Annexure-II

Kurukshetra University, Kurukshetra
(Established by the State Legislature Act XII of 1956)
('A+' Grade, NAAC Accredited)

।। योगस्थः कुरु कर्माणि।।
समबुद्धि व योग युक्त होकर कर्म करो

(Perform Actions while Stead fasting in the State of Yoga)

DEPARTMENT OF GEOGRAPHY

CBCS CURRICULUM (2020 -21)
Program Name: B.Sc.with Geography
(For the Batches Admitted From 2020-2021)

OUTCOME BASEDEDUCATION SYSTEM

CBCS CURRICULUM (2020-21)
Program Name: B. Sc. with Geography
(For the Batches Admitted From 2020-2021)

VISION

Be globally acknowledged as a distinguished centre of academic excellence.

MISSION

To prepare a class of proficient scholars and professionals withingrained human values and commitment to expand the frontiers
of knowledge for the advancement of society.

DEPARTMENT VISION AND MISSION

VISION

- To become a model department as a Centre of quality education, research with innovation and recognition at National and International level for serving the society.

MISSION

- **M1:** To provide quality education to aspiring young minds for improving their skills, inculcating values, creating leadership qualities and enhance research with innovative methods.
- **M2:** To produce young geographers who would contribute in the areas of higher education, regional and national planning, development, environment, ethics and sustainable environment development.
- **M3:** To develop Teaching-Learning methods which can produce socially committed professionals whocontribute effectively in nation building.

Mapping of University Vision and Mission to Department Vision and Mission

Acclaimed as modal Centre of Learning and Research by

University Vision and Mission	**Department Vision and Mission**
High quality knowledge delivery through state of art infrastructure and ethical values to the students	**Yes**
Students excellence will make them professionals and innovators emerging as national and global leaders	**Yes**
Research and development will help in furtherance of faculty knowledge	**Yes**

Program Outcomes (PO) with Graduate Attributes

Programme outcomes are attributes of the graduates from the programme that are indicative of the graduates' ability and competence to work after being a qualified professional geographer upon graduation. Program outcomes are statements that describe what students are expected to know or do by the time of graduation, they must relate to knowledge and skills that the students acquire from the programme. The achievement of all outcomes indicates that the student is well prepared to achieve the program educational objectives down the road. The department ofgeography has the following eleven PO's. The course syllabi and the overall curriculum have been designed to achieve these outcomes:

Program Outcomes (PO) for Under Graduate Programmes (CBCS) in the Faculty of Sciences, Kurukshetra University, Kurukshetra

PO1	Knowledge	Capable of demonstrating comprehensive disciplinary knowledge gained during course of study
PO2	Communication	Ability to communicate effectively on general and scientific topics with the scientific community and with society at large
PO3	Problem Solving	Capability of applying knowledge to solve scientific and other problems
PO4	Individual and Team Work	Capable to learn and work effectively as an individual, and as a member or leader in diverse teams, in multidisciplinary settings.
PO5	Investigation of Problems	Ability of critical thinking, analytical reasoning and research-based knowledge including design of experiments, analysis and interpretation of data to provide conclusions
PO6	Modern Tool usage	Ability to use and learn techniques, skills and modern tools for scientific practices
PO7	Science and Society	Ability to apply reasoning to assess the different issues related to society and the consequent responsibilities relevant to the professional scientific practices
PO8	Life-Long Learning	Aptitude to apply knowledge and skills that are necessary for participating in learning activities throughout the life
PO9	Environment and Sustainability	Ability to design and develop modern systems which are environmentally sensitive and to understand the importance of sustainable development.
PO10	Ethics	Apply ethical principles and professional responsibilities in scientific practices
PO11	Project Management	Ability to demonstrate knowledge and understanding of the scientific principles and apply these to manage projects

Program Specific Outcomes (PSO's):

- **PSO1:** Basic understanding of fundamental concepts of geography as an earth science.
- **PSO2:** Clearly formulate and solve real life challenges with respect to human environment interactions.
- **PSO3:** Applications of fundamental principles of geography for the betterment of human society.
- **PSO4:** Acquisition of skills to effectively communicate the knowledge of geography to the society for safe guarding the physical environment.

Kurukshetra University Kurukshetra
Scheme of Examination and Syllabusfor B.Sc.
under Choice Based Credit System w.e.f. 2020-21 in phased manner
Subject: Geography

Semester	Course	Course Code	Nomenclature of the Paper	Credits	Hours/ week	Marks			Duration of Exam.
						Ext.	Int.	Total	
I	Core Course (CC)-I (Geography)	B-GEO-101	Geography of India	3	3	60	15	75	3 Hours
		B-GEO-102	Geography of Haryana	3	3	60	15	75	3 Hours
		B-GEO-103	Maps and scales (Practical)	2	4	40	10	50	3 Hours
II	Core Course (CC)-II (Geography)	B-GEO-201	Physical Geography- I	3	3	60	15	75	3 Hours
		B-GEO-202	Human Geography- I	3	3	60	15	75	3 Hours
		B-GEO-203	Representation of Physical Features (Practical)	2	4	40	10	50	3 Hours
III	Core Course (CC)-III (Geography)	B-GEO-301	Physical Geography-II	3	3	60	15	75	3 Hours
		B-GEO-302	Human Geography -II	3	3	60	15	75	3 Hours
		B-GEO-303	Representation of Climatic Data (Practical)	2	4	40	10	50	3 Hours
IV	Core Course (CC)-IV(Geography)	B-GEO-401	Economic Geography	3	3	60	15	75	3 Hours
		B-GEO-402	Statistical methods in Geography	3	3	60	15	75	3 Hours
		B-GEO-403	Maps and Diagrams (Practical)	2	4	40	10	50	3 Hours
	Skill Enhancement Course (SEC) (Geography)	B-GEO-SEC-404	Map Reading and Interpretation	2	2	40	10	50	$2\frac{1}{2}$ Hours
			OR						
		B-GEO-SEC-405	Introduction to Digital Mapping						$2\frac{1}{2}$ Hours
V	Discipline Specific Elective (DSE)-A(Geography)	B-GEO-DSE-501	Agricultural Geography	2	2	40	10	50	$2\frac{1}{2}$ Hours
			OR						
		B-GEO-DSE-502	Resource Geography						$2\frac{1}{2}$ Hours
		B-GEO-DSE-503	Settlement Geography	2	2	40	10	50	$2\frac{1}{2}$ Hours
			OR						
		B-GEO-DSE-504	Transport Geography						$2\frac{1}{2}$ Hours
		B-GEO-DSE-505	Map Projections (Practical)	2	4	40	10	50	3 Hours
			OR						
		B-GEO-DSE-506	Socio-economic Field Survey (Practical)						3 Hours
			OR						
		B-GEO-DSE-507	*MOOC course from Swayam Portal	**	**			**	
VI	Discipline Specific Elective (DSE)-B (Geography)	B-GEO-DSE-601	Fundamentals of Remote Sensing	2	2	40	10	50	$2\frac{1}{2}$ Hours
			OR						
		B-GEO-DSE-602	Introduction to Geo-spatial Technology						$2\frac{1}{2}$ Hours
		B-GEO-DSE-603	Geography of Asia	2	2	40	10	50	$2\frac{1}{2}$ Hours
			OR						
		B-GEO-DSE-604	Geography of Europe						$2\frac{1}{2}$ Hours
		B-GEO-DSE-605	Elementary Remote Sensing (Practical)	2	4	40	10	50	3 Hours
			OR						
		B-GEO-DSE-606	Physical Field Survey (Practical)						3 Hours
		Total		46	58	920	230	1150	

Note: Ext. = External Assessment Marks
Ent. = Internal Assessment Marks

Semester-I
Core Course Code:B-GEO-101
Core Course Name: Geography of India

Time: 3 Hours | **Total Marks : 75**
Credits: 3 | **External Assessment Marks : 60**
Internal Assessment Marks : 15

CourseOutcomes (COs):

B-GEO-101.1: Provides understanding about the physical structure of India.
B-GEO-101.2: Enrichment of understanding about the human resource endowment.
B-GEO-101.3: Acquaintance with geographical distribution of major resources.
B-GEO-101.4: Enhancement of knowledge about spatial distribution of industries, transport and communication.

Note for Paper Setters: Question 1 is compulsory comprising of six sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be eight long questions, two from each unit. The candidate has to answer four long questions, at least one question from each unit. All questions carry equal marks.

UNIT- I

1. Introduction: location, relief structure and drainage systems.
2. Bio-climatic environment: Climate, soils and natural vegetation.

UNIT-II

3. Population: distribution, density and growth.
4. Human habitats: types of human settlements and levels of urbanization.

UNIT-III

5. Agriculture: land resources, irrigation, cropping pattern and Green Revolution.
6. Energy and mineral resources: coal, petroleum, hydropower, iron ore, manganese and mica.

UNIT-IV

7. Industries: iron and steel, cotton textile, sugar and industrial regions of India.
8. Transport and trade: modes of transport, international trade.

Suggested Readings:

1. Deshpande, C D: India-A Regional Interpretation, Northern Book Depot, New Delhi, 1992.
2. Hussain Majid (2015): Geography of India, Mc Graw Hill Education.
3. Singh, Gopal: Geography of India, Atma Ram and Sons, 2006.
4. Shafi, M: Geography of South Asia, McMillan and Company, Calcutta, 2000.
5. Singh, R L (ed): India: A Regional Geography, National Geographical Society, India, Varanasi, 1971.
6. Spate, O H K and ATA Learmonth: Indian and Pakistan-Land, People and Economy, Methuen and Company, London, 1967.

Mapping of Course Outcomes to Program Outcomes (Geography of India)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-101.1	3.0	3.0	1.0	1.0	2.0	1.0	2.0	3.0	3.0	1.0	2.0
B-GEO-101.2	3.0	3.0	2.0	2.0	2.0	1.0	3.0	3.0	3.0	2.0	3.0
B-GEO-101.3	3.0	2.0	2.0	1.0	3.0	1.0	2.0	3.0	3.0	1.0	2.0
B-GEO-101.4	3.0	2.0	2.0	2.0	3.0	2.0	3.0	3.0	2.0	1.0	2.0
Average	3.0	2.5	1.8	1.5	2.5	1.3	2.5	3.0	2.8	1.3	2.3

Mapping of Course Outcomes to Program Specific Outcomes(Geography of India)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-101.1	3.0	2.0	3.0	2.0
B-GEO-101.2	3.0	3.0	3.0	3.0
B-GEO-101.3	3.0	2.0	3.0	2.0
B-GEO-101.4	3.0	3.0	3.0	2.0
Average	3.0	2.5	3.0	2.5

Semester-I
Core Course Code: B-GEO-102
Core Course Name: Geography of Haryana

Time: 3 Hours	**Total Marks : 75**
Credits: 3	**External Assessment Marks : 60**
	Internal Assessment Marks : 15

Course outcomes (COs):

B-GEO-102.1:Provide understanding about the bio physical environment of Haryana.
B-GEO-102.1: Enhancement of knowledge about population distribution and agricultural pattern.
B-GEO-102.1: Enrichment of knowledge about spatial distribution of industries, transport and communication.
B-GEO-102.1: Acquaintance with regional diversities and structure.

Note for Paper Setters: Question 1 is compulsory comprising of six sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be eight long questions, two from each unit. The candidate has to answer four long questions, at least one question from each unit. All questions carry equal marks.

UNIT- I

1. Introduction: administrative divisions, geographical personality and relief.
2. Bio physical environment: drainage, climate, soils and vegetation.

UNIT- II

3. Population: distribution, density, growth and settlements.
4. Agriculture: land use and cropping pattern, irrigation and problems of agriculture.

UNIT-III

5. Industry: distribution and pattern of major industries and industrial regions.
6. Transportation: modes of transportation and communication.

UNIT-IV

7. Geographical regions: Ahirwal, Mewat,Khadar and Bagar.
8. Regional diversities: environmental, economic and socio-cultural diversities.

