton University Press
3. Gwynne, R., Shaw, D. and Klak, T. 2014. Alternative capitalisms: Geographies of emerging regions, Routledge
4. Krugman, P., 1995: Development, Geography and Economic Theory, MIT Press, Massachusetts.
5. Sheppard, E. and Barnes, T. J., 1984: The Capitalist Space Economy: Geographical Analysis after Ricardo Marx and Strafa, Unwin Hyman, London.

## Discipline Specific Elective(DSE)/ Generic Elective(GE)

### **GGE-101/GGG-105: Geomorphology**

#### **Course Outcomes:**

At the end of the course, students should be able to:

- a) understand the linkages between landscape form and processes.
- b) Explain basic principles for development of landforms through time,
- c) Learn the techniques of geomorphological analysis.

#### **Course Contents:**

Unit 1: Methods and approaches to the study of landforms; Basic concepts in geomorphology: Structures, Processes and Scales (Stage/Time); Theories of landscape development.

Unit 2: Concept of Plate tectonics; Mass movement of rock waste and resultant landforms; Concept, Evolution and Classification slopes; Theories of slope development.

Unit 3: Fluvial, Aeolian, Karst, Sea, and Glacial Geomorphology – Morphometry of drainage basins; Profile of equilibrium; Channel morphology; Climatic Geomorphology and Morphogenetic regions.

Unit 4: Structural Geomorphology–Fold, Fault and Domal Structures and Landforms; Palaeo and Neo–Geomorphology – Denudation Chronology of peninsular India and Himalayas.

#### **Books Recommended**

1. Bradshaw, M; Abbott, J and Gelsthorpe, A (1978). Earth's Changing Surface. Wiley. New York
2. Kale, VS and Gupta A (2018). Introduction to Geomorphology, Orient Longman Ltd.Hyderabad.
3. Singh, Savindra (2006). Geomorphology. Pravalika Publications. Allahabad
4. Strahler, A and Strahler A (2006). Introducing Physical Geography. Wiley. London
5. Summerfield, M. (2013). Global Geomorphology. Routledge. London

# **GGE-102/GGG-106: Oceanography**

## **Course Outcomes:**

After completion of this course, student will be able to:

- a) Acquire in-depth knowledge of basic concepts and theories in oceanography
- b) Learn the various types of marine landforms.
- c) Understand the global oceanic circulation and its causes.
- d) Learn about ocean deposits and ocean resources.

## **Course Contents:**

Unit 1: Meaning objectives, scope and significance of oceanography. Plate tectonics and sea floor spreading.

Unit 2: Ocean Bottom Topography: Continental shelf, continental floor, submarine canyon and ocean bottom relief. Configuration of Pacific Indian and Atlantic ocean floor.

Unit 3: Ocean motions-horizontal and vertical. Waves, tides and currents. Ocean Salinity and Temperature – Distribution and Determinants.

Unit 4: Coral reefs, marine deposits and ocean resources: Types and theories of origin; biotic, and mineral resources.

## **Books Recommended**

1. Garrison, T (2015). Oceanography: An Invitation to Marine Science. Cole Publications
2. Kershaw S., (2000). Oceanography: An Earth Science Perspective, Stanley Thornes, UK.
3. Pinet P. R., (2008). Invitation to Oceanography (Fifth Edition), Jones and Barlett Publishers, USA, UK and Canada.
4. Sharma R. C. and Vatal M., (1980). Oceanography for Geographers, Chaitanya Publishing House, Allahabad.
5. Sverdrup K. A. and Armbrust, E. V., (2008). An Introduction to the World Ocean, McGraw Hill, Boston.



# **GGE-103/GGG-107: Geo-Hydrology and Water Resource Management**

## **Course Outcomes:**

At the end of the course the students will be able to:

- a) Have a holistic view of the water environments i.e., hydrology seen as a water carrier in nature with human influence.
- b) Know diverse methods of collecting the hydrological information, which is essential to understand surface and groundwater hydrology.
- c) Describe how components of the water cycle are influenced by human activities.

## **Course Contents:**

Unit 1: Definition, Concepts and scope of geo-hydrology. Hydrology in relation to water resources development. Components of hydrological cycle.

Unit 2: Hydrological properties of rocks. Precipitation and runoff process, water discharge and measurement. Structure of the underground hydrosphere: Vadose and phreatic Zones. Recharge and discharge of ground water. Types of aquifer.

Unit 3: Movement of underground water: Infiltration, capacity, rate, and methods of computation. Hydraulic conductivity, Darcy's law, permeability, and transmissibility.

Unit 4: Conservation and Management: Water balance, utilization of water resources, Conservation of water; present future perspective, planning and programs. Concept of artificial recharge and water harvesting.

## **Books Recommended**

1. Andrew, D. W. and Trimble, S. (2004). Environmental Hydrology, 2nd Edition, Lewis Publishers, CRC Pres.
2. Chow, V.T., Maidment, D.R. and Mays, W.L. (1988). Applied Hydrology, McGraw-Hill International Editions, McGraw-Hill Book Company, New York.
3. Beach, Tim and Jonathan, M.F. (2017). Wetland Hydrology: The International Encyclopaedia of Geography, Wiley Online Library.
4. Mahajan G. 1989. Evaluation and Development of Groundwater, Ashish Publishing House, New Delhi.
5. Rai, S.C. 2017. Hydrology and Water Resources: A Geographical Perspective, Ane Book Pvt. Ltd., New Delhi.

