



Learning Outcome based Curriculum Framework (LOCF)

For

Choice Based Credit System (CBCS)

Syllabus

B.Sc. (Program) in GEOGRAPHY

w.e.f. Academic Session 2020-21



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PART I

INTRODUCTION

Learning Outcomes based Curriculum Framework (LOCF) for Geography under CBCS

1. Introduction

Geography has evolved as a discipline between human and physical sciences. Geography not only focuses on the physical aspects of the earth systems and processes but also seeks to understand the human societies, social systems and processes. Geography in true sense has emerged as a trans- disciplinary subject integrating the study of nature and society, the regional diversity with the concepts of the space and time. It has been able to provide the overview of transformation of rural ecology to globalized cultural landscape at several spatial level.

Geography is therefore a study of

- Village Ecology to Urban Regional Studies
- Qualitative Techniques and Spatial Information Technology
- Global to Micro-level Community Perception Approach

It is essential to focus on the current socio-spatial problems, issues and challenges to aware students application of geography in addressing the environmental problems and developmental issues. It is also essential to deliver ancient geographical knowledge to address the current local and global problems. In the context of global challenges, geography have to be studied from the multifaceted and dynamic perspective.

It is important for the policy makers to consider the geo-spatial aspects with references to the location and in context of the best utilization of natural resources and public goods. It is further expected that if the knowledge of geography will be instrumental in regional and national development.

2. Learning Outcomes based Approach to Curriculum Planning

Learning Outcomes based Curriculum Framework (LOCF) for geography curriculum revision incorporates dynamic processes including fundamental and modern techniques, contemporary paradigms such as global initiatives like Sustainable Development Goals (SDGs), Disaster Risk Reduction (DRR), Paris Climate Action and national initiatives like smart cities, Securities of food, water, energy, human health and livelihood, biodiversity, and disaster management. The approaches are to make geography more scientific and societal-need oriented that could be the panacea of India's developmental challenges. Geography uses scientific knowledge with the



current focus that includes spatio-temporal analysis, skill development, GI Science sustainable development and human security. At the same time, it also addresses the challenges like mining industries, environmental and land degradation.

2.1 Nature and Extent of the B.Sc. Programme

Geography curriculum inculcates knowledge of essential concepts of physical and human geography together with appropriate techniques using lectures, tutorials, group discussions, presentations, assignment evaluation, lab work and field visits. Thus, pedagogy process includes:

- Identifying and explaining the physical and cultural characteristics globally and processes at varied spatio-temporal contexts.
- Understanding human-environment and nature-society interactions as well as various global environmental challenges.
- Analysing geographic information by using geo-spatial technologies.
- Responding towards the global, national and local challenges and formulating proper remedial plan.

2.2 Aims B.Sc Programme

Four distinct and new learning outcomes have been incorporated from each Course such as:

- Appreciate the relevance of geographical knowledge to everyday life.
- Demonstrate the ability to communicate geographic information by utilising both lecture and practical exercises.
- Inculcate the ability to evaluate and solve geographical problems effectively.
- Demonstrate the skills in using geographical research tools including spatial statistics, cartography, remote sensing, GIS and GIScience.
- Based on the field knowledge and advanced technologies, the students should be able to understand the on-going geographical problems in different regions and levels with appropriate pragmatic solutions.

3. Graduate Attributes in Geography

The curriculum uses CBCS framework and organises under Core Course, Skill Enhancement Course, Elective - Discipline Specific and Elective - Generic Courses. The core courses cover key areas of geography about which all students should have basic knowledge. These courses are grouped as follows:

- A. Theory Courses: These courses build up the theoretical and conceptual foundations of geography.



- B. Practical Courses: Three courses on Statistical Techniques in Spatial Analysis; Remote Sensing and Geographical Information System, GIScience and Research Methods and Fieldwork in Geography will strengthen the methodological and practical foundations of geography.
- C. Regional Approach: Such courses focus on World Geography, Geography of India / West Bengal and local geographical aspects of Durgapur-Raniganj-Asansol area.
- D. Application Oriented: This includes disaster management, climate change, tourism geography, health and wellbeing, environmental degradation etc.

Each Course has three learning outcomes, five uniform contents and reading list incorporating a few Hindi books also wherever possible.

4. Qualification Descriptors for B.Sc. Program

The qualification descriptors for the B.Sc. Program in Geography shall have the learning attributes such as field knowledge, use of advance tools and techniques for better comprehension of space and society etc. It also involves awareness among the students regarding the issues of different regions and socio-cultural aspects. The main qualification descriptors for the B.Sc. students with geography are to develop the critical evaluation and understanding. Each student in B.Sc. with Geography should be able to;

- Demonstrate systematically geographical knowledge and understanding the theoretical as well as practical applications with understanding of various aspects related to heavy industries, mining, agriculture and urbanisation.
- Demonstrate the ability to understand the significance of geographical aspects in relation to development of the regions and minimizing regional inequalities.
- Demonstrate the ability and geographical thinking critically regarding rural and urban spaces and their day-to-day problems with the application of geographical knowledge.
- Students have to demonstrate their geographical knowledge acquired in the class and apply the same at local level.
- Recognise the scope of geography in terms of exploring the career opportunities, employment and life-long engagement in teaching and utilise the knowledge for publication for the future academic endeavors.

The students have to develop the ability through the theoretical and practical means for realising the Sustainable Development Goals (SDG) both in rural and urban spaces to minimize the differentials in developmental aspects.

5. The Program Learning Outcomes B.Sc. Program

The program learning outcomes relating to B.Sc. Program in geography:



UG Learning Outcome Based Curriculum Framework (LOCF) for Geography Prog

- Demonstrating the understanding of basic concepts in geography.
- Demonstrating the coherent and systematic knowledge in the discipline of geography to deal with current issues and their solution.
- Display an ability to read and understand maps and topographic sheets to look at the various aspects on the space.
- Cultivate ability to evaluate critically the wider chain of network of spatial aspects from global to local level on various time scales as well.
- Recognize the skill development in Geographical studies program as part of career avenues in various fields like teaching, research and administration.

5.1 Learning Outcomes

Three distinct and new learning outcomes have been incorporated from each course such as to:

1. Understand the relevance of geographical knowledge to everyday life.
2. Getting the ability to communicate geographic information utilizing both lecture and practical exercises.
3. Inculcate the ability to evaluate geographical problems effectively.
4. Exhibit the skill in using geographical research tools including spatial statistics, qualitative analysis, cartography, remote sensing.