Suggested Readings:

1. Census of India. 1981. Regional Division in Haryana.
2. Census of India. 2001. Administrative Atlas of Haryana.
3. Chaudhary, D.R. 2009. Haryana at Crossroads: problems and prospects. National Book Trust of India, New Delhi.
4. Singh, J. 1976. Agricultural Geography of Haryana, Vishal Publication, Kurukshetra.
5. Singh, R.L. 1971. India- A Regional Geography. National Geographical Society of India, Varanasi.
6. Verma, D.C. and Singh, S. 2001. Haryana-The Land and People. National Book Trust of India,New Delhi.

Mapping of Course Outcomes to Program Outcomes (Geography of Haryana)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-102.1	3.0	3.0	2.0	1.0	3.0	1.0	3.0	3.0	3.0	2.0	2.0
B-GEO-102.2	3.0	3.0	3.0	2.0	3.0	2.0	2.0	3.0	3.0	1.0	2.0
B-GEO-102.3	3.0	3.0	2.0	2.0	3.0	1.0	2.0	3.0	2.0	1.0	3.0
B-GEO-102.4	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0
Average	3.0	3.0	2.5	1.8	3.0	1.8	2.5	3.0	2.8	1.5	2.5

Mapping of Course Outcomes to Program Specific Outcomes(Geography of Haryana)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-102.1	3.0	3.0	2.0	3.0
B-GEO-102.2	3.0	3.0	2.0	2.0
B-GEO-102.3	3.0	3.0	3.0	2.0
B-GEO-102.4	3.0	3.0	3.0	3.0
Average	3.0	3.0	2.5	2.5

Semester-I
Core Course Code: B-GEO-103
Core Course Name: Maps and Scales (Practical)

Time: 3 Hours | **Total Marks : 50**
Credits: 2 | **External Assessment Marks : 40**
Internal Assessment Marks : 10

Course outcomes (COs):

B-GEO-103.1:Knowledge about cartographic skills.
B-GEO-103.2: Provides understanding about map scales.
B-GEO-103.3: Measurement skills of distances and areas on maps.
B-GEO-103.4: Enhancement of knowledge about enlargement and reduction of maps.

Note for Paper Setters: There will be four questions in all and candidate has to attempt three exercises.

Distribution of Marks for Evaluation

Exercise = 24 **File Record = 08** **Viva-voce = 08**

1. Introduction to Cartography.
2. Maps and their types.
3. Map Scales.
   (i) Methods of Expressing a scale — 2 exercise
   (ii) Conversion of Statement of Scale into R.F. and vice-versa. — 1 exercise
   (iii) Plain Scale (km and mile) — 1 exercise
   (iv) Comparative Scale — 2 exercise
   (v) Diagonal Scale — 2 exercise
4. Measurement of Distances and Areas on Maps — 2 exercise
5. Enlargement and Reduction of Maps — 2 exercise

Suggested Readings:

1. F.J. Monkhouse and H.R. Wilkinson (1972) Maps and Diagrams, Methuen and Co. Ltd., London
2. L.R. Singh and Raghuvander Singh (1973), Map Work and Practical Geography, Central Book Depot, Allahabad.
3. R.L. Singh and P.K. Dutt (1968), Elements of Practical Geography, Students Friends, Allahabad.
4. Singh Gopal (2004). Map Work and Practical Geography, Vikas Publication House.

Mapping of Course Outcomes to Program Outcomes (Maps and Scales-Practical)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-103.1	3.0	1.0	1.0	1.0	1.0	2.0	1.0	3.0	1.0	1.0	1.0
B-GEO-103.2	3.0	2.0	1.0	1.0	2.0	3.0	2.0	3.0	1.0	1.0	2.0
B-GEO-103.3	3.0	2.0	2.0	2.0	3.0	3.0	2.0	3.0	1.0	1.0	3.0
B-GEO-103.4	3.0	3.0	2.0	2.0	3.0	3.0	3.0	3.0	1.0	2.0	3.0
Average	3.0	2.0	1.5	1.5	2.3	2.8	2.0	3.0	1.0	1.3	2.3

Mapping of Course Outcomes to Program Specific Outcomes(Maps and Scales-Practical)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-103.1	3.0	1.0	2.0	1.0
B-GEO-103.2	3.0	1.0	3.0	2.0
B-GEO-103.3	3.0	2.0	3.0	2.0
B-GEO-103.4	3.0	3.0	3.0	3.0
Average	3.0	1.8	2.8	2.0

Semester-II
Core Course Code: B-GEO-201
Core Course Name: Physical Geography-I

Time: 3 Hours | **Total Marks : 75**
Credits: 3 | **External Assessment Marks : 60**
Internal Assessment Marks : 15

Course outcomes (COs):

B-GEO-201.1:Provides knowledge about the basics of physical geography
B-GEO-201.2: Enrichment of knowledge about tectonic activities.
B-GEO-201.3: Enhancement of knowledge about processes controlling weathering and mass movement
B-GEO-201.4: Provides ability to understand the processes and patterns of erosion.

Note for Paper Setters: Question 1 is compulsory comprising of six sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be eight long questions, two from each unit. The candidate has to answer four long questions, at least one question from each unit. All questions carry equal marks.

UNIT-I

1. Definition, nature, scope and fields of physical geography.
2. Interior of the earth, geological time scale and rocks.

UNIT-II

3. Earth movements; earth quakes and volcanoes.
4. Wegner's theory of continental drift and Plate tectonic theory.

UNIT-III

5. Weathering; causes and its types.
6. Mass-movements; causes, its types and impacts.

UNIT-IV

7. Concept of cycle of erosion
8. Landforms: wind, river, underground water and glaciers

Suggested Readings:

1. Bloom A.L. 1998. Geomorphology-A Systematic Analysis of Late Cenozoic Landforms. Prentice Hall of India, New Delhi, India.
2. Sharma H.S. Perspective in Geomorphology, Concept, New Delhi 1980.
3. Singh Savinder, Geomorphology, Prayag Publication, Allahabad 1998.
4. Singh Savinder, Physical Geography Prayag Publication, Allahabad, 1998.
5. Sparks B.W. Geomorphology, Longman, London, 1960.
6. Thornbury W.D. 1969 Principles of Geomorphology, New York, John Wiley & Sons.

Mapping of Course Outcomes to Program Outcomes (Physical Geography-I)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-201.1	3.0	2.0	2.0	1.0	3.0	2.0	2.0	3.0	3.0	1.0	1.0
B-GEO-201.2	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0
B-GEO-201.3	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	2.0	3.0
B-GEO-201.4	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	1.0	3.0
Average	3.0	2.8	2.8	2.3	3.0	2.3	2.8	3.0	3.0	1.8	2.5

Mapping of Course Outcomes to Program Specific Outcomes(Physical Geography-I)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-201.1	3.0	2.0	1.0	1.0
B-GEO-201.2	3.0	3.0	3.0	3.0
B-GEO-201.3	3.0	3.0	3.0	3.0
B-GEO-201.4	3.0	3.0	3.0	3.0
Average	3.0	2.8	2.5	2.5

Semester-II
Core Course Code:B-GEO-202
Core Course Name: Human Geography-I

Time: 3 Hours	**Total Marks : 75**
Credits: 3	**External Assessment Marks : 60**
	Internal Assessment Marks : 15

Course outcomes (COs):

B-GEO-202.1:Provides knowledge about the fundamentals of human geography.
B-GEO-202.2: Enrichment of knowledge about distribution of races and tribes in the world.
B-GEO-202.3: Acquaint with religions and their distribution in the world.
B-GEO-202.4: Familiarization with different languages of the world and their geographical distribution.

Note for Paper Setters: Question 1 is compulsory comprising of six sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be eight long questions, two from each unit. The candidate has to answer four long questions, at least one question from each unit. All questions carry equal marks.

UNIT-I

1. Nature and scope of human geography, branches of human geography.
2. Human-environment relationship: environmental determinism, possibilism and ecological approach.

UNIT – II

3. Human race: Meaning, classification of races and their global diffusion and distribution.
4. Tribe: Definition, classification and global distribution; environmental adaptation by Eskimo, Bushman, Gonds and Gujjars.

UNIT – III

5. Religion: Meaning, nature, classification and evolution.
6. Geographical distribution of religions: Christianity, Islam, Hinduism, Buddhism and Judaism.

UNIT-IV

7. Language and dialects: nature and classification of world languages.
8. Global distribution of major languages: English, Latin, Arabic, Mandarin and Hindi.

Suggested Readings:

1. Agarwal, A et al: The Citizen's Fifth Citizen's Report, Centre for Science & Environment, New Delhi, 1999.
2. Alexander, John. W.: Economic Geography, Prentice Hall of India Ltd., New Delhi, 1988.
3. Bergwan, Edward E: Human Geography: Culture Connections and Landscape, Prentice-Hall, New Jersey, 1985.
4. Carr, M. Patterns: Process and Change in Human Geography, McMillan Education, London, 1987.
5. Chandna, R.C.: A Geography of Population: Concepts, Determinants and Patterns, Kalyani Publishers, New Delhi, 1986.
6. DeBlij, H. J.: Human Geography, Culture, Society and Space, John Wiley, New York, 1996.
7. Fellman, J.L.: Human Geography-Landscapes of Human Activities, Brown and Benchman Pub., USA, 1997.
8. Hussain, M.Human Geography, Rawat, Publication, Jaipur, 2018.
9. McBride, P.J.: Human Geography; Systems Patterns and Change, Nelson, UK and Canada, 1996.
10. Michael, C.: New Patterns: Process and Change in Human Geography, Nelson, 1996.
11. Singh, N.A Text Book of Human Geography, Rajesh Publishing, 2015.
12. Sharma,Y.K.Human geography, Narain publishers, 2017.

Mapping of Course Outcomes to Program Outcomes (Human Geography-I)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-202.1	3.0	2.0	1.0	1.0	2.0	1.0	1.0	3.0	2.0	1.0	1.0
B-GEO-202.2	3.0	3.0	2.0	1.0	3.0	1.0	2.0	3.0	2.0	2.0	2.0
B-GEO-202.3	3.0	3.0	2.0	2.0	3.0	1.0	2.0	3.0	2.0	2.0	2.0
B-GEO-202.4	3.0	3.0	2.0	2.0	3.0	1.0	2.0	3.0	2.0	2.0	2.0
Average	3.0	2.8	1.8	1.5	2.8	1.0	1.5	3.0	2.0	1.8	1.8

Mapping of Course Outcomes to Program Specific Outcomes(Human Geography-I)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-202.1	3.0	2.0	2.0	1.0
B-GEO-202.2	3.0	2.0	3.0	3.0
B-GEO-202.3	3.0	2.0	3.0	3.0
B-GEO-202.4	3.0	2.0	3.0	3.0
Average	3.0	2.0	2.8	2.5

Semester-II
Core Course Code:B-GEO-203
Core Course Name: Representation of Physical Features (Practical)

Time: 3 Hours	**Total Marks : 50**
Credits: 2	**External Assessment Marks : 40**
	Internal Assessment Marks : 10

Course outcomes (COs):

B-GEO-203.1: Knowledge about different types of topographical maps.
B-GEO-203.2: Provides understanding about methods of relief representation.
B-GEO-203.3:Enhancement of skills of relief representation.
B-GEO-203.4:Knowledge of drawing of landform profiles.

Note for Paper Setters: There will be four questions in all and candidate has to attempt three exercises.

Distribution of Marks for Evaluation

Exercise = 24 **File Record = 08** **Viva-voce = 08**

1.	Introduction to Topographical Sheets India and adjacent countries Degree Sheet Half Degree Sheet Quarter Degree Sheet Conventional Signs	3 exercise
2.	Methods of representing relief	1 exercise
3.	Representation of Topographical features by contours. Slopes (Concave, convex, undulating and terraced) Valleys (V Shaped, U shaped, Gorge, Re-entrant) Ridges (Conical hill, Volcanic hill, Plateau, Escarpment) Complex features (waterfall, sea cliff, overhanging cliff, Fiord coast)	4 exercise
4.	Drawing of Profiles	5 exercise
(a)	Cross Profiles: Serial, superimposed, projected and composite profiles.	
(b)	Longitudinal profiles	

Suggested Readings:

1. F.J. Monkhouse and H.R. Wilkinson (1972) Maps and Diagrams, Methuen and Co. Ltd., London
2. L.R. Singh and Raghuvander Singh (1973), Map Work and Practical Geography, Central Book Depot, Allahabad.
3. R.L. Singh and P.K. Dutt (1968), Elements of Practical Geography, Students Friends, Allahabad.
4. Singh Gopal (2004), Map Work and Practical Geography, Vikas Publication House.

