Learning Outcomes Based Curriculum Framework (LOCF) for Geography

I.B.Sc. (Hons.)

II.B.Sc. (Programme)

Undergraduate Programme 2022

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Preamble

The purpose of any programme at Higher Education Institute is to prepare their students for the society. The West Bengal State University envisions all its programmes in the best interest of their students and in this endeavour it offers a new vision to all its Under-Graduate courses. It imbibes a Learning Outcome-based Curriculum Framework (LOCF) for all its Under Graduate programmes.

The LOCF approach is envisioned to provide a focused, outcome-based syllabus at the undergraduate level with an agenda to structure the teaching-learning experiences in a more student-centric manner. The LOCF approach has been adopted to strengthen students' experiences as they engage themselves in the programme of their choice. The Under-Graduate Programmes will prepare the students for both, academia and employability.

Each programme vividly elaborates its nature and promises the outcomes that are to be accomplished by studying the courses. The programmes also state the attributes that it offers to inculcate at the graduation level. The graduate attributes encompass values related to well-being, emotional stability, critical thinking, social justice and also skills for employability. In short, each programme prepares students for sustainability and life-long learning.

The new curriculum of B.Sc. (Hons) Geography offer following objectives:

1. To orient the students towards identification and analysis of various facets of geographic and geographical features and processes.
2. To develop students' aptitude for acquiring basic skills of carrying out field work.
3. To facilitate the students to learn skills of map making.
4. To guide students to learn the science and art of collecting, processing and interpreting the data.
5. To expose the students to the use of the updated technologies of remote sensing, GNSS, Geographical Information System (GIS) and GPS.

1. INTRODUCTION

Geography is the study of places and the relationships between people and their environments. Geographers explore both the physical properties of Earth's surface and the human societies spread across it. They also examine how human culture interacts with the natural environment and the way those locations and places can have an impact on people. Geography seeks to understand where things are found, why they are there, and how they develop and change over time. The study of the diverse environments, places, and spaces of Earth's surface and their interactions. It seeks to answer the questions of why things are as they are where they are. The modern academic discipline of geography is rooted in ancient practice, concerned with the characteristics of places, in particular their natural environments and peoples, as well as the relations between the two.

Choice Based Credit System (CBCS): Syllabus in Geography

In compliance with recent directives from the University Grants Commission, the undergraduate syllabus for Geography is reframed into Choice Based Credit System following the model syllabus prepared by the West Bengal State Council of Higher Education.

The main objective of this new curriculum is to give the students a holistic understanding of the subject putting equal weightage to the core content and techniques used in Geography. The syllabus tries to give equal importance to the two main branches of Geography: Physicaland Human.

The B.Sc .Honours programme in Geography offers a choice of varied papers covering theoretical, practical and applied aspects of the discipline. It is designed to cover both traditional and contemporary framework of study, thus giving a wide scope to the learners to apply their knowledge and skills in real scenarios.

The principal goal of the syllabus is to enable the students to secure a job at the end of the undergraduate programme. Keeping this in mind and in tune with the changing nature of Geography, adequate emphasis is rendered on applied aspects of the subject such as emerging techniques of mapping and field-based data generation. The syllabus emphasises on development of basic skills of the subject, so that everyone need not go for higherstudies in search of professional engagement or employment.

LEARNING OUTCOMES:

This syllabus is designed to impart basic knowledge on geography as a spatial science and train the undergraduates to secure employment in the sectors of geospatial analysis, development and planning, mapping and surveying.The main objective is to develop an aptitude towards erudition that is rich in its content as well as it delivers the requirement of the present day society and industry. The curriculum has

been carefully designed to include conceptual, practical, experiential and skill building component.

1.1.Fundamentals:

This curriculum also focuses on the understanding of core and fundamental branches of the discipline. These papers are specially designed to cater to foundation building of the students by imparting knowledge about the pillars of geography. It encompasses the evolution of the subject right from the experiences and understanding of travellers and explorers regarding space, place and people to the progression towards establishment of the discipline geography in social sciences. Care has been taken to cover all basic themes in geography. The classic and contemporary theories / models of the subject are incorporated in most papers. These core branches cover the two broad spectrums of physical and human geography, along with the interface branch of environmental studies.

1.2.Practical:

To enrich the process of knowledge assimilation varied tools and technique oriented papers have also been incorporated in the curriculum. It includes traditional mapping concepts to digital and space based learning. There has been emphasis on use of sophisticated methods of data collection as well as data processing through exhaustive field work, use of basic statistics and Geographic Information System. The advantage of going for compulsory fieldwork can train them to undertake research in future which is essential part of social science approach.

1.3 Application Oriented:

In addition to this, the applied component has also been integrated in the syllabus for skill enhancement and capacity building. Laboratory and project based learning are important constituents of these papers. Hands on learning making use of various tools, equipment and softwares are essential mechanism for knowledge transfer. There has been focus on student centric education that involves an exploratory approach and gaining proficiency by learning both inside and outside their classrooms.

1.4. Regional Approach:

In most of the papers regional dimensions are added through theoretical case studies and field excursions. Along with the global dimensions of the issues that are covered in syllabus papers like geography of India purely caters to regional and local approach to the understanding.

2. LEARNING OUTCOME – BASED APPROACH TO CURRICULUM PLANNING

The learning outcome is to prepare the students of BSc Honours degree in Geography, to understand the development of the subject and delve around issues suited to the needs of the contemporary world. It covers a wide range of papers covering various themes and also maintains uniformity of structure across universities in the country. Geography being interdisciplinary in nature integrates learning derived from all basic and applied sciences/social sciences

2.1. Nature and Extent of Programme

The Learning Outcomes-based Curriculum Framework (LOCF) for the B.Sc. (Honours) degree in Geography is intended to develop as per the requirements of the subject with emerging new domains of Geography. The framework allows for flexibility in programme design and course content along with maintaining a basic uniformity in structure in comparison with other universities across the country. The B.Sc. (Honours) Geography programme covers a wide range of fundamental and applied courses as well as courses of interdisciplinary nature. The core courses are designed to develop strong subject knowledge base in the student and apprise them with the applied aspects of this dynamic global discipline. The programme offers a wide range of elective courses to the student to choose from. The syllabi include skill enhancement courses that prepare the student for a career in academia or industry.

2.2. Aims of Bachelor degree programme in Geography

The student is equipped to pursue higher studies in an institution of her/his choice, and to apply the skills learnt in the programme to solving practical societal problems. The student will also be ready to join the industry as trained workforce.

3.GRADUATE ATTRIBUTES

Some of the characteristic attributes of an Honors graduate in Geography include:

3.1. Disciplinary Knowledge: Students gains in-depth knowledge of basic and applied areas of geography. Core and discipline courses train them in fundamental branches of the subject. Technical and skill courses help them to learn tools and technics. Geography student gets a unique opportunity to experiment and observe on the field.

3.2. Communication Skills: Students develops effective communication skills through oral presentations, and group discussions on the subject content. Besides interviewing people, field surveys and public dealing with different cadre of people makes him/her confident in communication. The compiling, processing and analyzingthe information from the field;and presenting in the form of reports enhances written communication skills.

3.3. Critical Thinking: Geography subject creates scientific logic aptitude and approaches a problem through critical reasoning. The course content is enabled to stimulate the questioning capacity for what, where, who, when and how. The papers like Environmental Geography, Disaster Management, Global Economic System, Resource Management to name a few.

3.4. Problem Solving: The understanding about surroundings, the issues that concerns life, climate or to that matter water crisis etc makes students yearn to look for solutions. Geography discipline has the flair which connects to everyday living and survival thus generates problem solving aptitude.

3.5. Analytical Reasoning: The geography course teaches variety of tools, techniques and data handling which develop analytical reasoning to solve the issues. In fact the training in all these courses is meant to develop the analytical reasoning, mining the data from satellite images, aerial photographs and observations to arrive at interpretations and inferences.

3.6. Research Related Skills: The course content trains students to learn basic research design, data collection process, and ethics to conduct research work through field work. The specially developed course on research methodology and field work acquaint them to prepare questionnaires, selecting sample plans, identifying right kind of objectives,data collections methods, field exposure, mental mapping, reproducing the observations, analysis and finally to prepare reports.

3.7. Cooperation/ Teamwork: The course enables to develop skill to work with students of diverse backgrounds and cooperation on same topic will increase better understanding. The group assignments and presentations are essential elements in the course design that will inculcate the team spirits. The field excursions help develop great bonding; working and executing the plans on ground .They also

learn to work as team in case any emergency with group member away from institution/home/or city.

3.8.Scientific Reasoning: Course will develop critical analysis of theories and models, raising critical questions about the theories and models, developing hypothesis and learning their testing. Many of the courses in geography are truly scientific in nature which will generate scientific reasoning aptitude and also skills to look towards new approaches.

3.9. Reflective Thinking: A graduate who successfully completes his/her course should be able to reflect on the assimilated knowledge so as to apply these skills at different levels. Whether they go for masters in pure or applied disciplines, it will inculcate a sense of understanding of the world to manage real world problems. Any teaching learning process is incomplete without clear refection of the theoretical, practical and applied knowledge of the subject. A degree in geography has ample scope in other field of studies too as the subject with its interdisciplinary approach helps the learners to think in a more comprehensive manner.

3.10. Information and Digital Library: The student of geography is always encouraged to explore beyond the basic textbooks. Besides availability of all types of reading material, a student needs to invest in learning and consulting from various open source library to expand the vista of their knowledge acquiring capability. Since it is a subject that does not completely rely on traditional text book oriented studies but has to delve deeper and research enough to keep pace with the ever-changing world. Thus the World Wide Web has proved to be very useful in keeping oneself apprised and continuously update ones knowledge base. The usage of open source software, tools and open access reading material are part of the curriculum which will train them for digital world.

1. Scheme for the CBCS Curriculum for Geography Honours (B.Sc.)

Credit Distribution across Courses

Course Type B.Sc. Honours	Total Courses	Credits	
		THEORY + PRACTICAL	THEORY + TUTORIAL*
Core Course: Geography (C)	14	14×4 = 56 14×2 = 28	14×5 = 70 14×1 = 14*
Discipline Specific Electives (DSE)	4	4×4 = 16 4×2 = 08	4×5 = 20 4×1 = 04*
Generic Electives (GE)	4	4×4 = 16 4×2 = 08	4×5 = 20 4×1 =0 4*
Ability Enhancement Compulsory Courses (AECC)	2	2×2 = 04	2 × 2=04
Skill Enhancement Courses (SEC)	2	2×2 = 04	2 × 2=04
Total	26	140	140

*Tutorials of 1 Credit will be conducted in case there is no practical component

Computation of work-load per week

Type of Course	Credit	Duration of Periods
Tutorial Class	1	1 Theoretical class of 1 hour duration
Theory (T)	1	1 Theoretical class of 1 hour duration
Practical (P)	1	1 Practical class of 2 hour duration
Semester Duration: 15 weeks of direct teaching		

List of Generic Elective subjects to be offered with Geography Honours

1. Political Science	4. Statistics
2. Economics	5. Zoology
3. Mathematics	6. Anthropology or Computer Science

Any 2 (two) GE subjects to be chosen from the above list and from each subject two courses to be taken.

Distribution of Courses across semesters for Geography Honours (B.Sc.)

Semester	Course	Course Code	Title	Credit	Marks	Remarks
I	Core	GEOACOR01T	Geotectonics and Geomorphology	04	50	Compulsory
		GEOACOR01P	Geotectonics and Geomorphology (Lab)	02	25	Compulsory
	Core	GEOACOR02T	Cartographic Techniques	04	50	Compulsory
		GEOACOR02P	Cartographic Techniques (lab)	02	25	Compulsory
	GE	XXXHGEC01T		06	75	One course of a subject (Eg. A) chosen from the list of subjects given in section 1.3
	AECC	ENGSAEC01M	Communicative English	02	25	Compulsory
II	Core	GEOACOR03T	Human Geography	06	75	Compulsory
	Core	GEOACOR04T	Cartograms and Thematic Mapping	04	50	Compulsory
		GEOACOR04P	Cartograms and Thematic Mapping (Lab)	02	25	Compulsory
	GE	XXXHGEC02T		06	75	Second course of the same subject (A) taken as XXXHGEC01T
	AECC	ENVSAEC02T	Environment Studies	02	25	Compulsory
III	Core	GEOACOR05T	Climatology	04	50	Compulsory
		GEOACOR05P	Climatology (Lab)	02	25	
	Core	GEOACOR06T	Geography of India	06	75	
	Core	GEOACOR07T	Statistical Methods in Geography	04	50	
		GEOACOR07P	Statistical Methods in Geography Lab	02	25	
	GE	XXXHGEC03T		06	75	One course of a subject (Eg. B) chosen from the list of subjects given in section 1.3
	SEC	GEOSSEC01M	Remote Sensing	02	25	Compulsory

IV	Core	GEOACOR08T	Regional Planning and Development	06	75	Compulsory
	Core	GEOACOR09T	Economic Geography	06	75	Compulsory
	Core	GEOACOR10T	Environmental Geography	04	50	Compulsory
		GEOACOR10P	Environmental Geography (Lab)	02	25	
	GE	XXXAGEC04T		06	75	Second course of the same subject (B) taken as XXXHGEC03T
	SEC	GEOSSEC02M	Advanced Spatial Statistical Techniques	02	25	Compulsory
V	Core	GEOACOR11T	Field Work and Research Methodology	04	50	Compulsory
		GEOACOR11P	Field Work and Research Methodology (Lab)	02	25	
	Core	GEOACOR12T	Remote Sensing and GIS	04	50	Compulsory
		GEOACOR12P	Remote Sensing and GIS (Lab)	02	25	
	DSE	GEOADSE01T	Soil and Biogeography	06	75	Compulsory
	DSE	GEOADSE02T	Settlement Geography	06	75	Students to choose any one of the two courses (02T or 03T)
		GEOADSE03T	Population Geography	06	75	
VI	Core	GEOACOR13T	Evolution of Geographical Thought	06	75	Compulsory
	Core	GEOACOR14T	Disaster Management	04	50	Compulsory
		GEOACOR14P	Disaster Management (Lab)	02	25	Compulsory
	DSE	GEOADSE04T	Hydrology and Oceanography	06	75	Compulsory
		GEOADSE05T	Social Geography	06	75	Students to choose any one of the two courses (05T or 06T)
	DSE	GEOADSE06T	Resource Geography	06	75	

Core Subjects

Code (Theory)	Code (Practical)	Course name
GEOACOR01T	GEOACOR01P	Geotectonics and Geomorphology
GEOACOR02T	GEOACOR02P	Cartographic Techniques
GEOACOR03T		Human Geography
GEOACOR04T	GEOACOR04P	Cartograms and Thematic Mapping
GEOACOR05T	GEOACOR05P	Climatology
GEOACOR06T		Geography of India
GEOACOR07T	GEOACOR07P	Statistical Methods in Geography
GEOACOR08T		Regional Planning and Development
GEOACOR09T		Economic Geography
GEOACOR10T	GEOACOR10P	Environmental Geography
GEOACOR11T	GEOACOR11P	Field Work and Research Methodology
GEOACOR12T	GEOACOR12P	Remote Sensing and GIS
GEOACOR13T		Evolution of Geographical Thought
GEOACOR14T	GEOACOR14P	Disaster Management

Choices for Four Discipline Specific Electives

Code	Course name
GEOADSE01T	Soil and Biogeography
GEOADSE02T	Settlement Geography
GEOADSE03T	Population Geography
GEOADSE04T	Hydrology and Oceanography
GEOADSE05T	Social Geography
GEOADSE06T	Resource Geography

Choices for Four Generic Electives for Honours Students of Other Disciplines

Code	Course name
GEOHGEC01T	Physical Geography
GEOHGEC02T	Human Geography
GEOHGEC03T	General Cartography
GEOAGEC04T	Environmental Geography

Choices for Two Skill Enhancement Courses

Code	Course name
GEOSSEC01M	Remote Sensing
GEOSSEC02M	Advanced Spatial Statistical Techniques

TEACHING-LEARNING PROCESS

- Classroom discussions and interactive learning.
- Audio visual presentation/ teaching methods.
- Presentation by students.
- Individuals/group training to work with software.
- Developing research skills through assignments/projects.
- Conduct theme based group activities.
- Developing Effective communication skills through group discussion.
- Beyond classroom teaching/learning through field excursions.
- Writing of reports/project.

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Core Course Syllabus

GEOACOR01T – Geotectonics and Geomorphology ✧

GEOACOR01P – Geotectonics and Geomorphology Lab (04+02=06 CREDIT) ✧

Course Objectives:

1. To understand the associations between geomorphologic landforms, concepts and processes.
2. To critically evaluate and connect information about geomorphic processes.
3. To provide a theoretical and empirical framework for understanding landscape evolution and the characteristics of individual types of geomorphic landscapes

Learning Outcomes:

After completion of this course, students will be able to

1. understand the functioning of Earth systems in real time and analyze how the natural and anthropogenic operating factors affects the development of landforms
2. distinguish between the mechanisms that control these processes
3. Assess the roles of structure, stage and time in shaping the landforms, interpret geomorphological maps and apply the knowledge in geographical research.

4. Understand the theories and fundamental concepts of Geotectonic and Geomorphology.
5. Understand earth's tectonic and structural evolution.

Gain knowledge about earth's interior.

6. Develop an idea about concept of plate tectonics, and resultant landforms.
7. Acquire knowledge about types of folds and faults and earthquakes, volcanoes and associated landforms.
8. Understanding crustal mobility and tectonics; with special emphasis on their role in landform development.

9. Overview and critical appraisal of landform development models.

10. Identification of rocks and minerals.

Course Content:

GEOACOR01T – Geotectonics and Geomorphology ✧

4 Credits, 50 Marks [60 classes]

Unit I: Geotectonics

1. Earth's tectonic and structural evolution with reference to geological time scale
2. Earth's interior with special reference to seismology. Isostasy: Models of Airy and Pratt
3. Plate Tectonics as a unified theory of global tectonics: Processes and landforms at plate margins and hotspots
4. Folds and Faults—origin and types

Unit II: Geomorphology

5. Degradational processes: Weathering, mass wasting and resultant landforms
6. Development of river network and landforms on uniclinal and folded structures
7. Development of landforms on granites, basalts and limestones.
8. Coastal processes andlandforms
9. Glacial and glacio-fluvial processes and landforms
10. Aeolian and fluvio-aeolian processes and landforms
11. Models on landscape evolution: Views of Davis, Penck and Hack

Reading List

Billings, M.P. 1971. Structural Geology, Pearson.

Frisch, W., Meschede, M., Blakey, R.C. 2011. Plate Tectonics: Continental Drift and Mountain Building. Springer.

Goudie, A.S. (Ed) 2004. Encyclopaedia of Geomorphology, vol. 1 & 2, Routledge. Gregory, K.J., Lewin, J. 2014. The Basics of Geomorphology: Key Concepts,

Sage.

Harvey, A. 2012. Introducing Geomorphology: A Guide to Landforms and Processes, Dunedin Academic Press. Kale, V.S., Gupta, A. 2001. Introduction to Geomorphology, Orient

Longman.

Kearey, P., Klepeis, K.A., Vine, F.J. 2011. Global Tectonics, 3rd ed, Wiley-India. Knighton, A.D. 1984. Fluvial Forms and Processes, Edward Arnold.

Selby, M.J. 1986. Earth's Changing Surface, Oxford University Press.

Strahler, A. 2016. Introducing Physical Geography, 6th ed, Wiley.

Summerfield, M.J. 2003. Global Geomorphology: An Introduction to the Study of landforms, Longman. Thornbury, W.D. 1969. Principles of Geomorphology, 2nd ed, Wiley-India / CBS.

GEOACOR01P – Geotectonics and Geomorphology ✧

2 Credits, 25 Marks [60 classes]

1. Megascopic identification of (a) *mineral samples*: Bauxite, calcite, chalcopyrite, feldspar, galena, gypsum, hematite, magnetite, mica, quartz, talc, tourmaline; and (b) *rock samples*: Granite, basalt, dolerite, laterite, limestone, shale, sandstone, conglomerate, slate, phyllite, schist, gneiss, quartzite, marble
2. Interpretation of geological maps with unconformity and intrusions on uniclinal and folded structures

Reading List

Farndon, J. 2012. The Illustrated Guide to Rocks & Minerals, Southwater. McCullough, P.K. 1978. Modern Concept in Geomorphology, Oxford University

Press. Pillent, C. 2002. Smithsonian Handbooks: Rocks & Minerals, Dorling Kindersley.

Sarkar, A. 2015. Practical Geography: A Systematic Approach, 3rd ed, Orient Blackswan Private Ltd.

Sen, P.K. 1989. Geomorphological Analysis of Drainage Basin: An Introduction to Morphometric and Hydrological Parameters, University of Burdwan.

Sorrell, C.A. Rocks and Minerals: A Guide to Field Identification, St. Martin's Press.