5.2 Course Level Learning Outcomes

The course level learning outcomes includes:

1. **Basic Concept:** The fundamental concepts and philosophical foundation of each course need to be discussed.
2. **Understanding Landscape:** An understanding of landscape at different levels needs to be discussed and understood for a thorough knowledge of spatial dimensions.
3. **Understanding Ecosystem Structure and Potential:** To comprehend the dynamic dimensions of human and ecosystem relationships.
4. **Human Perception and Behaviour:** Learning human perception and behaviour to acquire the geographical knowledge evolved over time, is essential to improve decision making process.
5. **Identification of Critical Problems and Issues:** Detection and identification of the critical problems and spatial issues are essential for sustainable development.
6. **Field Based Knowledge:** Field based knowledge is essential to understand the ground reality, spatial patterns and processes.
7. **Spatial Tools and Techniques:** The basics and applications of spatial tools and techniques are essential to make the studies more scientific and applicable.
8. **Statistical Techniques:** Use of statistical tools and techniques is essential for precise and objective geographic analysis and interpretation of complex phenomena.



9. **Applied Dimensions:** Identification of the critical problems and spatial issues form the core of the modern geography for various applications and decision making, including Surface and sub-surface Resources, Environment & Disaster Management, River Valley Planning, Industrial Hazards, Land Use Planning, and Urban and Regional Development together with Climate Change Mitigation and Adaptation, etc.
10. **Case Study based Analysis:** There is a need to understand the specificities of the problems in specific areas for their in-depth comprehension and solution. The case studies are essential, especially to find out the solutions to the lagging regions for their solutions based on firsthand information.
11. **Public Policy and Management:** Spatial aspects and dimensions are the integral parts in the policy making for sustainable regional development. Geographical knowledge needs to be inculcated for application and solutions of the various local, regional and national problems.
12. **Communication Skills:** Communication through models, analogue and digital maps, images and other geographical tools form the sound base for the dissemination of geographical information.

6. Course-Level Learning Outcomes Matrix

Outcomes	Core				DSE				SEC			
	1	2	3	4	5	6	7	8	9	10	11	12
Basic Concept	X	X	X	X	X	X	X	X	X	X	X	X
Understanding Landscape	X						X			X	X	X
Understanding Ecosystem structure and Potential				X	X	X	X	X	X			
Human Perception and Behaviour		X		X			X	X	X			
Identification of Critical Problems and Issues	X	X	X	X	X	X	X	X	X	X	X	X
Field Based Knowledge			X		X	X	X	X		X	X	X
Spatial Tools and Techniques			X							X	X	X
Statistical Techniques			X							X	X	X
Applied Dimensions	X	X	X		X	X		X	X	X	X	X
Case Study based Analysis				X	X	X	X		X	X	X	X
Public Policy and Management		X	X	X	X	X	X	X	X	X	X	X
Communication Skills	X	X	X	X	X	X	X	X	X	X	X	X

7. Geography Course Outcomes and SDGs

The global community has adopted the Sustainable Development Goals to ensure holistic and multifaceted development of human societies across the world. These goals adopted in 2015 were an ambitious upgradation of millennium development goals.

The Indian Geographical community aims to harness the trans-disciplinary nature of the



subject and link it with sustainable development goals through a range of multi-dimensional core and elective papers.

8. Teaching Learning Processes

Learning Outcomes based Curriculum Framework (LOCF) for geography incorporates dynamic processes including fundamental and modern techniques, contemporary paradigms such as global initiatives like Sustainable Development Goals (SDGs), Disaster Risk Reduction (DRR), Paris Climate Action and national initiatives like smart cities, food security, water security, energy security, biodiversity, disaster management, human health and wellbeing and livelihood security. The approaches are to make geography more scientific and societal-need oriented that could be the panacea of India's development. Geography uses scientific knowledge with the present focus that includes spatio-temporal analysis, skill development, GIScience, sustainable development and human security.

Learning is a challenging, engaging, and enjoyable activity. Learners should be encouraged to engage in a rigorous process of learning and self-discovery by adopting a highly focused and yet flexible approach to education. Each day learners should be encouraged to focus on key areas of the course and spend time on learning the course fundamentals and their application in life and society. In teaching and learning pedagogy, there should be a shift from domain or conclusions-based approach to the experiential or process-based approach.

Geography curriculum inculcates knowledge of essential concepts of physical and human geography together with appropriate techniques using lectures, tutorials, group discussion, presentation, assignment evaluation, lab work and field visits. Thus, pedagogy process includes:

- Identifying and explaining the physical and cultural characteristics globally and processes at varied spatio-temporal contexts.
- Understanding human-environment and nature-society interactions as well as various global environmental challenges.
- Analysing geographic information by using geo-spatial technologies.
- Responding towards the global and national initiatives.

Broad framework for teaching in the class includes:

1. Theory courses should have 6 hours per week for courses carrying 6 credits.
2. Tutorial group of each theory course should have a group size of 15 students.
3. Practical courses should have 12 hours per week for a group of 15 students.
4. Practical courses will not have tutorials.

The faculty should promote learning on a proportionate scale of 20:30:50 principle, where lectures (listening/hearing) constitute 20 per cent of the delivery; visuals (seeing) 30 per cent of the learning methods; and experience (doing/participating) 50 per cent. This ratio is subject to change as per institutional needs.

In order to achieve its objective of focused process based learning and holistic development, the Institution/University may use a variety of knowledge delivery methods:



1. Lectures

Lectures should be designed to provide the learners with interesting and fresh perspectives on the subject matter. Lectures should be interactive in a way that students work with their teachers to get new insights in the subject area, on which they can build their own bridges to higher learning.

2. Discussions

Discussions are critical components of learning, and can be used as a platform for students to be creative and critical with old and new ideas. Besides developing critiquing skills, arriving at consensus on various real life issues and discussion groups lead to innovative problem solving and, ultimately to success.

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5. Life Skills:

Life skills provide students opportunities to understand real life situations and scenarios (i.e. coping with disaster), and solve challenges in a controlled environment or make use of them in simulating cultural experiences by locating/transposing them in new (local, regional, national and international) situations.

6. Case Studies:

Case studies, wherever possible, should be encouraged in order to challenge students to find creative solutions to complex problems of individual, community, society and various aspects of knowledge domain concerned.

7. Role Playing

Assuming various roles, as in real life, is the key to understanding and learning. Students are challenged to make strategic decisions through role-plays, and to analyze the impact of these decisions. For this purpose, incidents from literary texts may also be used.