# GGE-104/GGG-108: Climate Change Vulnerability Impact & Adaptation

## Course outcomes:

This course will enable the students to:

1. Detailed understanding of climate change .
2. In-depth knowledge of vulnerability and impact on environment and human .
3. understand climate change adaptation and policy & planning in global , national and state level.

## Course Contents:

Unit 1: Fundamental Of Climatology And Climate Change : meaning , scope , Type of climatology , understanding Climate change , green house and global warming.

Unit 2: Climate Change And Vulnerability : understanding vulnerability and its type , physical vulnerability , economic vulnerability and social and gender vulnerability.

Unit-3 : Climate Change And Impact : climate change impact on glaciers of Himalayas , livelihood of Himalayan dwellers, Agro system , forest and grassland in Uttarakhand , extreme weather events in Himalayas.

Unit 4: Climate Change : Response And Adaptation - climate change theories and evidences , global initiatives in special reference to Asian countries , policies of UNFCCC , National and state level action plan.

## Books Recommended

1. IPCC. (2014). Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part A: Global and Sectoral Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change. NY, USA: Cambridge University Press, Cambridge, United Kingdom and New York. 94
2. Sen, Roy, S., and Singh, R.B., (2002). Climate Variability, Extreme Events and Agricultural Productivity in Mountain Regions. Delhi, India: Oxford & IBH Pub.
3. Singh, M., Singh, R.B., and Hassan, M.I., (Eds.) (2014):Climate change and biodiversity, Proceedings of IGU Rohtak Conference, Volume 1. Advances in Geographical and Environmental Studies, Springer
4. Singh, R.B., Mal, Suraj, and Huggel, C. (2018). Climate Change, Extreme Events and Disaster Risk Reduction. Switzerland : Springer, , pages 309.
5. Aguado, E. Burt, J.E. (2001): Understanding Weather and Climate, Prentice Hall of India Pvt. Ltd, New Delhi.

# **GGE-105: Ecological Approach in Geography**

## **Course Outcomes:**

At the end of the course the students will be able to:

- a) Explain human ecology and related concepts.
- b) Know theories related to cultural and political ecology.
- c) Understand multi-scalar approach in environmental planning.

## **Course Contents:**

Unit 1: Human Ecology: Meaning, scope and definition of Ecology. HH Barrows and human ecology. Concepts in human ecology-ecosystem services, ecological footprint, ecological economics, and Anthropocene.

Unit 2: Cultural Ecology: Julian Steward's theory of culture change. Marvin Harris and cultural materialism.

Unit 3: Political Ecology: Meaning and scope of political ecology. Political, economic, and social factors in environmental issues. Perspective of power in political ecology.

Unit 4: Regional Political Ecology: New Regional Geography and regionalisation. Concept of scale in environmental issues. Multi scalar approach in environmental geography. Vulnerability, marginalisation, and geographic space.

## **Books Recommended**

1. Devi, TVG (2019). Understanding Human Ecology. Routledge. New Delhi
2. Pattanaik, S and Sen, A (2022). Regional Political Ecologies and Environmental Conflicts in India. Routledge, London and New Delhi
3. Roy, A (2022). Ecology, Literature and Culture. Atlantic Publishers. New Delhi
4. Sharma, C (2018). Ecology, Environment and Politics. Kalpaz Publications. New Delhi
5. Subbarao, S Human Ecology. Rajat Publications. New Delhi.

# **GGE-106: Advanced Statistics for Spatial Science**

## **Course Outcomes:**

On completion of the course, a student will be able to

- f) Understand the importance of statistical methods in Geographical studies.
- g) Learn data collection, tabulation, analysis and prediction.
- h) Analyze settlements for various town planning methods.
- i) Analyse different elements of relief.
- j) Learn to perform statistical tests.

## **Course Contents:**

Unit 1: Point, line and polygon. Scales of Measurement Nominal, Ordinal, Interval, Ratio. Tabulation of data. Frequency distribution. Measures of central tendency-Mean, Media, Mode. Measure of Dispersion-mean deviation, quartile deviation and standard deviation.

Unit 2: Correlation-Rank order and product moment correlation, Karl Pearson and Spearman method. Linear regression, multi-linear regression.

Unit 3: Theories of Probability. Normal, Binomial and Poisson distributions. Significance testing: Z-test, t-test. Hypothesis testing: Null and research hypothesis, F-Distributions, analysis of variance, one-way and two-way classification. Non-parametric Tests: Chi-Square, Kolmogorov-Smirnov, Mann-Whitney and Kruskal-Wallis.

Unit 4: Nearest neighbor analysis, quadrant analysis, entropy analysis, trend surface analysis; Introduction to Flow Analysis Techniques. Lorenz Curve and Gini Co-efficient.

## **Books Recommended**

1. Birch, T.W. (1976). Maps : Topographical and Staistica. Oxford University Press. London.
2. Downie, N.M and Heath, R.W. Basic Statistical Methods (1970). Harper and Row. New York
3. Gregory, S (2014). Statistical Methods and the Geographer. Taylor and Francis. London.
4. Singh, L. R. (2006). Fundamentals of Practical Geography. Sharda Pustak Bhawan, Allahabad.
5. Singh, R.L. & Singh, Rana P.B.(1993).Elements of Practical Geography (Hindi & English Editions),Kalyani Publishers, New Delhi.