ACADEMIC PLAN

NAME OF THE TEACHER	COURSE CODE	ALLOTED TOPIC THEORY	ALLOTED TOPIC PRACTICAL	NUMBER OF REQUARED CLASS (IN HOURS)	NUMBER OF ALLOTED CLASS (IN HOURS)	TIME OF THE SESSION WHEN CLASS WILL BE CONDUCTED	NO OF EXTRA OR REMEDIAL CLASS AND CLASS TEST	Teaching and Learning Activity	Assessment Tasks
NS	GEOACOR01T (UNIT-I) **Geotectonics and Geomorphology (Theory)**	TOPIC- 1. Earth's tectonic and structural evolution with reference to geological time scale		3+1(TU)	Total 85 hours allotted to complete SEM-I	1st and 2nd Week of July	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOACOR01T (UNIT-I) **Geotectonics and Geomorphology (Theory)**	TOPIC- 2. Earth's interior with special reference to seismology. Isostasy: Models of Airy and Pratt		4+1(TU)		3rd and 4th Week of July	1St U.T. (Theory) 1st week of August 1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOACOR01T (UNIT-I) **Geotectonics and**	TOPIC- 3. Plate Tectonics as a unified		10+2(TU)		1st to 4th Week of August and 1st to	2 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

	Geomorphology (Theory)	theory of global tectonics: Processes and landforms at plate margins and hotspots				4th week of September	2 nd U.T. (Theory) 1st week of October		
P U	J A	V	A C A	T	I	O N			
NS	GEOACOR01T (UNIT-I) **Geotectonics and Geomorphology (Theory)**	TOPIC- 4. Folds and Faults—origin and types		4+1(TU)		2nd and 3rd Week of November		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
*******	********	**FINAL**	**********	**SEMISTER**	**********	**EXAM**	********		

NAME OF THE TEACHER	**COURSE CODE**	**ALLOTED TOPIC THEORY**	**ALLOTED TOPIC PRACTICAL**	**NUMBER OF REQUARED CLASS (IN HOURS)**	**NUMBER OF ALLOTED CLASS (IN HOURS)**	**TIME OF THE SESSION WHEN CLASS WILL BE CONDUCTED**	**NO OF EXTRA OR REMEDIAL CLASS AND CLASS TEST**	**Teaching and Learning Activity**	**Assessment Tasks**
RD	GEOACOR01T (UNIT-II) **Geotectonics and Geomorphology (Theory)**	TOPIC- 5. Degradational processes: Weathering, mass wasting and resultant landforms		4+1(TU)		1st and 2nd Week of July	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

RD	GEOACOR01T (UNIT-II) **Geotectonics and Geomorphology (Theory)**	TOPIC- 6. Development of river network and landforms on uniclinal and folded structures		5+1(TU)		3rd and 4th Week of July	1 Remedial Class on this topic 1St U.T. (Theory) 1st week of August 1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
RD	GEOACOR01T (UNIT-II) **Geotectonics and Geomorphology (Theory)**	TOPIC- 7. Development of landforms on granites, basalts and limestones.		4+1(TU)		1st and 2nd week of August	1 Remedial Class on this topic 2 nd U.T. (Theory) 1st week of October	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
RD	GEOACOR01T (UNIT-II) **Geotectonics and Geomorphology (Theory)**	TOPIC- 8. Coastal processes andlandforms		3+1(TU)		2nd and 3rd Week of August	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
RD	GEOACOR01T (UNIT-II) **Geotectonics**	TOPIC- 9. Glacial and glacio-fluvial		3+1(TU)		4th Week of August and 1st	1 Remedial Class on	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

	and Geomorphology (Theory)	processes and landforms				Week of September	this topic		
RD	GEOACOR01T (UNIT-II) **Geotectonics and Geomorphology (Theory)**	TOPIC- 10. Aeolian and fluvio-aeolian processes and landforms		3+1(TU)		2nd and 4th Week of September	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
P U	J A	V	A C A	T	I	O N	P U		
RD	GEOACOR01T (UNIT-II) **Geotectonics and Geomorphology (Theory)**	TOPIC- 11. Models on landscape evolution: Views of Davis, Penck and Hack		7+1(TU)		2nd to 4th Week of November	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
*******	********	**FINAL**	**********	**SEMISTER**	**********	**EXAM**	********		

NAME OF THE TEACHER	COURSE CODE	ALLOTED TOPIC THEORY	ALLOTED TOPIC PRACTICAL	NUMBER OF REQUARED CLASS (IN HOURS)	NUMBER OF ALLOTED CLASS (IN HOURS)	TIME OF THE SESSION WHEN CLASS WILL BE CONDUCTED	NO OF EXTRA OR REMEDIAL CLASS AND CLASS TEST	Teaching and Learning Activity	Assessment Tasks
RD	GEOACOR01P **Geotectonics and Geomorphology (Practical)**		Topic-1 Megascopic identification of (a) Rocks (b) Minerals	15		1st Week of July to 4th Week of August		Classroom Lectures, Practical demonstration	Assignments,Hans-on exercise, classroom test.
RD	GEOACOR01P **Geotectonics and Geomorphology (Practical)**		Topic-1 Interpretation of Geological map	10		1st Week of September to 4th Week of September and 2nd to 4th Week of November		Classroom Lectures, Practical demonstration	Assignments,Hans-on exercise, classroom test.

GEOACOR02T – Cartographic Techniques✧

GEOACOR02P – Cartographic Techniques (Lab)(04+02=06 Credit)✧

Course Objectives:

1. Create professional and aesthetically pleasing maps through thoughtful application of cartographic conventions;
2. Develop an understanding of the concepts regarding scale, map projections to suit map purposes;
3. Better understand the techniques of interpretation of topographical and weather maps

Learning Outcomes:

1. Explain how maps work, conceptually and technically and will be able to understand science and art of cartography
2. Recognize the benefits and limitations of some common map projections and their use.
3. Understand and perform interpretation of topographical maps and weather maps.
4. Understand and prepare different kinds of maps.
5. Recognize basic themes of map making.

6. Development of observation skills

Course Content:

GEOACOR02T – Cartographic Techniques

4 Credit, 50 Marks [60 classes]

1. Maps: Classification and types. Components of a map
2. Concept and application of scales: Plain, comparative, diagonal and vernier
3. Survey of India topographical maps: Reference scheme of old and open series. Information on the margin of maps
4. Coordinate systems: Polar and rectangular
5. Concept of generating globe and UTM projection
6. Grids: angular and linear systems of measurement
7. Map projections: Classification, properties and uses

Reading List

Kennedy, M., Kopp, S. 2001. Understanding Map Projections, Esri Press.

Kimerling, A.J., Buckley, A.R., Muehrcke, P.C., Muehrcke, J.O. 2011. Map Use: Reading, Analysis, Interpretation, 7th ed, Esri Press.

Monkhouse, F.J., Wilkinson, H.R. 1971. Maps and Diagrams: Their Compilation and Construction, 3rd ed (2017 reprint), Alphaneumera-Kolkata.

Pearson II, F. 1990. Map Projections: Theory and Applications 2nd ed, CRC Press.

Robinson, A.H., Morrison, J.L., Phillip, C.M., Kimerling, A.J., Guptill, S.C. 1995. Elements of Cartography, 6th ed, Wiley.

Sarkar, A. 2015. Practical Geography: A Systematic Approach, 3rd ed, Orient Blackswan Private Ltd. Singh, R.L., Singh, R.P.B. 2008. Elements of Practical Geography, Kalyani Publishers.

Vaidyanadhan, R., Subbarao, K.V. 2014. Landforms of India from Topomaps and Images, Geological Society of India.

GEOACOR02P – Cartographic Techniques (Lab)

2 Credits, 25 Marks [90 classes]

1. Graphical construction of scales: Plain, comparative, diagonal and vernier
2. Construction of projections: Polar Zenithal Stereographic, Simple Conic with two standard parallels, Bonne's, Cylindrical Equal Area, and Mercator's
3. Delineation of drainage basin from Survey of India topographical map. Construction and interpretation of relief profiles (superimposed, projected and composite), relative relief map, slope map (Wentworth), and stream ordering (Strahler) on a drainage basin.
4. Correlation between physical and cultural features from Survey of India topographical maps using transect chart.

Kennedy, M., Kopp, S. 2001. Understanding Map Projections, Esri Press.

Reading List

Kimerling, A.J., Buckley, A.R., Muehrcke, P.C., Muehrcke, J.O. 2011. Map Use: Reading, Analysis, Interpretation, 7th ed, Esri Press.

Monkhouse, F.J., Wilkinson, H.R. 1971. Maps and Diagrams: Their Compilation and Construction, 3rd ed (2017 reprint), Alphaneumera-Kolkata.

Pearson II, F. 1990. Map Projections: Theory and Applications 2nd ed, CRC Press.

Robinson, A.H., Morrison, J.L., Phillip, C.M., Kimerling, A.J., Guptill, S.C. 1995. Elements of Cartography, 6th ed, Wiley.

Sarkar, A. 2015. Practical Geography: A Systematic Approach, 3rd ed, Orient Blackswan Private Ltd. Singh, R.L., Singh, R.P.B. 2008. Elements of Practical Geography, Kalyani Publishers.

ACADEMIC PLAN

NAME OF THE TEACHER	COURSE CODE	ALLOTED TOPIC THEORY	ALLOTED TOPIC PRACTICAL	NUMBER OF REQUARED CLASS (IN HOURS)	NUMBER OF ALLOTED CLASS (IN HOURS)	TIME OF THE SESSION WHEN CLASS WILL BE CONDUCTED	NO OF EXTRA OR REMEDIAL CLASS AND CLASS TEST	Teaching and Learning Activity	Assessment Tasks
SG	GEOACOR02T – Cartographic Techniques	TOPIC- 1 Maps: Classification and types. Components of a map		2+1	Total 85 hours allotted to complete SEM-I	1st Week of July	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SG	GEOACOR02T – Cartographic Techniques	TOPIC-2 Concept and application of scales: Plain, comparative, diagonal and vernier		4+1(TU)		2nd and 3rd Week of July	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SG	GEOACOR02T – Cartographic	TOPIC- 3. Survey of India		8+2(TU)		4th Week of	2 Remedial Class on	Classroom Lectures,	Assignments, Discussions/Debates

	Techniques	topographical map:				August and 1st and 2nd week of September	this topic 1St U.T. (Theory) 1st week of August	Tutorials, PPT	classroom test.
SG	**GEOACOR02T – Cartographic Techniques**	TOPIC- 4. Coordinate systems: Polar and rectangular		2		3rd Week of September		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SG	**GEOACOR02T – Cartographic Techniques**	TOPIC-5 Concept of generating globe and UTM projection		2		4th Week of September	2 nd U.T. (Theory) 1st week of October	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
P U	J A	V	A C A	T	I	O N			
SG	**GEOACOR02T – Cartographic Techniques**	TOPIC- 6 Grids: angular and linear systems of measurement		2		2ND Week of November		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SG	**GEOACOR02T**	TOPIC-7		6		3rd and 4th		Classroom	Assignments,

	–Cartographic Techniques	Map projections: Classification, properties and uses				Week of November		Lectures, Tutorials, PPT	Discussions/Debates classroom test.
******	********	**FINAL**	**********	**SEMISTER**	**********	**EXAM**	********		
RD	**GEOACOR02P – Cartographic Techniques (Lab)**		Topic-1 Graphical construction of scales: Plain, comparative, diagonal and vernier	8+2		1st Week of July to 4th Week of July		Classroom Lectures, Practical demonstration	Assignments,Hans-on exercise, classroom test.
RD	**GEOACOR02P – Cartographic Techniques (Lab)**		TOPIC-2 Construction of Projection	10		1st Week of August to 4th Week of August	1St U.T. (Theory) Last week of August	Classroom Lectures, Practical demonstration	Assignments,Hans-on exercise, classroom test.
	GEOACOR02P – Cartographic Techniques (Lab)		TOPIC -3 Delineation of drainage basin from survey of India topographical map	6		1st to 4th Week of September	2 nd U.T. (Theory) 1st week of October	Classroom Lectures, Practical demonstration	Assignments,Hans-on exercise, classroom test.
P U	J A	V	A C A	T	I	O N			

	GEOACOR02P – Cartographic Techniques (Lab)		TOPIC-4 Correlation between physical and cultural features from SOI Topographical map	4		2nd to 4th Week of November		Classroom Lectures, Practical demonstration	Assignments,Hans-on exercise, classroom test.
**********	**FINAL**	**********	**SEMISTER**	**********	**EXAM**	********			

GEOACOR03T – Human Geography (6 Credit) ✧

Course Objectives:

1. Various dimensions of human geography and cultural landscape.
2. Detailed analysis of population growth and distribution.
3. Understanding of the relationship between population and resource.

Learning Outcomes:

1. Detailed exposure of contemporary relevance of cultural landscape.
2. In-depth knowledge of space and society of cultural regions.
3. Understanding the settlement pattern and population resource relationship.
4. Gain knowledge about major themes of human Geography.
5. Acquire knowledge on the history and evolution of humans.
6. Understand the approaches and processes of Human Geography as well as the diverse patterns of habitat and adaptations.
7. Develop an idea about space and society

Course Content:

GEOACOR03T – Human Geography

6 Credits, 75 Marks [90 classes]

Unit I: Nature and Principles

1. Nature, scope and recent trends. Elements of Human Geography
2. Approaches to Human Geography; Resource, Locational, Landscape, Environmental
3. Concept and classification of race; ethnicity
4. Space, society and cultural regions (language and religion)

Unit :II: Society, Demography and Ekistics

5. Evolution of human societies: Hunting and food gathering, pastoral nomadism, subsistence farming and industrial society
6. Human adaptation to environment: Eskimo, Masai and Maori
7. Population growth and distribution, composition; demographic transition
8. Population–Resource regions (Ackerman)
9. Types and patterns of rural settlements
10. Morphology of urban settlements

Reading List

Chandna, R.C. 2016. Geography of Population: Concepts, Determinants and Patterns, Kalyani Publishers.

Fouberg, E.H., Murphy, A.B., de Blij H.J. 2015. Human Geography: People, Place, and Culture, 11th ed, Wiley.

Ghosh, S. 1998. Introduction to Settlement Geography, Sangam Books Ltd.

Gould, W.T.S. 2015.Population and Development, Routledge.

Gregory, D., Johnston, R., Pratt, G., Watts.,Whatmore, S. (Eds) 2009. The Dictionary of Human Geography, 5th ed, Wiley.

Knox, P.L., Marston, S.A. 2014. Human Geography: Places and Regions in Global Context, 6th ed, Pearson Education Limited.

Knox, P.L., McCarthy, L.M. 2011. Urbanization: An Introduction to Urban Geography, 3rd ed, Pearson Educztuion Ltd.

Mandal, R.B. 2001. Introduction to Rural Settlement, 2nd ed, Concept Publishing Company.

Moseley, W.G., Perramond, E., Hapke, H.M., Laris, P. 2013. An Introduction to Human-Environment Geography: Local Dynamics and Global Processes, Wiley-Blackwell.

Norton, W. 2014. Human Geography, 8th ed, Oxford University Press.

Pickering K. and Owen A. A. (1997): An Introduction to Global Environmental Issues, 2nd edition Rutledge, London.

Rubenstein, J.M. 2016. The Cultural Landscape: An Introduction to Human Geography, 12th ed, Pearson Education Limited.

Short, R.J. 2017. Human Geography: A Short Introduction, 2nd ed, Oxford University Press.

ACADEMIC PLAN

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RD	**GEOACOR03T – Human Geography Unit-I**	TOPIC- 1. Nature, scope and recent trends. Elements of Human Geography		3+1(TU)		1st to 3rd Week of January	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
RD	**GEOACOR03T – Human Geography Unit-I**	TOPIC- 2. . Approaches to Human Geography; Resource, Locational, Landscape, Environmental		4+1(TU)		4th Week of January to 2nd Week of February	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
RD	**GEOACOR03T – Human Geography Unit-I**	TOPIC- 3. Concept and classification of race; ethnicity		4+1(TU)		3rd Week of February to 2nd Week of March	1 Remedial Class on this topic 1St U.T. (Theory)	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

							1st week of March		
RD	**GEOACOR03T – Human Geography Unit-I**	TOPIC- 4. Space, society and cultural regions (language and religion)		4+1(TU)		3rd and 4th Week of March and1st Week of April		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
RD	**GEOACOR03T – Human Geography Unit-II**	TOPIC- 5. Evolution of human societies:		5+1(TU)		2nd to 3rd Week of April	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
RD	**GEOACOR03T – Human Geography Unit-II**	TOPIC- 6. Human adaptation to environment: Eskimo, Masai and Maori		3+1(TU)		4th Week of April to 1st Week of May	1 Remedial Class on this topic 2nd UT In the 2nd Week of May	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	**GEOACOR03T – Human Geography Unit-II**	TOPIC- 7. Population		4+1(TU)		1st to 4th week of January	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

		growth and distribution, composition; demographic transition							
NS	**GEOACOR03T – Human Geography Unit-II**	TOPIC- 8. Population–Resource regions (Ackerman)		3+1(TU)		1st to 4th week of February	1 Remedial Class on this topic 1St U.T. (Theory) 1st week of March	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	**GEOACOR03T – Human Geography Unit-II**	TOPIC- 9. Types and patterns of rural settlements		3+1(TU)		1st to 4th Week of March	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	**GEOACOR03T – Human Geography Unit-II**	TOPIC- 10. Morphology of urban settlements		3+1(TU)		1st to 4th Week of April	1 Remedial Class on this topic 2nd UT In the 2nd Week of	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

							May		
********	FINAL	**********	SEMISTER	**********	EXAM	********			

GEOACOR04T – Cartograms and Thematic Mapping ✧

GEOACOR04P – Cartograms and Thematic Mapping (Lab) (04+02=06 Credit)✧

Course Objectives:

1. Diagrammatically representation of data
2. Develop an understanding of the concepts regarding rounding notation andlog and antilog;
3. Learn how to use instruments

Learning Outcomes:

- Comprehend the concept of scales and representation of data through cartograms.
- Interpret geological and weather maps.
- Learn the usages of survey instruments.

- Brings direct interaction of different types of surveying instruments like Dumpy level and Theodolite with environment.
- Develop an idea about different types of thematic mapping techniques.

Course Content:

GEOACOR04T – Cartograms and Thematic Mapping ✧

4 Credits, 50 Marks [60 classes]

1. Concepts of rounding, scientific notation, logarithm and anti-logarithm, natural and log scales

2. Diagrammatic representation of data: Line, Bar, Isopleths

3. Representation of area data: Dots and spheres, proportional circles and Choropleth

4. Preparation and interpretation of land use land cover maps

5. Preparation and interpretation of socio-economic maps

6. Bearing: Magnetic and true, whole-circle and reduced

7. Basic concepts of surveying and survey equipment: Prismatic Compass, Dumpy Level, Theodolite

Reading List

Basak, N.N. 2017. Surveying and Levelling, 2nd ed, McGraw Hill Education.

Bolton. T. 2009 (reprint). Geological Maps: Their Solution and Interpretation, Cambridge University Press.

Kanetkar, T.P., Kulkatni, S.V. 1988. Surveying and Levelling, Part I, Pune VidyarthiGrihaPrakashan.

Monkhouse, F.J., Wilkinson, H.R. 1971. Maps and Diagrams: Their Compilation and Construction, 3rd ed (2017 reprint), Alphaneumera-Kolkata.

Robinson, A.H., Morrison, J.L., Phillip, C.M., Kimerling, A.J., Guptill, S.C. 1995. Elements of Cartography, 6th ed, Wiley.

Sarkar, A. 2015. Practical Geography: A Systematic Approach, 3rd ed, Orient Blackswan Private Ltd.

Singh, R.L., Singh, R.P.B. 2008.Elements of Practical Geography, Kalyani Publishers.

Subramanian, R. 2012. Surveying and Levelling, 2nd ed, Oxford University Press

GEOACOR04P – Cartograms and Thematic Mapping (Lab) ✧

2 Credits, 25 Marks [60 classes]

1. Thematic maps:

– Choropleth showing density of population

– Dots and Spheres diagram showing distribution of rural and urban population.

– Proportional pie-diagrams representing economic data and land use data

2. Traverse survey using prismatic compass

Profile survey using dumpy Level

Reading List

Basak, N.N. 2017. Surveying and Levelling, 2nd ed, McGraw Hill Education.

Bolton. T. 2009 (reprint). Geological Maps: Their Solution and Interpretation, Cambridge University Press.

Kanetkar, T.P., Kulkatni, S.V. 1988. Surveying and Levelling, Part I, Pune VidyarthiGrihaPrakashan.

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Robinson, A.H., Morrison, J.L., Phillip, C.M., Kimerling, A.J., Guptill, S.C. 1995. Elements of Cartography, 6th ed, Wiley.

Sarkar, A. 2015. Practical Geography: A Systematic Approach, 3rd ed, Orient Blackswan Private Ltd.