8. Team Work

Positive collaboration in the form of teamwork is critical in the classroom environment, for which outcomes. In the process of teamwork, learners will acquire the skills of managing knowledge acquisition and other collaborative learners, thereby understanding how to incorporate and balance personalities.

9. Study Tours/Field Visits:

Study Tours/ Field trips provide opportunities to the learners to test their in-class learning in real life situations as well as to understand the functional diversity in the learning spaces. These may include visits to sites of knowledge creation, preservation, dissemination and application. Institutions may devise their own methods to substitute/modify this aspect.

10. Academics-Industries Interface:

The course curriculum of BSc should encourage students for closer interaction with industries/collieries/corporate/research institutes, etc. for at least one week internship and training.



PART II

9. Introduction

The curriculum uses CBCS framework and organizes under Core Courses, Skill Enhancement Course, Discipline Specific Elective, Generic Elective Courses and Ability Enhancement Compulsory Courses. The core courses cover key areas of geography about which all students should have basic knowledge. These courses are grouped as follows:

- **Theory** – These courses build up the theoretical and conceptual foundations of geography.
- **Practical** – Three courses on Statistical Techniques in Spatial Analysis; Remote Sensing and GIS, GIScience and Research Methods and Fieldwork in Geography, Thematic mapping, will strengthen the methodological and practical foundations of geography.
- **Regional Approach** – Such courses focus on Geography of India / different states.
- **Application Oriented** – This includes disaster management, climate change, tourism geography, health and wellbeing, Industrial and rural development etc.

Each Course has three learning outcomes, five uniform contents and references incorporating a few Hindi books wherever possible.

9.1. Structure of B.Sc. (Program) IN GEOGRAPHY

Learning Outcomes based Curriculum Framework (LOCF) for Geography B.Sc (Program)

STRUCTURE OF B.SC (PROGRAM) IN GEOGRAPHY

A. Core Courses: (4) (4x6= 24 Credits)
B. Discipline Specific Elective courses (DSE) (any two) (2x6=12 Credits)
C. Ability Enhancement Compulsory Course (AECC) (As per UGC CBCS guidelines) (08 Credits)
D. Skill Enhancement Course (SEC) (4x4=16 Credits)
GRAND TOTAL (A+B+C+D): Total Courses: 10
Total Credits: (24+12+8+16=60)



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Abbreviated Degree	Discipline	Abbreviated Degree Programme	Semester	Course Name	Course Type	Course Code	Course Details	L - T - P	Course Credit	Sem Credit	CA Marks		ESE Marks		Total Marks	Sem Marks
											Practical	Theoretical	Practical	Theoretical		
BSCP	GEOGRAPHY	BSCPGE0	I	Physical Geography	C	BSCPGE0C101	CC-1(1)	5 - 1 - 0	6	22		10		40	50	100 + Marks of Disc.2 & Disc.3
				Discipline 2: CC-1(1) of Other Program Discipline		See Pool	CC-2(1)	See Pool	6		See Pool				Marks of Disc.2 & Disc.3	
				Discipline 3: CC-1(1) of Other Program Discipline		See Pool	CC-3(1)	See Pool	6							
				Environment Studies	AE	AEE101	AECC-1	4 - 0 - 0	4			10		40	50	
			II	Human Geography	C	BSCPGE0C201	CC-1(2)	5 - 1 - 0	6	22		10		40	50	100 + Marks of Disc.2 & Disc.3
				Discipline 2: CC-1(2) of Other Program Discipline		See Pool	CC-2(2)	See Pool	6		See Pool				Marks of Disc.2 & Disc.3	
				Discipline 3: CC-1(2) of Other Program Discipline		See Pool	CC-3(2)	See Pool	6							
				English/MIL Communication	AE	See Pool	AECC-2	4 - 0 - 0	4			10		40	50	
			III	Cartographic Techniques	C	BSCPGE0C301	CC-1(3)	5 - 1 - 0	6	22		10		40	50	100 + Marks of Disc.2 & Disc.3
				Discipline 2: CC-1(3) of Other Program Discipline		See Pool	CC-2(3)	See Pool	6		See Pool				Marks of Disc.2 & Disc.3	
				Discipline 3: CC-1(3) of Other Program Discipline		See Pool	CC-3(3)	See Pool	6							
				Regional Planning and Sustainable Development	SE	BSCPGE0SE301	SEC-1	4 - 0 - 0	4			10		40	50	
			IV	Environmental Geography	C	BSCPGE0C401	CC-1(4)	5 - 1 - 0	6	22		10		40	100	150 + Marks of Disc.2 & Disc.3
				Discipline 2: CC-1(4) of Other Program Discipline		See Pool	CC-2(4)	See Pool	6		See Pool				Marks of Disc.2 & Disc.3	
				Discipline 3: CC-1(4) of Other Program Discipline		See Pool	CC-3(4)	See Pool	6							
				Fundamentals of Remote Sensing and GPS	SE	BSCPGE0SE401	SEC-2	0 - 0 - 8	4		30		20		50	
			V	Systematic Geography of India	(Any One)	DSE	BSCPGE0DSE501	DSEC-1(1)	5 - 1 - 0	22		10		40	50	100 + Marks of DSEC
				World Economic Geography			5 - 1 - 0				10		40			
				Discipline 2: DSE-1(1) of Other Program Discipline	See Pool	DSEC-2(1)	See Pool	6	See Pool				Marks of DSEC chosen			
				Discipline 3: DSE-1(1) of Other Program Discipline	See Pool	DSEC-3(1)	See Pool	6								
				Field Techniques and Surveying Methods	SE	BSCPGE0SE501	SEC-3	0 - 0 - 8	4		30		20		50	
			VI	Disaster Risk Reduction	(Any One)	DSE	BSCPGE0DSE601	DSEC-1(2)	5 - 1 - 0	22		10		40	50	100 + Marks of DSEC
				Geography of Tourism			5 - 1 - 0				10		40			
				Discipline 2: DSE-1(2) of Other Program Discipline	See Pool	DSEC-2(2)	See Pool	6	See Pool				Marks of DSEC chosen			
Discipline 3: DSE-1(2) of Other Program Discipline	See Pool	DSEC-3(2)		See Pool	6											
Introduction to Geographic Information System	SE	BSCPGE0SE601		SEC-4	0 - 0 - 8	4	30		20			50				
				Total Credit and Marks						132					650 + Marks of Disc.2 & Disc.3 + Marks of DSEC	



UG Learning Outcome Based Curriculum Framework (LOCF) for Geography Prog

Abbreviations: C= Core; CC=Core Course; AE= Ability Enhancement; AECC= Ability Enhancement Compulsory Course; GE= Generic Elective; GEC= Generic Elective Course; SE= Skill Enhancement; SEC= Skill Enhancement Course; DSE= Discipline Specific Elective; DSEC= Discipline Specific Elective Course; CA= Continuous Assessment, ESE= End Semester Examination, L= Lecture Hour; T= Tutorial Hour and P= Practical Hour/ Field Work and NA= Not Applicable

Discipline-2: Students of a particular Program Course will choose Discipline-2 of any other Program Disciplines other than the Discipline-1. For example, if a student opts for Program Course in Geography then that student is required to opt Discipline-2 from Program Courses other than Geography. Once Discipline-2 is chosen in the 1st Semester the student is to continue with the same in the remaining semesters.