# **GGE-107: Advanced Remote Sensing and GIS**

## **Course Outcome:**

The course will enable the students to:

- e) Understand the meaning and importance of Remote Sensing and GIS.
- f) Learn the method and use of Supervised and Unsupervised classification
- g) Learn to map making by using RS and GIS.
- h) Learn to use GIS for various analysis techniques like Overlay Analysis, Spatial Analysis etc.

## **Course Content:**

Unit 1: Meaning, principles, processes and stages of Remote sensing. Satellite and sensors: active and passive. Concept of resolution, photography vs. image, Electromagnetic Radiation Interaction of EMR with the Earth surface & atmosphere. Basic principles of Thermal & Microwave Remote Sensing, infrared Region of EMR, Characteristics of IR Images and their use, Radar Image Characteristics, Advantages of Radar Imagery.

Unit 2: Types of Image, Digital form of data, Digital Processing Techniques, Digital image classification.

Unit 3: Meaning, scope & concepts of GIS. History & development of GIS. Elements of GIS: Types of data, data models and structure, Representation of spatial and non - spatial Information, Data Input Methods: Geo-referencing, digitisation. Data Base, Data integration, Geospatial Data Analysis.

Unit 4: Internet GIS , Virtual 3 - D GIS , Digital Elevation Model ( DEM ) , GPS System & application, digital cartography, application of GIS in Geomorphology, land-use planning and urban morphology, disaster management, resource management

## **Book Recommended**

1. Campell, J. B. (2003): Introduction to Remote Sensing. 4th edition. Taylor and Francis, London.
2. Chang, K.,(2006) : Introduction to Geographic Information Systems, Tata McGraw-Hill
3. Chaunial, D. D. (2004): Remote Sensing and Geographical Information System (in Hindi), ShardaPustak Bhawan, Allahabad
4. Heywood, I. et al. (2004) : An Introduction to Geographic Information Systems, Pearson
5. Lillesand, T.M. and Kiefer, R.W. (2000): Remote Sensing and Image Interpretation. John Wiley and Sons, New York

# **GGE-108: Contemporary Human Geography**

## **Course Outcomes:**

At the end of the course the students will be able to:

- a) Understand the contribution of the discipline of geography to social sciences.
- b) Critically analyse contemporary social issues from a geographical perspective.
- c) Have a basic social, cultural, political and economic understanding from global and local perspectives of a broad range of contemporary issues.

## **Course Contents:**

Unit 1: Introduction: Foundational and Contemporary issues and debates, defining space and place, understanding different approaches in conceptualising space and place

Unit 2: Socio-spatial interconnections: Place-making, processes of place making in everyday lives, identities, difference and exclusion.

Unit 3: Critical geopolitics: Territoriality and power, nationalism, citizenship and governance, conflicts.

Unit 4: Development Geographies: Theories of development, Re-thinking development, development in the global south.

## **Books Recommended**

1. Agnew, J.A. and Duncan, J.S. (2016). *The Wiley Companion to Human Geography*, Wiley, UK.
2. Benko, G and Strohmayer, U (eds) (2004). *Human Geography. A History for the 21st Century*, Routledge, London and New York.
3. Cloke, P., Philo, C., Sadler, D. 2003. *Approaching Human Geography: An Introduction to Contemporary Theoretical Debates*, Sage: London
4. Hubbard P, Kitchin B and Valentine G. 2008. *Key Texts in Human Geography*, Sage, London
5. Kobayashi, A and MacKenzie, S. (1989). *Remaking Human Geography*, Routledge, London New York.

# **GGE-109/GGG-109: Economic Geography**

## **Course outcomes:**

At the end of the course the students will be able to:

- a) Understand broad meaning and scope of Economic Geography.
- b) Learn world production of crops, industries, resources, and petroleum etc.
- c) Learn theories of industrial location and factors responsible.
- d) Understand trade and transportation scenario of the world

## **Course Contents:**

Unit 1: Meaning, aim and scope of economic geography, Resources: Meaning, classification, conservation and concepts, Economic landscapes.

Unit 2: Mineral resources (Iron ore and bauxite), Power resources (Coal, Petroleum and Hydro-electricity), Resource conservation. Main crops in the world: Wheat, paddy, sugarcane, coffee and tea. industries: Iron & steel, textiles, petro-chemical and sugar.

Unit 3: Theory of industrial location: Weber and Losch, Industrial regions of India and World.

Unit 4: World transportation: trans-continental railways, sea and air routes, international trade, patterns and trends, trade blocks: NAFTA, EEC, ASEAN, G7 and G20, Globalization and developing countries.

## **Books Recommended**

1. Alexander, I W (1988) Economic Geography. Prentice Hall, New Delhi.
2. Boesch, H (1964) A Geography of World Economy. Von Nostrand, New York.
3. Coe N. M., Kelly P. F. and Yeung H. W. C. 2007. Economic Geography: A Contemporary Introduction, Blackwell, Oxford.
4. Hanink D. M. 1997. Principles and Applications of Economic Geography, John Wiley, New York
5. Hartshorne, TA & Alexander IW (1988) Economic Geograohy. Englewood Cliff, New Jersey.