Mapping of Course Outcomes to Program Outcomes (Representation of Physical Features-Practical)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-203.1	3.0	2.0	1.0	2.0	3.0	2.0	2.0	3.0	1.0	2.0	3.0
B-GEO-203.2	3.0	3.0	3.0	3.0	3.0	2.0	2.0	3.0	1.0	2.0	3.0
B-GEO-203.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	3.0
B-GEO-203.4	3.0	2.0	3.0	2.0	2.0	2.0	2.0	3.0	3.0	2.0	3.0
Average	3.0	2.5	2.5	2.5	2.8	2.3	2.3	3.0	1.8	2.0	3.0

Mapping of Course Outcomes to Program Specific Outcomes(Representation of Physical Features-Practical)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-203.1	3.0	2.0	3.0	3.0
B-GEO-203.2	3.0	3.0	3.0	3.0
B-GEO-203.3	3.0	3.0	3.0	3.0
B-GEO-203.4	3.0	3.0	3.0	3.0
Average	3.0	2.8	3.0	3.0

Semester-III
Core Course Code: B-GEO-301
Core Course Name: Physical Geography-II

Time: 3 Hours	**Total Marks : 75**
Credits: 3	**External Assessment Marks : 60**
	Internal Assessment Marks : 15

Course outcomes (COs):

B-GEO-301.1:Provides knowledge about the basics of climatology and oceanography.
B-GEO-301.2: Enrichment of knowledge about atmospheric circulation and humidity.
B-GEO-301.3: Augmentation of knowledge about weather disturbances.
B-GEO-301.4: Familiarization with the oceanic floor and circulation.

Note for Paper Setters: Question 1 is compulsory comprising of six sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be eight long questions, two from each unit. The candidate has to answer four long questions, at least one question from each unit. All questions carry equal marks.

UNIT-I

1. Weather and Climate; composition and structure of atmosphere.
2. Global heat budget and distribution of temperature.

UNIT-II

3. Atmospheric pressure: distribution, pressure belts, planetary winds and monsoon.
4. Humidity: measurement and variables, processes of evaporation, condensation and precipitation.

UNIT-III

5. Air masses and fronts: classification, types and their characteristics.
6. Weather disturbances: tropical and extra-tropical cyclones.

UNIT-IV

7. Oceanic relief: Pacific, Atlantic and Indian Oceans.
8. Distribution of salinity and oceanic circulation (tides and currents)

Suggested Readings:

1. Barry, RG and Chorley R.J., Atmosphere, Weather and Climate, Routledge, 1998.
2. Critchfield, H., General Climatology, Prentice-Hall of India, 2002.
3. King, C. Oceanography for Geographers, Edward Arnold, London, 1975.
4. Trewartha, GT: An Introduction to Climate, Mc-Graw Hill, New York, 1981.
5. Trewartha, G.T., The Earth's Problems Climates, University of Wisconsin Press, USA.

Mapping of Course Outcomes to Program Outcomes (Physical Geography-II)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-301.1	3.0	3.0	2.0	2.0	1.0	1.0	2.0	3.0	2.0	1.0	2.0
B-GEO-301.2	3.0	3.0	2.0	2.0	2.0	1.0	2.0	3.0	2.0	1.0	2.0
B-GEO-301.3	3.0	3.0	2.0	2.0	2.0	1.0	2.0	3.0	2.0	1.0	2.0
B-GEO-301.4	3.0	3.0	2.0	2.0	1.0	1.0	2.0	3.0	2.0	1.0	2.0
Average	3.0	3.0	2.0	2.0	1.5	1.0	2.0	3.0	2.0	1.0	2.0

Mapping of Course Outcomes to Program Specific Outcomes(Physical Geography-II)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-301.1	3.0	1.0	1.0	3.0
B-GEO-301.2	3.0	1.0	1.0	3.0
B-GEO-301.3	3.0	1.0	1.0	3.0
B-GEO-301.4	3.0	1.0	1.0	3.0
Average	3.0	1.0	1.0	3.0

Semester-III
Core Course Code:B-GEO-302
Core Course Name:Human Geography-II

Time: 3 Hours	**Total Marks : 75**
Credits: 3	**External Assessment Marks : 60**
	Internal Assessment Marks : 15

Course outcomes (COs):

B-GEO-302.1:Provides awareness about the population distribution and density.
B-GEO-302.2: Augmentation of knowledgeabout the growth, fertility and mortality rates.
B-GEO-302.3: Familiarization with age and sex composition of population and literacy rates
B-GEO-302.4: Development of ability to understand the process of urbanization and its impacts.

Note for Paper Setters: Question 1 is compulsory comprising of six sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be eight long questions, two from each unit. The candidate has to answer four long questions, at least one question from each unit. All questions carry equal marks.

UNIT- I

1. Distribution and determinants of world population
2. Density of population: meaning, types, world pattern and temporal change.

UNIT- II

3. Growth rate of population: world pattern and trends.
4. Fertility and mortality rates: world pattern and determinants

UNIT- III

5. Age and sex composition of world population; comparison of developed and developing countries.
6. Literacy: Definition, world pattern of literacy rate, its determinants and impacts.

UNIT- IV

7. Urban settlements: origin, classification and functions of towns.
8. Urbanization pattern in the world; determinants and impacts of urbanization.

Suggested Readings:

1. Agarwal, A et al: The Citizen's Fifth Citizen's Report, Centre for Science & Environment, New Delhi, 1999.
2. Alexander, John. W.: Economic Geography, Prentice Hall of India Ltd., New Delhi, 1988.
3. Bergwan, Edward E: Human Geography: Culture Connections and Landscape, Prentice-Hall, New Jersey, 1985.
4. Carr, M. Patterns: Process and Change in Human Geography, McMillan Education, London, 1987.
5. Carter, H.: The study of Urban Geography, Edward Arnold, London, 1972.
6. Chandna, R.C.: A Geography of Population: Concepts, Determinants and Patterns, Kalyani Publishers, New Delhi, 2016.
7. DeBlij, H. J.: Human Geography, Culture, Society and Space, John Wiley, New York, 1996.
8. Fellman, J.L.: Human Geography-Landscapes of Human Activities, Brown and Benchman Pub., USA, 1997.
9. Hassan, I.: Population Geography: A Systematic Exposition, Routledge, London.
10. McBride, P.J.: Human Geography; Systems Patterns and Change, Nelson, UK and Canada, 1996.
11. Michael, C.: New Patterns: Process and Change in Human Geography, Nelson, 1996.
12. Qazi, S.A.: Population Geography, APH publishers, 2010.
13. Ramachandra,R.: Urbanization and Urban System in India, Oxford, London, 1992.

Mapping of Course Outcomes to Program Outcomes (Human Geography-II)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-302.1	3.0	3.0	2.0	3.0	1.0	1.0	2.0	3.0	2.0	2.0	2.0
B-GEO-302.2	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	3.0
B-GEO-302.3	3.0	2.0	2.0	3.0	2.0	1.0	2.0	3.0	2.0	2.0	2.0
B-GEO-302.4	3.0	3.0	2.0	2.0	1.0	1.0	2.0	3.0	2.0	2.0	2.0
Average	3.0	2.8	2.3	2.8	1.8	1.5	2.3	3.0	2.0	2.0	2.3

Mapping of Course Outcomes to Program Specific Outcomes(Human Geography-II)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-302.1	3.0	3.0	3.0	3.0
B-GEO-302.2	3.0	3.0	3.0	3.0
B-GEO-302.3	3.0	3.0	3.0	3.0
B-GEO-302.4	3.0	3.0	3.0	3.0
Average	3.0	3.0	3.0	3.0

Semester-III
Core Course Code: B-GEO-303
Core Course Name: Representation of Climatic Data (Practical)

Time: 3 Hours	**Total Marks : 50**
Credits: 2	**External Assessment Marks : 40**
	Internal Assessment Marks : 10

Course outcomes (COs):

B-GEO-303.1:Capability of measurement of climatic data.
B-GEO-303.2: Ability to represent the temperature and rainfall data.
B-GEO-303.3:Development of skill to read and interpret the weather maps.
B-GEO-303.4: Acquaintance with skills of chain and tape survey.

Note for Paper Setters: There will be four questions in all and candidate has to attempt three exercises.

Distribution of Marks for Evaluation

Exercise = 24 **File Record = 08** **Viva-voce = 08**

1. Measurement of temperature, rainfall, pressure and humidity.
2. Representation of temperature and rainfall.
   - (i) Line and Bar Graph — 1 exercise
   - (ii) Distribution of temperature — 1 exercise
   - (iii) Distribution of rainfall — 1 Exercise.
   - (iv) Hythergraph — 1 exercise.
   - (v) Rainfall deviation diagram — 1 exercise.
3. Climograph (wet and dry places) — 2 exercise.
4. Distribution of pressure — 2 Exercise.
5. Weather map Interpretation (January & July) — 2 exercise.
6. Chain and tape survey — 2 Exercise.

Suggested Readings

1. Khan, A.A. 1996. Text Book of Practical Geography, Concept, New Delhi.
2. Lawrence, GRP. 1968. Cartographic Methods, Methuen, London.
3. Monkhouse, F.J. and Wilkinson, H.R1994. Maps and Diagrams, Methuen, London.
4. Mishra R.P. and Ramesh A. 1999. Fundamentals of Cartography, Concept Publishing Company, New Delhi.
5. Robinson, A.H. et.al. Elements of Cartography, John Wiley & Sons, 1995.
6. Singh, R.L., 1979. Elements of Practical Geography, Kalyani Publisher, New Delhi.
7. Sarkar, A.K 1997: Practical Geography-A Systematic Approach, Orient Longman, Calcutta.

Mapping of Course Outcomes to Program Outcomes (Representation of Climatic Data-Practical)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-303.1	3.0	3.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0
B-GEO-303.2	3.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0
B-GEO-303.3	3.0	3.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0
B-GEO-303.4	3.0	2.0	1.0	3.0	1.0	2.0	1.0	1.0	1.0	1.0	1.0
Average	3.0	2.8	2.0	2.3	1.8	2.0	1.8	2.5	1.8	1.8	1.8

Mapping of Course Outcomes to Program Specific Outcomes(Representation of Climatic Data-Practical)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-303.1	3.0	2.0	2.0	3.0
B-GEO-303.2	3.0	3.0	3.0	3.0
B-GEO-303.3	3.0	3.0	3.0	3.0
B-GEO-303.4	2.0	2.0	2.0	2.0
Average	2.8	2.5	2.5	2.8

Semester-IV
Core Course Code:B-GEO-401
Core Course Name: Economic Geography

Time: 3 Hours	**Total Marks : 75**
Credits: 3	**External Assessment Marks : 60**
	Internal Assessment Marks : 15

Course outcomes (COs):

B-GEO-401.1: Provides knowledge about the fundamental concepts of economic geography.
B-GEO-401.2: Acquisition of knowledge about resources and their conservation.
B-GEO-401.3: Enrichment of knowledge about distribution of crops, minerals and energy resources.
B-GEO-401.4: Acquaintance with global industries, transport, communication and trade.

Note for Paper Setters: Question 1 is compulsory comprising of six sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be eight long questions, two from each unit. The candidate has to answer four long questions, at least one question from each unit. All questions carry equal marks.

UNIT- I

1. Nature and scope of economic geography and its relationship with economics.
2. Classification of economic activities and their impact on environment.

UNIT- II

3. Natural resources: types, bases of classification.
4. Utilization and conservation of natural resources.

UNIT- III

5. World distribution of food crops (rice and wheat), commercial crops (cotton and sugarcane) and plantation crops (tea and coffee).
6. World distribution and production of coal, petroleum and natural gas, iron ore and bauxite

UNIT- IV

7. World distribution and production of iron and steel industry, textile industry, sugar industry and automobile industry.
8. Transport, communication and trade: geographical factors in their development, major modes of water, land and air transport, recent trends in international trade.