Discipline-3: Students of a particular Program Course will choose Discipline-3 of any other Discipline except Discipline 1 and Discipline 2 already chosen. Once Discipline-3 is chosen in the 1st Semester the student is to continue with the same in the remaining semesters.

Semesterwise Pool of Core Courses offered by this Discipline (when treated as Discipline 2 for other Program Courses across the faculties as far as practicable)

Discipline-2	Semester	Course Name		Course Type	Course Code	Course Details	L - T - P	Course Credit	Sem Credit	CA Marks		ESE Marks		Total Marks	Sem Marks
										Practical	Theoretical	Practical	Theoretical		
GEOGRAPHY	I	Physical Geography		C	BSCPGEOC101	CC-2(1)	5 - 1 - 0	6	NA		10		40	50	NA
	II	Human Geography			BSCPGEOC201	CC-2(2)	5 - 1 - 0	6			10		40	50	
	III	Cartographic Techniques			BSCPGEOC301	CC-2(3)	5 - 1 - 0	6			10		40	50	
	IV	Environmental Geography			BSCPGEOC401	CC-2(4)	5 - 1 - 0	6			10		40	50	

Semesterwise Pool of Core Courses offered by this Discipline (when treated as Discipline 3 for other Program Courses across the faculties as far as practicable)

Discipline-3	Semester	Course Name		Course Type	Course Code	Course Details	L - T - P	Course Credit	Sem Credit	CA Marks		ESE Marks		Total Marks	Sem Marks
										Practical	Theoretical	Practical	Theoretical		
GEOGRAPHY	I	Physical Geography		C	BSCPGEOC101	CC-3(1)	5 - 1 - 0	6	NA		10		40	50	NA
	II	Human Geography			BSCPGEOC201	CC-3(2)	5 - 1 - 0	6			10		40	50	
	III	Cartographic Techniques			BSCPGEOC301	CC-3(3)	5 - 1 - 0	6			10		40	50	
	IV	Environmental Geography			BSCPGEOC401	CC-3(4)	5 - 1 - 0	6			10		40	50	

Discipline Specific Elective Course (DSEC) -2: Students of a particular Program Course will choose DSEC-2 from DSEC-1 of Discipline 2.

Discipline Specific Elective Course (DSEC) -3: Students of a particular Program Course will choose DSEC-3 from DSEC-1 of Discipline 3.

Semesterwise Pool of Discipline Specific Elective Courses (DSEC) offered by this Discipline (when treated as Discipline 2 for other Program Courses across the faculties as far as practicable)

Discipline-2	Semester	Course Name		Course Type	Course Code	Course Details	L - T - P	Course Credit	Sem Credit	CA Marks		ESE Marks		Total Marks	Sem Marks	
										Practical	Theoretical	Practical	Theoretical			
GEOGRAPHY	V	Systematic Geography of India		DSE	BSCPGEODSE501	DSEC-2(1)	5 - 1 - 0	6	NA		10		40	50	NA	
		World Economic Geography			(Any One)		BSCPGEODSE502			5 - 1 - 0		10				40
	VI	Disaster Risk Reduction			(Any One)	BSCPGEODSE601	DSEC-2(2)	5 - 1 - 0		6		10		40		50
		Geography of Tourism				BSCPGEODSE602		5 - 1 - 0				10		40		

Semesterwise Pool of Discipline Specific Elective Courses (DSEC) offered by this Discipline (when treated as Discipline 3 for other Program Courses across the faculties as far as practicable)

Discipline-3	Semester	Course Name		Course Type	Course Code	Course Details	L - T - P	Course Credit	Sem Credit	CA Marks		ESE Marks		Total Marks	Sem Marks	
										Practical	Theoretical	Practical	Theoretical			
GEOGRAPHY	V	Systematic Geography of India		DSE	BSCPGEODSE501	DSEC-3(1)	5 - 1 - 0	6	NA		10		40	50	NA	
		World Economic Geography			(Any One)		BSCPGEODSE502			5 - 1 - 0		10				40
	VI	Disaster Risk Reduction			(Any One)	BSCPGEODSE601	DSEC-3(2)	5 - 1 - 0		6		10		40		50
		Geography of Tourism				BSCPGEODSE602		5 - 1 - 0				10		40		

Pool of Communication Courses offered as Ability Enhancement Compulsory Courses

Discipline	Semester	Course Name		Course Type	Course Code	Course Details	L - T - P	Course Credit	Sem Credit	CA Marks		ESE Marks		Total Marks	Sem Marks	
										Practical	Theoretical	Practical	Theoretical			
English/MIL Communication	II	English Communication		AE	AECCE201	AECC-2	4 - 0 - 0	4	NA		10		40	50	NA	
		Bengali Communication			(Any One)		AECCE201			4 - 0 - 0		10				40
		Hindi Communication			AECCH201		4 - 0 - 0				10		40			
		Urdu Communication			AECCH201		4 - 0 - 0				10		40			



B.Sc. Program in Geography





Semester-I

Course Name: Physical Geography

Course Code: BSCPGEOC101

Course Type: Core (Theoretical)	Course Details: CC-1(1) [CC-2(1) & CC-3(1)]		L-T-P: 5 - 1 - 0		
Credit: 6	Full Marks: 50	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		..	10	..	40

Course Learning Outcomes:

After the completion of course, the students will have 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.