Singh, R.L., Singh, R.P.B. 2008.Elements of Practical Geography, Kalyani Publishers.

Subramanian, R. 2012. Surveying and Levelling, 2nd ed, Oxford University Press

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SG	GEOACOR04T – Cartograms and Thematic Mapping	TOPIC- 1. Concepts of rounding, scientific notation, logarithm and anti-logarithm, natural and log scales		8+1(TU)		1st to 3rd Week of January	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SG	GEOACOR04T – Cartograms and Thematic Mapping	TOPIC- 2. . Diagrammatic representation of data: Line, Bar, Isopleths		6+1(TU)		4th Week of January to 2nd Week of	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

						February			
SG	GEOACOR04T – Cartograms and Thematic Mapping	TOPIC- 3. Representation of area data: Dots and spheres, proportional circles and Choropleth		4+1(TU)		3rd and 4th Week of February	1 Remedial Class on this topic 1St U.T. (Theory) 1st week of March	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SG	GEOACOR04T – Cartograms and Thematic Mapping	TOPIC- 4. Preparation and interpretation of land use land cover maps		6+1(TU)		1st and 2nd Week of April		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SG	GEOACOR04T – Cartograms and Thematic Mapping	TOPIC- 5. Preparation and interpretation of socio-economic maps		5+1(TU)		2nd to 3rd Week of April	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SG	GEOACOR04T – Cartograms and Thematic Mapping	TOPIC- 6. Bearing: Magnetic and true, whole-circle and reduced		3+1(TU)		4th Week of April	1 Remedial Class on this topic 2nd UT In the 2nd	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

							Week of May		
SG	GEOACOR04T – Cartograms and Thematic Mapping	TOPIC- 7. Basic concepts of surveying and survey equipment: Prismatic Compass, Dumpy Level, Theodolite		4+1(TU)		1st Week of May	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
********	FINAL	**********	SEMISTER	**********	EXAM	********			

NAME OF THE TEACHER	COURSE CODE	ALLOTED TOPIC THEORY	ALLOTED TOPIC PRACTICAL	NUMBER OF REQUARED CLASS (IN HOURS)	NUMBER OF ALLOTED CLASS (IN HOURS)	TIME OF THE SESSION WHEN CLASS WILL BE CONDUCTED	NO OF EXTRA OR REMEDIAL CLASS AND CLASS TEST	Teaching and Learning Activity	Assessment Tasks
RD	GEOACOR04P – Cartograms and Thematic Mapping		TOPIC-1 Thematic maps: a.Choropleth showing density of population	18		1st Week of January to4th Week of March		Classroom Lectures, Practical demonstration	Assignments,Hans-on exercise, classroom test.

			b.Dots and Spheres diagram showing distribution of rural and urban population. c.Proportional pie-diagrams representing economic data and land use data						
RD	GEOACOR04P – Cartograms and Thematic Mapping		TOPIC- 2. . Traverse survey using prismatic compass Profile survey using dumpy Level	10		1st Week of April to 1st Week of May		Classroom Lectures, Practical demonstration	Assignments,Hans-on exercise, classroom test.
********	FINAL	**********	SEMISTER	**********	EXAM	********			

GEOACOR05T – Climatology✧

GEOACOR05T – Climatology (Lab) (04+02=06 Credit)✧

Course Objectives:

1. Various dimensions of climatology like structure and composition.
2. Detailed analysis of global atmospheric pressure and wind system.
3. Understanding of the concept of Atmospheric system

Learning Outcomes:

•Understand the elements of weather and climate, different atmospheric phenomena and climate change.

• Learn to associate climate with other environmental and human issues. Approaches to climate classification. • To analyze the dynamics of the Earth's atmosphere and global climate. Assessing the role of man in global climate change.

• Prepare various climatic maps and charts and interpret them.

• Learn to use of various meteorological instruments

. • Learn the interaction between the atmosphere and the earth's surface. Understand the importance of the atmospheric pressure and winds.

• Understand how atmospheric moisture works.

Course Content:

GEOACOR05T – Climatology✧

4 Credits, 50 Marks [60 classes]

Unit I: Elements of the Atmosphere

1. Nature, composition and layering of the atmosphere
2. Insolation: controlling factors. Heat budget of the atmosphere
3. Temperature: horizontal and vertical distribution. Inversion of temperature: types, causes andconsequences
4. Greenhouse effect and importance of ozone layer

Unit II: Atmospheric Phenomena and Climatic Classification

5. Condensation: Process and forms. Mechanism of precipitation: Bergeron-Findeisen theory,collision and coalescence. Forms of precipitation
6. Air mass: Typology, origin, characteristics and modification
7. Fronts: warm and cold; frontogenesis and frontolysis
8. Weather: stability and instability; barotropic and baroclinic conditions
9. Circulation in the atmosphere: Planetary winds, jet stream, index cycle
10. Tropical and mid-latitude cyclones
11. Monsoon circulation and mechanism with reference to India
12. Climatic classification after Köppen, Thornthwaite (1955) and Oliver

Reading List

BOOKS

Ahrens, C.D. 2012. Essentials of Meteorology: An Invitation to the Atmosphere. 9th Ed, Cengage Learning.Barry R. G. and Carleton A. M., 2001: Synoptic and Dynamic Climatology, Routledge, UK.

Barry, R.G, Chorley R.J. 2009.Atmosphere Weather and Climate. 9th Ed, Routledge.Critchfield, H. J. 1983. General Climatology. Prentice Hall

India Ltd (2010 Reprint). Lal, D.S. 2012. Climatology. Sharda PustakBhawan.

Lutgens, F.K., Tarbuck, E.J. 1998. The Atmosphere : An Introduction to Meteorology, 9th Ed, Prentice-Hall Inc.Oliver, J.E., Hidore J.J. 2002. Climatology: An Atmospheric Science, Pearson Education India

GEOACOR05T – Climatology✧

2 Credits, 25 Marks [60 classes]

1. Interpretation of daily weather map of India (any two): Pre-Monsoon, Monsoon and Post-Monsoon
2. Construction and interpretation ofhythergraph andclimograph (G. Taylor)
3. Construction and interpretation of wind rose
4. A Project File, comprising of one exercise from each of the following is to be prepared andsubmitted

Reading List

Monkhouse, F.J., Wilkinson, H.R. 1971. Maps and Diagrams: Their Compilation and Construction, 3rd ed (2017reprint), Alphaneumera-Kolkata.

Sarkar, A. 2015. Practical Geography: A Systematic Approach, 3rd ed, Orient Blackswan.Singh, R.L., Singh, R.P.B. 2008.Elements of Practical Geography, Kalyani Publishers.

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SG	GEOACOR05T – Climatology **Unit-I**	TOPIC- 1. Nature, composition and layering of the atmosphere		3+1(TU)		1st to 3rd Week of July	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SG	GEOACOR05T – Climatology **Unit-I**	TOPIC- 2. . Insolation: controlling factors. Heat budget of the atmosphere		5+1(TU)		4th Week of July to 2nd week of August	1St U.T. (Theory) 1st week of August 1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SG	GEOACOR05T – Climatology **Unit-I**	TOPIC- 3. Temperature: horizontal and vertical distribution. Inversion of		6+1(TU)		3rd and 4th Week of August and 1st and 2nd Week September	2 Remedial Class on this topic 2 nd U.T. (Theor	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

		temperature: types, causes and consequences					y) 1st week of October		
P U	J A	V	A C	T	I	O N			
SG	GEOACOR05T – Climatology **Unit-I**	TOPIC- 4. Greenhouse effect and importance of ozone layer		4+1(TU)		3rd and 4th Week of September and 2nd Week November		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
********	FINAL	**********	SEMISTER	**********	EXAM	********			
NS	GEOACOR05T – Climatology **Unit-II**	TOPIC- 5. Condensation: Process and forms. Mechanism of precipitation: Bergeron-Findeisen theory,collision and coalescence. Forms of precipitation		5+1(TU)		1st and 2nd Week of July	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOACOR05T – Climatology **Unit-II**	TOPIC- 6 Air mass: Typology, origin, characteristics and modification		3+1(TU)		3rd and 4th Week of July	1 Remedial Class on this topic 1St U.T. (Theory) 1st week of August 1 Remedial	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

							Class on this topic		
NS	GEOACOR05T – Climatology **Unit-II**	TOPIC- 7. Fronts: warm and cold; frontogenesis and frontolysis		4+1(TU)		1st and 2nd week of August	1 Remedial Class on this topic 2 nd U.T. (Theory) 1st week of October	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOACOR05T – Climatology **Unit-II**	TOPIC- 8. Weather: stability and instability; barotropic and baroclinic conditions		3+1(TU)		3rd and 4th week of August	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOACOR05T – Climatology **Unit-II**	TOPIC- 9. Circulation in the atmosphere: Planetary winds, jet stream, index cycle		3+1(TU)		1st and 2nd Week of September	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOACOR05T – Climatology **Unit-II**	TOPIC- 10. Tropical and mid-latitude cyclones		3+1(TU)		3rd and 4th Week of September	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
P U	J A	V	A C	A T	I	O N			

	GEOACOR05TP– Climatology **Unit-II**	TOPIC- 11. Monsoon circulation and mechanism with reference to India		3+1(TU)		2nd Week of November	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
	GEOACOR05P – Climatology **Unit-II**	TOPIC- 12. Climatic classification after Köppen, Thornthwaite (1955) and Oliver		3+1(TU)		3rd and 4th Week of November	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
********	**FINAL**	**********	**SEMISTER**	**********	**EXAM**	********			

NAME OF THE TEACHER	COURSE CODE	ALLOTED TOPIC THEORY	ALLOTED TOPIC PRACTICAL	NUMBER OF REQUARED CLASS (IN HOURS)	NUMBER OF ALLOTED CLASS (IN HOURS)	TIME OF THE SESSION WHEN CLASS WILL BE CONDUCTED	NO OF EXTRA OR REMEDIAL CLASS AND CLASS TEST	Teaching and Learning Activity	Assessment Tasks
SG	GEOACOR05P– Climatology		Topic-1 Interpretation of daily weather map of India (any two): Pre-Monsoon, Monsoon and Post-Monsoon	15		1st Week of July to 4th Week of July And 1st and 2nd Week of August		Classroom Lectures, Practical demonstration	Assignments,Hans-on exercise, classroom test.
SG	GEOACOR05P – Climatology		TOPIC-2 Construction and interpretation of hither graph and climograph (G. Taylor)	10		2nd and 3rd Week of August and 1st and 2nd Week of September	1St U.T. (Theory) Last week of August	Classroom Lectures, Practical demonstration	Assignments,Hans-on exercise, classroom test.
P U	J A	V	A C A	T	I	O N			
SG	GEOACOR05P – Climatology		TOPIC -3 Construction and interpretation of wind rose	6		3rd and 4th Week of September and 2nd to 4th Week of November	2 nd U.T. (Theory) 1st week of October	Classroom Lectures, Practical demonstration	Assignments,Hans-on exercise, classroom test.

**********	FINAL	**********	SEMISTER	**********	EXAM	********			

GEOACOR06T – Geography of India (6 Credits)

Course Objectives:

1. Various dimensions of the geographical features of India and their spatial distribution.
2. Detailed analysis of economic resources of India
3. Understanding of regional divisions of India.

Learning Outcomes:

After the completion of course, the students will have ability to:

1. Understand the physical profile of the country

2. Study the resource endowment and its spatial distribution and utilization for sustainable development

3. Synthesise and develop the idea of regional dimensions.

Course Content:

GEOACOR06T – Geography of India ✧

6 Credits, 75 Marks [90 classes]

Unit I: Geography of India

1. Tectonic and stratigraphic provinces, physiographic divisions
2. Climate, soil and vegetation: Characteristics and classification
3. Population: Distribution, growth, structure and policy
4. Tribes of India with special reference to Gaddi, Toda, Santal and Jarwa
5. Agricultural regions. Green revolution and its consequences
6. Mineral and power resources distribution and utilisation of iron ore, coal, petroleum and natural gas
7. Industrial development: Automobile and information technology
8. Regionalisation of India: Physiographic (R.L. Singh) and economic (P. Sengupta)

Unit II: Geography of West Bengal

9. Physical perspectives: Physiographic divisions, forest and water resources
10. Resources: Agriculture, mining, and industry
11. Population: Growth, distribution and human development

12. Regional Issues: Darjeeling Hills and Sundarban

Reading List

Bandyopadhyay, S., Kar, N.S., Das, S., Sen, J. 2014. River system and water resources of West Bengal: A Review. In: Vaidyanadhan, R. (Ed) Rejuvenation of Surface Water Resources of India: Potential, Problems and Prospects, Geological Society of India Special Publication.

Dhara, M.K., Basu, S.K., Bandyopadhyay, R.K., Roy, B., Pal, A.K. (Eds.) 1999. Geology and Mineral Resources of the States of India, Part-1: West Bengal. Geological Survey of India Miscellaneous Publication.

Ghurey, G.S. 1963. The Scheduled Tribes of India, 1980 reprint, Transaction Books.

Johnson, B.L.C. (Ed) 2001. Geographical Dictionary of India, Vision Books.

Khullar, D.R. 2011. India: A Comprehensive Geography, Kalyani Publishers

Mandal, H., Mukherjee, S., Datta, A. 2002. India: An Illustrated Atlas of Tribal World, Anthropological Survey of India.

Pathak, C.R. 2003. Spatial Structure and Processes of Development in India, Regional Science Association-Kolkata.

Sharma, T.C. 2012.Economic Geography of India, Rawat Publications.

Singh, J. 2003. India-A Comprehensive & Systematic Geography, GyanodayaPrakashan.

Singh, R.L. 1971. India: A Regional Geography, National Geographical Society of India.

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

Tiwari, R.C. 2007.Geography of India, PrayagPustakBhawan.

Valdiya, K.S. 2010. The Making of India: Geodynamic Evolution, Macmillan Pubishers India Ltd.

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SG	GEOACOR06T – Geography of India **Unit-I**	TOPIC- 1. Tectonic and stratigraphic provinces, physiographic divisions		3+1(TU)		1st to 3rd Week of July	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SG	GEOACOR06T – Geography of India **Unit-I**	TOPIC- 2. . Climate, soil and vegetation: Characteristics and classification		5+1(TU)		4th Week of July to 2nd week of August	1St U.T. (Theory) 1st week of August 1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SG	GEOACOR06T – Geography of India **Unit-I**	TOPIC- 3. Population: Distribution, growth, structure and policy		6+1(TU)		3rd and 4th Week of August and 1st and 2nd Week September	2 Remedial Class on this topic 2 nd U.T. (Theory) 1st week of October	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
P U	J A	V	A C	T	I	O N			

SG	GEOACOR06T – Geography of India **Unit-I**	TOPIC- 4. Tribes of India with special reference to Gaddi, Toda, Santal and Jarwa		4+1(TU)		3rd and 4th Week of September and 2nd Week November		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
********	**FINAL**	**********	**SEMISTER**	**********	**EXAM**	********			
NS	GEOACOR06T – Geography of India **Unit-I**	TOPIC- 5. Agricultural regions. Green revolution and its consequences		5+1(TU)		1st and 2nd Week of July	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOACOR06T – Geography of India **Unit-I**	TOPIC- 6 Mineral and power resources distribution and utilisation of iron ore, coal, petroleum and naturalgas		3+1(TU)		3rd and 4th Week of July	1 Remedial Class on this topic 1St U.T. (Theory) 1st week of August 1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOACOR06T – Geography of India **Unit-I**	TOPIC- 7. Industrial development: Automobile and information technology		4+1(TU)		1st and 2nd week of August	1 Remedial Class on this topic 2 nd U.T.	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

							(Theory) 1st week of October		
NS	GEOACOR06T – Geography of India **Unit-I**	TOPIC- 8. Regionalisation of India: Physiographic (R.L. Singh) and economic (P. Sengupta)		3+1(TU)		3rd and 4th week of August	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOACOR06T – Geography of India **Unit-II**	TOPIC- 9 Physical perspectives: Physiographic divisions, forest and water resources		3+1(TU)		1st and 2nd Week of September	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOACOR06T – Geography of India **Unit-II**	TOPIC- 10. Resources: Agriculture, mining, and industry		3+1(TU)		3rd and 4th Week of September	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
P U	J A	V	A C	A T	I	O N			
	GEOACOR06T – Geography of India **Unit-II**	TOPIC- 11. Population: Growth, distribution and human development		3+1(TU)		2nd Week of November	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

	GEOACOR06T – Geography of India **Unit-II**	TOPIC- 12. Regional Issues: Darjeeling Hills and Sundarban		3+1(TU)		3rd and 4th Week of November	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
********	**FINAL**	**********	**SEMISTER**	**********	**EXAM**	********			

GEOACOR07T – Statistical Methods in Geography(04+02=06 Credit)✧
GEOACOR07P – Statistical Methods in Geography (Lab)✧

Course Objectives

1. The concept of quantitative information in general and Geographical data in particular. The importance of data analytics. The ways data is collected or data is taken from different sources. The sampling methods' application for data collection purposes.
2. The ways to handle the collected data through classification, tabulation and stigmatization. The data presentation using graphical and diagrammatic ways.
3. To calculate different averages on data and to identify the variations in data.
4. To compute relations and impacts among the data series.
5. The concept of probability particularly normal curve.

Learning Outcomes:

The following will be the outcomes of this course, student shall be able:

1. To differentiate between qualitative and quantitative information.
2. To know the nature of various data , different sources and methods of data collection.
3. To apply sampling methods for data collection.
4. To classify, summarize and produce various types of data tabulations.
5. To present data through graphical and diagrammatic formats.
6. To apply different forms of averages, their relevance on descriptive data and geographical descriptive data as well.
7. To analyze the variations in spatial and non-spatial data.
8. To study the associations and cause/effect or impact from the data series
9. To use the concept of probability mainly the normal distribution.
10. Learn the significance of statistics in geography. Understand the importance of use of data in geography
11. Recognize the importance and application of Statistics in Geography
12. Interpret statistical data for a holistic understanding of geographical phenomena. Know about different types of sampling.
13. Develop an idea about theoretical distribution.
14. Learn to use tabulation of data. Gain knowledge about association and correlation.

Course Content:

GEOACOR07T – Statistical Methods in Geography(4 Credit)

1. Importance and significance of statistics in Geography
2. Discrete and continuous data, population and samples, scales of measurement (nominal, ordinal, interval and ratio),
3. Sources of geographical data for statistical analysis
4. Collection of data and formation of statistical tables
5. Sampling: Need, types, and significance and methods of random sampling
6. Theoretical distribution: frequency, cumulative frequency, normal and probability

Unit II: Numerical Data Analysis

7. Central tendency: Mean, median, mode, partition values
8. Measures of dispersion range: mean deviation, standard deviation, coefficient of variation
9. Association and correlation: Rank correlation, product moment correlation
10. Regression: Linear and non-linear
11. Time series analysis: Moving average

Reading List

Acevedo, M.F. 2012. Data Analysis and Statistics for Geography, Environmental Science and Engineering, CRC Press.

Harris, R., Jarvis, C. 2011. Statistics for Geography and Environmental Science, Prentice Hall.

McGrew Jr., J.C., Lembo Jr., A.J.,Monroe, C.B. 2014. An Introduction to Statistical Problem Solving in Geography, 3rd ed, Waveland Press.

Pal S. K., 1998. Sstatistics for Geoscientists: Techniques and Applications, Concept Pub Co.

Rogerson, P.A. 2015. Statistical Methods for Geography: A Student's Guide, 4th ed, Sage.

Sarkar, A. 2015. Practical Geography: A Systematic Approach, 3rd ed, Orient Blackswan.

GEOACOR07P – Statistical Methods in Geography (Lab)✧

2 Credits, 25 Marks [60 classes]

1. Construction of data matrix with each row representing an areal unit (districts / blocks / *mouzas* / towns) and corresponding columns of relevant attributes
2. Based on the above, a frequency table, measures of central tendency and dispersion would be computed and interpreted using histogram and frequency curve
3. From the data matrix a sample set (20%) would be drawn using, random, systematic and stratified methods of sampling and locate the samples on a map with a short note on methods used
4. Based on the sample set and using two relevant attributes, a scatter diagram and linear regression line would be plotted and residual from regression would be mapped with a short interpretation

Reading List

Acevedo, M.F. 2012. Data Analysis and Statistics for Geography, Environmental Science and Engineering, CRC Press.

Harris, R., Jarvis, C. 2011. Statistics for Geography and Environmental Science, Prentice Hall.

McGrew Jr., J.C., Lembo Jr., A.J.,Monroe, C.B. 2014. An Introduction to Statistical Problem Solving in Geography, 3rd ed, Waveland Press.

Pal S. K., 1998. Statistics for Geoscientists: Techniques and Applications, Concept Pub Co.

Rogerson, P.A. 2015. Statistical Methods for Geography: A Student's Guide, 4th ed, Sage.

Sarkar, A. 2015. Practical Geography: A Systematic Approach, 3rd ed, Orient Blackswan.