Suggested Readings:

1. Gautam, A. 2010. Advanced Economic Geography. Sharda Pustak Bhawan, Allahabad.
2. Hartshorne, T. A. and Alexander, J. W. 2001. Economic Geography. Prentice Hall of India.New Delhi.
3. Hudson, R. 2005. Economic Geography. Sage Publication, New Delhi.
4. Jones, C. F. and Drakenwarld, G. G. Economic Geography. The Macmillan and Company.New York.
5. Knowled, R. and Wareing, J. 1992. Economic and Social Geography. Rupa and Company, Calcutta.
6. Knox, P. 2003. The Geography of World Economy. Arnold, London.
7. Saxena, H.M. 2013. Economic Geography. Rawat Publications, Jaipur.
8. Thomas, RS. 1962. The Geography of Economic Activities. McGraw Hill, New York.
9. Wheeler, J.O. and Muller, P.O. 1995. Economic Geography. John Wiley and Sons. New York.

Mapping of Course Outcomes to Program Outcomes (Economic Geography)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-401.1	3.0	2.0	1.0	1.0	1.0	1.0	1.0	3.0	2.0	2.0	2.0
B-GEO-401.2	3.0	3.0	3.0	2.0	1.0	1.0	2.0	3.0	2.0	2.0	2.0
B-GEO-401.3	3.0	2.0	2.0	2.0	2.0	1.0	2.0	3.0	2.0	2.0	2.0
B-GEO-401.4	3.0	3.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0
Average	3.0	2.5	2.0	1.8	1.5	1.3	1.8	3.0	2.0	2.0	2.0

Mapping of Course Outcomes to Program Specific Outcomes(Economic Geography)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-401.1	2.0	1.0	2.0	1.0
B-GEO-401.2	3.0	3.0	3.0	3.0
B-GEO-401.3	3.0	2.0	3.0	3.0
B-GEO-401.4	3.0	2.0	3.0	3.0
Average	2.8	2.0	2.8	2.5

Semester-IV
Core Course Code: B-GEO-402
Core Course Name:Statistical Methods in Geography

Time: 3 Hours | **Total Marks : 75**
Credits: 3 | **External Assessment Marks : 60**
Internal Assessment Marks : 15

Course outcomes (COs):

B-GEO-402.1:Development of capability to understand the basics of statistics.
B-GEO-402.2: Capability to comprehend the methods ofcentral tendencies and dispersion.
B-GEO-402.3: Awareness about various tools of inequality analysis.
B-GEO-402.4: Understanding the use of bivariate analysis in geography.

Note for Paper Setters: Question 1 is compulsory comprising of six sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be eight long questions, two from each unit. The candidate has to answer four long questions, at least one question from each unit. All questions carry equal marks.

UNIT- I

1. Descriptive statistics: visual descriptive methods, histograms, frequency curve.
2. Measures of central tendency and partition values.

UNIT-II

3. Measure of dispersion: quartile deviation, mean deviation and standard deviation.
4. Probability distributionand normal curve.

UNIT-III

5. Sampling: types of sampling and its applications in geographical studies.
6. Inferential statistics: confidence intervals and hypothesis testing.

UNIT-IV

7. Measures of inequality: Loren curve, Gini's coefficient.
8. Bivariate analysis: scatter diagram, correlation (Spearman's rank correlation).

Suggested Readings:

1. Ashis Sarkar (2013), Quantitative Geography: Techniques and Presentations.
2. Gregory S. 1963. Statistical Methods and the Geography, Longman, London.
3. Mahmood. A. (1993): Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi.
4. Rogerson. P.A. (2010), Statistical Methods for Geography,Sage Publication, New Delhi
5. Paul. S.K. (1998): Statistics for Geoscientists: Techniques and Applications, Concept Publishing Company, New Delhi.

Mapping of Course Outcomes to Program Outcomes (Statistical Methods in Geography)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-402.1	3.0	2.0	2.0	1.0	1.0	1.0	1.0	3.0	1.0	1.0	1.0
B-GEO-402.2	3.0	2.0	2.0	1.0	2.0	2.0	1.0	3.0	2.0	1.0	1.0
B-GEO-402.3	3.0	2.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	1.0	1.0
B-GEO-402.4	3.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0	1.0	1.0
Average	3.0	2.0	2.0	1.5	1.8	2.0	1.5	2.8	2.5	1.0	1.0

Mapping of Course Outcomes to Program Specific Outcomes(Statistical Methods in Geography)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-402.1	3.0	2.0	2.0	2.0
B-GEO-402.2	3.0	2.0	2.0	2.0
B-GEO-402.3	3.0	3.0	3.0	3.0
B-GEO-402.4	3.0	2.0	2.0	2.0
Average	3.0	2.3	2.3	2.3

Semester-IV
Core Course Code: B-GEO-403
Core Course Name: Maps and Diagrams (Practical)

Time: 3 Hours	**Total Marks : 50**
Credits: 2	**External Assessment Marks : 40**
	Internal Assessment Marks : 10

Course outcomes (COs):

B-GEO-403.1:Knowledge about different types of thematic maps.
B-GEO-403.2: Skill acquisition for construction of qualitative distribution maps.
B-GEO-403.3: Ability to construct quantitative thematic maps.
B-GEO-403.4: Capability to carry out prismatic compass survey.

Note for Paper Setters: There will be four questions in all and candidate has to attempt three exercises.

Distribution of Marks for Evaluation

Exercise = 24 **File Record = 08** **Viva-voce = 08**

1. Principal of map design and layout
2. Symbolization: point, line and area symbol
3. Lettering and toponomy
4. Mechanics of map construction
5. Distribution maps
   (i) Qualitative distribution maps
   - Choro schematic maps — 1 Exercise
   - Chorochromatic maps — 2 Exercise

   (ii) Quantitative distribution Maps
   - Isopleth maps — 3 Exercises
   - Choropleth maps — 3 Exercises
   - Dot maps — 3 Exercises
   - Diagrammatic maps — 3 Exercises.
6. Prismatic Compass Survey — 2 Exercises.

Suggested readings:

1. Mishra RP and Ramesh A. 1999. Fundamentals of Cartography, Concept Publishing Company, New Delhi.
2. Monkhouse FJ and Wilkinson HR. 1972. Maps and Diagrams, Methuen Press, London
3. Singh Gopal. 2004. Map Work and Practical Geography, Vikas Publication House, New Delhi.
4. Singh RL. 1979. Elements of Practical Geography, Kalyani Publishers, New Delhi

Mapping of Course Outcomes to Program Outcomes (Maps and Diagrams-Practical)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-403.1	3.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0
B-GEO-403.2	3.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	2.0	1.0	2.0
B-GEO-403.3	3.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	2.0	1.0	2.0
B-GEO-403.4	3.0	1.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Average	3.0	2.5	2.5	2.0	2.0	2.0	2.0	2.5	2.0	1.3	2.0

Mapping of Course Outcomes to Program Specific Outcomes(Maps and Diagrams-Practical)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-403.1	3.0	2.0	2.0	2.0
B-GEO-403.2	3.0	2.0	2.0	2.0
B-GEO-403.3	3.0	2.0	2.0	2.0
B-GEO-403.4	3.0	1.0	1.0	1.0
Average	3.0	1.8	1.8	1.8

Semester-IV
Skill Enhancement Course Code:B-GEO- SEC-404
Skill Enhancement Course Name: Map Reading and Interpretation

Time: $2\frac{1}{2}$ Hours | **Total Marks : 50**
Credits: 2 | **External Assessment Marks : 40**
Internal Assessment Marks :10

Course outcomes (COs):

B-GEO- SEC-404.1:Knowledge about fundamentals of map reading.
B-GEO- SEC-404.2: Ability to determine the time at different locations in world.
B-GEO- SEC-404.3:Augmentation of knowledge about topographic features**.**
B-GEO- SEC-404.4: Development of skills to delineate drainage basin and measurement of height and slope.

Note for Paper Setters: Question 1 is compulsory comprising of five sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. All questions carry equal marks.

UNIT- I

1. Essentials and uses of maps.
2. Types of maps: topographic and thematic maps.
3. Reading of atlas maps.
4. Scales: definition, types and uses.
5. Directions: their measurement and compass bearing.
6. Latitudes and Longitudes: determination of location on maps using CGS and FPS system.
7. GMT and local time (CST, IST, CEST, BST, EST and PST) determination.

UNIT- II

8. Indexing of topographical maps (old and new scheme).
9. Relief features representation on topographic maps: Spot heights, Bench mark, Trigonometrical Points, Contours andForm lines, Hill Shading, Layer Colouring, Hachures.
10. Identification of features on topographic maps: Conical Hill, Plateau, V shaped Valley, U shaped Valley, Cliff, Waterfall, Escarpment, Saddle, Spur.
11. Measurements of height (shadow method).
12. Measurement of slope (clinometer method).
13. Profiles: their types and characteristics.
14. Principles of drainage basin delineation.

Suggested Readings:

1. Mishra RP and Ramesh A. 1999. Fundamentals of Cartography, Concept Publishing Company, New Delhi.
2. Monkhouse FJ and Wilkinson HR. 1972. Maps and Diagrams, Methuen Press, London
3. Singh Gopal. 2004. Map Work and Practical Geography, Vikas Publication House, New Delhi.
4. Singh RL. 1979. Elements of Practical Geography, Kalyani Publishers, New Delhi

Mapping of Course Outcomes to Program Outcomes (Map Reading and Interpretation)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO- SEC-404.1	3.0	3.0	2.0	2.0	2.0	2.0	1.0	3.0	2.0	2.0	2.0
B-GEO- SEC-404.2	3.0	3.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0	1.0
B-GEO- SEC-404.3	3.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	2.0	1.0	2.0
B-GEO- SEC-404.4	3.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	2.0	1.0	2.0
Average	3.0	3.0	2.8	2.0	2.0	2.0	1.8	2.8	2.0	1.3	1.8

Mapping of Course Outcomes to Program Specific Outcomes(Map Reading and Interpretation)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO- SEC-404.1	3.0	2.0	2.0	2.0
B-GEO- SEC-404.2	3.0	1.0	1.0	1.0
B-GEO- SEC-404.3	3.0	3.0	3.0	3.0
B-GEO- SEC-404.4	3.0	3.0	3.0	3.0
Average	3.0	2.3	2.3	2.3

Semester-IV
Skill Enhancement Course Code: B-GEO-SEC-405
Skill Enhancement Course Name: Introduction to Digital Maps

Time: $2\frac{1}{2}$ Hours | **Total Marks : 50**
Credits: 2 | **External Assessment Marks : 40**
Internal Assessment Marks : 10

Course outcomes (COs):

B-GEO-SEC-405.1: Provides knowledge about reading and interpretation of digital maps.
B-GEO-SEC-405.2: Acquisition of skills aboutinterpretation of satellite weather maps
B-GEO-SEC-405.3: Makes aware about classroom and scanning technology.
B-GEO-SEC-405.4: Understanding about global positioning system and digital navigation maps.

Note for Paper Setters: Question 1 is compulsory comprising of five sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. All questions carry equal marks.

UNIT- I

1. Reading of digital and web maps.
2. Reading and interpretation of satellite weather maps and imageries.
3. Reading and interpretation of photographs and imageries.

UNIT- II

4. Class room technology: white board, online world atlas and magazine maker.
5. Scanning technology: types, significance and applications.
6. Applications of global positioning system and digital navigation maps.

Suggested Readings:

1. Tempfli K et al 2009. Principal of Remote Sensing, ITC Educational Textbook, the Netherland
2. John R. Jensen 2009. Remote Sensing of the Environment-An Earth Resource Perspective, Pearson Education, (India Edition) New Delhi.
3. Lillesand and R.W. Kiefer,2005. Remote Sensing and Image Interpretation, John Wiley and Sons.