Course Content:

1. Definition, Scope and Concept of Physical Geography
2. Lithosphere – Internal Structure of Earth based on Seismic Evidence, Classification and Basic Characteristics of Rocks, Folds and Faults, Plate Tectonics and its associated features
3. Fluvial Cycle of Erosion – Davis and Penck
4. Atmosphere – Thermal Structure and Layering of Atmosphere, Global Heat Balance, Global Circulation Pattern Origin and Characteristics of Monsoon, Origin and Characteristics Tropical Cyclones
5. Hydrosphere – Hydrological Cycle, Ocean Bottom Relief Features, Tides and Ocean Currents

Continuous Assessment: MCQ based Midterm test

References/ Suggested Readings:

1. Conserva, H. T., (2004): Illustrated Dictionary of Physical Geography, Author House, New York.
2. Gabler, R. E., Petersen, J. F. and Trapasso, L. M., (2007): Essentials of Physical Geography(8th Edition), Thompson, Brooks/Cole, New York..
3. Garrett, N., (2000): Advanced Geography, Oxford University Press, Oxford.
4. Goudie, A., (1984): The Nature of the Environment: An Advanced Physical Geography, BasilBlackwell Publishers, Oxford.
5. Hamblin, W. K., (1995): Earth's Dynamic System, Prentice Hall, N.J.
6. Husain, M., (2002): Fundamentals of Physical Geography, Rawat Publications, Jaipur.
7. Monkhouse, F. J. (2009): Principles of Physical Geography, Platinum Publishers, Kolkata.
8. Bloom, A. L., (2003): Geomorphology: A Systematic Analysis of Late Cenozoic Landforms, Prentice-Hall of India, New Delhi.



9. Bridges, E. M., (1990): World Geomorphology, Cambridge University Press, Cambridge.
 10. Das Gupta, A and Kapoor, A.N., (2001) Principles of Physical Geography, S.C. Chand & Company Ltd. New Delhi.
 11. Dayal, P., (1996) A Text book of Geomorphology. Shukla Book Depot, Patna.
 12. Huggett, R.J. (2007) Fundamentals of Geomorphology, Routledge, New York.
 13. Kale, V. S. and Gupta A., (2001): Introduction to Geomorphology, Orient Longman, Hyderabad.
 14. Khullar, D.R., (2012) Physical Geography, Kalyani Publishers, New Delhi.
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**Semester-II****Course Name: Human Geography****Course Code: BSCPGEOC201**

Course Type: Core (Theoretical)	Course Details: CC-1(2) [CC-2(2) & CC-3(2)]		L-T-P: 5-1-0		
Credit: 6	Full Marks: 50	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		.....	10	.....	40

Course Learning Outcomes:

After the completion of course, the students will have 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.

Course Content:

1. Human Geography: Definition, Nature, Major Sub-fields, Contemporary Relevance
2. Space and Society; Cultural Regions; Race; Religion and Language
3. Population: Population Growth and Demographic Transition Theory
4. World Population Distribution and Composition (Age, Gender and Literacy)
5. Settlements: Types and Patterns of Rural Settlements; Functional classification of Urban Settlements; Trends and Patterns of World Urbanisation; Problems of Indian urbanisation

Continuous Assessment: Assignment on any one local population/urban issue.

References/ Suggested Readings:

1. Chandna, R.C. (2010) Population Geography, Kalyani Publisher, New Delhi.
2. Daniel, P.A. and Hopkinson, M.F. (1989) The Geography of Settlement, Oliver & Boyd, London.
3. Ghosh, S. (2015) Introduction to Settlement Geography, Orient Black Swan Private Ltd., Kolkata.
4. Hussain, Majid (2012) Manav Bhugol. Rawat Publications, Jaipur.
5. Johnston, R; Gregory, D, Pratt, G. et al. (2008) The Dictionary of Human Geography, Blackwell Publication, New Jersey.
6. Jordan-Bychkov, et al. (2006) The Human Mosaic: A Thematic Introduction to Cultural Geography. W. H. Freeman and Company, New York.
7. Kaushik, S.D. (2010) Manav Bhugol, Rastogi Publication, Meerut.
8. Maurya, S.D. (2012) Manav Bhugol, Sharda Pustak Bhawan, Allahabad.



Semester-III

Course Name: Cartographic Techniques

Course Code: BSCPGEOC301

Course Type: Core (Theoretical)	Course Details: CC-1(3) [CC-2(3) & CC-3(3)]		L-T-P: 5-1-0		
Credit: 6	Full Marks: 50	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		...	10	....	40

Course Learning Outcomes:

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

1. Understand various types of maps and their elements.
2. Understand how projections are applied to prepare maps from the globe;
3. Learn prepare maps from geographic data and their interpretations.

Course Content:

1. Maps: Types, Elements and Uses
2. Map Scales: Types and Application, Reading Distances on a Map
3. Map Projections: Criteria for Choice of Projections; Attributes and Properties of: Zenithal Gnomonic Polar Case, Zenithal Stereographic Polar Case, Cylindrical Equal Area, Conical Projection with One-Standard Parallel.
4. Representation of Data: Dots, Choropleth, Isopleth and Flow Diagrams, Interpretation of Thematic Maps
5. Environmental Mapping: Bio-physical and Cultural Environment

Continuous Assessment: Project File containing each exercise from Topic 3 and 4.

References/ Suggested Readings:

1. Dent, B. D., (1999) Cartography: Thematic Map Design, (Vol. 1), McGrawHill, New York.
2. Gupta, K. K and Tyagi, V. C., (1992) Working with Maps, Survey of India, DST, New Delhi.
3. Misra, R.P., (2014) Fundamentals of Cartography (Second Revised and Enlarged Edition), Concept Publishing, New Delhi.
4. Robinson, A., (1953) Elements of Cartography, John Wiley, New Jersey.
5. Sharma, J. P., (2010) Prayogic Bhugol, Rastogi Publishers, Meerut.
6. Singh, R. L. and Singh, R. P. B., (1999): Elements of Practical Geography, Kalyani Publishers, New Delhi.
7. Singh, R. L., (1998) Prayogic Bhoogol Rooprekha, Kalyani Publications, New Delhi.
8. Steers, J. A., (1965) An Introduction to the Study of Map Projections, University of London, London.



Course Name: Regional Planning and Sustainable Development

Course Code: BSCPGEOSE301

Course Type: Skill Enhancement (Theoretical)	Course Details: SEC-1		L-T-P: 4-0-0		
Credit: 4	Full Marks: 50	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		.....	10	....	40

Course Learning Outcomes:

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

1. Understand the need of regional planning methodology.
2. Know the history of various planning strategies for balanced national development;
3. Capable of diagnosing the regional issues.