# **GGE-110/GGG-110: Political Geography**

## **Course Outcomes:**

At the end of the course the students will be able to:

- a) Understand territorial bases of the state and role of geographic factors in shaping political history.
- b) Know the process of evolution of constituencies and politico electoral regions of India.
- c) Learn about India's position in regional power blocs, bilateral relations with SAARC countries and the geopolitics of the Indian Ocean region

## **Course Contents:**

Unit 1: Meaning, Scope and definition of political geography. Geography and its relationship with political economy and political sociology. Political geography vs geo-politics.

Unit 2: Frontiers and boundaries and their laws; international boundaries functions and classification; buffer zones; political geography of the ocean-maritime laws and UNCLOS. Concept of state and nation. Geo-strategic views: Mahan, Mackinder, Spikeman, conflict between states and conflict resolutions.

Unit 3: Electoral Geography: Electoral Geography: electoral systems, methods of studying electoral geography, geographical influence in voting. National and regional political parties and voting behaviours in India. Legislative structure of Uttarakhand .

Unit 4: Political geography of India and neighbourhood. India-Pakistan-China: Issues and challenges. Supra-national organisations and their geographical significance: SAARC, Non-Aligned Movement and Politics of Indian Ocean Region.

## **Books Recommended**

1. Agnew, J. (ed.), (1997). *Political Geography*, Arnold, London.
2. Blake, G. (ed.) (1987). *Maritime Boundaries and Ocean Resources*, Croom Helm, London
3. Dikshit, R. D., 1997: *Developments in Political Geography: A Century of Progress*, Sage Publications, New Delhi.
4. Parker, G. (1998). *Geopolitics: Past Present and Future*, Printer, London
5. Taylor, P.J. and Johnston, R.J., 1979: *Geography of Elections*, Croom Helm, London



# **GGE-111/GGG-111: Tourism Geography**

## **Course Outcomes:**

At the end of the course, a student will be able to:

- a) Understand the concept and importance of tourism and Tourism Geography.
- b) Learn about the impact of tourism on environment, economy and society.
- c) Know the prospects and challenges of tourism in Uttarakhand.

## **Course Contents:**

Unit 1: Definition, scope, nature, significance and development of tourism geography. Geography of tourism as applied geography. Impact of tourism: physical, economic, social and cultural impacts; concept of ecotourism; new emerging trends in tourism. Statistics of tourism and data collection.

Unit 2: Tourism Marketing: marketing concepts and marketing in tourism. Tourism circuits, tour agencies, components of a tourism plan, the tourism planning process.

Unit 3: Globalization and tourism, tourism in India, national tourism policy in India. Tourism organizations: role of WTO, IATA, IATO, etc. in promotion and development of tourism.

Unit 4: Development of tourism in the Himalayas with special reference to Uttarakhand. Tourism as a process of development and change in Hill region. Problems & planning measures for tourism in Uttarakhand.

## **Books Recommended**

1. Burkarl, A.J. (1974). Tourism, Past, present and future Heineman London.
2. Robinson H. (1976). A Geography of Tourism. MacDonal and Evans Ltd; London.
3. Douglas Pearce (1981). Topics in Applied Geography, Tourist Development. Longman London New York.
4. Stephen L.J. (1989). Tourism Analysis: A Handbook-Longman Scientific of Technical.
5. Pande, G.C. and D.C. Pandey (1999). Environmental Development and Management: Strategies and Policies, New Delhi.

# **GGE-112/GGG-112: Gender Perspectives in Disaster Management**

## **Course Outcomes:**

The course will enable the students to:

- A. understanding concept of gender & hazard
- B. gender role to natural hazards
- C. risk and resilience to NH
- D. understand gender role and response in DRM designing
- E. define approaches to better promote gender equality

## **Course Contents:**

Unit I :Conceptualising Gender within Geography: Concept of gender , Development of and theoretical approaches to the study of Gender in geography;. concept of disaster, concept of resilience, gender role , disaster impact, exposure and vulnerability & challenges and limitation.

Unit II :Examining Gender in relation to space, resources: Gendered environments, gendered access to and experience of resource.

Unit III: Gender role in disaster management : Gender in disaster risk management , preparedness and coping capacity , female participation , community participation.

Unit IV: Analysing gender and space in India, women leadership in building resilience in Indian Himalayan Disaster risk management, Effective gender responsive DRM, Case study , local gap assessment.

## **Books Recommended**

1. Agarwal Bina, (1994). A Field Of One's Own: Gender And Land Rights In South Asia, Cambridge University Press
2. Massey Doreen, (1994). Space, Place And Gender, University Of Minnesota Press, Minneapolis
3. McDowell Linda, (1999). Gender, Identity And Place: Understanding Feminist Geographies,Blackwell Publishers, Oxford
4. Elaine Enarson , (2019).Women, Gender And Disaster: Global Issues And Initiative,Sage Publication
5. Sara Bradshaw (2013). Gender, Development And Disaster ,Edward Elgar Publ.Ltd
6. Nahid Rezwana (2022), Gender Based Violence And Layered Disaster ,Routledge Publ.
7. GFDDR
8. UNDP REPORT

# **GGE-113/GGG-13: Rural Development and Planning**

## **Course Outcomes:**

The course will enable the students to:

- a) Understand the basics of rural geography.
- b) Formulate the basic structure and pattern of rural settlements in India.
- c) Understand the intricacies of rural planning in India
- d) Know the various programmes for rural development in India.