Mapping of Course Outcomes to Program Outcomes (Introduction to Digital Mapping)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-SEC-405.1	3.0	3.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	1.0	2.0
B-GEO-SEC-405.2	3.0	3.0	3.0	2.0	2.0	3.0	2.0	3.0	2.0	1.0	2.0
B-GEO-SEC-405.3	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0
B-GEO-SEC-405.4	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	1.0	2.0
Average	3.0	2.8	2.5	2.3	2.3	2.5	2.3	2.8	2.0	1.0	2.0

Mapping of Course Outcomes to Program Specific Outcomes(Introduction to Digital Mapping)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-SEC-405.1	3.0	3.0	3.0	3.0
B-GEO-SEC-405.2	3.0	3.0	3.0	3.0
B-GEO-SEC-405.3	3.0	1.0	2.0	1.0
B-GEO-SEC-405.4	3.0	3.0	3.0	3.0
Average	3.0	2.5	2.8	2.5

Semester-V
Discipline Specific Elective Course Code:B-GEO-DSE-501
Discipline Specific Elective Course Name: Agricultural Geography

Time: $2\frac{1}{2}$ Hours | **Total Marks : 50**
Credits: 2 | **External Assessment Marks : 40**
Internal Assessment Marks : 10

Course outcomes (COs):

B-GEO-DSE-501.1:Acquittance with the basics of agricultural geography.
B-GEO-DSE-501.2: Ability to understand the determinants of agricultural patterns.
B-GEO-DSE-501.3: Enrichment of knowledge about world agricultural systems.
B-GEO-DSE-501.4: Understanding the skills of measurement of agricultural productivity and food security.

Note for Paper Setters: Question 1 is compulsory comprising of five sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. All questions carry equal marks.

UNIT- I

1. Definition, nature and scope of agricultural geography
2. Physical, technological and institutional factors of agricultural patterns
3. Basis of agricultural regionalization: land use, cropping pattern, crop combination, crop diversification

UNIT- II

4. World agricultural regions based on Whittlesey's criteria.
5. Measurement of agricultural efficiency and productivity
6. Food and nutritional security: availability, accessibility and utilization outcome of food in India

Suggested Readings:

1. Bowler T.R. (1992) The Geography of Agriculture in Developed Market Economics, Longman.
2. Grigg D. (1995) Introduction to Agricultural Geography, Routledge, London.
3. Husain, Majid (1996), Systemic Agricultural Geography Rawat Publications, Jaipur.
4. Singh J. and Dhillon S.S. (1994) Agricultural Geography, Tata Mc Graw Hill, New Delhi.
5. Safi, Mohammad (2007) Agricultural Geography.

Mapping of Course Outcomes to Program Outcomes (Agricultural Geography)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-501.1	3.0	2.0	2.0	3.0	2.0	1.0	3.0	3.0	2.0	2.0	2.0
B-GEO-DSE-501.2	3.0	2.0	2.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-501.3	3.0	1.0	1.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-501.4	3.0	2.0	3.0	2.0	3.0	2.0	3.0	3.0	2.0	1.0	2.0
Average	3.0	1.8	2.0	2.3	2.8	2.3	3.0	3.0	2.5	1.8	2.0

Mapping of Course Outcomes to Program Specific Outcomes(Agricultural Geography)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-501.1	3.0	2.0	3.0	2.0
B-GEO-DSE-501.2	3.0	3.0	2.0	3.0
B-GEO-DSE-501.3	3.0	2.0	3.0	2.0
B-GEO-DSE-501.4	3.0	3.0	2.0	3.0
Average	3.0	2.5	2.5	2.5

Semester-V
Discipline Specific Elective Course Code: B-GEO-DSE-502
Discipline Specific elective Course Name: Resource Geography

Time: $2\frac{1}{2}$ Hours	**Total Marks**	**: 50**
Credits: 2	**External Assessment Marks**	**: 40**
	Internal Assessment Marks	**: 10**

Course outcomes (COs):

B-GEO-DSE-502.1:Acquaintance with the nature and field of resource geography.
B-GEO-DSE-502.2: Provides knowledge about concepts and models of natural resource utilization.
B-GEO-DSE-502.3: Enhancement of knowledge about development and conservation of natural resources.
B-GEO-DSE-502.4: Enrichment of knowledge about policies and problems of resource management in India.

Note for Paper Setters: Question 1 is compulsory comprising of five sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. All questions carry equal marks.

UNIT- I

1. Nature, scope and importance of resource geography.
2. Concepts of resource: exploitation, accumulation, poverty and resource degradation.
3. Models of natural resources process: Zimmermann primitive, Kirk's decision and Brookfield system model.

UNIT- II

4. Relationship between natural resources and development process.
5. Conservation and management methods: Soil, water, forest and mineral resources
6. Policies and problems of natural resource management in India

Suggested Readings:

1. Barbier, Edward B (2005) Natural Resources and Economic Development, Cambridge University Press.
2. Borton, I and R W Kates (1984) Readings in Resource Management and Conservation, University of Chicago Press, Chicago.
3. Bruce, Mitchell (1989) Geography and Resource Analysis, John Wiley and Son, New York.
4. Das Gupta, Biplab (1979) the Environmental Debate, Economic and Political Weekly, Vol.13, No. 6/7, Annual Number (Feb., 1978), pp. 385-387+389+391+393+395+397-400
5. Eliot Hurst, M E (1972) A Geography of Economic Behaviour: An Introduction, Duxbury Press, California.
6. Fabricius, C & Eddie Koch Eds. (2004) Rights, Resources and Rural Development: Community based Natural Resource Management in Southern Africa, Earthscan, London Sterling.
7. Guha, J L and P R Chattroj (1994) Economic Geography- A Study of Resources, The World Press Pvt. Ltd. Calcutta
8. Martino, R L (1969) Resource Management. Mc Graw Hill Book Co., London.
9. Negi, B S (2000) Geography of Resources, Kedar Nath and Ram Nath, Meerut
10. Owen, Oliver, S (1971) Natural Resource Conservation: A Ecological Approach, McMillion, New Delhi.
11. Raja, M (1989) Renewable Resources, Development, Concept Pub. New Delhi.
12. Ramesh, A (1984) Resource Geography (Ed.) R P Misra, Contribution to Indian Geography, Heritage Publishers, New Delhi.
13. UNDP & World Resource Institute (2005) The Wealth of the Poor—Managing Ecosystems to Fight Poverty, World Resources Institute, Washington, DC 20002
14. Zimmermann, E W (1951) World Resources and Industries, Harper and Brothers, New Delhi.

Mapping of Course Outcomes to Program Outcomes (Resource Geography)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-502.1	3.0	1.0	1.0	2.0	2.0	1.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-502.2	3.0	2.0	2.0	2.0	2.0	1.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-502.3	3.0	2.0	2.0	2.0	3.0	1.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-502.4	3.0	2.0	2.0	2.0	2.0	1.0	3.0	3.0	3.0	2.0	2.0
Average	3.0	1.8	1.8	2.0	2.3	1.0	3.0	3.0	3.0	2.0	2.0

Mapping of Course Outcomes to Program Specific Outcomes(Resource Geography)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-502.1	3.0	2.0	2.0	1.0
B-GEO-DSE-502.2	3.0	3.0	3.0	2.0
B-GEO-DSE-502.3	3.0	3.0	2.0	2.0
B-GEO-DSE-502.4	3.0	3.0	3.0	2.0
Average	3.0	2.8	2.5	1.8

Semester-V
Discipline Specific Elective Course Code: B-GEO-DSE-503
Discipline Specific Elective Course Name: Settlement Geography

Time: $2\frac{1}{2}$ Hours | **Total Marks : 50**
Credits: 2 | **External Assessment Marks : 40**
Internal Assessment Marks : 10

Course outcomes (COs):

B-GEO-DSE-503.1:Familiarization with basic concepts of settlement geography.
B-GEO-DSE-503.2: Enhancement of knowledge about types and patterns of rural settlements.
B-GEO-DSE-503.3: Provides critical view about different models of internal structure of cities.
B-GEO-DSE-503.4: Augmentation of knowledge on socio-spatial problems of cities.

Note for Paper Setters: Question 1 is compulsory comprising of five sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. All questions carry equal marks.

UNIT- I

1. Nature and scope of settlement geography.
2. Concepts of rural settlements: hamlet and village; urban settlements: town, city, metropolis, megalopolis.
3. Types and patterns of rural settlements and their determinants.

UNIT- II

4. Urban land use models: concentric zone model, sector model and multiple nuclei model.
5. Urban problems: housing, poverty, water supply and sanitation.
6. Expansion of urban spaces: rural-urban fringe and interaction.

Suggested Reading:

1. Chishlom M., 2007: Rural Settlement and Land Use, Transaction Publishers.
2. Daniel, P. 2002: Geography of Settlement, Rawat Publications, Jaipur & New Delhi.
3. Ghosh, Santwana 1999: A Geography of Settlements, Orient Longman, Kolkata.
4. Kalia Ravi, 1999: Chandigarh: The Making of Indian City, Oxford University Press.
5. Kaplan D. H., Wheeler J. O. and Holloway S. R., 2008: Urban Geography, John Wiley.
6. Krishan G., 1999: Inner Spaces – Outer Spaces of a Planned City: A Thematic Atlas of Chandigarh, Celebrating Chandigarh.
7. Misra, R. P. &Misra, K. eds. 1998: Million Cities of India, Sustainable Development Foundation, New Delhi.
8. Pacione M., 2009: Urban Geography: A Global Perspective, Taylor and Francis.
9. Ramachandran R., 1989: Urbanization and Urban Systems of India, Oxford University Press.
10. Ramachandran, R., 1992: The Study of Urbanization, Oxford University Press, Delhi
11. Singh R. Y., 1994: The Geography of Settlement, Rawat Publication, New Delhi.
12. Tiwari, R. C. 2000: Settlement Geography, (in Hindi), Prayag Publ., Allahabad.

Mapping of Course Outcomes to Program Outcomes (Settlement Geography)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-503.1	3.0	2.0	2.0	1.0	2.0	1.0	2.0	3.0	3.0	2.0	2.0
B-GEO-DSE-503.2	3.0	2.0	2.0	2.0	2.0	1.0	3.0	3.0	3.0	2.0	1.0
B-GEO-DSE-503.3	3.0	2.0	2.0	1.0	2.0	1.0	3.0	3.0	3.0	2.0	1.0
B-GEO-DSE-503.4	3.0	3.0	3.0	2.0	2.0	1.0	3.0	3.0	3.0	2.0	1.0
Average	3.0	2.3	2.3	1.5	2.0	1.0	2.8	3.0	3.0	2.0	1.3

Mapping of Course Outcomes to Program Specific Outcomes(Settlement Geography)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-503.1	3.0	2.0	2.0	2.0
B-GEO-DSE-503.2	3.0	2.0	2.0	2.0
B-GEO-DSE-503.3	3.0	3.0	3.0	2.0
B-GEO-DSE-503.4	3.0	3.0	3.0	2.0
Average	3.0	2.5	2.5	2.0

Semester-V
Discipline Specific Elective Course Code: B-GEO-DSE-504
Discipline Specific Elective Course Name: Transport Geography

Time: $2\frac{1}{2}$ Hours	**Total Marks : 50**
Credits: 2	**External Assessment Marks : 40**
	Internal Assessment Marks : 10

Course outcomes (COs):

B-GEO-DSE-504.1:Provides understanding the basic concepts of transport geography.
B-GEO-DSE-504.2: Enhancement of knowledge about the factors and spatial pattern of transportation systems.
B-GEO-DSE-504.3: Capable to understandrelationship between transport and location of economic activities.
B-GEO-DSE-504.4: Enrichment of knowledge about problems and management of urban transportation systems.

Note for Paper Setters: Question 1 is compulsory comprising of five sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. All questions carry equal marks.

UNIT-I

1. Nature, scope, significance and development of transport geography.
2. Factors associated with development of transport system; physical, economic, social cultural and institutional.
3. Regional variations in transport density; traffic flow and regional interaction; Bases of spatial interaction.

UNIT-III

4. Transport and locational activities; Impact of different aspects of transport on spatial equilibrium of location; problem of location and regional development.
5. Transportation network: Function, pattern and geometry; Models of network change.
6. Problems of urban transportation: transportation and environmental degradation; vehicular pollution and congestion; alternative to transport system in Mega-cities.