Course Content:

1. Regional Planning: Concepts, Need and Types; Delineation of Planning Regions
2. Models for Regional Planning: Growth Pole Theory; Growth Pole Theory; Core Periphery Model and Growth Foci Concept in Indian Context
3. Backward Regions and Regional Plans - Special Area Development Plans in India: DVC: Success and failures, NITI Aayog
4. Sustainable Development: Concept, Principles and Components
5. Sustainable Development Goals (SDGs): History, Global Challenges, Blueprint, Target by 2030

Continuous Assessment: Project on DVC: Success and failures.

References/ Suggested Readings:

1. Bajaj, Amrita and Ajay Kumar, (2018): Geography of Development: Indian Perspectives, Indian Pub. House, Jaipur.
2. Blij H. J. De, (1971): Geography: Regions and Concepts, John Wiley and Sons, New Jersey.
3. Claval, P.I, (1998): An Introduction to Regional Geography, Blackwell Publishers, Oxford.
4. Friedmann, J. and Alonso W. (1975): Regional Policy - Readings in Theory and Applications, MIT Press, Massachusetts.
5. Gore, C. G., (1984): Regions in Question: Space, Development Theory and Regional Policy,



Semester-IV

Course Name: Environmental Geography

Course Code: BSCPGEOC401

Course Type: Core (Theoretical)	Course Details: CC-1(4) [CC-2(4) & CC-3(4)]		L-T-P: 5-1-0		
Credit: 6	Full Marks: 50	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		.....	10	.....	40

Course Learning Outcomes:

After the completion of course, the students will have 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

Course Content:

1. Environmental Geography: Concepts and Approaches; Ecosystem – Concept and Structure; Ecosystem Functions: Concepts of food chain, food web, nutrient cycle and energy flow
2. Human-Environment Relationship in Equatorial, Desert, Mountain and Coastal Regions
3. Environmental Problems and Management: Air Pollution; Solid and Liquid Waste; Biodiversity Loss
4. Environmental Programmes and Policies: Developed Countries; Developing Countries
5. New Environmental Policy of India; Government Initiatives

Continuous Assessment: Assignment on case study related to any one environmental problem from Topic 3.

References/ Suggested Readings:

1. Anand, Subhash (2010) Solid Waste Management, Mittal Publication, New Delhi.
2. Casper, J.K. (2010) Changing Ecosystems: Effects of Global Warming. Info base Pub. New York.
3. Hudson, T. (2011) Living with Earth: An Introduction to Environmental Geology, PHI Learning Private Limited, New Delhi.
4. Kumaraswamy K., Alagappa Moses A., and M. Vasanthi (2018) Glimpses of Environmental Sciences, Notion Press, Chennai.
5. Miller, G.T. (2007) Living in the Environment: Principles, Connections, and Solutions, Brooks/ Cole Cengage Learning, Belmont.
6. Singh, R.B. (1993) Environmental Geography, Heritage Publishers, New Delhi.
7. Singh, R.B., Prokop, Pawel (Eds.) (2016) Environmental Geography of South Asia, Springer, Tokyo.
8. Singh, Savindra (2001). Paryavaran Bhugol, Prayag Pustak Bhawan, Allahabad. (*in Hindi*)



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

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

Course Name: Fundamentals of Remote Sensing and GPS

Course Code: BSCPGEOSE401

Course Type: Skill Enhancement (Practical)	Course Details: SEC-2		L-T-P: 0-0-8		
Credit: 4	Full Marks: 50	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		30	...	20	.....

Course Learning Outcomes:

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

1. Appreciate the development and uses of aerial and satellite remote sensing system and navigation satellite systems in India and other nations;
2. Understand the basics of EMR and energy interaction in atmosphere and on earth surface features;
3. Analyse and interpret the aerial and satellite data products and GNSS/GPS survey results.

Course Content:

1. Remote Sensing: Definition, Development, Platforms and Types
2. Aerial Photography: Principles, Types and Geometry
3. Satellite Remote Sensing: Principles, EMR Interaction with Atmosphere and Earth Surface; Satellites (Landsat and IRS) and Sensors
4. Interpretation and Application of Remote Sensing: Land use/ Land Cover
5. Global Positioning System (GPS) and Global Navigation Satellite System (GNSS): Principles and Uses

Continuous Assessment:

Practical Record:

- A project consisting of Four exercises will be done from, Aerial Photography, satellite images and navigation satellite positioning (scale, orientation and interpretation). (10 Marks)
- Preparation of any boundary map using GPS or Preparation of LULC map of a region. (20 Marks)

References/ Suggested Readings:

1. Campbell, J. B., (2007) Introduction to Remote Sensing, Guildford Press, New York.
2. Jensen, J. R., (2004) Introductory Digital Image Processing: A Remote Sensing Perspective, Prentice Hall, New Jersey.
3. Joseph, G. (2005) Fundamentals of Remote Sensing, Universities Press, Hyderabad.



4. Kumar, Dilip, Singh, R.B. and Kaur, Ranjeet (2019) Spatial Information Technology for Sustainable Development Goals, Springer, Basel.
 5. Lillesand, T. M., Kiefer, R. W. and Chipman J. W., (2004) Remote Sensing and Image Interpretation, Wiley, New Jersey. (*Wiley Student Edition*).
 6. Nag P. and Kudra, M., (1998) Digital Remote Sensing, Concept, New Delhi.
 7. Rees, W. G., (2001) Physical Principles of Remote Sensing, Cambridge University Press, Cambridge.
 8. Singh, R. B. and Murai, S., (1998) Space-informatics for Sustainable Development, Oxford and IBH Pub, New Delhi.
 9. Wolf, P. R. and Dewitt, B. A., (2000) Elements of Photogrammetry: With Applications in GIS, McGraw-Hill, New York.
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Semester-V

Course Name: Systematic Geography of India

Course Code: BSCPGEODSE501

Course Type: Discipline Specific Elective (Theoretical)	Course Details: DSEC-1(1) [DSEC-2(1) & DSEC-3(1)]		L-T-P: 5-1-0		
Credit: 6	Full Marks: 50	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		....	10	.....	40

Course Learning Outcomes:

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

1. Learn about physiography of India;
2. Understand the Indian demographic and settlement structure.
3. Study the economy and various types of resources in India.