## **Course Contents:**

Unit 1: Definition, nature, scope and significance of rural geography. Approaches to rural development. Rural-urban dichotomy.

Unit 2: Origin and evolution of Indian villages & their relationships in different regions. Spatial components of rural settlements - size, spacing, shape, site arrangement pattern and their relationship. Types and patterns of rural settlements in India with special reference to the Himalayan region.

Unit 3: Policy and Planning: Rural settlement planning in India, policies & programmes related to rural development in India. Methods of micro-level planning: Block and District level planning.

Unit 4: Rural development programmes in India: The Gandhian model of rural development and Panchayati Raj. Integrated Rural Development Programmes, P. M. Awas Yojana and area specific programmes. Mountain, tribal and desert development programmes in India.

## **Books Recommended**

1. Hudson , F.S. (1970) A Geography of Settlements. Macdonalds and Evans
2. Mandal , R.B. (2001). Introduction to Rural Settlements. Concept Publishing. New Delhi
3. Money , D.C. (1972) Patterns of Settlements. Evans Bros. London
4. Singh , R.L. et . al . ( eds . ) (1975) Readings in Rural Settlement Geography. National Geo-graphical Society of India. Varanasi
5. Wanmali , S. (1975) Service Centres in Rural India

# **GGE-114/GGG-114: Urban Development and Planning**

## **Course outcomes:**

After completion of this course, student will be able to:

- a) Understand the concepts and components of urban development and management.
- b) analyse the urban poverty and slums at different scales.
- c) Have in-depth knowledge of urban infrastructure development management and urban governance.
- d) Critically evaluate the infrastructure development programmes & policies aimed at sustainable urban development and management strategies.

## **Course Contents:**

Unit 1: Concept of urban development; urbanization: meaning and characteristics, trends, patterns; classification of urban settlements.

Unit 2: Urban Morphology; Hierarchy of urban settlement; Urban areas and conurbation; Urban influences: Umland & rural-urban fringe.

Unit 3: Urban Issues and challenges in the developing world; Nature of slum; evaluation of slum improvement programmes and schemes in India; resettlement and rehabilitation actions; Infrastructure development; water supply and sanitation; housing; traffic; urban disasters.

Unit 4: Sustainable Urban Development and Management; Government programmes and policies. Urban land use planning.

## **Books Recommended**

1. Atkinson, A. et. al., 1999. The Challenges of Environmental Management in Urban Areas, Ashgate Pub. Co., Sydney.
2. Hardoy, J.E., Mitlin, D. and Satterthwaite, D. 1992. Environmental Problems in Third World Cities, Earthscan, London
3. Joss, Simon, 2015. Sustainable Cities: Governing for Urban Innovation, Palgrave, London
4. Singh, R. B. (ed) 2015. Urban Development Challenges, Risks and Resilience in Asian Mega Cities, Springer, Japan
5. Sivaramakrishnan, K.C. 2001. Problems of Governance in South Asia, Centre for Policy Research, New Delhi

# **GGE-115/GGG-115: Regional Geography of the Himalayas.**

## **Course outcomes:**

- (a) The objective of this course is to impart holistic knowledge of the Himalayas.
- (b) The students will be able understand the physical as well as cultural aspects of the Himalayas.
- (c) After the completion of the course, the students are expected to gain an understanding of the problems facing the Himalayas in the form of environmental degradation and hazards.
- (d) The students should get a complete idea of the prospects of development in the Himalayan region with proper planning.

## **Course Contents:**

Unit 1: Himalayan orogeny. Physical aspects: relief, drainage, glaciers, lakes, vegetation, bio-diversity, natural hazards and environmental degradation of the Himalayas.

Unit 2: Regional Classification of the Himalayas: Regional divisions of the Himalayas into macro, meso and micro regions and their parameters and characteristics. Salient Characteristics of each region.

Unit 3: Cultural Aspects: Population density, growth, and distribution. Settlement: Urbanization , tribal and pastoral communities. Agriculture, animal husbandry, horticulture, transport and tourism, power projects, implications of out - migration on the regional economy and problems of waste land expansion.

Unit 4: Development and Planning: Geographical account valleys in Himalayas: Kashmir, Ladakh, Lahul and Spiti, Doon, Kathmandu, and Teesta valley. Mountain development planning and policy and future prospects of development in the Himalayas.

## **Books Recommended**

- 6. Bose . S.C (1968). Land and People of the Himalaya. India Publishers. Kolkata
- 7. Hussain, Majid (2015) Geography of India, McGraw Hill Education, New Delhi.
- 8. Joshi, S.C. (2001): Uttaraanchal: Environment & Development
- 9. Nand, Nitya and Kumar, Kamlesh (1989). The Holy Himalaya: A Geographical Interpretation of Garhwal. Daya Books. New Delhi
- 10. Singh O.P. (ed.). (1983): The Himalaya: Nature, Man and Culture

# **GGE-116/GGG-116: Mountain Development with Special Reference To The Indian Himalayas.**

## **Course outcomes:**

1. To Develop understanding of mountain evolution and system
2. Able to Understand mountain resources and management
3. To analyse Changing climate impact on mountain system
4. To Integrated development in Himalayan region.