Suggested Readings:

1. Ashton, W.D., (1966): The Theory of Traffic Flow, Methuen, London
2. Bhaduri, S. 1992. Transport and Regional Development, Concept Publishing Company, New Delhi.
3. Berry, B.J.L et al. (1966): Essays on Commodity Flow and Spatial Structure of Indian Economy, Department of Geography, Chicago.
4. Berry, B.L.J. and Marble, D.F. (eds.) (1971): Spatial Analysis: A Reader in Statistical Geography, Prentice Hall.
5. Brooks, P.W., (1994): The Development of Air Transport Hurst, M.E. (ed.) Transportation geography: Comments and Reading, Mc Graw Hill, 256-273
6. Cooley, C.H. (1994): The Theory of Transportation, in Hurst, M.E. (ed.) Transportation geography: Comments and Reading, Mc Graw Hill, 15-29.
7. Fleming, D.K. and Hayuth, Y. (1994): Spatial Characteristics of Transportation Hubs: Centrality and Intermediacy, Journal of Transport Geography, 2 (1), 3-18.
8. Gautam, P.S. (1992) Transport Geography of India: A Study of Chambal Division, M.P., Mittal Publications, New Delhi
9. Huggett, P. (1965) Locational Analysis in Human Geography,Methuen, London.
10. Huggett, P. and Chorley, R.J. (1969) Networks in Geography, London.
11. Hay, A. 1973. Transport Economy, Macmillan, London.
12. Hoyle, B. S. and Knowles, R. 2000, Modern Transport Geography. John Wiley and Sons, New York.
13. Hoyle, B.S. 1973. Transport and Development. Macmillan, London.
14. Husain, M. and Zaidi, S.S.H. 1996. Environmental Management in India. Concept Publications, New Delhi.
15. Kensky, K.J., (1963): Structure of Transportation Networks: Relationships between Network Geometry and Regional Characteristics, University of Chicago, Department of Geography, Research Paper, Chicago, 84.

16. Nagar, V.D. and Gautam S. (1984): Principles and Problems of Indian Transport, Kailash PustakSadan, Gwalior.
17. Owen, W. (1968): Distance and Development: Transport and Communications in India, Washington.
18. Raza, M. and Aggarwal, Y., (1986) Transport Geography of India, Concept Publishing Company, New Delhi.
19. Taaffe, E.J.et al.(1963) Transport Expansion in Underdeveloped Countries: A Comparative Analysis, Geographical Review, 53:503-29.
20. Vaidya, B.C. 1998. Readings in Transport Geography, Devika Publications, New Delhi.
21. White, H. P. and Senior, M.L. (1983) Transportation Geography, Longman, London.

Mapping of Course Outcomes to Program Outcomes (Transport Geography)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-504.1	3.0	2.0	1.0	1.0	1.0	1.0	2.0	2.0	2.0	2.0	1.0
B-GEO-DSE-504.2	3.0	2.0	2.0	2.0	3.0	2.0	3.0	3.0	3.0	2.0	1.0
B-GEO-DSE-504.3	3.0	2.0	3.0	2.0	3.0	1.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-504.4	3.0	2.0	2.0	1.0	2.0	1.0	3.0	3.0	3.0	2.0	2.0
Average	3.0	2.0	2.0	1.5	2.3	1.3	2.8	2.8	2.8	2.0	1.5

Mapping of Course Outcomes to Program Specific Outcomes(Transport Geography)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-504.1	3.0	2.0	2.0	1.0
B-GEO-DSE-504.2	3.0	2.0	3.0	2.0
B-GEO-DSE-504.3	3.0	3.0	3.0	2.0
B-GEO-DSE-504.4	3.0	2.0	3.0	2.0
Average	3.0	2.8	2.8	1.8

Semester-V
Discipline Specific Elective Course Code: B-GEO-DSE-505
Discipline Specific Elective Course Name: Map Projections (Practical)

Time: 3 Hours	**Total Marks : 50**
Credits: 2	**External Assessment Marks : 40**
	Internal Assessment Marks : 10

Course outcomes (COs):

B-GEO-DSE-505.1:Acquaintance with nature and significance of projections system.
B-GEO-DSE-505.2: Augmentation of skills to make cylindrical and conical projections.
B-GEO-DSE-505.3: Capability to construct zenithal and world map projections.
B-GEO-DSE-505.4: Enrichment of surveying skills using plane table.

Note for Paper Setters: There will be four questions in all and candidate has to attempt three exercises.

Distribution of Marks for Evaluation

Exercise = 24 **File Record = 08** **Viva-voce = 08**

1. Introduction to Map Projection: Meaning, Classification and importance; Characteristics of latitudes and longitudes lines.
2. Cylindrical projections: Characteristics, applications and drawing; 3 exercise
   (i) Simple cylindrical projection
   (ii) Cylindrical equal area projection.
   (iii) True shape or orthomorphic or Mercator's Projection.
3. Conical Projections: Characteristics, applications and drawing. 5 exercise
   (i) Simple conical projections with one standard parallel
   (ii) Simple conical projection with two standards parallel
   (iii) Bonne's Projection
   (iv) Polyconic projection.
   (v) International Map Projection.
4. Zenithal Projections: Characteristics, applications and drawing. 5 exercise
   (i) Polar Zenithal Equidistant Projection.
   (ii) Polar Zenithal Equal Area Projection
   (iii) Polar Zenithal Gnomonic Projection
   (iv) Polar Zenithal Stereographic Projection.
   (v) Polar Zenithal Orthographic Projection
5. Characteristics, applications and drawings of: 2 exercise
   (i) Sinusoidal and
   (ii) Mollweide Projections
6. Plane Table Survey. 2 exercise

Suggested Readings:

1. Khan, A.A. 1996. Text Book of Practical Geography, Concept, New Delhi.
2. Lawrence, GRP.1968. Cartographic Methods, Methuen, London.
3. Mishra R.P. and Ramesh A. 1999. Fundamentals of Cartography, Concept Publishing Company, New Delhi.
4. Monkhouse, F.J. and Wilkinson, H.R. 1994. Maps and Diagrams, Methuen, London.
5. Robinson, A.H. et.al. Elements of Cartography, John Wiley & Sons, 1995.
6. Singh, R.L., 1979. Elements of Practical Geography, Kalyani Publisher, New Delhi.
7. Sarkar, A.K 1997: Practical Geography-A Systematic Approach, Orient Longman, Calcutta.
8. Steers, J.B. Map Projections; University of London Press, London.

Mapping of Course Outcomes to Program Outcomes (Map Projections-Practical)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-505.1	3.0	1.0	3.0	2.0	1.0	3.0	3.0	3.0	1.0	1.0	1.0
B-GEO-DSE-505.2	3.0	2.0	3.0	2.0	1.0	3.0	3.0	3.0	1.0	1.0	1.0
B-GEO-DSE-505.3	3.0	1.0	3.0	2.0	2.0	3.0	3.0	3.0	1.0	2.0	1.0
B-GEO-DSE-505.4	3.0	2.0	3.0	3.0	1.0	2.0	3.0	3.0	1.0	2.0	1.0
Average	3.0	1.5	3.0	2.3	1.3	2.8	3.0	3.0	1.0	1.5	1.0

Mapping of Course Outcomes to Program Specific Outcomes(Map Projections-Practical)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-505.1	3.0	2.0	2.0	3.0
B-GEO-DSE-505.2	3.0	3.0	2.0	3.0
B-GEO-DSE-505.3	3.0	3.0	3.0	3.0
B-GEO-DSE-505.4	3.0	3.0	3.0	3.0
Average	3.0	2.8	2.5	3.0

Semester-V
Discipline Specific Elective Course Code: B-GEO-DSE-506
Discipline Specific Elective Course Name: Socio-economic Field Survey (Practical)

Time: 3 Hours	**Total Marks : 50**
Credits: 2	**External Assessment Marks : 40**
	Internal Assessment Marks : 10

Course outcomes (COs):

B-GEO-DSE-506.1: Makes students confidant in handling field situations.
B-GEO-DSE-506.2: Gives opportunity to identify socio-economic problem.
B-GEO-DSE-506.3: Awareness about sampling techniques for data collection in the field.
B-GEO-DSE-506.4: Training ofretrieval, analysis and interpretation of socio-economic field data.

Note for Paper Setters: Examiner will have to evaluate the candidate on the basis of field report prepared by the student.

Distribution of Marks for Evaluation of Project Report

Field Report: 24 marks **Viva-voce on report: 16 marks**

Note: The students will carry out the socio-economic survey of a village or urban locality of at least 100 households/respondents and will prepare a field report.

Suggested Readings:

1. Black James A and D.J. champion (1976): Methods and Issues in social Research, New York, John Wiley and Sons, Inc.
2. Goode and Hat, Research Methodology in Social Sciences, OxfordUniversity Press, New Delhi.
3. Har Prasad (1992): Research Methods and Techniques in Geography, Rawat Publishers, Jaipur.
4. Mishra, H.N. and Singh V.P. (ed.) (1998), Research Methodology: Social, Spatial and Policy Dimensions, Rawat Publishers, Jaipur.

Mapping of Course Outcomes to Program Outcomes (Socio-economic Field Survey-Practical)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-506.1	1.0	1.0	1.0	3.0	3.0	2.0	2.0	3.0	1.0	2.0	2.0
B-GEO-DSE-506.2	1.0	1.0	3.0	3.0	3.0	2.0	3.0	3.0	2.0	2.0	2.0
B-GEO-DSE-506.3	3.0	2.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-506.4	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0
Average	2.0	1.8	2.5	3.0	3.0	2.3	2.8	3.0	2.3	2.3	2.0

Mapping of Course Outcomes to Program Specific Outcomes(Socio-economic Field Survey-Practical)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-506.1	2.0	2.0	3.0	3.0
B-GEO-DSE-506.2	2.0	3.0	3.0	3.0
B-GEO-DSE-506.3	3.0	3.0	3.0	3.0
B-GEO-DSE-506.4	3.0	3.0	3.0	3.0
Average	2.5	2.8	3.0	3.0

Semester-V
Discipline Specific Elective Course Code: B-GEO-DSE-507
Discipline Specific Elective Course Name: MOOC Course from Swayam Portal

Semester-VI
Discipline Specific Elective Course Code: B-GEO-DSE-601
Discipline Specific Elective Course Name: Fundamental of Remote Sensing

Time: $2\frac{1}{2}$ Hours | **Total Marks : 50**
Credits: 2 | **External Assessment Marks : 40**
Internal Assessment Marks : 10

Course outcomes (COs):

B-GEO-DSE-601.1:Acquaintance with fundamentals of remote sensing
B-GEO-DSE-601.2: Capability to interpret aerial photographs
B-GEO-DSE-601.3: Enrichment of skills to extract information from imageries.
B-GEO-DSE-601.4: Understanding the applications of remote sensing.

Note for Paper Setters: Question 1 is compulsory comprising of five sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. All questions carry equal marks.

UNIT-I

1. Introduction to aerial photographs: types and advantages.
2. Elements of aerial photo interpretation.
3. Digital photographs: sources and interpretation.

UNIT-II

4. Space borne remote sensing: electromagnetic spectrum, stages in remote sensing,
5. Type of satellites, nature of data and utility.
6. Applications of remote sensing: agriculture, environment and resource mapping.

Suggested Readings:

1. John R. Jensen 2009. Remote Sensing of the Environment-An Earth Resource Perspective, Pearson Education, (India Edition) New Delhi.
2. Kumar Meenakshi 2001. Remote Sensing, NCERT, New Delhi.
3. Lillesand and R.W. Kiefer,2005. Remote Sensing and Image Interpretation, John Wiley and Sons.
4. Pritvish Nag, and M. Kudrat 1998. Digital Remote Sensing, Concept Publishing Company, New Delhi.