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NS	GEOACOR07T – Statistical Methods in Geography **Unit-I**	TOPIC- 1.		3+1(TU)		1st Week of July	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOACOR07T – Statistical Methods in Geography **Unit-I**	TOPIC- 2.		5+1(TU)		2nd And 3rd Week of July	1St U.T. (Theory) 1st week of August 1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOACOR07T – Statistical Methods in Geography **Unit-I**	TOPIC- 3.		3+1(TU)		4th Week of July	2 Remedial Class on this topic 2 nd U.T. (Theory) 1st week of October	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

NS	GEOACOR07T – Statistical Methods in Geography **Unit-I**	TOPIC- 4.		4+1(TU)		1st Week of August		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOACOR07T – Statistical Methods in Geography **Unit-I**	TOPIC- 5.		3+1(TU)		2nd Week of August	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOACOR07T – Statistical Methods in Geography **Unit-I**	TOPIC- 6		4+1(TU)		3rd and 4th Week of August	1 Remedial Class on this topic 1St U.T. (Theory) 1st week of August 1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOACOR07T – Statistical Methods in Geography **Unit-II**	TOPIC- 7.		5+1(TU)		1st and 2nd week of September	1 Remedial Class on this topic 2 nd U.T. (Theory) 1st week of	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

							October		
NS	GEOACOR07T – Statistical Methods in Geography **Unit-II**	TOPIC- 8.		4+1(TU)		3rd week of September	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOACOR07T – Statistical Methods in Geography **Unit-II**	TOPIC- 9		3+1(TU)		4th Week of September	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOACOR07T – Statistical Methods in Geography **Unit-II**	TOPIC- 10.		3+1(TU)		3rd and 4th Week of September	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
P U	J A	V	A C	A T	I	O N			
NS	GEOACOR07T – Statistical Methods in Geography **Unit-II**	TOPIC- 11.		3+1(TU)		2nd Week of November	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
********	**FINAL**	**********	**SEMISTER**	**********	**EXAM**	********			

NAME OF THE TEACHER	**COURSE CODE**	**ALLOTED TOPIC THEORY**	**ALLOTED TOPIC PRACTICAL**	**NUMBER OF REQUARED CLASS (IN HOURS)**	**NUMBER OF ALLOTED CLASS (IN HOURS)**	**TIME OF THE SESSION WHEN CLASS WILL BE CONDUCTED**	**NO OF EXTRA OR REMEDIAL CLASS AND CLASS TEST**	**Teaching and Learning Activity**	**Assessment Tasks**
SD	GEOACOR07P – Statistical Methods		Topic-1	15		1st Week of July to 4th Week of July		Classroom Lectures,	Assignments,Hans-on exercise,

	in Geography					And 1stWeek of August		Practical demonstration	classroom test.
SD	GEOACOR07P – Statistical Methods in Geography		TOPIC-2	15		2nd and 3rd Week of August and 1st and 2nd Week of September	1St U.T. (Theory) Last week of August	Classroom Lectures, Practical demonstration	Assignments,Hans-on exercise, classroom test.
SD	GEOACOR07P – Statistical Methods in Geography		TOPIC -3	6		3rd and 4th Week of September	2 nd U.T. (Theory) 1st week of October	Classroom Lectures, Practical demonstration	Assignments,Hans-on exercise, classroom test.
P U	J A	V	A C A	T	I	O N			
SD	**GEOACOR07P – Statistical Methods in Geography**		TOPIC -4			2nd to 4th Week of November		Classroom Lectures, Practical demonstration	Assignments,Hans-on exercise, classroom test.
****** **	**FINAL**	**********	**SEMISTER**	**********	**EXAM**	********			

GEOACOR08T – Regional Planning and Development✧

Course Objectives:

1. To understand the concept of Region and Regional Planning.
2. To familiarize the students with Theories and Models for Regional Planning.
3. To develop understanding about concept of Development, Sustainable Development and different programmes and policies.

Learning Outcomes:

After the completion of course, the students will have ability to:

1. Identify notable lagging regions and solutions for their overall development
2. Have comprehensive understanding regarding the different regions and application of different models and theories for integrated regional development.
3. Select appropriate indicators for the measurement of socio-economic regional development.

Course Content:

GEOACOR08T – Regional Planning and Development✧

6 Credits, 75 Marks [90 classes]

Unit I: Regional Planning

1. Concept of regions: Types of regions and their delineation
2. Regional Planning: Types, principles, objectives, tools and techniques
3. Need for regional planning in India, multi- level planning in India
4. Metropolitan concept and urban agglomerations

Unit I: Regional Development

5. Concepts of growth and development, growth versus development
6. Indicators of development: Economic, social and environmental
7. Human development: Concept and measurement
8. Theories and models for regional development: Cumulative causation (Myrdal)
9. Theories and models for regional development: Stages of development (Rostow), growth polemodel (Perroux).
10. Concept and causes of underdevelopment
11. Regional development in India: Disparity and diversity
12. Need and measures for balanced development in India

Reading List

Bhargava, G. 2001. Development of India's Urban, Rural, and Regional Planning in 21st Century: PolicyPerspective, Gyan Publishing House.

Chand, M., Puri, V.K. 2000. Regional Planning In India, Allied Publishers Ltd. Chandana, R.C. 2016. Regional Planning and Development, 6th ed, Kalyani Publishers.Glasson, J. 2017. Contemporary Issues in Regional Planning, Routledge.

Gore, C. 2011. Regions in Question: Space, Development Theory, and Regional Policy, Routledge.

Gregory, D., Johnston, R., Pratt, G., Watts.,Whatmore, S. (Eds) 2009. The Dictionary of Human Geography, 5th ed, Wiley.

Hall, P., Tewdwr-Jones, M. 2010.Urban and Regional Planning, Routledge.

Higgins, B., Savoie, D.J. 2017. Regional Development: Theories and Their Application, Routledge. Kulshetra, S.K. 2012. Urban and Regional Planning in India: A Handbook for Professional Practioners, Sage Publication.

Kumar, A., Meshram, D.S., Gowda, K. (Eds) 2016. Urban and Regional Planning Education: Learning for India,Springer.

Misra, R.P. 1992. Regional Planning: Concepts, Techniques , Policies and Case Studies, Concept Publishing.Ray, J. 2001. Introduction to Development & Regional Planning, Orient Blackswan.

ACADEMIC PLAN

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NS	GEOACOR08T – Regional Planning and Development	TOPIC- 1.		3+1(TU)		1st Week of January	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOACOR08T – Regional Planning and Development	TOPIC- 2. .		4+1(TU)		2nd and 3rd Week of January	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOACOR08T – Regional Planning and Development	TOPIC- 3.		4+1(TU)		4th Week of January and 1st Week of February	1 Remedial Class on this topic 1St U.T. (Theory) 1st week of March	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

NS	GEOACOR08T – Regional Planning and Development	TOPIC- 4.		3+1(TU)		2nd Week of February		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOACOR08T – Regional Planning and Development	TOPIC- 5.		4+1(TU)		3rd Week Of February	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOACOR08T – Regional Planning and Development	TOPIC- 6.		4+1(TU)		4th Week of February	1 Remedial Class on this topic 2nd UT In the 2nd Week of May	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOACOR08T – Regional Planning and Development	TOPIC- 7.		3+1(TU)		1st Week of March	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOACOR08T – Regional Planning and Development	TOPIC- 8.		3+1(TU)		2nd Week of March	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOACOR08T – Regional Planning and Development	TOPIC- 9.		4+1(TU)		3rd and 4th Week of March	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOACOR08T – Regional Planning and Development	TOPIC- 10.		4+1(TU)		1st and 2nd Week of April	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

NS	GEOACOR08T – Regional Planning and Development	TOPIC- 11.		3+1(TU)		3rd Week of April	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOACOR08T – Regional Planning and Development	TOPIC- 12.		3+1(TU)		4th Week of April 1st Week of May	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
********	FINAL	**********	SEMISTER	**********	EXAM	********			

GEOACOR09T — Economic Geography(6 Credit)✧

Course Objectives:

1. To understand the concept and spatial distribution of economic activities in the world.
2. To analyse the factors affecting the economics activity focusing on Von Thunen and Weber theory.
3. **To describe in the details the regionalization of different economic activities.**

Learning Outcomes:

1. Understand the concept of economic activity, factors affecting location of economic activity.
2. Gain knowledge about different types of Economic activities
3. Assess the significance of Economic Geography, the concept of economic man and theories of choice.
4. Analyze the factors of location of agriculture and industries.
5. Understand the evolution of varied types of economic activities.
6. Map and interpret data on production, economic indices, transport network and flows.

Course Content:

GEOACOR09T — Economic Geography✧

6 Credits, 75 Marks [90 classes]

Unit I: Concepts

1. Meaning and approaches to Economic Geography.
2. Concepts in Economic Geography: Goods and services, production, exchange and consumption
3. Concept of economic man, theories of choices
4. Economic distance and transport costs

Unit II: Economic Activities

5. Concept and classification of economic activities
6. Factors affecting location of economic activity with special reference to agriculture (VonThünen), and industry (Weber).
7. Primary activities: Agriculture, forestry, fishing and mining
8. Secondary activities: Manufacturing (cotton textile, iron and steel), concept of manufacturingregions, special economic zones and technology parks
9. Tertiary activities: Transport, trade and services
10. Agricultural systems: Case studies of tea plantation in India and mixed farming in Europe
11. Transnational sea-routes, railways and highways with reference to India
12. International trade and economic blocs: WTO, GATT and BRICS: Evolution, structure andfunctions

Reading List

Alexander J. W., 1963: Economic Geography, Prentice-Hall Inc., Englewood Cliffs, New JerseyAoyama, Y., Murphy, J.T., Hanson, S. 2010.Key Concepts in Economic Geography, Sage.

Coe N. M., Kelly P. F. and Yeung H. W., 2007: Economic Geography: A Contemporary Introduction, Wiley-Blackwell.

Combes P., Mayer T. and Thisse J. F., 2008: Economic Geography: The Integration of Regions and Nations,Princeton University Press.

Wheeler, J.O., Muller, P.O., Thrall, G.I., Fik, T.J. 1998. Economic Geography, 3rd ed, Wiley.Willington D. E., 2008: Economic Geography, Husband Press.

Wood, A., Roberts, A. 2010. Economic Geography: Places, Networks and Flows, Routledge.

ACADEMIC PLAN

NAME OF THE TEACHER	COURSE CODE	ALLOTED TOPIC THEORY	ALLOTED TOPIC PRACTICAL	NUMBER OF REQUARED CLASS (IN HOURS)	NUMBER OF ALLOTED CLASS (IN HOURS)	TIME OF THE SESSION WHEN CLASS WILL BE CONDUCTED	NO OF EXTRA OR REMEDIAL CLASS AND CLASS TEST	Teaching and Learning Activity	Assessment Tasks
RD	GEOACOR09T — Economic Geography	TOPIC- 1.		3+1(TU)		1st Week of January	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
RD	GEOACOR09T — Economic Geography	TOPIC- 2. .		4+1(TU)		2nd and 3rd Week of January	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
RD	GEOACOR09T — Economic Geography	TOPIC- 3.		4+1(TU)		4th Week of January and 1st Week of February	1 Remedial Class on this topic 1St U.T. (Theory) 1st week of March	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
RD	GEOACOR09T — Economic	TOPIC- 4.		3+1(TU)		2nd Week of		Classroom Lectures,	Assignments, Discussions/Debates

	Geography					February		Tutorials, PPT	classroom test.
RD	GEOACOR09T — Economic Geography	TOPIC- 5.		4+1(TU)		3rd Week Of February	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
RD	GEOACOR09T — Economic Geography	TOPIC- 6.		4+1(TU)		4th Week of February	1 Remedial Class on this topic 2nd UT In the 2nd Week of May	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
RD	GEOACOR09T — Economic Geography	TOPIC- 7.		3+1(TU)		1st Week of March	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
RD	GEOACOR09T — Economic Geography	TOPIC- 8.		3+1(TU)		2nd Week of March	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
RD	GEOACOR09T — Economic Geography	TOPIC- 9.		4+1(TU)		3rd and 4th Week of March	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
RD	GEOACOR09T — Economic Geography	TOPIC- 10.		4+1(TU)		1st and 2nd Week of April	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
RD	GEOACOR09T —	TOPIC- 11.		3+1(TU)		3rd Week	1	Classroom	Assignments,

	Economic Geography					of April	Remedial Class on this topic	Lectures, Tutorials, PPT	Discussions/Debates classroom test.
RD	GEOACOR09T — Economic Geography	TOPIC- 12.		3+1(TU)		4th Week of April 1st Week of May	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
********	FINAL	**********	SEMISTER	**********	EXAM	********			

GEOACOR10T—Environmental Geography(04+02=06 Credit)✧

GEOACOR10P—Environmental Geography Lab✧

Course Objectives:

1. Various dimensions of environment and natural resource management.
2. Detailed analysis of concept, structure and functions.
3. Understanding of the concept of appraisal and conservation of Environment and Natural Resources

Learning Outcomes:

After the completion of course, the students will have ability to:

1. Understand the dynamic interactive relationship between man and environment.
2. Have sound understanding on distribution, utilization and proper management of natural resources at global level.
3. Make assessment and review of planning and policies related to environment and natural resources.

Course Content:

GEOACOR10T—Environmental Geography✧

4 Credits, 50 Marks [60 classes]

Concepts

1. Geographers' approach to environmental studies
2. Concept of holistic environment and systems approach
3. Ecosystem: Concept, structure and functions
4. Space–time hierarchy of Environmental problems: Local, regional and global

Environmental problems and policies

5. Environmental pollution and degradation: Land, water and air
6. Urban environmental issues with special reference to waste management
7. Environmental policies – National Environmental Policy, 2006, Earth Summits (Stockholm, Rio,Johannesburg)
8. Global initiatives for environmental management (special reference to Montreal Protocol, KyotoProtocol, Paris Climate Summit)

Basu, R. and Bhaduri, S. (Eds) 2007. Contemporary Issues and Techniques in Geography, ProgressivePublishers.

Reading List

Chandna, R.C. 2002. Environmental Geography, Kalyani Press.

Chapman, J.L., Reiz, M.J. 1993. Ecology: Principle and Applications, Cambridge University Press. Cunninghum, W.P., Cunninghum, M.A. 2004. Principals of Environmental Science: Inquiry and Applications,
Tata Macgraw Hill.

Gilpin, A., 1994. Environmental Impact Assessment: Cutting Edge for the 21st Century, Cambridge UniversityPress.

Goudie, A. 2001. 2013. The Human Impact on the Natural Environment: Past, Present, and Future, 7th ed,Wiley-Blackwell.

Miller, G.T. 2004. Environmental Science: Working with the Earth, Thomson Brooks.Odum, E.P.,Barrett, G.W. 2005.Fundamentals of Ecology, Ceneage Learning.

Raven, P.H., Hassenzahl, D.M., Hager, M.C., Gift, N.Y., Berg, L.R. 2015. Environment, 9th ed, Wiley.Sharma, P.D. 2011. Ecology and Environment, Rastogi Publications.

Singh, S. 2013. Environmental Geography, PrayagPustakBhawan.

Withgott, J.H., Laposata, M. 2017. Environment: The Science behind the Stories, 6th ed, Pearson.

GEOACOR10P—Environmental Geography✧

2 Credits, 25 Marks [60 classes]

1. Preparation of questionnaire for perception survey on environmental problems
2. Preparation of check-list for Environmental Impact Assessment of an urban / industrial project
3. Interpretation of air quality using CPCB / WBPCB data

Reading List

Gilpin, A., 1994. Environmental Impact Assessment: Cutting Edge for the 21st Century, Cambridge University Press.

WEBSITES:

BBC – Science & Environment: www.bbc.com/news/science_and_environmentCentral Pollution Control Board: www.cpcb.nic.in

Centre for Science and Environment: www.cseindia.org

Ministry of Environment, Forest and Climate Change: www.envfor.nic.inThe Energy and Resources Institute: www.teriin.org

The World Bank – Environment: www.worldbank.org/en/topic/environmentUnited Nations Environment Programme: www.unenvironment.org

West Bengal Pollution Control Board: www.wbpcb.gov.in

ACADEMIC PLAN

NAME OF THE TEACHER	COURSE CODE	ALLOTED TOPIC THEORY	ALLOTED TOPIC PRACTICAL	NUMBER OF REQUARED CLASS (IN HOURS)	NUMBER OF ALLOTED CLASS (IN HOURS)	TIME OF THE SESSION WHEN CLASS WILL BE CONDUCTED	NO OF EXTRA OR REMEDIAL CLASS AND CLASS TEST	Teaching and Learning Activity	Assessment Tasks
SD	GEOACOR10T—Environmental Geography	TOPIC- 1.		3+1(TU)		1st Week of January	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SD	GEOACOR10T—Environmental Geography	TOPIC- 2. .		4+1(TU)		2nd and 3rd Week of January	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SD	GEOACOR10T—Environmental Geography	TOPIC- 3.		4+1(TU)		4th Week of January and 1st Week of February	1 Remedial Class on this topic 1St U.T. (Theory) 1st week of March	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SD	GEOACOR10T—Environmental	TOPIC- 4.		4+1(TU)		2nd Week of		Classroom Lectures,	Assignments, Discussions/Debates

	Geography					February		Tutorials, PPT	classroom test.
SD	GEOACOR10T—Environmental Geography	TOPIC- 5.		9+1(TU)		3rd and 4th Week Of February and 1st Week of March	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SD	GEOACOR10T—Environmental Geography	TOPIC- 6.		4+1(TU)		1st and 2nd Week of March	1 Remedial Class on this topic 2nd UT In the 2nd Week of May	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SD	GEOACOR10T—Environmental Geography	TOPIC- 7.		3+1(TU)		3rd and 4th Week of March	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SD	GEOACOR10T—Environmental Geography	TOPIC- 8.		3+1(TU)		1st and 2nd Week of April	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SD	GEOACOR10T—Environmental Geography	TOPIC- 9.		4+1(TU)		3rd and 4th Week of April and 1st Week of May	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
********	**FINAL**	**********	**SEMISTER**	**********	**EXAM**	********			

NAME OF THE TEACHER	COURSE CODE	ALLOTED TOPIC THEORY	ALLOTED TOPIC PRACTICAL	NUMBER OF REQUARED CLASS (IN HOURS)	NUMBER OF ALLOTED CLASS (IN HOURS)	TIME OF THE SESSION WHEN CLASS WILL BE CONDUCTED	NO OF EXTRA OR REMEDIAL CLASS AND CLASS TEST	Teaching and Learning Activity	Assessment Tasks
NS	GEOACOR10P—Environmental Geography		Topic-1	15		1st Week of January to 4th Week of February		Classroom Lectures, Practical demonstration	Assignments,Hans-on exercise, classroom test.
NS	GEOACOR10P—Environmental Geography		TOPIC-2	15		1st Week of March ro1st Week of April	1St U.T. (Theory) 1st week of March	Classroom Lectures, Practical demonstration	Assignments,Hans-on exercise, classroom test.
NS	GEOACOR10P—Environmental Geography		TOPIC -3	10		2nd Week of April to 1st Week of May	2nd UT In the 2nd Week of May	Classroom Lectures, Practical demonstration	Assignments,Hans-on exercise, classroom test.
****** **	FINAL	**********	SEMISTER	**********	EXAM	********			

GEOACOR11T – Fieldwork and Research Methodology✧
GEOACOR11P – Fieldwork and Research Methodology (Lab)✧

Course Objectives:

1. Various dimensions of field work and its role in geographical studies..
2. Detailed analysis of different field techniques.
3. Understanding of the report writing and field tools.

Learning Outcomes:

After the completion of course, the students will have ability to:

1. Conduct proper fieldwork for the collection of primary data to bring out grassroots realities.
2. Make use of proper tools and surveying methods for measurement in context of collection and processing of data.
3. Prepare a report based on field data.
4. Have expertise in identification of area of study, methodology, quantitative and quantitative analysis, and conclusions to be drawn about the area – fundamental to geographical research.
5. Handle logistics and other emergencies on field.
6. Develop skills in photography, mapping and video recording.

Course Content:

GEOACOR11T – Fieldwork and Research Methodology✧

4 Credits, 50 Marks [60 classes]

Unit I: Research Methodology

1. Research in Geography: Meaning, types and significance
2. Literature review and formulation of research design
3. Defining research problem, objectives and hypothesis.
4. Research materials and methods
5. Techniques of writing scientific reports: Preparing notes, references, bibliography, abstract and keywords

Unit II: Fieldwork

6. Fieldwork in Geographical studies: Role and significance. Selection of study area and objectives. Pre-field academic preparations. Ethics of fieldwork

7. Field techniques and tools: Observation (participant, non participant), questionnaires (open, closed, structured, non-structured). Interview
8. Field techniques and tools: Landscape survey using transects and quadrants, constructing a sketch, photo and video recording.
9. Positioning and collection of samples. Preparation of inventory from field data.
10. Post-field tabulation, processing and analysis of quantitative and qualitative data

Reading List

Clifford, N., Cope, M., Gillespie, T.W., French, S. (Eds) 2016. Key Methods in Geography, 3rd ed, Sage.