Course Content:

1. Structure and Relief, Drainage, Climate of India
2. Size and Growth of Indian Population since 1901, Distribution, Literacy, Sex Ratio of Indian Population
3. Settlement System - Rural Settlement Types and Patterns, Urban Patterns
4. Resource Base – Livestock (Cattle and Fisheries), Power (Coal, and Hydro-electricity), Minerals (Iron Ore and Bauxite)
5. Economy – Agriculture (Rice, Wheat, Jute, Groundnut, Tea); Industries (Cotton Textile, Iron-Steel, Automobile), IT and service-based Industries

Continuous Assessment: MCQ Based Mid-term Test

References/ Suggested Readings:

1. Dave, Bharati, (2018): Mapping the Quality of Living Spaces in India, Indian Research Academy, New Delhi.
2. Hussain, M., (1992): Geography of India, Tata McGraw Hill Education, New York.
3. Mamoria, C. B., (1980): Economic and Commercial Geography of India, Shiva Lal Agarwala.
4. Miller, F. P., Vandome, A. F. and McBrewster, J., (2009): Geography of India: Indo-Gangetic Plain, Thar Desert, Major Rivers of India, Climate of India, Geology of India, Alphascript Publishing, New Delhi.
5. Nag, P. and Sengupta, S., (1992): Geography of India, Concept Publishing, New Delhi.
6. Pichamuthu, C. S., (1967): Physical Geography of India, National Book Trust, Delhi.
7. Rana, Tejbir Singh, (2015) Diversity of India, R.K. Books, New Delhi.



Course Name: World Economic Geography

Course Code: BSCPGEODSE502

Course Type: Discipline Specific Elective (Theoretical)	Course Details: DSEC-1(1) [DSEC-2(1) & DSEC-3(1)]		L-T-P: 5-1-0		
Credit: 6	Full Marks: 50	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		....	10	.....	40

Course Learning Outcomes:

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

- 1. Understand the basic concepts and approaches of economic geography.*
- 2. Examine the significance and relevance of economic theories and different economic activities.*
- 3. Understanding the pre-requisites of different economic activities.*

Course Content:

1. Economic Geography: Definition, Approaches and Fundamental Concepts; Patterns of Development
2. Locational Theories: Agriculture (Von Thunen), Industrial (Weber) and Services (Christaller)
3. Primary Activities: Subsistence Agriculture, Intensive Farming in Asia, Commercial Grain Farming in Europe, Plantation farming in Brazil and India, Commercial Dairy Farming in U.S.A, Commercial Fishing in China and India, and Mining (Iron Ore, Coal and Petroleum)
4. Secondary Activities: Cotton Textile Industry, Major Manufacturing Regions
5. Tertiary and Quaternary Activities: Modes of Transportation, Patterns of International Trade, and Information and Communication Technology Industry.

Continuous Assessment: Assignment on Coal Mining or any Major Manufacturing Region
References/ Suggested Readings:

1. Alexander, J. W., (1963): Economic Geography, Prentice-Hall Inc., Englewood Cliffs, New Jersey.
2. Bagchi-Sen, S. and Smith, H. L., (2006): Economic Geography: Past, Present and Future, Taylor and Francis, London.
3. Coe, N. M., Kelly P. F. and Yeung H. W., (2007): Economic Geography: A Contemporary Introduction, Wiley-Blackwell, New Jersey.
4. Combes, P., Mayer T. and Thisse J. F., (2008): Economic Geography: The Integration of Regions and Nations, Princeton University Press, New Jersey.
5. Durand, L., (1961): Economic Geography, Crowell Washington, D.C..
6. Hodder, B. W. and Lee, R., (1974): Economic Geography, Taylor and Francis, London.
7. Wheeler, J. O., (1998): Economic Geography, Wiley, New Jersey.
8. Willington, D. E., (2008): Economic Geography.

**Course Name: Field Techniques and Surveying Methods****Course Code: BSCPGEOSE501**

Course Type: Skill Enhancement (Practical)	Course Details: SEC-3		L-T-P: 0-0-8		
Credit: 4	Full Marks: 50	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		30	.....	20	.....

Course Learning Outcomes:

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

1. Conduct field work in physical and human geography, besides investigating socio-economic and environmental issues;
2. Develop tools to collect primary data from the field and interpret them meaningfully;
3. Prepare field report with suitable tables, maps and diagrams based on the data collected from the field and secondary sources.

Course Content:

1. Field work in Geographical Studies – Definition, Concept, Role, Value and Ethics of Field work.
2. Defining the Field and Identifying the Case Study – Rural / Urban / Physical / Human / Environmental, Types of data.
3. Field Techniques – Merits, Demerits and Selection of the Appropriate Technique
4. Surveying methods: Questionnaires (Open/ Closed / Structured / Non-Structured); Interview with Special Focus on Focused Group Discussions; Participatory Rural Appraisal (PRA).
5. Designing the Field Report – Aims and Objectives, Methodology, Analysis, Interpretation and Writing the Report.

Continuous Assessment:**Practical Record:** 20 Marks

1. Each student will prepare an individual report based on primary and secondary data collected during field work.
2. The duration of the field work should not exceed 10 days.
3. The word count of the report should be about 2500 to 4000 excluding figures, tables, photographs, maps, references and appendices. The total pages should not exceed 20 pages.
4. Students are advised to make use of GPS during observation and it report.
5. One copy of the report on A4 size paper should be submitted in soft binding.

Class Test: 10 Marks**References/ Suggested Readings:**

1. Creswell, J., (1994): Research Design: Qualitative and Quantitative Approaches, Sage Publications, California.



2. Dikshit, R. D. (2003). *The Art and Science of Geography: Integrated Readings*, Prentice-Hall of India, New Delhi.
 3. Evans, M., (1988): "Participant Observation: The Researcher as Research Tool" in *Qualitative Methods in Human Geography*, Eds. J. Eyles and D. Smith, Polity, Cambridge.
 4. Mukherjee, N., (1993). *Participatory Rural Appraisal: Methodology and Application*. Concept Publs. Co., New Delhi.
 5. Mukherjee, N., (2002). *Participatory Learning and Action: with 100 Field Methods*. Concept Pub. Co., New Delhi.
 6. Robinson, A., (1998): "Thinking Straight and Writing That Way", in *Writing Empirical Research Reports: A Basic Guide for Students of the Social and Behavioural Sciences*, eds. by F. Pryczak and R. Bruce Pryczak, Publishing, Los Angeles.
 7. *The Geographical Review* (2001) Special Issue on "Doing Fieldwork" 91:1-2, John Wiley, New Jersey.
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Semester-VI

Course Name: Disaster Risk Reduction

Course Code: BSCPGEODSE601

Course Type: Discipline Specific Elective (Theoretical)	Course Details: DSEC-1(2) [DSEC-2(2) & DSEC-3(2)]		L-T-P: 5-1-0		
Credit: 6	Full Marks: 50	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
	...	10	.....	40	

Course Learning Outcomes:

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

1. Acquire knowledge on concepts, types, distribution and mapping of disasters in India;
2. Understand the man-made disasters and human negligence in the context of environment;
3. Bring awareness about the preparedness, mitigation and processes of disaster risk reduction.