Mapping of Course Outcomes to Program Outcomes (Remote Sensing)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-601.1	3.0	2.0	3.0	2.0	3.0	3.0	2.0	2.0	3.0	2.0	2.0
B-GEO-DSE-601.2	3.0	1.0	3.0	2.0	2.0	3.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-601.3	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0
B-GEO-DSE-601.4	3.0	3.0	3.0	2.0	3.0	3.0	3.0	2.0	2.0	3.0	3.0
Average	3.0	2.3	3.0	2.0	2.8	3.0	2.8	2.5	2.8	2.3	2.5

Mapping of Course Outcomes to Program Specific Outcomes(Remote Sensing)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-601.1	3.0	2.0	3.0	3.0
B-GEO-DSE-601.2	3.0	3.0	2.0	3.0
B-GEO-DSE-601.3	3.0	3.0	3.0	3.0
B-GEO-DSE-601.4	3.0	3.0	3.0	3.0
Average	3.0	2.8	2.8	3.0

Semester-VI
Discipline Specific Elective Course Code: B-GEO-DSE-602
Discipline Specific Elective Course Name: Introduction to Geospatial Technology

Time: $2\frac{1}{2}$ Hours | **Total Marks : 50**
Credits: 2 | **External Assessment Marks : 40**
Internal Assessment Marks : 10

Course outcomes (COs):

B-GEO-DSE-602.1: Acquaintance with the fundamentals of geo-spatial technology.
B-GEO-DSE-602.2: Capability to understand geographical information systems hardware, software and data types.
B-GEO-DSE-602.3: Knowledge about types and functioning of global positioning system.
B-GEO-DSE-602.4: Understanding about the applications of geospatial technology.

Note for Paper Setters: Question 1 is compulsory comprising of five sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. All questions carry equal marks.

UNIT-I

1. Introduction to geo-spatial technology: remote sensing, geographical information systems and global positioning system
2. Elements of geographical information system: hardware, software and data requirements.
3. Structure of spatial and non-spatial data and data base management system.

UNIT-II

4. Application of geographical information system in urban, regional and real time planning.
5. Global positioning system: types and functioning.
6. Applications of global positioning system and mobile mapping.

Suggested Readings:

1. Burrough, P.A. and McDonnell, R. (1998). Principles of Geographic Information Systems. Oxford University Press, Oxford.
2. Bhatta Basudeb (2014). Remote Sensing and GIS. Oxford University Press, Oxford.
3. Guha Pardeep (2013). Remote Sensing for the Beginner. East West Press, New Delhi.
4. Heywood I, Cornelius S and Carver S. 2000. An Introduction to Geographical Information Systems, Longman, New York.
5. Meenakshi Kumar (2000). Text Book on Remote Sensing. NCERT, New Delhi.

Mapping of Course Outcomes to Program Outcomes (Geo-spatial Technology)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-602.1	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	2.0	2.0	2.0
B-GEO-DSE-602.2	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0
B-GEO-DSE-602.3	3.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-602.4	3.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0
Average	3.0	2.5	3.0	2.0	3.0	3.0	3.0	3.0	2.8	2.0	2.3

Mapping of Course Outcomes to Program Specific Outcomes(Geo-spatial Technology)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-602.1	3.0	2.0	3.0	2.0
B-GEO-DSE-602.2	3.0	3.0	3.0	3.0
B-GEO-DSE-602.3	3.0	3.0	3.0	3.0
B-GEO-DSE-602.4	3.0	3.0	3.0	3.0
Average	3.0	2.8	3.0	2.8

Semester-VI
Discipline Specific Elective Course Code: B-GEO-DSE-603
Discipline Specific Elective Course Name: Geography of Asia

Time: $2\frac{1}{2}$ Hours	**Total Marks : 50**
Credits: 2	**External Assessment Marks : 40**
	Internal Assessment Marks : 10

Course outcomes (COs):

B-GEO-DSE-603.1:Awareness about physiographic structure of Asia.
B-GEO-DSE-603.2: Knowledge aboutthe characteristics of people.
B-GEO-DSE-603.3: Understanding about distribution pattern of major crops and cropping pattern.
B-GEO-DSE-603.4: Acquaintance with the distribution pattern of major minerals and industries.

Note for Paper Setters: Question 1 is compulsory comprising of five sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. All questions carry equal marks.

UNIT-I

1. Physiographic characteristics, climate, natural vegetation and major river systems
2. Demographic attributes: population distribution, density, growth and urbanization.
3. Socio-cultural attributes: languages, religions and races.

UNIT-II

4. Agriculture: area, production and yield of wheat, rice, sugarcane, cotton, tea, coffee and rubber.
5. Minerals distribution and production: iron-ore, manganese, mica, coal and petroleum.
6. Major industries and trade: textile, iron and steel, petro-chemicals, automobiles and electronics.

Suggested Readings:

1. Farmer, B. H. (1993): An Introduction to South Asia, Routledge Publications, London.
2. Hussain, M. (2012) World Geography, Rawat, Jaipur.
3. Memoria,C.and Aggarwal, M.L.(2018)Geography of Asia, Sahitya Bhawan, New Delhi.
4. Sharma, Y.K.(2019) Geography of Asia, Lakshmi Narain Aggarwal Publisher, New Delhi.
5. Stamp L.D. (1952) Asia: A Regional and Economic Geography, Methuen, London.
6. Tirtha, R. (2006) Geography of Asia, Rawat publication, Jaipur.

Mapping of Course Outcomes to Program Outcomes (Geography of Asia)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-603.1	3.0	1.0	2.0	2.0	2.0	1.0	3.0	3.0	3.0	1.0	2.0
B-GEO-DSE-603.2	3.0	2.0	2.0	2.0	3.0	1.0	2.0	3.0	3.0	2.0	2.0
B-GEO-DSE-603.3	3.0	3.0	2.0	1.0	2.0	1.0	2.0	3.0	3.0	2.0	2.0
B-GEO-DSE-603.4	3.0	2.0	2.0	1.0	1.0	1.0	3.0	3.0	3.0	2.0	2.0
Average	3.0	2.0	2.0	1.5	2.0	1.0	2.5	3.0	3.0	1.8	2.0

Mapping of Course Outcomes to Program Specific Outcomes(Geography of Asia)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-603.1	3.0	2.0	2.0	2.0
B-GEO-DSE-603.2	3.0	2.0	2.0	2.0
B-GEO-DSE-603.3	3.0	2.0	2.0	2.0
B-GEO-DSE-603.4	3.0	2.0	2.0	2.0
Average	3.0	2.0	2.0	2.0

Semester-VI
Discipline Specific Elective Course Code: B-GEO-DSE-604
Discipline Specific Elective Course Name: Geography of Europe

Time: $2\frac{1}{2}$ Hours | **Total Marks : 50**
Credits: 2 | **External Assessment Marks : 40**
Internal Assessment Marks : 10

Course outcomes (COs):

B-GEO-DSE-604.1: Awareness about physiographic structure of Europe.
B-GEO-DSE-604.2: Knowledge about the demographic characteristics of people.
B-GEO-DSE-604.3: Acquaintance with distribution pattern of agriculture, forestry and fisheries.
B-GEO-DSE-604.4: Understanding the distribution pattern ofminerals, industries and international trade.

Note for Paper Setters: Question 1 is compulsory comprising of five sub parts spread over entire syllabus (two marks for each sub part), to be answered in 15-20 words. There will be six long questions, three from each unit. The candidate has to answer three long questions, at least one question from each unit. All questions carry equal marks.

UNIT-I

1. Physical features: relief, physiographic regions, climate, drainage, soils and natural vegetation.
2. Demographic characteristics: population distribution, density and growth.
3. Socio-cultural attributes: languages, ethnic groups and migrant groups.

UNIT-II

4. Agriculture, forestry and fisheries.
5. Distribution of major minerals and industries.
6. International trade, transport and communication, European Union.

Suggested Readings:

1. Brian W. Blouet(2007),The EU and Neighbors: A Geography of Europe in the Modern, Wiley Publishers.
2. Eduard A. Koster (2005), A Physical Geography of Western Europe (Oxford Regional Environments), Oxford University Press.
3. Goran Mutabdzija (2018), Regional Geography of Europe, Independently Published.
4. Jean Gottmann (1969), Geography of Europe, Holt McDougal, California.
5. Thomas Alford Smith (2012), A Geography of Europe, Rare Books Club.

Mapping of Course Outcomes to Program Outcomes (Geography of Europe)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-604.1	3.0	1.0	2.0	1.0	2.0	1.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-604.2	3.0	1.0	2.0	1.0	2.0	1.0	3.0	3.0	3.0	2.0	1.0
B-GEO-DSE-604.3	3.0	2.0	2.0	1.0	2.0	1.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-604.4	3.0	2.0	2.0	1.0	2.0	2.0	3.0	3.0	3.0	2.0	2.0
Average	3.0	1.5	2.0	1.0	2.0	1.3	3.0	3.0	3.0	2.0	1.8

Mapping of Course Outcomes to Program Specific Outcomes(Geography of Europe)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-604.1	3.0	2.0	2.0	2.0
B-GEO-DSE-604.2	3.0	2.0	2.0	2.0
B-GEO-DSE-604.3	3.0	3.0	2.0	2.0
B-GEO-DSE-604.4	3.0	2.0	3.0	2.0
Average	3.0	2.3	2.3	2.0

Semester-VI
Discipline Specific Elective Course Code: B-GEO-DSE-605
Discipline Specific Elective Course Name: Elementary Remote Sensing (Practical)

Time: 3 Hours | **Total Marks : 50**
Credits: 2 | **External Assessment Marks : 40**
Internal Assessment Marks : 10

Course outcomes (COs):

B-GEO-DSE-605.1:Familiarization with the skill of measurements on aerial photographs.
B-GEO-DSE-605.2: Development of artof visualizing 3-D surface on photographs.
B-GEO-DSE-605.3:Capability to read and interpret physical and cultural features on photographs.
B-GEO-DSE-605.4: Ability to extract features from satellite imageries.

Note for Paper Setters: There will be four questions in all and candidate has to attempt three exercises.

Distribution of Marks

Exercise = 24 **File Record = 08** **Viva-voce = 08**

1.	Demarcation of principal point	1 exercise
2.	Conjugate principal point	1 exercise
3.	Flight line	1 exercise
4.	Determination of scale of photograph	1 exercise.
5.	Making of 3-D using stereoscope	1 exercise.
6.	Reading of ZESIS card	1exercise
7.	Interpretation of physical features from aerial photograph	1 exercise.
8.	Interpretation of cultural features from aerial photograph	1 exercise
9.	Demarcation of land use from aerial photograph	1 exercise
10.	Identification of satellite imagery of an area using row and path	1exercise
11.	Construction of spectral reflectance curves of ground features	1 exercise
12.	Interpretation of a satellite imagery	1exercise

Suggested Readings:

1. Bhatta Basudeb (2014). Remote Sensing and GIS. Oxford University Press, Oxford.
2. Guha Pardeep (2013). Remote Sensing for the Beginner. East West Press, New Delhi.
3. Kumar Meenakshi 2001. Remote Sensing, NCERT, New Delhi.
4. Lillesand and R.W. Kiefer,2005. Remote Sensing and Image Interpretation, John Wiley and Sons.
5. Pritvish Nag, and M. Kudrat 1998. Digital Remote Sensing, Concept Publishing Company, New Delhi.

Mapping of Course Outcomes to Program Outcomes (Elementary Remote Sensing-Practical)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-605.1	3.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	1.0	2.0
B-GEO-DSE-605.2	3.0	2.0	3.0	3.0	3.0	3.0	2.0	3.0	2.0	2.0	2.0
B-GEO-DSE-605.3	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-605.4	3.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0
Average	3.0	2.3	3.0	2.3	3.0	3.0	2.8	3.0	2.8	1.8	2.0

Mapping of Course Outcomes to Program Specific Outcomes(Elementary Remote Sensing-Practical)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-605.1	3.0	3.0	3.0	2.0
B-GEO-DSE-605.2	3.0	2.0	3.0	3.0
B-GEO-DSE-605.3	3.0	3.0	3.0	3.0
B-GEO-DSE-605.4	3.0	3.0	3.0	2.0
Average	3.0	2.8	3.0	2.5

Semester-VI
Discipline Specific Elective Course Code: B-GEO-DSE-606
Discipline Specific Elective Course Name: Physical Field Survey (Practical)

Time: 3 Hours | **Total Marks : 50**
Credits: 2 | **External Assessment Marks : 40**
Internal Assessment Marks : 10

Course outcomes (COs):

B-GEO-DSE-606.1: Makes students confidant in handling field situations.
B-GEO-DSE-606.2: Gives opportunity to identify geo-physical problems.
B-GEO-DSE-606.3: Awareness abouttechniques for data collection in the field.
B-GEO-DSE-606.4: Training ofanalysis and interpretation of physical field data.