Gomes, B., Jones III, J.P. (Eds) 2010. Research Methods in Geography: A Critical Introduction, Wiley-Blackwell.

Lenon, B., Cleves, P. 2015. Geography Fieldwork and Skills, Harper-Collins.

Montello , D.R, Sutton, P. 2012. An Introduction to Scientific Research Methods in Geography and Environmental Studies, 2nd ed, Sage.

Murthy , K.LN. 2004. Research Methodology in Geography: A Text Book, Concept Publishing Co.

Northey, N., Draper, D., Knight, D.B. 2015. Making Sense in Geography and Environmental Sciences: A Student's Guide to Research and Writing, 6th ed, Oxford University Press.

Parsons, T., Knight, P.G. 2015. How To Do Your Dissertation in Geography and Related Disciplines, 3rd ed, Routledge.

Phillips, R., Johns, J. 2012. Fieldwork for Human Geography, Sage.

Riordan, D. 2013. Technical Report Writing Today, 10th ed, Wadsworth Publishing.

Thornbush, M.J., Allen, C.D., Fitzpatrick, F.A. (Eds) 2014. Geomorphological Fieldwork, Elsevier.

GEOACOR11P – Fieldwork and Research Methodology (Lab)✧

2 Credits, 25 Marks [60 classes]

Every student needs to participate in fieldwork and prepare a field report according to the following guideline, failing which he/she will not be evaluated for Core P11.

1. Each student will prepare a report based on primary data collected from field survey and secondary data collected from different sources.
2. Students will select either one rural area (*mouza*) or an urban area (municipal ward) for the study, with the primary objective of evaluating the relation between physical and cultural landscape.
3. The fieldwork should be completed within seven days.
4. The report should be handwritten in English on A4 size paper in candidate's own words within 5,000 words (Introductory Chapter: 1000 words; Physical Aspects: 1500 words; Socio-economic Aspects: 1500 words; Concluding Chapter: 500 words, approximately) excluding tables, photographs, maps, diagrams, references and appendices.
5. Maps and diagrams should not exceed 15 pages.
6. All sections of the report should contain relevant maps, diagrams and photographs using primaryand secondary data, clearly citing sources.
7. A copy of the bound report, duly signed by the concerned teacher, will be submitted during examination.

ACADEMIC PLAN

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NS	**GEOACOR**11T – Fieldwork and Research Methodology	TOPIC- 1.		3+1(TU)		1st and 2nd Week of July	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	**GEOACOR**11T – Fieldwork and Research Methodology	TOPIC- 2.		4+1(TU)		3rd and 4th Week of July	1St U.T. (Theory) 1st week of August 1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	**GEOACOR**11T – Fieldwork and Research Methodology	TOPIC- 3.		6+1(TU)		1st And 2nd Week of August	2 Remedial Class on this topic 2 nd U.T. (Theory) 1st	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

							week of October		
NS	**GEOACOR**11T – Fieldwork and Research Methodology	TOPIC- 4.		4+1(TU)		3rdWeek of August		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	**GEOACOR**11T – Fieldwork and Research Methodology	TOPIC- 5.		4+1(TU)		4th Week of August		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	**GEOACOR**11T – Fieldwork and Research Methodology	TOPIC- 6.		4+1(TU)		1st and 2nd Week of September		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	**GEOACOR**11T – Fieldwork and Research Methodology	TOPIC- 7.		4+1(TU)		2nd and 3rd Week of September		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
P U	J A	V	A C A	T	I	O N			
NS	**GEOACOR**11T – Fieldwork and Research Methodology	TOPIC- 8.		4+1(TU)		2nd Week of November		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	**GEOACOR**11T – Fieldwork and Research Methodology	TOPIC- 9.		4+1(TU)		3rd Week of November		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	**GEOACOR**11T – Fieldwork and Research Methodology	TOPIC- 10.		4+1(TU)		4th Week of November		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
*******	********	**FINAL**	**********	**SEMISTER**	**********	**EXAM**	********		

NAME OF THE TEACHER	COURSE CODE	ALLOTED TOPIC THEORY	ALLOTED TOPIC PRACTICAL	NUMBER OF REQUARED CLASS (IN HOURS)	NUMBER OF ALLOTED CLASS (IN HOURS)	TIME OF THE SESSION WHEN CLASS WILL BE CONDUCTED	NO OF EXTRA OR REMEDIAL CLASS AND CLASS TEST	Teaching and Learning Activity	Assessment Tasks
NS	**GEOACOR**11P – Fieldwork and Research Methodology		**Field excursion in the month of September and report writing after then**						
********	**FINAL**	**********	**SEMISTER**	**********	**EXAM**	********			

GEOACOR12T – Remote Sensing and GIS✧

GEOACOR12P – Remote Sensing and GIS✧

Course Objectives:

1. The course aim is to give basic technical knowledge and practical experience in digital remote sensing.
2. Knowledge and practical experience in handling satellite images focusing on hands-on experience of image pre-processing, enhancement and classification;
3. Better understand the techniques for the study of land use land cover and urban study.

Learning Outcomes:

After the completion of course, the students will have ability to:

1. Appreciate the strength and application of remote sensing
2. Map the resources, their location and availability
3. Apply this knowledge for sustainable development
4. Have knowledge of the principles of remote sensing, sensor resolutions and image referencing schemes.
5. Interpret satellite imagery and understand the preparation of false color composites from them.
6. Training in the use Geographic Information System (GIS) software for contemporary mapping skills.
7. Analyzing and interpreting remotely sensed satellite images and aerial photographs in order to understand topographical and cultural variations on the Earth's surface.
8. Conducting field excursions and preparation of field report on research on problem in different areas of India
9. Apply GIS to the preparation of thematic maps.
10. Use GNSS.

Course Content:

GEOACOR12T – Remote Sensing and GIS✧

4 Credits, 50 Marks [60 classes]

Unit I: Remote Sensing

1. Principles of Remote Sensing (RS): Types of RS satellites and sensors
2. Sensor resolutions and their applications with reference to IRS and Landsat missions
3. Preparation of False Colour Composites from IRS LISS-3 and Landsat TM and OLI data.
4. Principles of image correction and interpretation. Preparation of inventories of landuse land cover (LULC) features from satellite images.

Unit II: Geographical Information Systems and Global Navigation Satellite System

5. Concept of GIS and its applicability ; GIS data structures: types: spatial and non-spatial, raster and vector
6. Principles of preparing attribute tables and data manipulation and overlay analysis
7. Principles of GNSS positioning and waypoint collection
8. Transferring waypoints to GIS. Area and length calculations from GNSS data.

Reading List

Bhatta, B. 2011. Global Navigation Satellite Systems: Insights into GPS, GLONASS, Galileo, Compass and Others, CRC Press.

Bhatta, B. 2011. Remote Sensing and GIS, 2nd ed, Oxford Univ. Press.

Bolstad, P. 2016. GIS Fundamentals: A First Text on Geographic Information Systems, 5th ed, XanEdu Publishing.

Brewer, C.A. 2015. Designing Better Maps: A Guide for GIS Users, 2nd ed, Esri Press.

Harvey, F. 2015. A Primer of GIS: Fundamental Geographic and Cartographic Concepts, 2nd ed, The Guilford Press.

Jensen, J.R., 2013. Remote Sensing of the Environment: An Earth Resource Perspective, Pearson Education India.

Joseph, G. and Jegannathan, C. 2018. Fundamentals of Remote Sensing, 3rd ed, Universities Press.

Lillesand, T.M., Kiefer, R.W. and Chipman, J.W., 2015. Remote Sensing and Image Interpretation, 7th ed, Wiley.

Sarkar, A. 2015. Practical Geography: A Systematic Approach. 2nd ed, Orient Black Swan Private Ltd.

GEOACOR12P – Remote Sensing and GIS✧

2 Credits, 25 Marks [60 classes]

1. Georeferencing of maps and images using Open Source software
2. Preparation of FCC and identification of features using standard FCC and other bandcombinations
3. Digitisation of features. Data attachment, overlay and preparation of annotated thematic maps(choropleth, pie chart and bar graphs).
4. Note: All exercises to be done using QGIS (2.10 and above)

Reading List

WEBSITES:

International Society for Photogrammetry and Remote Sensing: www.isprs.orgNASA Landsat Science: www.landsat.gsfc.nasa.gov

National Remote Sensing Centre: www.nrsc.gov.in USGS Global Visualization Viewer: www.glovis.usgs.gov

NAME OF THE TEACHER	COURSE CODE	ALLOTED TOPIC THEORY	ALLOTED TOPIC PRACTICAL	NUMBER OF REQUARED CLASS (IN HOURS)	NUMBER OF ALLOTED CLASS (IN HOURS)	TIME OF THE SESSION WHEN CLASS WILL BE CONDUCTED	NO OF EXTRA OR REMEDIAL CLASS AND CLASS TEST	Teaching and Learning Activity	Assessment Tasks
SD	**GEOACOR12T – Remote Sensing and GIS**	TOPIC- 1.		3+1(TU)		1st Week of July	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SD	**GEOACOR12T – Remote Sensing and GIS**	TOPIC- 2.		5+1(TU)		2nd And 3rd Week of July	1St U.T. (Theory) 1st week of August 1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SD	**GEOACOR12T – Remote Sensing and GIS**	TOPIC- 3.		3+1(TU)		4th Week of July	2 Remedial Class on this topic 2 nd U.T. (Theory) 1st week of October	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

SD	**GEOACOR12T – Remote Sensing and GIS**	TOPIC- 4.		4+1(TU)		1st Week of August		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SD	**GEOACOR12T – Remote Sensing and GIS**	TOPIC- 5.		3+1(TU)		2nd Week of August	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SD	**GEOACOR12T – Remote Sensing and GIS**	TOPIC- 6		4+1(TU)		3rd and 4th Week of August	1 Remedial Class on this topic 1St U.T. (Theory) 1st week of August 1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SD	**GEOACOR12T – Remote Sensing and GIS**	TOPIC- 7.		5+1(TU)		1st and 2nd week of September	1 Remedial Class on this topic 2 nd U.T. (Theory) 1st week	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

							of October		
SD	**GEOACOR12T – Remote Sensing and GIS**	TOPIC- 8.		4+1(TU)		3rd week of September	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SD	**GEOACOR12T – Remote Sensing and GIS**	TOPIC- 9		3+1(TU)		4th Week of September	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SD	**GEOACOR12T – Remote Sensing and GIS**	TOPIC- 10.		3+1(TU)		3rd and 4th Week of September	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
P U	J A	V	A C	A T	I	O N			
SD	**GEOACOR12T – Remote Sensing and GIS**	TOPIC- 11.		3+1(TU)		2nd Week of November	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
********	**FINAL**	**********	**SEMISTER**	**********	**EXAM**	********			

NAME OF THE TEACHER	COURSE CODE	ALLOTED TOPIC THEORY	ALLOTED TOPIC PRACTICAL	NUMBER OF REQUARED CLASS (IN HOURS)	NUMBER OF ALLOTED CLASS (IN HOURS)	TIME OF THE SESSION WHEN CLASS WILL BE CONDUCTED	NO OF EXTRA OR REMEDIAL CLASS AND CLASS TEST	Teaching and Learning Activity	Assessment Tasks
NS	**GEOACOR12P – Remote Sensing and GIS**		Topic-1	15		1st Week of July to 4th Week of July And 1stWeek of August		Classroom Lectures, Practical demonstration	Assignments,Hans-on exercise, classroom test.
NS	GEOACOR12P – Remote Sensing and GIS		TOPIC-2	15		2nd and 3rd Week of August and 1st and 2nd Week of September	1St U.T. (Theory) Last week of August	Classroom Lectures, Practical demonstration	Assignments,Hans-on exercise, classroom test.
NS	GEOACOR12P – Remote Sensing and GIS		TOPIC -3	6		3rd and 4th Week of September	2 nd U.T. (Theory) 1st week of October	Classroom Lectures, Practical demonstration	Assignments,Hans-on exercise, classroom test.
P U	J A	V	A C A	T	I	O N			
NS	**GEOACOR12P – Remote Sensing and GIS**		TOPIC -4			2nd to 4th Week of November		Classroom Lectures, Practical demonstration	Assignments,Hans-on exercise, classroom test.
********	**FINAL**	**********	**SEMISTER**	**********	**EXAM**	********			

GEOACOR13T – Evolution of Geographical Thought✧

Course Objectives:

1.Understanding historical evolution of geographic thought

2.Detailed analysis of different paradigms in geography

3.Evaluating the contemporary trends in geographical studies

Learning Outcomes:

1. Perceive the evolution of the philosophy of Geography.

2. Appreciate the contribution of the thinkers in Geography.

3. Give power point presentations on different schools of geographical thought.

4. Discussing the evolution of geographical thought from ancient to modern times. 5. Establishing relationship of Geography with other disciplines and man-environment relationships.

6.Analyzing modern and contemporary principles of Empiricism, Positivism, Structuralism, Human and Behavioral Approaches in Geography

7. Distinguish the paradigms in geography discipline through time

8. Understand the geographical thinking in different regions of world

9. Appreciate the past and future trends of world geography in general and Indian geography in particular

Course Content:

GEOACOR13T – Evolution of Geographical Thought✧

6 Credits, 75Marks [90 classes]

Unit I: Nature of Pre Modern Geography

1. Development of Geography: Contributions of Greek and Chinesegeographers
2. Impact of 'Dark Age' in Geography and Arab contributions
3. Geography during the age of 'Discovery' and 'Exploration' (contributions of Columbus, Vasco daGama, Magellan, Thomas Cook)
4. Transition from cosmography to scientific Geography (contributions of Bernard Varenius and Immanuel Kant). Dualism and Dichotomies (Ideographic vs. Nomothetic, Physical vs. Human,Regional vs. Systematic, Determinism vs. Possibilism,)
5. Evolution of Geographical thoughts in Germany, France, Britain and United States of America

Unit II: Foundations of Modern Geography and Recent Trends

6. Contributions of Humboldt and Ritter
7. Contributions of Richthofen, Hettner, Ratzel and Vidal deLaBlaché
8. Trends of geography in the post-World War-II period: Quantitative Revolution, systemsapproach.
9. Evolution of Critical Geography: Behavioural, humanistic and radical.
10. Changing concept of time-space in geography in the 21st Century

Reading List

Adhikari, S. 2015. Fundamentals of Geographical Thought, Orient Blackswan.

Clifford, N. Holloway S.L., Rice, S.P., Valentine, G. 2009. Key Concepts in Geography, 2nd ed, Sage.

Couper, P. 2015. A Student's Introduction to Geographical Thought: Theories, Philosophies, Methodologies, Sage.

Cresswell, T. 2013. Geographic Thought: A Critical Introduction, Wiley-Blackwell.

Dikshit, R.D. 2004. Geographical Thought: A Contextual History of Ideas, Prentice Hall India.Holt-Jensen, A. 2011. Geography: History and Concepts: A Student's Guide, Sage.

Husain, M. 2015. Evolution of Geographical Thought, 6th ed, Rawat Publications.

Gregory, D., Johnston, R., Pratt, G., Watts.,Whatmore, S. (Eds) 2009. The Dictionary of Human Geography, 5thed, Wiley.

Pete, R. 1998. Modern Geographical Thought, Wiley-Blackwell.

ACADEMIC PLAN

NAME OF THE TEACHER	COURSE CODE	ALLOTED TOPIC THEORY	ALLOTED TOPIC PRACTICAL	NUMBER OF REQUARED CLASS (IN HOURS)	NUMBER OF ALLOTED CLASS (IN HOURS)	TIME OF THE SESSION WHEN CLASS WILL BE CONDUCTED	NO OF EXTRA OR REMEDIAL CLASS AND CLASS TEST	Teaching and Learning Activity	Assessment Tasks
SG	GEOACOR13T – Evolution of Geographical Thought	TOPIC- 1.		3+1(TU)		1st Week of January	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SG	GEOACOR13T – Evolution of Geographical Thought	TOPIC- 2. .		4+1(TU)		2nd and 3rd Week of January	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SG	GEOACOR13T – Evolution of Geographical Thought	TOPIC- 3.		4+1(TU)		4th Week of January to 2nd Week of February	1 Remedial Class on this topic 1St U.T. (Theory) 1st week of March	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SG	GEOACOR13T – Evolution of Geographical	TOPIC- 4.		4+1(TU)		3rd and 4th Week of		Classroom Lectures,	Assignments, Discussions/Debates

	Thought					February		Tutorials, PPT	classroom test.
SG	GEOACOR13T – Evolution of Geographical Thought	TOPIC- 5.		5+1(TU)		1st and 2nd Week of March	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SG	GEOACOR13T – Evolution of Geographical Thought	TOPIC- 6.		3+1(TU)		3rd Week of March	1 Remedial Class on this topic 2nd UT In the 2nd Week of May	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SG	GEOACOR13T – Evolution of Geographical Thought	TOPIC- 7.		4+1(TU)		4th Week of March	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SG	GEOACOR13T – Evolution of Geographical Thought	TOPIC- 8.		3+1(TU)		1st week of April	1 Remedial Class on this topic 1St U.T. (Theory) 1st week of March	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SG	GEOACOR13T – Evolution of Geographical Thought	TOPIC- 9.		3+1(TU)		2nd Week of April	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SG	GEOACOR13T –	TOPIC- 10.		3+1(TU)		3rd and 4th	1	Classroom	Assignments,

	Evolution of Geographical Thought					week of April	Remedial Class on this topic 2nd UT In the 2nd Week of May	Lectures, Tutorials, PPT	Discussions/Debates classroom test.
********	**FINAL**	**********	**SEMISTER**	**********	**EXAM**	********			

GEOACOR14T – Disaster Management✧

GEOACOR14P – Disaster Management✧

Course Objectives:

1. Understanding the basic concepts of disaster management
2. Detailed analysis about the different types of disasters in India
3. Evaluating the various dimensions of disaster management through field works

Learning Outcomes:

After the completion of course, the students will have ability to:

1. Understand processes and impact of disaster
2. Understand both the natural and man-made disaster and human negligence in context of environment
3. Write a field work based report on Disaster Management to minimize the disaster risk/ Risk from Disaster.
4. Understand the nature of hazards and disasters.
5. Assess risk, perception and vulnerability with respect to hazards.
6. Prepare hazard zonation maps.
7. Assessing the nature, impact and management of major natural and man-made hazards affecting the Indian subcontinent.

Course Content:

GEOACOR14T – Disaster Management✧

4 Credits, 50 Marks [60 classes]

Unit I: Concepts

1. Classification of hazards and disasters.-4
2. Approaches to hazard study: Risk perception and vulnerability assessment. Hazard paradigms.-4
3. Responses to hazards: Preparedness, trauma and aftermath. Resilience and capacity building.-5
4. Hazards mapping: Data and geospatial techniques (for hazards enlisted in Unit II and Core 14P)-5

Unit II: Hazard-specific Study with focus on India

5. Earthquake: Factors, vulnerability, consequences and management-4
6. Landslide: Factors, vulnerability, consequences and management-4

7. Tropical Cyclone: Factors, vulnerability, consequences and management-5
8. Riverbank erosion: Factors, vulnerability, consequences and management-5
9. Radioactive fallout: Factors, vulnerability, consequences and management-5

Reading List

Coch, N.K. 1994. Geohazards: Natural and Human, Pearson College.

Coenraads, R. (Ed.) 2006. Natural Disasters and How We Cope, Millennium House.

Cutter, S.L. 2006. Hazards Vulnerability and Environmental Justice, Routledge

Government of India. 1997. Vulnerability Atlas of India, Revised ed, Building Materials & Technology Promotion Council, Ministry of Urban Development.

Hyndman,D., Hyndman, D. 2016. Natural Hazards and Disasters, 5th ed, Brooks Cole.

Kapur, A. 2010. Vulnerable India: A Geographical Study of Disasters, Sage.

Keller. E.A., DeVecchio, D.E. 2014. Natural Hazards: Earth's Processes as Hazards, Disasters, and Catastrophes, 4th ed, Routledge.

Pine, J.C. 2014. Hazards Analysis: Reducing the Impact of Disasters, 2nd ed, CRC Press.

Robbins, P., Hintz, J., Moore, S.A. 2014. Environment and Society: A Critical Introduction 2nd ed, Wiley.

Smith, K. 2013. Environmental Hazards: Assessing Risk and Reducing Disaster, 6th ed, Routledge.