## **Course Contents:**

Unit 1: Mountain system : major mountains of world and India , location and extent, geology , physiography , demographic and socio – cultural characteristic.

Unit 2: Mountain natural resources: land , water , forest , wildlife ; distribution and utilization .

Unit 3: Mountain institution : role of local and regional institutions, environmental governance in Himalayas ; indigenous and community based development.

Unit 4: Development and planning : concept of development in mountain region; well being of mountains and communities ,UN goals on mountains; conservation and Integrated and sustainable development in Himalayas region .

## **Books Recommended**

1. P. Wester, A. Mishra, A. Mukherji, A. B. Shrestha (eds), The Hindu Kush Himalaya Assessment: Mountains, Climate Change, Sustainability and People, Springer Nature Switzerland AG, Cham. pp., 2019
2. World Bank, South Asia's Hotspots Impacts of Temperature and Precipitation Changes on Living Standards, Report Preview Spring 2018, World Bank Group, Washington D.C. 2018
3. S. Irudaya Rajan, R. B. Bhagat eds, Climate Change, Vulnerability and Migration, Routledge, India, 2018
4. M.S.S. Rawat et al. (eds), Environment, Resources and Development of the Indian Himalaya, Trans-media Publication, Srinagar, Garhwal, Uttarakhand, India, 2018
5. Tor H. Aase, Climate Change and the Future of Himalayan Farming, Oxford University Press, 2017

# GGG-101: Geography as Science of Synthesis

## Course Outcomes:

After the course, the student will be able to:

- a) Have a general understanding of the discipline of Geography.
- b) Learn about inter-disciplinary nature of Geography.
- c) Understand the role of geography as a bridge between natural and social sciences.

## Course Contents:

Unit 1: Meaning, nature and scope of Geography. Definitions of Geography.

Unit 2: Fennman's circumference of Geography. Inter-disciplinary nature of Geography. Approaches to study Geography: Systematic and Regional. Branches of Geography: Physical and Human.

Unit 3: Relationship of Geography with other disciplines. Fennman's circumference of Geography. Inter-disciplinary nature of Geography. Geography as a bridge between natural and social sciences.

Unit 4: Contemporary Geography: relevance of Geography in a fragmented world. Globalisation, regionalisation, regionalism and changing ideas of space and place.

## Books Recommended

1. Bonnett, Alastair, 2008. What is geography? Sage Publications.
2. Castree, R, A. Rogers and D. Sherman, 2005. Questioning Geography: Fundamental Debates, Black-well
3. Crang, Mike and Nigel Thrift, 2000. Thinking Space, Routledge
4. Holt Jensen Arid, 1999. Geography: History and Concepts, Sage Publications
5. Hubbard, Phil., Kitchin, Rob., Bartley Brendan and Duncan Fuller, (eds) 2002. Thinking Geographi-cally: Space, Theory and Contemporary Human Geography, Continuum

# GGG-102: Elements of Physical Geography

## Course Outcomes:

- a) To introduce the students to physical geography-its meaning, scope and subject matter.
- b) By the completion of the course the students will be able to explain the origin and de-velopment of different landforms on the surface of the earth.
- c) The students will learn about various earth movements and the movement of plates that give rise to continents and ocean basins.
- d) To explain the global climatic systems and climate change
- e) Understand the ocean systems of the world.
- f) The student should become well versed in biogeography and basic elements of vegetation and soil.

## Course Contents:

Unit 1: Meaning, scope and development of physical geography; origin of the earth – Theories of Kant, Laplace, Chamberlin, James Jeans; geological history of earth; interior of the earth; rocks. Origin of continents and ocean basin: plate tectonic and isostasy. Earth's movements - endogenetic and exogenetic, volcanoes and earthquakes; weathering and erosion; drainage pattern; landform development: river, arid, glacier, marine, and karst.

Unit 2: Structure and composition of the atmosphere; insolation; temperature; pressure belts and winds; planetary and local winds; monsoons; stability and instability of the atmosphere. Humidity and rainfall; fronts, frontogenesis, cyclones and anti-cyclones. Climatic regions of the world: Koeppen & Thonhwaite classification of world climates. Climate change, issues, challenges and policies.

Unit 3: Ocean bottom topography, ocean deposits, salinity, temperature, ocean currents, tides and coral reefs.

Unit 4: Abiotic and biotic components of the biosphere; characteristics and types of ecosystem; biosphere as an ecosystem; biotic succession; Man and biosphere, distribution and dispersal of plants; biome types -equatorial rainforest, monsoon, savanna and temperate grassland biomes.

## Books Recommended

1. Barry, R.G. and Chorley, R.J. (1998). Atmosphere, Weather and Climate. Routledge, London..
2. Garrison T (1998). Oceanography. Wordsworth Cp, Bedmont.
3. Singh, S. (2003). Physical Geography (English and Hindi Editions) Prayag Pustak Bhawan, Allahabad.
4. Strahler, A.N. and Strahler A.M. (1992). Modern Physical Geography, John Wiley and Sons, New York Trewartha, GT and Horn, LA (1980): An Introduction to Climate, McGraw Hill and Co
5. Wytts (1971). Principles of Biogeography, McGraw Hill & Co.