Course Content:

1. Disasters, Hazards, Risk, Vulnerability and Disasters: Definition and Concepts
2. Disasters in India: (a) Causes, Impacts and Distribution: Flood and Drought
3. Disasters in India: (b) Causes, Impacts and Distribution: Earthquake and Cyclone
4. Human induced disasters: Causes, Impacts and Distribution: Underground fire and land subsidence in colliery region
5. Disaster Risk Reduction: Mitigation and Preparedness, NDMA and NIDM; Community-Based Disaster Management; Do's and Don'ts during Disasters

Continuous Assessment: Assignment on any one disaster in India.

References/ Suggested Readings:

1. Government of India. (1997) Vulnerability Atlas of India. Building Materials & Technology Promotion Council, Ministry of Urban Development, Government of India, New Delhi.
2. Kapur, A. (2010) Vulnerable India: A Geographical Study of Disasters, Sage Publication, New Delhi.
3. Modh, S. (2010) Managing Natural Disaster: Hydrological, Marine and Geological Disasters, Macmillan, Delhi.
4. Singh, Jagbir (2007) "Disaster Management Future Challenges and Opportunities",. Publisher- I.K. International Pvt. Ltd New Delhi.



Course Name: Geography of Tourism

Course Code: BSCPGEODSE602

Course Type: Discipline Specific Elective (Theoretical)	Course Details: DSEC-1(2) [DSEC-2(2) & DSEC-3(2)]		L-T-P: 5-1-0		
Credit: 6	Full Marks: 50	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
	...	10	....	40	

Course Learning Outcomes:

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

1. Appreciate the basic concepts and geographical parameters of tourism;
2. Acquire knowledge on the recent trends and patterns of tourism development in India and other countries;
3. Understand the impacts of tourism on national, regional and local economy, environment and society.

Course Content:

1. Tourism: Concepts, Nature and Scope; Inter-Relationships between Tourism, Pilgrimage, Recreation and Leisure
2. Geographical Parameters of Tourism by Robinson; Type of Tourism: Nature Tourism, Cultural Tourism, Medical Tourism, Pilgrimage, Geo-tourism
3. Recent Trends of Tourism: International and Regional; Domestic (India); Eco- Tourism, Sustainable Tourism, Meetings, Incentives, Conventions and Exhibitions (MICE); Trends of Pilgrimage Tourism
4. Impacts of Tourism: Economy; Environment; Society
5. Tourism in India: World heritage sites Tourism Infrastructure; Case Studies of Himalaya, Desert and Coastal and Heritage Tourist places of West Bengal; National Tourism Policy

Continuous Assessment: Assignment on tourism prospect of West Bengal

References/ Suggested Readings:

1. Dhar, P.N. (2006) International Tourism: Emerging Challenges and Future Prospects. Kanishka, New Delhi.
2. Hall, M. and Stephen, P. (2006) Geography of Tourism and Recreation – Environment, Place and Space, Routledge, London.
3. Kamra, K. K. and Chand, M. (2007) Basics of Tourism: Theory, Operation and Practise, Kanishka Publishers, Pune.
4. Page, S. J. (2011) Tourism Management: An Introduction, Butterworth- Heinemann, Oxford
5. Raj, R. and Nigel, D. (2007) Morpeth Religious Tourism and Pilgrimage Festivals Management: An International perspective by, CABI, Cambridge(www.cabi.org).
6. Singh, Jagbir (2014) “Eco-Tourism, I.K. International Publisher. New Delhi.
7. Tourism Recreation and Research Journal, Center for Tourism Research and Development, Lucknow.



Course Name: Introduction to Geographic Information System

Course Code: BSCPGEOSE601

Course Type: Skill Enhancement (Practical)	Course Details: SEC-4		L-T-P: 0-0-8		
Credit: 4	Full Marks: 50	CA Marks		ESE Marks	
		Practical	Theoretical	Practical	Theoretical
		30	...	20	...

Course Learning Outcomes:

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

1. Appreciate the basic principles and components of GIS;
2. Apply raster and vector data structure for GIS analysis;
3. Analyse the basic resources, land use and urban related data using GIS software for meaningful interpretation.

Course Content:

1. Geographic Information System (GIS): Definition, Components and Principles
2. GIS Data Structures: Types (Spatial and Non-spatial), Raster and Vector Data Structure
3. GIS Data Analysis: Input; Geo-Referencing; Editing and Output; Overlays
4. Application of GIS in Urban Sprawl Natural Resource Management
5. Application of GIS in Land use/Land-cover

Continuous Assessment:

- i. **Practical Record:** A project file consisting of 4 exercises on latest version of QGIS software on above mentioned themes. (20 Marks)
- ii. **Class Test:** 10 Marks

References/ Suggested Readings:

1. Bhatta, B. (2010) Analysis of Urban Growth and Sprawl from Remote Sensing, Springer, BerlinHeidelberg.
2. Burrough, P.A., and McDonnell, R.A. (2000) Principles of Geographical Information System-Spatial Information System and Geo-statistics, Oxford University Press, Oxford.
3. Chauniyal, D.D. (2010) Sudur Samvedanevam Bhogolik Suchana Pranali, Sharda Pustak Bhawan, Allahabad.
4. Heywoods, I., Cornelius, S and Carver, S. (2006) An Introduction to Geographical Information system. Prentice Hall, New Jersey.
5. Jha, M.M. and Singh, R.B. (2008) Land Use: Reflection on Spatial Informatics Agriculture and Development, Vedams eBooks (P) Ltd., New Delhi.
6. Nag, P. (2008) Introduction to GIS, Concept India, New Delhi.
7. Sarkar, A. (2015) Practical Geography: A Systematic Approach. Orient Black Swan Private Ltd., New Delhi.
8. Singh, R.B. and Murai, S. (1998) Space Informatics for Sustainable Development, Oxford and IBH, New Delhi.