Websites:

AGU landslide Blog: blogs.agu.org/landslideblog

Disaster News Network: secure.disasternews.net

India Meteorological Department Cyclone Page: www.rsmcnewdelhi.imd.gov.in/index.php?lang=en

USGS Earthquake Hazards Programme: www.earthquake.usgs.gov

GEOACOR14P – Disaster Management✧

2 Credits, 25 Marks [60 classes]

An individual Project Report is to be prepared and submitted based on any one case study among the following disasters of West Bengal incorporating a preparedness plan

1. Thunderstorm
2. Landslide
3. Flood
4. Coastal / riverbank erosion
5. Fire
6. Industrial accident
7. Structural collapse

One case study will be done by a group of five students. Different groups may choose different case studies from any one or different types of disasters. The report should be prepared on secondary data and handwritten on A4 page in candidates' own words not exceeding 2000 words excluding references. The report should contain a proper title. The report should incorporate relevant tables, maps, diagrams and references not exceeding five pages. Photographs are not required. A copy of the stapled report in a transparent front file, duly signed by the concerned teacher, will be submitted during examination. Without the report the candidates will not be evaluated for Core P14.

ACADEMIC PLAN

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SD	GEOACOR14T – Disaster Management	TOPIC- 1.		3+1(TU)		1st Week of January	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SD	GEOACOR14T – Disaster Management	TOPIC- 2. .		3+1(TU)		2nd and 3rd Week of January	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

SD	GEOACOR14T – Disaster Management	TOPIC- 3.		4+1(TU)		4th Week of January to 2nd Week of February	1 Remedial Class on this topic 1St U.T. (Theory) 1st week of March	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SD	GEOACOR14T – Disaster Management	TOPIC- 4.		4+1(TU)		3rd and 4th Week of February		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SD	GEOACOR14T – Disaster Management	TOPIC- 5.		3+1(TU)		1st and 2nd Week of March	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SD	GEOACOR14T – Disaster Management	TOPIC- 6.		3+1(TU)		3rd Week of March	1 Remedial Class on this topic 2nd UT In the 2nd Week of May	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SD	GEOACOR14T – Disaster Management	TOPIC- 7.		4+1(TU)		4th Week of March	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SD	GEOACOR14T – Disaster Management	TOPIC- 8.		4+1(TU)		1st week of April	1 Remedial Class on	Classroom Lectures,	Assignments, Discussions/Debates

							this topic 1St U.T. (Theory) 1st week of March	Tutorials, PPT	classroom test.
SD	GEOACOR14T – Disaster Management	TOPIC- 9.		4+1(TU)		2nd to 4th Week of April	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
********	**FINAL**	**********	**SEMISTER**	**********	**EXAM**	********			

3. Department Specific Elective Subjects Syllabus

GEOADSE01T– Soil and Biogeography✧

Course Objectives

1. To understand the basics of Soil
2. To explain the integrated concept of Soil and Bio Geography
3. To describe the basic characteristics of soil resource

Learning Outcomes:

1.Have knowledge about the character and profile of different soil types.

2. Understand the impact of man as an active agent of soil transformation, erosion and degradation.

3.Recognize land capability and classify it.

4. Explaining the Pedological and Edaphological Approaches to Soil Studies - Processes of soil formation, types of soil, and principles of soil and land classification; and management.

5.Understand the varied ecosystems and classify them.

6. Recognize the significance of biogeochemical cycles and biodiversity.

7. Comprehend the devastating impact of deforestation.

8.Identify soil types and derive their pH**.**

Course Content:

GEOADSE01T– Soil and Biogeography✧

6 Credit, 75 Marks [90 classes]

Unit I: Soil Geography

1. Factors of soil formation. Man as an active agent of soil transformation.
2. Soil profile. Origin and profile characteristics of Lateritic, Podzol and Chernozem soils
3. Definition and significance of soil properties: Texture, structure and moisture,
4. Definition and significance of soil properties: pH, organic matter and NPK
5. Soil erosion and degradation: Factors, processes and mitigation measures
6. Principles of soil classification: Genetic and USDA. Concept of land capability and its classification.

Unit II: Biogeography

7. Concepts of biosphere, ecosystem, biome, ecotone, community, niche, succession and ecology
8. Concepts of trophic structure, food chain and food web. Energy flow in ecosystems
9. Geographical extent and characteristic features of: Tropical rain forest, Taiga and Grasslandbiomes
10. Bio-geochemical cycles with special reference to carbon dioxide and nitrogen
11. Spatial distribution of world fauna.
12. Measures for conservation of bio-diversity in India: Man and Biosphere Programme

Reading List

Chapman J.L., Reiz, M.J. 1993. Ecology: Principle and Applications, Cambridge University Press.

Chiras, D.D., Reganold, J.P. 2009. Natural Resource Conservation: Management for a Sustainable Future. Pearson.

Cox, B., Moore, P.D., Ladle, R. 2016. Biogeography: An Ecological and Evolutionary Approach, Wiley-Blackwell.Daji, J.A., Kadam, J.R., Patil, N.D. 1996.A Textbook of Soil Science, Media Promoters and Publishers Pvt Ltd.

Dash, M.C., 2001. Fundamental of Ecology, 2nd edition, Tata McGrawHill, New Delhi

Dey, N. K., Ghosh.P. 1993. India: A Study in Soil Geography, Sribhumi Publishing Company.

Franzmeier, D.P., McFee, W.W., Graveel, J.G., Kohnke, H. 2016. Soil Science Simplified, 5th ed, Waveland Press.Huggett, R. 1998. Fundamentals of Biogeography, Routledge, London:

Lomolino, M.V., Riddle, B.R., Whittaker, R.J. 2016. Biogeography, 5th ed, Oxford University Press.MacDonald, G.2001. Biogeography: Introduction to Space, Time, and Life, Wiley

Morgan, R.P.C. 1995. Soil Erosion and Conservation, 2nd edition, Longman.

Santra. A. 2006. Handbook on Wild and Zoo Animals, International Book Distributing Co.Sharma, P.D. 2011. Ecology and Environment, Rastogi Publications.

Weil, R.R. and Brady, N.C. 2016.The Nature and Properties of Soil, 15th edition, Pearson.

White, R. 2006. Principles and Practice of Soil Science: The Soil as a Natural Resource, Blackwell.

ACADEMIC PLAN

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SG	GEOADSE01T–Soil and Biogeography (UNIT –I)	TOPIC- 1.		3+1(TU)		1st and 2nd Week of July	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SG	GEOADSE01T–Soil and Biogeography (UNIT –I)	TOPIC- 2.		4+1(TU)		3rd and 4th Week of July	1St U.T. (Theory) 1st week	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

							of August 1 Remedial Class on this topic		
SG	GEOADSE01T– Soil and Biogeography (UNIT –I)	TOPIC- 3.		6+1(TU)		1st To 3rd Week of August	2 Remedial Class on this topic 2 nd U.T. (Theory) 1st week of October	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SG	GEOADSE01T– Soil and Biogeography (UNIT –I)	TOPIC- 4.		6+1(TU)		4th Week of August to 2nd Week of September		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SG	GEOADSE01T– Soil and Biogeography (UNIT –I)	TOPIC- 5.		4+1(TU)		3rd to 4th Week of September		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
P U	J A	V	A C A	T	I	O N			
SG	GEOADSE01T– Soil and Biogeography (UNIT –I)	TOPIC- 6.		4+1(TU)		1st and 2nd Week of November		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
RD	GEOADSE01T– Soil and Biogeography (UNIT –II)	TOPIC- 7.		6+1(TU)		1st to 3rd Week of July		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

RD	GEOADSE01T– Soil and Biogeography (UNIT –II)	TOPIC- 8.		4+1(TU)		4th Week of July to 1st Week of August		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
RD	GEOADSE01T– Soil and Biogeography (UNIT –II)	TOPIC- 9.		5+1(TU)		2nd to3rd Week of August		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
RD	GEOADSE01T– Soil and Biogeography (UNIT –II)	TOPIC- 10.		4+1(TU)		4th Week of August and 2nd Week of September		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
RD	GEOADSE01T– Soil and Biogeography (UNIT –II)	TOPIC- 11.		4+1(TU)		3rd and 4th Week of September		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
P U	J A	V	A C A	T	I	O N			
RD	GEOADSE01T– Soil and Biogeography (UNIT –II)	TOPIC- 12.		5+1(TU)		2nd to 4th Week of November		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
*******	********	FINAL	**********	SEMISTER	**********	EXAM	********		

GEOADSE02T –Settlement Geography ✧

Learning Outcomes:

1.Acquire knowledge about Rural settlements- Definition, nature and characteristics

2. Analyze the morphology of rural settlements

3. Learn the rural house types, census categories of rural settlements and idea of social segregation

4. Learn the census definition and categories of urban settlements

5. Analyze the urban morphology models of Burgess, Hoyt, Harris and Ullman

6. Differentiate between city-region and conurbation •

7. Analyze the functional classification of cities

8. Develop the skill of mapping language distribution of India

9. Learn to plot proportional squares to illustrate housing distribution

9. Acquire the skill of identifying rural settlement types from topographical sheet

Course Content:

GEOADSE02T –Settlement Geography ✧

6 Credit, 75 Marks [90 classes]

Unit I Rural Settlement

1. Scope and content of Settlement Geography; rural, urban and peri-urban areas
2. Rural Settlement: Definition, nature and characteristics
3. Morphology of rural settlements: site and situation, layout-internal and external
4. Rural house types with reference to India, Social segregation in rural areas; Census categories ofrural settlements.
5. Problems and policies related to rural infrastructure with reference to India

Unit II Urban Settlement

6. Urban Settlements :Census definition (Temporal) and categories in India
7. Urban morphology: Classical models: Burgess, Homer Hoyt, Harris and Ullman Metropolitanconcept.
8. City-region and Conurbation , Functional classification of cities: Harris, Nelson and McKenzie
9. Aspects of urban places: Location, site and situation, Size and spacing of cities: the rank size rule,the law of the primate city
10. Urban hierarchies : Central Place Theory; August Löch's theory of market centres

Reading List

Banerjee Guha, S. (Ed.) 2004. Space, Society and Geography, Rawat Publication.

Bjelland, M.D., Montello, D.R., Fellmann, J.D., Getis, A., Getis, J. 2000. Human Geography: Landscape of HumanActivity, McGraw Hill.

Carter, H. 1995. The Study of Urban Geography, 4th ed, Arnold.

Dhanagare, D.N. 2004. Themes and Perspectives in Indian Sociology, Rawat Publication.Fern, R.L. 2002. Nature, God and Humanity,

Cambridge University Press.

Fouberg, E.H., Murphy, A.B., de Blij H.J. 2015. Human Geography: People, Place, and Culture, 11th ed, WileyGhosh, S. 1998. Introduction to Settlement Geography, Sangam Books Ltd.

Gottdiener, M., Budd, M. Lehtovuori, P. 2016. Key Concepts in Urban Studies, 2nd ed, Sage.

Gregory, D., Johnston, R., Pratt, G., Watts., Whatmore, S. (Eds) 2009. The Dictionary of Human Geography, Wiley.Hudson, F.S. 1970. Geography of Settlements, Macdonald and Evans Ltd.

Hussain, M. 2007. Models in Geography, Rawat Publication.

Jordan,T., Rowntree, L. 1990. Human Mosaic, Harper Collins Publishers.Knox, P., Pinch, S. 2000. Urban Social Geography,

Pearson Education.

Mandal, R.B. 2001. Introduction to Rural Settlement, 2nd ed, Concept Publishing Company.Mitchell, D. 2000. Cultural Geography: A Critical Introduction, Blackwell.

Singh, R.Y. 2000. Geography of Settlements, Rawat Publication.

ACADEMIC PLAN

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SG	GEOADSE02T – Settlement Geography	TOPIC- 1.		3+1(TU)		1st Week of July	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SG	GEOADSE02T – Settlement Geography	TOPIC- 2.		3+1(TU)		2nd Week of July	1St U.T. (Theory) 1st week of August 1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SG	GEOADSE02T – Settlement Geography	TOPIC- 3.		4+1(TU)		3rd Week of July	2 Remedial Class on this topic 2 nd U.T. (Theory) 1st	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

							week of October		
SG	GEOADSE02T – Settlement Geography	TOPIC- 4.		4+1(TU)		4th Week July		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SG	GEOADSE02T – Settlement Geography	TOPIC- 5.		4+1(TU)		1st Week of August		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SG	GEOADSE02T – Settlement Geography	TOPIC- 6.		4+1(TU)		2nd Week of August		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SG	GEOADSE02T – Settlement Geography	TOPIC- 7.		5+1(TU)		2nd to 3rd Week of August		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SG	GEOADSE02T – Settlement Geography	TOPIC- 8.		4+1(TU)		4th Week of August to 1st Week of September		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SG	GEOADSE02T – Settlement Geography	TOPIC- 9.		5+1(TU)		2nd to 4th Week of September		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
P U	J A	V	A C A	T	I	O N			
SG	GEOADSE02T – Settlement Geography	TOPIC- 10.		4+1(TU)		2nd to 4th Week of November		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
*******	********	FINAL	**********	SEMISTER	**********	EXAM	********		

GEOADSE03T – Population Geography ✧

Learning Outcomes:

After the completion of course, the students will have ability to:

1. **Learn the role of demography and population studies as a distinct fields of human geography**
2. **Have sound knowledge of key concept, different components of population along with its drivers**
3. **Examine population dynamics and characteristic with contemporary issues**

Course Content:

GEOADSE03T – Population Geography ✧

75 Marks 6 Credits

Unit I: Population Dynamics

1. Development of Population Geography as a field of specialization. Relation between population geography and demography. Sources of population data, their level of reliability and problems ofmapping.
2. Population distribution: density and growth. Classical and modern theories in populationdistribution and growth, Demographic transition model.
3. World patterns determinants of population distribution and growth. Concept of optimumpopulation.
4. Population distribution, density and growth profile in India.

Unit II: Population and Development

5. Concepts of Age-Sex Composition; Rural and Urban Composition; Literacy and education
6. Measurements of fertility and mortality. Concept of cohort and life table
7. Population composition of India: Urbanisation and Occupational structure.
8. Migration: Causes and types
9. National and international patterns of migration with reference to India.

10. Population and development: population-resource regions. Concept of human developmentindex and its components.
11. Population policies in developed and less developed countries. India's population policies,population and environment, implication for the future.
12. Contemporary Issues – Ageing of Population; Declining Sex Ratio; Population and environmentdichotomy, HIV/AIDS.

Barrett, H.R. 1995. Population Geography, Oliver and Boyd.

Reading List

Bartram, D. Poros, M. Monforte, P. 2014. Key Concepts in Migration, Sage.

Binde, N., Kanitkar, H. 2000. The Principle of Population Studies, Himalaya Publications.

Chandna, R.C. 2016. Geography of Population: Concepts, Determinants and Patterns, Kalyani Publishers.Dyson,T. 2011. Population and Development: The Demographic Transition, Rawat Publications.

Gregory, D., Johnston, R., Pratt, G., Watts.,Whatmore, S. (Eds) 2009. The Dictionary of Human Geography, 5th ed, Wiley.

Hassan, M.I. 2005.Population Geography, Rawat publications.Hussain, M. 1994. Human Geography, Rawat publications.

Jhingan, M.L., Bhatt, B.K., Desai, J.N. 2014.Demography, Vrinda Publications.Jones, H. R. 2000. Population Geography, 3rd ed, Chapman.

Lutz, W., Warren, C.S., Scherbov, S. 2004. The End of the World Population Growth in the 21st Century,Earthscan.

Majumdar, P.K. 2013. India’s Demography: Changing Demographic Scenario in India, Rawat Publications.

Mukherji, S. 2013. Migration in India: Links to Urbanization, Regional Disparities and Development Policies,Rawat Publications

Newbold, K.B. 2017. Population Geography: Tools & Issues, 3rd ed, Rowman & Littlefield Publishers.Pacione, M. 2012. Population Geography: Progress and Prospect, Routledge.

ACADEMIC PLAN

NAME OF THE TEACHER	COURSE CODE	ALLOTED TOPIC THEORY	ALLOTED TOPIC PRACTICAL	NUMBER OF REQUARED CLASS (IN HOURS)	NUMBER OF ALLOTED CLASS (IN HOURS)	TIME OF THE SESSION WHEN CLASS WILL BE CONDUCTED	NO OF EXTRA OR REMEDIAL CLASS AND CLASS TEST	Teaching and Learning Activity	Assessment Tasks
NS	GEOADSE03T – Population Geography	TOPIC- 1.		3+1(TU)		1st and 2nd Week of July	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOADSE03T – Population Geography	TOPIC- 2.		4+1(TU)		3rd and 4th Week of July	1St U.T. (Theory) 1st week of August 1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOADSE03T – Population Geography	TOPIC- 3.		6+1(TU)		1st To 3rd Week of August	2 Remedial Class on this topic 2 nd U.T. (Theory) 1st	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

							week of October		
NS	GEOADSE03T – Population Geography	TOPIC- 4.		6+1(TU)		4th Week of August to 2nd Week of September		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOADSE03T – Population Geography	TOPIC- 5.		4+1(TU)		3rd to 4th Week of September		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
P U	GEOADSE03T – Population Geography	V	A C A	T	I	O N			
NS	GEOADSE03T – Population Geography	TOPIC- 6.		4+1(TU)		1st and 2nd Week of November		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
RD	GEOADSE03T – Population Geography	TOPIC- 7.		6+1(TU)		1st to 3rd Week of July		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
RD	GEOADSE03T – Population Geography	TOPIC- 8.		4+1(TU)		4th Week of July to 1st Week of August		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
RD	GEOADSE03T – Population Geography	TOPIC- 9.		5+1(TU)		2nd to3rd Week of August		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
RD	GEOADSE03T – Population Geography	TOPIC- 10.		4+1(TU)		4th Week of August and 2nd Week of September		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

RD	GEOADSE03T – Population Geography	TOPIC- 11.		4+1(TU)		3rd and 4th Week of September		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
P U	J A	V	A C A	T	I	O N			
RD	GEOADSE03T – Population Geography	TOPIC- 12.		5+1(TU)		2nd to 4th Week of November		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
*******	********	FINAL	**********	SEMISTER	**********	EXAM	********		

GEOADSE04T – Hydrology and Oceanography✧

Learning Outcomes:

1.Analyse the concepts of Hydrology and Oceanography

2. Emphasizing the significance of groundwater quality and its circulation

3. Evaluate the role of the global hydrological cycle.

4. Studying the behavior and characteristics of the global oceans.

5. Realize the importance of water conservation.

6. Identify marine resources and characteristics of ocean waters.

7. Interpret hydrological and rainfall dispersion graphs and diagrams.

Course Content:

GEOADSE04T – Hydrology and Oceanography✧

6 Credits, 75 Marks [90 classes]

Unit-I: Hydrology

1. Systems approach in hydrology. Global hydrological cycle: Its physical and biological role
2. Run off: controlling factors. Infiltration and evapotranspiration. Run off cycle
3. Drainage basin as a hydrological unit. Principles of water harvesting and watershed management
4. Groundwater: Occurrence and storage. Factors controlling recharge, discharge and movement

Unit-II: Oceanography

5. Major relief features of the ocean floor: characteristics and origin according to plate tectonics
6. Physical and chemical properties of ocean water
7. Water mass, T–S diagram

8. Ocean temperature and salinity: Distribution and determinants
9. Marine resources: Classification and sustainable utilisation
10. Sea level change: Types and causes

Reading List

Dingman, S.L. 2015. Physical Hydrology, 3rd ed, Macmillan Publishing Co.Fitts, C.R. 2002. Groundwater Science, Elsevier.

Garrison, T. 2016. Oceanography: An Invitation to Marine Science, 9th ed, Cengage Learning.Kearey, P., Klepeis, K.A., Vine, F.J. 2011. Global Tectonics, 3rd ed, Wiley-India.

Karanth, K.R., 1988: Ground Water: Exploration, Assessment and Development, Tata- McGraw Hill, New Delhi.Pinet, P.R. 2014. Invitation to Oceanography. 7th ed, Jones and Barlett Publishers.

Pinneker, E.V. 2010. General Hydrogeology, Cambridge University Press.

Pugh, D., Woodworth, P. 2014. Sea-Level Science: Understanding Tides, Surges, Tsunamis and Mean Sea-LevelChanges, 2nd ed, Cambridge University press.

Raghunath, H.M. 2006. Hydrology: Principles, Analysis, Design, 3rd ed, New Age International Publishers.Reddy, P.J.R. 2014. A Textbook of Hydrology, University of Science Press.

Subramanya, K. 2013. Engineering Hydrology, McGraw Hill Education.

Sverdrup, K.A., Armrest, E.V. 2010. An Introduction to the World Oceans, 10th ed, McGraw Hill.Todd, D.K., Larry, W.M. 2004.Groundwater Hydrology, John Wiley & Sons.

Ward, A.D., Trimble, S.W., Burckhard, S.R., Lyon, J.G. 2016. Environmental Hydrology, 3rd ed, CRC Press.