# **GGG-103: Principles of Human Geography**

## **Course Outcomes:**

This course will enable the students to:

- a) Learn Meaning, Concept, Nature, Scope and development of Human Geography.
- b) Learn the basics of economic geography of the world.
- c) Understand the distribution of various resources and industrial production.
- d) Be able to divide the world into agricultural regions.
- e) Understand the various cultures and cultural regions of the world

## **Course Contents:**

Unit 1: Nature, scope and development of human geography; Branches of human geography; man and environment relationship - determinism, possibilism neodeterminism and probalism.

Unit 2: Population growth, distribution, migration problems and planning; ethnic groups and tribes: characteristics of tribes and their world distribution; rural and urban settlements –functional types, patterns and morphology.

Unit 3: Agriculture: Types of farming; agricultural regions of the world; distribution and production of iron ore, coal, petroleum and hydroelectricity; Industries: location and development of iron and steel, cotton textile and chemical industry; fishing; major oceanic and rail routes; pattern of world trade.

Unit 4: Cultural and social processes - social interactions, social groups and organization; diffusion of cultures; cultural hearths; major cultural realms, major religions of the world.

## **Books Recommended**

1. Singh, L.R. (2005). Fundamentals of Human Geography. Sharda Pustak Bhawan, Allahabad..
2. Haggett, P. (2004). Geography: A Modern Synthesis. Harper & Row, New York.
3. Hussain, M. (1994): Human Geography. Rawat Publication, Jaipur.
4. Norton W. (1995). Human Geography. Oxford University Press, New York..
5. Singh, K. N. & Singh J. (2001). Manviya Bhoogol. Gyanodaya Prakashan, Gorakhpur.

# **GGG-104: Natural Hazards and Disaster Management**

## **Course Outcomes:**

After studying this course the student will be able to:

- a) Learn about the different types of hazards.
- b) Know the difference between hazards and disasters.
- c) Understand the impact of hazards and disasters on various spheres of human life.
- d) Analyse the role of humans in mitigating the impacts of different hazards.
- e) Understand key concepts in hazard and disaster studies like vulnerability, risk, response, re-silience and recovery.

## **Course Contents:**

Unit 1: Understanding hazard : definition, type of Hazards, causes and impact , concept of risk and vulnerability.

Unit 2: Disaster : definition and classification , natural disaster and man made disaster- cause , impact and distribution.

Unit 3: Disaster in India : floods, landslides , drought, earthquake , cyclone cause and impact.  
Man made disaster : cause and impact

Unit 4: Mitigation and management : basic principles of disaster management , institutional framework of NDMA and NIDM.

## **Books Recommended:**

1. Kapur, A. (2010) Vulnerable India: A Geographical Study of Disasters, Sage Publication, New Delhi.
2. Modh, S. (2010) Managing Natural Disaster: Hydrological, Marine and Geological Disasters, Macmillan, Delhi.
3. Sinha, A. (2001). Disaster Management: Lessons Drawn and Strategies for Future, New United Press, New Delhi.
4. Stoltman, J.P. et al. (2004) International Perspectives on Natural Disasters, Kluwer Academic Publications. Dordrecht.
5. Singh Jagbir (2007) “Disaster Management Future Challenges and Opportunities”, I.K. International Pvt. Ltd, New Delhi

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## Skill Enhancement Course (SEC)

### **GGGS-101: Traditional Knowledge System in Resource Management**

#### **Leraning outcome**

- A. Explain traditional knowledge
- B. help in improving decision makers
- C. help conservation and management of natural Resources
- D. understand linkage between local people and Natural Resources

Unit I: Introduction to indigenous knowledge ,concept of Traditional knowledge system, difference between indigenous knowledge and western knowledge , need and priority

Unit II: Methodology and approaches : ethnographic , comparative , integrated , Traditional ecological knowledge, traditional technical knowledge, traditional values and ethics

Unit III: Case studies – Saura Tribe Of Odisha , Water Management Of Johad , Rajasthan , Zabo In Naga Community ,Surangas In Kerela, Agriculture And Forest Management

Unit IV: Project and outreach.

#### Further reads

1. Julian T Inglis (1993) Traditional Ecological Knowledge ,Concepts And Cases, In-ternational Development Research Centre .
2. Charles R Menzies (2006) .Traditional Ecological Knowledge And Natural ResourceManagement , University Of Nebraskas Press
3. Reports And Research Paper

# **GGGS-102: Innovative Techniques of Resource Conservation & Management**

Course outcomes:

At the end of the course the students will be

1. able to Understand the concept of Resource conservation;
2. its process and management.
3. learn resource analyses innovative techniques such as Remote sensing and GIS in resource management.

Course:

Unit 1: Resources: Concept; Classification and Process; Concept and Approaches of Resource conservation & management.

Unit 2: Production, Availability and Utilization of Resources, Resource Efficiency, Carrying Capacity of Natural Resources with special reference to Himalaya.

Unit 3: Food and Agricultural security in Himalayan region; Community Based Resource Management; Participatory Resource Management. Concept of Integrated Resource Development.