ACADEMIC PLAN

NAME OF THE TEACHER	COURSE CODE	ALLOTED TOPIC THEORY	ALLOTED TOPIC PRACTICAL	NUMBER OF REQUARED CLASS (IN HOURS)	NUMBER OF ALLOTED CLASS (IN HOURS)	TIME OF THE SESSION WHEN CLASS WILL BE CONDUCTED	NO OF EXTRA OR REMEDIAL CLASS AND CLASS TEST	Teaching and Learning Activity	Assessment Tasks
SD	GEOADSE04T – Hydrology and Oceanography	TOPIC- 1.		3+1(TU)		1st Week of January	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SD	GEOADSE04T – Hydrology and Oceanography	TOPIC- 2. .		3+1(TU)		2nd and 3rd Week of January	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SD	GEOADSE04T – Hydrology and Oceanography	TOPIC- 3.		4+1(TU)		4th Week of January to 2nd Week of February	1 Remedial Class on this topic 1St U.T. (Theory) 1st week of March	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SD	GEOADSE04T – Hydrology and	TOPIC- 4.		4+1(TU)		3rd and 4th Week of		Classroom Lectures,	Assignments, Discussions/Debates

	Oceanography					February		Tutorials, PPT	classroom test.
SD	GEOADSE04T – Hydrology and Oceanography	TOPIC- 5.		3+1(TU)		1st and 2nd Week of March	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SD	GEOADSE04T – Hydrology and Oceanography	TOPIC- 6.		3+1(TU)		3rd Week of March	1 Remedial Class on this topic 2nd UT In the 2nd Week of May	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SD	GEOADSE04T – Hydrology and Oceanography	TOPIC- 7.		4+1(TU)		4th Week of March	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SD	GEOADSE04T – Hydrology and Oceanography	TOPIC- 8.		4+1(TU)		1st week of April	1 Remedial Class on this topic 1St U.T. (Theory) 1st week of March	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
SD	GEOADSE04T – Hydrology and Oceanography	TOPIC- 9.		4+1(TU)		2nd to 4th Week of April	1 Remedial Class on this topic	Classroom Lectures, Tutorials,	Assignments, Discussions/Debates classroom test.

								PPT	
	GEOADSE04T – Hydrology and Oceanography	TOPIC- 10.		4+1(TU)		2nd to 4th Week of April	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
********	FINAL	**********	SEMISTER	**********	EXAM	********			

GEOADSE05T – Social Geography✧

Learning Outcomes:

After the completion of course, the students will have ability to:

1.The paper will be useful for the students in developing ideas on basic concept of social geography.

2.It deals with the social categories like- caste, class, religion, ethinicity, and gender and their spatial distribution.

3. The paper indents to provide basic concept of State, Nation and Nation State.

4. The paper will be helpful for the students to know about the various political phenomenon of a county.

5. It helps the leaner to understand various conflicts among the countries of the world.

GEOADSE05T – Social Geography

6 Credits, 75 Marks [90 classes]

Unit I: Society, Identity and Crisis

1. Social Geography: Concept, Origin, Nature and Scope
2. Concept of Space, Social differentiation and stratification; social processes
3. Social Categories: Caste, Class, Religion, Race and Gender and their Spatial distribution
4. Basis of Social region formation; Evolution of social-cultural regions of India
5. Peopling Process of India: Technology and Occupational Change; Migration.
6. Social groups, social behaviour and contemporary social environmental issues with specialreference to India
7. Concept of Social Well-being, Quality of Life, Gender and Social Well-being

Unit II: Social Wellbeing and Planning

8. Measures of Social Well-being: Healthcare, Education, Housing, Gender Disparity
9. Social Geographies of Inclusion and Exclusion, Slums, Gated Communities, Communal Conflictsand Crime.
10. Social Planning during the Five Year Plans in India
11. Social Policies in India: Education and Health
12. Social Impact Assessment (SIA): Concept and importance

Reading List

Ahmed A., 1999. Social Geography, Rawat Publications.

Casino, V. J. D., Jr., 2009. Social Geography: A Critical Introduction, Wiley Blackwell.

Cater, J. and Jones T., 2000: Social Geography: An Introduction to Contemporary Issues, Hodder Arnold.

Gregory, D., Johnston, R., Pratt, G., Watts.,Whatmore, S. (Eds) 2009. The Dictionary of Human Geography, 5th ed, Wiley.

Holt, L., 2011. Geographies of Children, Youth and Families: An International Perspective, Taylor & Francis. Majumdar, P.K. 2013. India's Demography: Changing

Demographic Scenario in India, Rawat Publications. Mukherji, S. 2013. Migration in India: Links to Urbanization, Regional Disparities and Development Policies, Rawat Publications

Panelli, R., 2004. Social Geographies: From Difference to Action, Sage.

Rachel, P., Burke, M., Fuller, D., Gough, J., Macfarlane, R. and Mowl, G. 2001. Introducing Social Geographies,Oxford University Press.

Smith, D. M., 1994.Geography and Social Justice, Blackwell, Oxford.

Smith, S.J., Pain, R., Marston, S. A., Jones, J. P., 2009. The SAGE Handbook of Social Geographies, SagePublications.

Valentine, G. 2014. Social Geographies: Space and Society, Routledge.

ACADEMIC PLAN

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NS	GEOADSE05T – Social Geography	TOPIC- 1.		3+1(TU)		1st Week of January	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOADSE05T – Social Geography	TOPIC- 2. .		4+1(TU)		2nd and 3rd Week of January	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOADSE05T – Social Geography	TOPIC- 3.		4+1(TU)		4th Week of January to 2nd Week of February	1 Remedial Class on this topic 1St U.T. (Theory)	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

							1st week of March		
NS	GEOADSE05T – Social Geography	TOPIC- 4.		4+1(TU)		3rd and 4th Week of February		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOADSE05T – Social Geography	TOPIC- 5.		5+1(TU)		1st and 2nd Week of March	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOADSE05T – Social Geography	TOPIC- 6.		3+1(TU)		3rd Week of March	1 Remedial Class on this topic 2nd UT In the 2nd Week of May	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOADSE05T – Social Geography	TOPIC- 7.		4+1(TU)		4th Week of March	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOADSE05T – Social Geography	TOPIC- 8.		3+1(TU)		1st week of April	1 Remedial Class on this topic 1St U.T. (Theory) 1st week	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

							of March		
NS	GEOADSE05T – Social Geography	TOPIC- 9.		3+1(TU)		2nd Week of April	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOADSE05T – Social Geography	TOPIC- 10.		3+1(TU)		3rd week of April	1 Remedial Class on this topic 2nd UT In the 2nd Week of May	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOADSE05T – Social Geography	TOPIC- 11.		4+1(TU)		4th week of April	1 Remedial Class on this topic 2nd UT In the 2nd Week of May	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOADSE05T – Social Geography	TOPIC- 12.		3+1(TU)		1st Week of May	1 Remedial Class on this topic 2nd UT In the 2nd Week of May	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
********	**FINAL**	**********	**SEMISTER**	**********	**EXAM**	********			

GEOADSE06T – Resource Geography ✧

Learning Outcomes:

1. This theory course basically deals with concept of resource and its classification, and the distribution, utilization and management of land, water, forest and energy resources.

2. It provides basic idea about sustainable development of resources.

3. Understanding the basic concept of resource and its various types and their utilities.

4. Acquiring basic information about potentials and management of resources like land, water, forest and power in global context.139

5. Understanding the prevailing natural resource potential of India and problems of management.

GEOADSE06T – Resource Geography

75 Marks, 6 Credits [90 classes]

Unit I: Resource and Development

1. Natural Resources: Concept and classification
2. Approaches to Resource Utilization: Utilitarian, Conservational, Community based adaptation
3. Significance of Resources: Backbone of Economic growth and development
4. Pressure on resources. Appraisal and Conservation of Natural Resources
5. Problems of resource depletion—global scenario (forest, water, fossil fuels).
6. Sustainable Resource Development

Unit II: Resource Conflict and Management

7. Distribution, Utilisation, Problems and Management of Mineral Resources: Bauxite and Iron Ore.
8. Distribution, Utilisation, Problems and Management of Energy Resources: Conventional and Non-Conventional
9. Contemporary Energy Crisis and Future Scenario
10. Limits to Growth and Sustainable Use of Resources; Concept of Resource sharing: Water

Reading List

Chiras, D.D., Reganold, J.P. 2009. Natural Resource Conservation: Management for a Sustainable Future, 10thed, Pearson.

Cutter, S.N., Renwich, H.L., Renwick, W. 1991. Exploitation, Conservation, and Preservation: A GeographicalPerspective on Natural Resources Use, John Wiley and Sons.

Gadgil, M., Guha, R. 2005. The Use and Abuse of Nature: Incorporating This Fissured Land: An Ecological Historyof India and Ecology and Equity, Oxford University Press.

Gregory, D., Johnston, R., Pratt, G., Watts.,Whatmore, S. (Eds) 2009. The Dictionary of Human Geography, 5th ed, Wiley.

Holechek, J.L.C., Richard, A., Fisher, J.T., Valdez, R. 2003. Natural Resources: Ecology, Economics and Policy,Prentice Hall.

Jones, G., Hollier, G. 1997. Resources, Society and Environmental Management, Paul Chapman.Klee, G. 1991. Conservation of Natural Resources,

Prentice Hall.

Mather, A.S., Chapman, K. 1995. Environmental Resources, John Wiley and Sons.Mitchell, B. 1997.Resource and Environmental

Management, Longman Harlow.

Owen, S., Owen, P.L. 1991.Environment, Resources and Conservation, Cambridge University Press.Rees, J. 1990. Natural Resources: Allocation,

Economics and Policy, Routledge.

ACADEMIC PLAN

NAME OF THE TEACHER	COURSE CODE	ALLOTED TOPIC THEORY	ALLOTED TOPIC PRACTICAL	NUMBER OF REQUARED CLASS (IN HOURS)	NUMBER OF ALLOTED CLASS (IN HOURS)	TIME OF THE SESSION WHEN CLASS WILL BE CONDUCTED	NO OF EXTRA OR REMEDIAL CLASS AND CLASS TEST	Teaching and Learning Activity	Assessment Tasks
NS	GEOADSE06T – Resource Geography	TOPIC- 1.		3+1(TU)		1st Week of January	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOADSE06T – Resource Geography	TOPIC- 2. .		3+1(TU)		2nd and 3rd Week of January	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOADSE06T – Resource Geography	TOPIC- 3.		4+1(TU)		4th Week of January to 2nd Week of February	1 Remedial Class on this topic 1St U.T. (Theory) 1st	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

							week of March		
NS	GEOADSE06T – Resource Geography	TOPIC- 4.		4+1(TU)		3rd and 4th Week of February		Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOADSE06T – Resource Geography	TOPIC- 5.		3+1(TU)		1st and 2nd Week of March	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOADSE06T – Resource Geography	TOPIC- 6.		3+1(TU)		3rd Week of March	1 Remedial Class on this topic 2nd UT In the 2nd Week of May	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOADSE06T – Resource Geography	TOPIC- 7.		4+1(TU)		4th Week of March	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOADSE06T – Resource Geography	TOPIC- 8.		4+1(TU)		1st week of April	1 Remedial Class on this topic 1St U.T. (Theory) 1st week	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.

							of March		
NS	GEOADSE06T – Resource Geography	TOPIC- 9.		4+1(TU)		2nd to 4th Week of April	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
NS	GEOADSE06T – Resource Geography	TOPIC- 10.		4+1(TU)		2nd to 4th Week of April	1 Remedial Class on this topic	Classroom Lectures, Tutorials, PPT	Assignments, Discussions/Debates classroom test.
********	**FINAL**	**********	**SEMISTER**	**********	**EXAM**	********			

SKILL ENHANCEMENT COURSES

GEOSSEC01M – Remote Sensing✧

Course Objectives:

1. The course aim is to give basic understanding of concept of GIS, its definitions and components;

2. To gain working experience geographical data collection using GPS;

3. To do analysis and application of geographical data in land use, urban sprawl, and forest study.

Learning Outcome:

This is a practical, hands-on course; when you have completed it, you will be able to:

1. Develop basic understanding and hands-on on GIS software and GPS ;

2. Understand GIS Data Structures and GIS Data Analysis ;

3. Apply GIS for natural resource management, urban and land use land cover study;

GEOSSEC01M – Remote Sensing

2 Credits, 25 Marks [30 classes]

1. Principles of Remote Sensing (RS): Classification of RS satellites and sensors

2. Sensor resolutions and their applications with reference to IRS and Landsat missions, image referencing schemes and data acquisition.

3. Preparation of False Colour Composites from IRS LISS-3 and Landsat TM and OLI data. Principles of image rectification and enhancement.

4. Principles of image interpretation and feature extraction. Preparation of inventories of

land use land cover features from satellite images.

A project file consisting of four exercises on the above themes is to be submitted

Reading List

Bhatta, B. 2011. Global Navigation Satellite Systems: Insights into GPS, GLONASS, Galileo, Compass and Others, CRC Press.

Jensen, J.R., 2013. Remote Sensing of the Environment: An Earth Resource Perspective, Pearson Education India.

Joseph, G. and Jegannathan, C. 2018. Fundamentals of Remote Sensing, 3rd ed, Universities Press.

Lillesand, T.M., Kiefer, R.W. and Chipman, J.W., 2015. Remote Sensing and Image Interpretation, 7th ed, Wiley.

WEBSITES:

International Society for Photogrammetry and Remote Sensing: www.isprs.org

NASA Landsat Science: www.landsat.gsfc.nasa.gov

National Remote Sensing Centre: www.nrsc.gov.in

Teaching Learning Plan

Week 1: TOPIC I

Week 2: TOPIC I

Week 3: TOPIC I

Week 4: TOPIC II

Week 5: TOPIC II

Week 6 : Mid-Semester Examinations

Week 7: Mid-Semester Break

Week 8**:** TOPIC III

Week 9: TOPIC III

Week 10: TOPIC IV

2. Advanced Spatial Statistical Techniques

Course Objectives:

1. Understanding the application of statistical data in the spatial analysis.
2. Detailed analysis of statistical techniques in geographical study
3. Understanding of statistical applications to analyse both spatial and non-spatial data

Learning Outcomes:

1. In depth understanding about the use of quantitative data in the geographical studies
2. Detailed knowledge of statistical techniques to analyse the quantitative data
3. Understanding of statistical software package to enhance the students with quantitative analysis

Course Content

GEOSSEC02M – Advanced Spatial Statistical Techniques □

2 Credits, 25 Marks [30 classes]

1. Probability theory, probability density functions with respect to Normal, Binomial and Poisson distributions and their geographical applications.

2. Sampling: Sampling plans for spatial and non-spatial data, sampling distributions. Sampling estimates for large and small samples tests involving means and proportions.

3. Correlation and Regression Analysis: Rank order correlation and product moment correlation; linear regression, residuals from regression, and simple curvilinear regression. Introduction to multi-variate analysis.

4. Time Series Analysis: Time Series processes; Smoothing time series; Time series components.

Any statistical Software Package (e.g., SPSS, MS Excel, R, etc.) may be used for practice. A project file consisting of four exercises on the above themes is to be submitted.

Reading List

Acevedo, M.F. 2012. Data Analysis and Statistics for Geography, Environmental Science and Engineering, CRC Press.

Harris, R., Jarvis, C. 2011. Statistics for Geography and Environmental Science, Prentice Hall.

McGrew Jr., J.C., Lembo Jr., A.J.,Monroe, C.B. 2014. An Introduction to Statistical Problem Solving in Geography, 3rd ed, Waveland Press.

Pal S. K., 1998. Statistics for Geoscientists: Techniques and Applications, Concept Pub Co.

Rogerson, P.A. 2015. Statistical Methods for Geography: A Student's Guide, 4th ed, Sage.

Teaching Learning Plan

Week 1: Unit I
Week 2: Unit I
Week 3: Unit I
Week 4: Unit II
Week 5: Unit II
Week 6: Mid-Semester Examinations

Week 7: Mid-Semester Break
Week 8**:** Unit III
Week 9: Unit III
Week 10: Unit IV
Week 11: Unit IV

4. Generic Elective Subjects Syllabus for Honours Students of Other Disciplines

GEOHGEC01T– Physical Geography ✧

Learning Outcomes:

After the completion of the course, the students will have the ability to:

1. Understand the components of the earth system – atmosphere, lithosphere and hydrosphere;

2. Appreciate and understand various features of the spheres with local, regional and global examples;

3. Associate and bring out the relationships of the features of one sphere with other spheres.

6 Credit, 75 Marks [90 classes]

Unit I: Geotectonics and Geomorphology

1. Physical Geography – Definition and Scope, Components of Earth System.
2. Internal Structure of Earth based on Seismic Evidence, Plate Tectonics and its associated Features.
3. Influence of rocks on topography**:** Limestone and Granite
4. Evolution of landforms under fluvial process, Normal Cycle of Erosion of Davis
5. Formation of erosional and depositional landforms by coastal and aeolian processes

Unit II: Climatology and Oceanography

6. Insolation and Heat Balance.
7. Horizontal and Vertical distribution of temperature and pressure
8. Planetary wind system, characteristics of Monsoon and Tropical Cyclone
9. Climatic Classification: Köppen
10. Hydrological Cycle, Ocean Bottom Relief Features, ocean currents.

Reading List

Conserva H. T., 2004: Illustrated Dictionary of Physical Geography, Author House, USA.
Gabler R. E., Petersen J. F. and Trapasso, L. M., 2007: Essentials of Physical Geography (8th Edition), Thompson, Brooks/Cole, USA.
Garrett N., 2000: Advanced Geography, Oxford University Press.
Goudie, A., 1984: The Nature of the Environment: An Advanced Physical Geography, Basil Blackwell Publishers, Oxford.

Hamblin, W. K., 1995: Earth's Dynamic System, Prentice Hall, N.J.
Husain M., 2002: Fundamentals of Physical Geography, Rawat Publications, Jaipur.

Monkhouse, F. J. 2009: Principles of Physical Geography, Platinum Publishers, Kolkata.

Strahler A. N. and Strahler A. H., 2008: Modern Physical Geography, John Wiley & Sons, New York.

GEOHGEC02T – Human Geography ✧

After the completion of the course, the students will have the ability to:

1. Understand the basic concepts in various sub-fields of human geography;

2. Appreciate the growth, distribution and composition of population in different parts of the world;

3. Analyse the types and patterns of rural and urban settlements, urbanisation and related issues in India and other regions of the world.

6 Credit, 75 Marks [90 classes]

Unit I Population and Social Geography

1. Factors of Growth and distribution of world population. Demographic Transition Theory.
2. World Population Composition: Age, Gender and Literacy.
3. Migration**:** Types, causes and consequences.
4. Space and Society: Cultural Regions; Race; Religion and Language
5. Contemporary social issues: Illiteracy and Poverty

Unit II Economic and Settlement Geography

6. Sectors of the economy: primary, secondary, tertiary and quaternary
7. Types of agriculture**:** Intensive subsistence rice farming, Plantation agriculture (Tea and Coffee)
8. Location, problems and prospects of Indian industries — Cotton textile, Petroleum refining, Locomotive
9. Types and Patterns of Rural Settlements
10. Classification of Urban Settlements; Trends and Patterns of World Urbanization

Reading List

Chandna, R.C. (2010) Population Geography, Kalyani Publisher.

Daniel, P.A. and Hopkinson, M.F. (1989) The Geography of Settlement, Oliver & Boyd, London.

Ghosh, S. (2015) Introduction to settlement geography. Orient Black Swan Private Ltd., Kolkata

Hussain, Majid (2012) Human Geography. Rawat Publications, Jaipur

Johnston R; Gregory D, Pratt G. et al. (2008) The Dictionary of Human Geography, Blackwell Publication.

Jordan-Bychkov et al. (2006) The Human Mosaic: A Thematic Introduction to Cultural Geography. W. H. Freeman and Company, New York.

Kaushik, S.D. (2010) Manav Bhugol, Rastogi Publication, Meerut.

Maurya, S.D. (2012) Manav Bhugol, Sharda Pustak Bhawan. Allahabad.

GEOHGEC03T – General Cartography ✧

After the completion of the course, the students will have the ability to:

1. Distinguish between various types of maps and also appreciate the elements of map;

2. Appreciate how projections are applied to prepare maps from the globe;

3. Acquire knowledge to prepare maps from geographic data and also the ability to interpret them.

4 Credits, 50 Marks [60 classes]

Cartographic Techniques

1. Concept of map scale: Types and Application. Reading distances on a map.
2. Map Projections: Criteria for choice of projections. Attributes and properties of: Zenithal Gnomonic Polar Case, Zenithal Stereographic Polar Case, Cylindrical Equal Area, Mercator's Projection, Bonne's Projection. Concept of UTM projection
3. Survey of India topographical maps: Reference scheme of old and open series. Information on the margin of maps.
4. Representation of Data – Symbols, Dots, Choropleth, Isopleth and Flow Diagrams, Interpretation of Thematic Maps.

Reading List

Dent B. D., 1999: *Cartography: Thematic Map Design*, (Vol. 1), McGraw Hill.

Gupta K. K and Tyagi V. C., 1992: *Working with Maps*, Survey of India, DST, New Delhi.

Mishra R. P. and Ramesh A., 1989: *Fundamentals of Cartography*, Concept Publishing.

Robinson A., 1953: *Elements of Cartography*, John Wiley.

Sharma J. P., 2010: *Prayogic Bhugol*, Rastogi Publishers.

Singh R. L. and Singh R. P. B., 1999: *Elements of Practical Geography*, Kalyani Publishers

Singh R. L., 1998: *Prayogic Bhoogol Rooprekha*, Kalyani Publications.

Steers J. A., 1965: *An Introduction to the Study of Map Projections*, University of London.

GEOHGEC03P – General Cartography ✧

2 Credits, 25 Marks [60 classes]

Cartographic Techniques

1. Graphical construction of scales: Plain and comparative. [10]

2. Construction of projections: Zenithal Gnomonic Polar Case, Zenithal Stereographic Polar Case, Cylindrical Equal Area, Mercator's Projection, Bonne's Projection. [30]
3. Construction and interpretation of relief profiles from Survey of India topographical map — superimposed, projected and composite, relative relief map, slope map (Wentworth), and Correlation between physical and cultural features from Survey of India topographical maps using transect chart.

GEOHGEC04T – Environmental Geography ✧

After the completion of the course, the students will have the ability to:

1. Appreciate the structure and functions of ecosystems with examples;

2. Understand the environmental problems and relevant management strategies;

3. Acquire knowledge about the new environmental policies and the need to revise policies to tackle the environmental issues of India, in particular.

6 Credits, 75 Marks [90 classes]

Concepts

1. Environmental Geography: Concepts and Approaches;
2. Human-Environment Relationship in equatorial, desert, mountain and coastal regions
3. Concept of holistic environment and system approach
4. Ecosystem: Concept, structure and functions

Environmental problems and policies

5. Environmental Problems and Management: Air Pollution; Water pollution; Biodiversity Loss; Solid and Liquid Waste.
6. Environmental problems and management: Desertification and soil erosion
7. Environmental Programmes and Policies: Developed Countries; Developing Countries.
8. New Environmental Policy of India.

Reading List

Casper J.K. (2010) Changing Ecosystems: Effects of Global Warming. Infobase Pub. New York.

Hudson, T. (2011) Living with Earth: An Introduction to Environmental Geology, PHI Learning Private Limited, New Delhi.

Miller, G.T. (2007) Living in the Environment: Principles, Connections, and Solutions, Brooks/ Cole Cengage Learning, Belmont.

Singh, R.B. (1993) Environmental Geography, Heritage Publishers, New Delhi.

UNEP (2007) Global Environment Outlook: GEO4: Environment For Development, United Nations Environment Programme. University Press, Cambridge.

Wright R. T. and Boorse, D. F. (2010) Toward a Sustainable Future, PHI Learning Pvt Ltd, New Delhi.

Singh, R.B. and Hietala, R. (Eds.) (2014) Livelihood security in Northwestern Himalaya:

Case studies from changing socio-economic environments in Himachal Pradesh, India. Advances in Geographical and Environmental Studies, Springer

1. Scheme for the CBCS Curriculum for Geography General (B.Sc.)

Credit Distribution across Courses

Course Type B.Sc. General	Total Papers	Credits	
		THEORY + PRACTICAL	THEORY + TUTORIAL*
Core Course: 04 courses from each of the 03 disciplines of choice	12	12×4 = 48 12×2 = 24	12×5 = 60 12×1 = 12*
Elective Courses: 02 papers from each discipline of choice	6	6×4 = 24 6×2 = 12	6×5 = 30 6×1 = 06*
Ability Enhancement Courses: 02 papers of 02 credits	2	2×2 = 04	2 × 2=04
Skill Enhancement Courses: 04 papers of 02 credits each	4	4×2 = 08	4 × 2=08
		120	120

*Tutorials of 1 Credit will be conducted in case there is no practical component

Computation of work-load per week

Type of Course	Credit	Duration of Periods
Tutorial Class	1	1 Theoretical class of 1 hour duration
Theory (T)	1	1 Theoretical class of 1 hour duration
Practical (P)	1	1 Practical class of 2 hour duration
Semester Duration: 15 weeks of direct teaching		

List of subjects to be offered with Geography General

1. Political Science	4. Statistics
2. Economics	5. Zoology
3. Mathematics	6. Anthropology or Computer Science

Any 2 (two) subjects to be chosen from the above list and from each subject four papers to be taken as Core Course and two papers as Elective Course as mentioned in Table 3.2.

Distribution of Courses across semesters for Geography General (B.Sc.)

Semester	Course	Course Code	Title	Credit	Marks	Remarks
I	Core (DSC 1A)	GEOGCOR01T	Physical Geography	06	75	From Geography
	Core (DSC 2A)	XXXGCOR01T		06	75	Subject 2 apart from Geography
	Core (DSC 3A)	XXXGCOR01T		06	75	Subject 3 apart from Geography
	AECC	ENGSAEC01M	Communicative English	02	25	Shared course
II	Core (DSC 1B)	GEOGCOR02T	Human Geography	06	75	From Geography
	Core (DSC 2B)	XXXGCOR02T		06	75	Subject 2 apart from Geography
	Core (DSC 3B)	XXXGCOR02T		06	75	Subject 3 apart from Geography
	AECC	ENVSAEC02T	Environment Studies	02	25	Shared course
III	Core (DSC 1C)	GEOGCOR03T	General Cartography	04	50	From Geography
		GEOGCOR03P	General Cartography (Lab)	02	25	
	Core (DSC 2C)	XXXGCOR03T		04	50	Subject 2 apart from Geography
	Core (DSC 3C)	XXXGCOR03T		06	75	Subject 3 apart from Geography
	SEC1	XXXSSEC01M	Remote Sensing	02	25	Shared course

IV	Core (DSC 1D)	GEOGCOR04T	Environmental Geography	06	75	From Geography
	Core (DSC 2D)	XXXGCOR04T		06	75	Subject 2 apart from Geography
	Core (DSC 3D	XXXGCOR04T		06	75	Subject 3 apart from Geography
	SEC2	XXXSSEC02M	Advanced Spatial Statistical Techniques	06	75	Shared course
V	DSE1A	GEOGDSE01T	A. Soil and Biogeography			Any one course among A, B and C from Geography
		GEOGDSE02T	B. Regional Development			
		GEOGDSE03T	C. Disaster Management			
	DSE2A	XXXGDSE01T				Subject 2 apart from Geography
	DSE3A	XXXGDSE01T				Subject 3 apart from Geography
	SEC3					Shared course
VI	DSE1B	GEOGDSE04P	Project Report Based on Field Work	06	75	Compulsory from Geography
	DSE2B	XXXGDSE01T		02	25	Subject 2 apart from Geography
	DSE3B	XXXGDSE01T		06	75	Subject 3 apart from Geography
	SEC3			06	75	Shared course

Core Subjects

Code (Theory)	Code (Practical)	Course Name
GEOGCOR01T		Physical Geography
GEOGCOR02T		Human Geography
GEOGCOR03T	GEOGCOR03P	General Cartography
GEOGCOR04T		Environmental Geography

Choices for Two Discipline Specific Electives

Code (Theory)	Course Name
GEOGDSE01T	A. Soil and Biogeography
GEOGDSE02T	B. Regional Development
GEOGDSE03T	C. Disaster Management
GEOGDSE04P	Project Report Based on Field Work

Choices for Two Skill Enhancement Courses

Code (Theory)	Course Name
XXXSSEC01M	Remote Sensing
XXXSSEC02M	Advanced Spatial Statistical Techniques

2. Core Course Syllabus

(4 compulsory papers)

GEOGCOR01T– Physical Geography ✧

6 Credit, 75 Marks [90 classes]

Unit I: Geotectonics and Geomorphology

6. Physical Geography – Definition and Scope, Components of Earth System.
7. Internal Structure of Earth based on Seismic Evidence, Plate Tectonics and its associated Features.
8. Influence of rocks on topography**:** Limestone and Granite
9. Evolution of landforms under fluvial process, Normal Cycle of Erosion of Davis
10. Formation of erosional and depositional landforms by coastal and aeolian processes

Unit II: Climatology and Oceanography

11. Insolation and Heat Balance.
12. Horizontal and Vertical distribution of temperature and pressure
13. Planetary wind system, characteristics of Monsoon and Tropical Cyclone
14. Climatic Classification: Köppen
15. Hydrological Cycle, Ocean Bottom Relief Features, ocean currents.

Reading List

Conserva H. T., 2004: Illustrated Dictionary of Physical Geography, Author House, USA.

Gabler R. E., Petersen J. F. and Trapasso, L. M., 2007: Essentials of Physical Geography (8th Edition), Thompson, Brooks/Cole, USA.

Garrett N., 2000: Advanced Geography, Oxford University Press.

Goudie, A., 1984: The Nature of the Environment: An Advanced Physical Geography, Basil Blackwell Publishers, Oxford.

Hamblin, W. K., 1995: Earth's Dynamic System, Prentice Hall, N.J.

Husain M., 2002: Fundamentals of Physical Geography, Rawat Publications, Jaipur.

Monkhouse, F. J. 2009: Principles of Physical Geography, Platinum Publishers, Kolkata.

Strahler A. N. and Strahler A. H., 2008: Modern Physical Geography, John Wiley & Sons, New York.

GEOGCOR02T – Human Geography ✧

6 Credit, 75 Marks [90 classes]

Unit I Population and Social Geography

1. Factors of Growth and distribution of world population. Demographic Transition Theory.
2. World Population Composition: Age, Gender and Literacy.
11. Migration: Types, causes and consequences.
12. Space and Society: Cultural Regions; Race; Religion and Language
13. Contemporary social issues: Illiteracy and Poverty

Unit II Economic and Settlement Geography

14. Sectors of the economy: primary, secondary, tertiary and quaternary
15. Types of agriculture: Intensive subsistence rice farming, Plantation agriculture (Tea and Coffee)
16. Location, problems and prospects of Indian industries — Cotton textile, Petroleum refining, Locomotive
17. Types and Patterns of Rural Settlements
18. Classification of Urban Settlements; Trends and Patterns of World Urbanization

Reading List

Chandna, R.C. (2010) Population Geography, Kalyani Publisher.

Daniel, P.A. and Hopkinson, M.F. (1989) The Geography of Settlement, Oliver & Boyd, London.

Ghosh, S. (2015) Introduction to settlement geography. Orient Black Swan Private Ltd., Kolkata

Hussain, Majid (2012) Manav Bhugol. Rawat Publications, Jaipur

Johnston R; Gregory D, Pratt G. et al. (2008) The Dictionary of Human Geography, Blackwell Publication.

Jordan-Bychkov et al. (2006) The Human Mosaic: A Thematic Introduction to Cultural Geography. W. H. Freeman and Company, New York.

Kaushik, S.D. (2010) Manav Bhugol, Rastogi Publication, Meerut.

Maurya, S.D. (2012) Manav Bhugol, Sharda Pustak Bhawan. Allahabad.

GEOGCOR03T – General Cartography ✧

4 Credits, 50 Marks [60 classes]

Cartographic Techniques

4. Concept of map scale: Types and Application. Reading distances on a map.
5. Map Projections: Criteria for choice of projections. Attributes and properties of: Zenithal Gnomonic Polar Case, Zenithal Stereographic Polar Case, Cylindrical Equal Area, Mercator's Projection, Bonne's Projection. Concept of UTM projection
6. Survey of India topographical maps: Reference scheme of old and open series. Information on the margin of maps.
5. Representation of Data – Symbols, Dots, Choropleth, Isopleth and Flow Diagrams, Interpretation of Thematic Maps.

Reading List

Dent B. D., 1999: *Cartography: Thematic Map Design*, (Vol. 1), McGraw Hill.

Gupta K. K and Tyagi V. C., 1992: *Working with Maps*, Survey of India, DST, New Delhi.

Mishra R. P. and Ramesh A., 1989: *Fundamentals of Cartography*, Concept Publishing.

Robinson A., 1953: *Elements of Cartography*, John Wiley.

Singh R. L. and Singh R. P. B., 1999: *Elements of Practical Geography*, Kalyani Publishers

Steers J. A., 1965: *An Introduction to the Study of Map Projections*, University of London.

GEOGCOR03P – General Cartography ✧

2 Credits, 25 Marks [60 classes]

Cartographic Techniques

4. Graphical construction of scales: Plain and comparative. [10]
5. Construction of projections: Zenithal Gnomonic Polar Case, Zenithal Stereographic Polar Case, Cylindrical Equal Area, Mercator's Projection, Bonne's Projection. [30]
6. Construction and interpretation of relief profiles from Survey of India topographical map — superimposed, projected and composite, relative relief map, slope map (Wentworth), and Correlation between physical and cultural features from Survey of India topographical maps using transect chart.

GEOGCOR04T – Environmental Geography ✧

6 Credits, 75 Marks [90 classes]

Concepts

9. Environmental Geography: Concepts and Approaches
10. Human-Environment Relationship in equatorial, desert, mountain and coastal regions
11. Concept of holistic environment and system approach
12. Ecosystem: Concept, structure and functions

Environmental problems and policies

13. Environmental Problems and Management: Air Pollution; Water pollution Biodiversity Loss; Solid and Liquid Waste.
14. Environmental problems and management: Desertification and soil erosion
15. Environmental Programmes and Policies: Developed Countries; Developing Countries.
16. New Environmental Policy of India.

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Miller, G.T. (2007) Living in the Environment: Principles, Connections, and Solutions, Brooks/ Cole Cengage Learning, Belmont.

Singh, R.B. (1993) Environmental Geography, Heritage Publishers, New Delhi.

UNEP (2007) Global Environment Outlook: GEO4: Environment For Development, United Nations Environment Programme. University Press, Cambridge.

Wright R. T. and Boorse, D. F. (2010) Toward a Sustainable Future, PHI Learning Pvt Ltd, New Delhi.

Singh, R.B. and Hietala, R. (Eds.) (2014) Livelihood security in Northwestern Himalaya:

Case studies from changing socio-economic environments in Himachal Pradesh, India. Advances in Geographical and Environmental Studies, Springer

3. Discipline Specific Elective

(2 Compulsory papers)

GEOGDSE01T – Soil and Biogeography

6 Credits, 75 Marks [90 classes]

Unit I: Soil Geography

1. Factors of soil formation.
2. Soil profile. Origin and profile characteristics of Lateritic and Chernozem soils
3. Definition and significance of soil properties: Texture, structure and moisture, pH and organic matter
4. Principles of soil classification: Genetic and USDA. Concept of land capability and its classification.

Unit II: Biogeography

5. Concepts of biosphere, ecosystem, biome, ecotone, community, niche and succession.
6. Concepts of food chain and food web. Energy flow in ecosystems
7. Geographical extent and characteristic features of: Tropical rain forest and Grassland biomes
8. Bio-geochemical cycles with special reference to carbon dioxide and nitrogen.

Reading List

Biswas, T.D. and Mukherjee, S.K. 1997: Textbook of Soil Science, TataMcGraw Hill,

Brady, N.C. and Weil, R.R. 1996. The Nature and Properties of Soil, 11th edition, Longman, London :

Chapman J.L. and Reiss, M.J. 1993. Ecology: Principle and Applications, Cambridge University Press, Cambridge:

Dash, M.C., 2001. Fundamental of Ecology, 2nd edition, Tata McGrawHill, New Delhi

Huggett, R. 1998. Fundamentals of Biogeography, Routledge, London:

Kormondy, E.J. 1996. Concept of Ecology, 4th edition, Prentice- Hall, India, New Delhi

Myers, A. A. and Giller, P.S. (editors) 1988. Analytical Biogeography: an Integrated Approach to the Study of Animal and Plant Distribution. Chapman and Hall, London

GEOGDSE02T – Regional Development

6 Credits, 75 Marks [90 classes]

Concepts of Regions and Regional Planning

1. Definition of Region. Types and Need of Regional planning:
2. Choice of a Region for Planning: Characteristics of an Ideal Planning Region; Delineation of Planning Region
3. Regionalization of India for Planning (Agro Ecological Zones)
4. Strategies/Models for Regional Planning: Growth Pole Model of Perroux; Growth Centre Model in Indian Context.
5. Problem Regions and Regional Planning: Backward Regions and Special Area Development Plans in India.

Regional Development

6. Changing concept of development and underdevelopment;
7. Indicators of development: Economic, social and environmental. Concept of human development
8. Development and regional disparities in India since Independence: Disparities in agricultural development andindustrial development
9. Development and regional disparities in India since independence : Disparities in human resource development in terms of education and health

Reading List

Bhargava, G. 2001. Development of India's Urban, Rural, and Regional Planning in 21st Century: Policy Perspective, Gyan Publishing House.

Bhatt, L.S. 1976 Micro Level Planning in India. KB Publication, Delhi

Chand,M., Puri, V.K. 2000. Regional Planning In India, Allied Publishers Ltd.

Chandana, R.C. 2016. Regional Planning and Development, 6th ed, Kalyani Publishers.

Deshpande C. D., 1992: *India: A Regional Interpretation*, ICSSR, New Delhi.

Glasson, J. 2017. Contemporary Issues in Regional Planning, Routledge.

Gregory, D., Johnston, R., Pratt, G., Watts., Whatmore, S. (Eds) 2009. The Dictionary of Human Geography.

Hall, P., Tewdwr-Jones, M. 2010. Urban and Regional Planning, Routledge.

Higgins, B., Savoie, D.J. 2017. Regional Development: Theories and Their Application, Routledge.

Kulshetra, S.K. 2012. Urban and Regional Planning in India: A Handbook for Professional Practioners, Sage Pub.

Kumar, A., Meshram, D.S., Gowda, K. (Eds) 2016. Urban and Regional Planning Education: Learning for India, Springer.

Misra, R.P. 1992. Regional Planning: Concepts, Techniques , Policies and Case Studies, Concept Publishing.

Rapley, J. 2007. Understanding Development: Theory and Practice in the Third World, Lynne Rienner.

Rapley, John (2007) Understanding Development: Theory and Practice in the 3rd World. Lynne Raza, M., Ed. (1988). Regional Development. Contributions to Indian Geography. New Delhi,

Ray, J. 2001. Introduction to Development & Regional Planning, Orient Black swan.

Raza, M. (Ed.) 1988. Regional Development: Contributions to Indian Geography, Heritage Publishers.

GEOGDSE03T – Disaster Management

6 Credits, 75 Marks [90 classes]

Unit I: Concepts

1. Hazards, risk, vulnerability and disasters: definition and concepts.
2. Approaches to hazard study: risk perception and vulnerability assessment. Hazard paradigms.
3. Response and mitigation to disasters: mitigation and preparedness, NDMA and NIDM; indigenous knowledge and community-based disaster management; do's and don'ts during disasters.

Unit II: Hazard-specific Study with focus on India

4. Disasters in india: (a) causes, impact, distribution and mapping: flood, drought and cyclone
5. Disasters in india: (b) causes, impact, distribution and mapping: earthquake, tsunami and landslide
6. Human induced disasters: causes, impact, distribution and mapping: radioactive fallout.

Reading List

Government of India. (1997) Vulnerability Atlas of India. New Delhi, Building Materials & Technology Promotion Council, Ministry of Urban Development, Government of India.

Kapur, A. (2010) Vulnerable India: A Geographical Study of Disasters, Sage Publication, New Delhi.

Modh, S. (2010) Managing Natural Disaster: Hydrological, Marine and Geological Disasters, Macmillan, Delhi.

Singh, R.B. (2005) Risk Assessment and Vulnerability Analysis, IGNOU, New Delhi. Chapter 1, 2 and 3

Singh, R. B. (ed.), (2006) Natural Hazards and Disaster Management: Vulnerability and Mitigation, Rawat Publications, New Delhi.

Sinha, A. (2001). Disaster Management: Lessons Drawn and Strategies for Future, New United Press, New Delhi.

Stoltman, J.P. et al. (2004) International Perspectives on Natural Disasters, Kluwer Academic Publications. Dordrecht.

Singh Jagbir (2007) "Disaster Management Future Challenges and Oppurtunities", 2007. Publisher- I.K. International Pvt. Ltd. S-25, Green Park Extension, Uphaar Cinema Market, New Delhi, India (www.ikbooks.com).

GEOGDSE04P – Project Report based on Field Work

6 Credits, 75 Marks

Project work is compulsory for completing B.Sc Course in Geography. Project Work is intended to provide an opportunity to the candidate to field test the learning.

The Project report should be based on field work on some specified topics as suggested by the Department.

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

The duration of the field work should not exceed 10 days.

The word count of the report should be about **8000** excluding figures, tables, photographs, maps, references and appendices.

The report should include an introduction, literature review, project aims and objectives, methodology, results and discussion and references.

It should not exceed 20 to 25 pages (A4 pages) including maps, diagrams, and photographs etc.

One copy of the report on A 4 size paper should be submitted prior to examination.