Unit 4: Application of Remote Sensing and Geographic Information System in Resource conservation studies: Resource Analyses, Resource Mapping.

Recommended literature review;

- A. Global Change and Natural Resource Management, Vitousek, P.M. 1994. Beyond global warming: Ecology and global change. *Ecology* 75, 1861-1876.
- B. Kumar S. (2002) Does "Participation" in Common Pool Resource Management Help the Poor? A Social Cost-benefit Analysis of Joint Forest Management in Jharkhand, India, *World Development*, 30(5), pp-763-782.
- C. M.S.S. Rawat et al. (eds), *Environment, Resources and Development of the Indian Himalaya*, Transmedia Publication, Srinagar, Garhwal, Uttarakhand, India, 2018.
- D. Simonsen, Jesper and Toni Robertson. 2012. *Routledge International Handbook of Participatory Design* (Routledge International Handbooks).Routledge.

# **GGGS-103: Methods and Techniques Towards Disaster Risk Management**

## **Course Outcome:**

At the end of the course the students will be:

- A. enhance the level of awareness and preparedness towards different disaster
- B. enhance analytical skills and competencies towards response mechanism
- C. develop strategies towards different disasters prevailing in the region.

The program will be offered jointly by Department of Geography, Doon University in collaboration with various disaster management institutes of India and Uttarakhand:

## **Course Content:**

Unit 1: Provide students with application-based knowledge of disaster studies. The courses also facilitate students to share their views, ideas and information on a common platform.

Unit 2: The programme includes discussions, queries, clarifications, assignments and end-of-course projects which are evaluated by experienced course facilitators.

Unit 3: Successful candidates will be given training by various disaster management institutes.

Unit 4: Project and outreach.

# **GGGS-104: Bio Medical Waste Management: Methods, Techniques and Practices**

## **Course Outcomes:**

- Equip the learners with the latest knowledge regarding health care waste management as per Govt of India Rules and WHO guidelines Proficient with skills to manage the health care waste effectively and safely and contribute effectively in this area Experienced to be involved in research through projects Competent to train others
- Develop a skill base for Bio Medical waste management practices among learners.

The programme has been developed in line with the Bio-Medical Waste Management (BMWM) rules 2016 of Government of India and safe management of waste from health-care activities, WHO 2014. The aim of the programme is to create essential knowledge and skills in health care waste and equip the learners to manage it effectively and safely and safeguard the community against adverse health impact of health care waste. Sensitise the learners about health care waste and its impact on health and environment. Acquaint the learner group to existing legislation, knowledge and practices regarding health care waste Management practices in South East Asia Region countries with particular reference to India. Equip the learner with skills to manage health care waste effectively and safely.

## **Course Content:**

- Unit: 1: Fundamentals: Environment and Health, Health Care Waste Management Regulations:
- Unit -2: Health Care Waste Management: Concepts, Technologies and Training
- Unit -3: Current Status of Health Care Waste Management, Legislation in the Regional Countries, existing legal and administrative aspects of waste management.
- Unit: 4 Practical visit to medical facility and on-site tour (On site learning experience of different existing methods and practices to segregate and dispose bio medical waste in near by medical facilities and pre-paring a draft report of the same.

# **GGGS-105: Hydrological Mapping and Surveying Techniques**

## **Course Outcomes:**

- Enable the students to practise mapping of hydrological resources with the help of on-field training.
- Equip the students with techniques to effectively manage water resources.
- Develop surveying skills of the students.

The programme has been developed in association with Uttarakhand Jal Sansthan. The aim of the programme is to allow students of Department of Geography, Doon University to take part in surveying and mapping of hydrological resources along with staff and employees of Uttarakhand Jal Sansthan. the students will be expected to prepare a project report based on the work they have done with Uttarakhand Jal Sansthan. On successful evaluation of the project, the students will be awarded 2 credits by Doon University and a Certificate of Participation by the Uttarakhand Jal Sansthan.

# **GG-106: Plastic Waste Recycling and Management**

## **Course Outcomes:**

- Enable the students to practise recycling of plastic waste.
- Equip the students with techniques to effectively manage plastic waste.
- Develop waste management skills of the students.

The programme has been developed in association with Central Institute of Petrochemical Engineering and Technology. The aim of the programme is to allow students of Department of Geography, Doon University to take part in plastic waste recycling and management along with staff and employees of CIPET. The students will be expected to prepare a project report based on the work they have done with CIPET. On successful evaluation of the project, the students will be awarded 2 credits by Doon University and a Certificate of Participation by the CIPET.



## **Project**

A project may be undertaken in the form of a case study or otherwise and data be collected, if required, as the case may be. The topic of the project be chosen in consultation with the assigned supervisor and the candidate should prepare a summary/synopsis of the proposed project related to some topic in Geography. The candidate needs to collect data/related literature on any particular aspect of the identified topic and shall prepare the report of the project from historical point of view, or as a survey or unification of different aspects.

## **Dissertation (based on some scientific problem)**

Any topic in Geography may be picked up by a candidate in consultation with the assigned supervisor. An in-depth study of the topic in a specific direction be made leading to the identification of a problem. The derivation of full/partial answer to the problem be written in the form of a thesis. The investigation be made either to give birth to another proof of an existing result or a new technique be proposed in lieu of an existing technique or a novel finding.