Note for Paper Setters: Examiner will have to evaluate the candidate on the basis of field report prepared by the student.

Distribution of Marks for Evaluation of Project Report

Field Report: 24 marks **Viva-voce on report: 16 marks**

Note: The students will carry out the survey of physical environment of a site such as landforms, climate, soils, drainage and natural vegetation under the supervision of a teacher and will prepare a field report.

Suggested Readings:

1. Ahmed L, Kanth RA, Parvez S and Mahdi S. 2017. Experimental Agrometeorology-A Practical Manual. Springer Publication.
2. Bunnet RB. 1965. Physical Geography in Diagrams. Pearson Education, NOIDA, India.
3. Ghosh RK. 1999. Practical Hydrology. Roman Printers Pvt. Ltd. Howrah, West Bengal.
4. Gomez B and John Paul Jones. 2010. Research Methods in Geography-A Critical Introduction. Wiley Blackwell Publications, Singapore.
5. Goudie A. 1990. Geomorphological Techniques. Unwin Hyman, London.
6. Walsh MK. 2014. Teaching Geographic Field Methods using Paleoecology. Journal of Geography 113: 97-106.

Mapping of Course Outcomes to Program Outcomes (Physical Field Survey-Practical)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-DSE-606.1	1.0	3.0	3.0	3.0	3.0	1.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-606.2	2.0	2.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-606.3	3.0	2.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	2.0	2.0
B-GEO-DSE-606.4	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	2.0
Average	2.3	2.5	3.0	3.0	3.0	1.8	3.0	3.0	3.0	2.3	2.0

Mapping of Course Outcomes to Program Specific Outcomes(Physical Field Survey-Practical)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
B-GEO-DSE-606.1	1.0	3.0	2.0	3.0
B-GEO-DSE-606.2	2.0	3.0	3.0	3.0
B-GEO-DSE-606.3	3.0	3.0	3.0	3.0
B-GEO-DSE-606.4	3.0	3.0	2.0	3.0
Average	2.3	3.0	2.5	3.0

Mapping of Course Outcomes, Program Outcomes and Program Specific Outcomes (BA HumanitiesGeography)

Course Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PSO1	PSO2	PSO3	PSO4
B-GEO-101	3.0	2.5	1.8	1.5	2.5	1.3	2.5	3.0	2.8	1.3	2.3	3.0	2.5	3.0	2.5
B-GEO-102	3.0	3.0	2.5	1.8	3.0	1.8	2.5	3.0	2.8	1.5	2.5	3.0	3.0	2.5	2.5
B-GEO-103	3.0	2.0	1.5	1.5	2.3	2.8	2.0	3.0	1.0	1.3	2.3	3.0	1.8	2.8	2.0
B-GEO-201	3.0	2.8	2.8	2.3	3.0	2.3	2.8	3.0	3.0	1.8	2.5	3.0	2.8	2.5	2.5
B-GEO-202	3.0	2.8	1.8	1.5	2.8	1.0	1.5	3.0	2.0	1.8	1.8	3.0	2.0	2.8	2.5
B-GEO-203	3.0	2.5	2.5	2.5	2.8	2.3	2.3	3.0	1.8	2.0	3.0	3.0	2.8	3.0	3.0
B-GEO-301	3.0	3.0	2.0	2.0	1.5	1.0	2.0	3.0	2.0	1.0	2.0	3.0	1.0	1.0	3.0
B-GEO-302	3.0	2.8	2.3	2.8	1.8	1.5	2.3	3.0	2.0	2.0	2.3	3.0	3.0	3.0	3.0
B-GEO-303	3.0	2.8	2.0	2.3	1.8	2.0	1.8	2.5	1.8	1.8	1.8	2.8	2.5	2.5	2.8
B-GEO-401	3.0	2.5	2.0	1.8	1.5	1.3	1.8	3.0	2.0	2.0	2.0	2.8	2.0	2.8	2.5
B-GEO-402	3.0	2.0	2.0	1.5	1.8	2.0	1.5	2.8	2.5	1.0	1.0	3.0	2.3	2.3	2.3
B-GEO-403	3.0	2.5	2.5	2.0	2.0	2.0	2.0	2.5	2.0	1.3	2.0	3.0	1.8	1.8	1.8
B-GEO-SEC-404	3.0	3.0	2.8	2.0	2.0	2.0	1.8	2.8	2.0	1.3	1.8	3.0	2.3	2.3	2.3
B-GEO-SEC-405	3.0	2.8	2.5	2.3	2.3	2.5	2.3	2.8	2.0	1.0	2.0	3.0	2.5	2.8	2.5
B-GEO-DSE-501	3.0	1.8	2.0	2.3	2.8	2.3	3.0	3.0	2.5	1.8	2.0	3.0	2.5	2.5	2.5
B-GEO-DSE-502	3.0	1.8	1.8	2.0	2.3	1.0	3.0	3.0	3.0	2.0	2.0	3.0	2.8	2.5	1.8
B-GEO-DSE-503	3.0	2.3	2.3	1.5	2.0	1.0	2.8	3.0	3.0	2.0	1.3	3.0	2.5	2.5	2.0
B-GEO-DSE-504	3.0	2.0	2.0	1.5	2.3	1.3	2.8	2.8	2.8	2.0	1.5	3.0	2.8	2.8	1.8
B-GEO-DSE-505	3.0	1.5	3.0	2.3	1.3	2.8	3.0	3.0	1.0	1.5	1.0	3.0	2.8	2.5	3.0
B-GEO-DSE-506	2.0	1.8	2.5	3.0	3.0	2.3	2.8	3.0	2.3	2.3	2.0	2.5	2.8	3.0	3.0
B-GEO-DSE-507*															
B-GEO-DSE-601	3.0	2.3	3.0	2.0	2.8	3.0	2.8	2.5	2.8	2.3	2.5	3.0	2.8	2.8	3.0
B-GEO-DSE-602	3.0	2.5	3.0	2.0	3.0	3.0	3.0	3.0	2.8	2.0	2.3	3.0	2.8	3.0	2.8
B-GEO-DSE-603	3.0	2.0	2.0	1.5	2.0	1.0	2.5	3.0	3.0	1.8	2.0	3.0	2.0	2.0	2.0
B-GEO-DSE-604	3.0	1.5	2.0	1.0	2.0	1.3	3.0	3.0	3.0	2.0	1.8	3.0	2.3	2.3	2.0
B-GEO-DSE-605	3.0	2.3	3.0	2.3	3.0	3.0	2.8	3.0	2.8	1.8	2.0	3.0	2.3	3.0	2.3
B-GEO-DSE-606	2.3	2.5	3.0	3.0	3.0	1.8	3.0	3.0	3.0	2.3	2.0	2.3	3.0	2.5	3.0

*** MOOC Course from Swayam Portal.**

Attainment of COs:

The attainment of COs can be measured on the basis of the results of Internal Assessment Marks and semester examination. The attainment is measured on scale of 3 after setting the target for COs attainment. **Following table** shows the CO attainment levels assuming the set target of 60% marks:

CO Attainment Levels for internal assessment

Attainment Level	
1 (low level of attainment)	60% of students score more than 60% of marks in class tests of a course.
2 (Medium level of attainment)	70% of students score more than 60% of marks in class tests of a course.
3 (High level of attainment)	80% of students score more than 60% of marks in class tests of a course.

Note: In the above table, the set target is assumed as 60%. It may vary in different departments/institutes. The staff councils of the departments/institutes may finalize the set target.

A proper mapping of course outcomes with assessment methods should be defined before measuring the attainment level. The questions in tests for internal assessment are based on COs. Here it is assumed that class test-I is based on first two COs **(i.e. B-GEO-101.1 and B-GEO-101.2)** of a course with equal weightage given to both COs.Similarly, class test-II is based on next two COs (i.e. **B-GEO-101.3 and B-GEO-101.4**) of a course with equal weightage given to these two COs.For each internal assessment test, the percentage of studentsattaining the target level of CO is estimated and average percentage will decide the attainment level ofCOs. Following steps may be followed for determining the attainment level in internal assessment of a course.

(i) Estimate the %age of students scoring set target (say 60%) or more in the question(s) of test -I based on first CO i.e. **B-GEO-101.1.**

(ii) Estimate the %age of students scoring set target (60%) or more in the question(s) of test-I based on second CO i.e. **B-GEO-101.2.**
(iii) Estimate the %age of students scoring set target (60%) or more in the question(s) of test-II based on third CO i.e. **B-GEO-101.3.**
(iv) Estimate the %age of students scoring set target (60%) or more in the question(s) of test-II based on the fourth CO i.e. **B-GEO-101.4.**
(v) Take average of the percentages obtained above.
(vi) Determine the attainment level i.e. 3,2 or 1 as per scale defined in **the above table**.

Note: *In the above steps, it is assumed that internal assessment is based on two tests only. However, if internal assessment is based on more than two tests and/or on assignments then same may by incorporated to determine the COs attainment level. There may be more than four COs for a course. The set target may also be different for different COs. These issues may be resolved by the staff councils of the departments/institutes.*

For determining the attainment levels for end semester examination, it is assumed that questions in the end term examination are based on all COs of the course. Attainment levels for end semester examination of a course can be determined after the declaration of the results.The CO attainment levels for end semester examination are given **in the following Table.**

CO Attainment Levels for End Semester Examination (ESE)

Attainment Level	
1 (Low level of attainment)	60% of students obtained letter grade of A or above (for CBCS programs) or score more than 60% of marks (for non-CBCS programs) in ESE of a course.
2 (Medium level of attainment)	70% of students obtained letter grade of A or above (for CBCS programs) or score more than 60% of marks (for non-CBCS programs) in ESE of a course.
3 (High level of attainment)	80% of students obtained letter grade of A or above (for CBCS programs) or score more than 60% of marks (for non-CBCS programs) in ESE of a course.

Note: *In the above table, the set target is assumed as grade A for CBCS courses and 60% for non-CBCS courses. It may vary in different departments/institutes.The staff councils of the departments/institutes may finalize the set target.*

Overall CO Attainment level of a Course:

The overall CO attainment level of a course can be obtained as:

Overall CO attainment level = 50% of CO attainment level in internal assessment + 50% of CO attainmentlevel in end semester examination.

The overall COs attainment level can be obtained for all the courses of the program in a similar manner.

Attainment of POs:

The overall attainment level of POs is based on the values obtained using direct and indirect methods in the ratio of 80:20. The direct attainment of POs is obtained through the attainment of COs.The overall CO attainment value as estimated above and CO-PO mapping value as shown in **Table 3** are used to compute the attainment of POs.PO attainment values obtained using direct method can be written as shown **in the following Table.**

PO Attainment Values using Direct Method

Course Code	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
B-GEO-101											
B-GEO-102											
B-GEO-103											
B-GEO-201											
B-GEO-202											
B-GEO-203											
B-GEO-301											
B-GEO-302											
B-GEO-303											
B-GEO-401											
B-GEO-402											
B-GEO-403											
B-GEO-SEC-404											
B-GEO-SEC-405											
B-GEO-DSE-501											
B-GEO-DSE-502											
B-GEO-DSE-503											
B-GEO-DSE-504											
B-GEO-DSE-505											
B-GEO-DSE-506											
B-GEO-DSE-507*											
B-GEO-DSE-601											
B-GEO-DSE-602											
B-GEO-DSE-603											
B-GEO-DSE-604											
B-GEO-DSE-605											
B-GEO-DSE-606											
Direct PO attainment	Average of above values	Average of above values	Average of above values	--	--	--	--	--	--	--	Average of above values

*** Code will be decided as per the choice of student from the group of generic electives.**

The PO attainment values to be filled in above table can be obtained as follows:

For B-GEO-101-PO1 Cell:

PO1 attainment value = (Mapping factor of **B-GEO-101**-PO1 from **Table 3** × Overall CO attainment value for the course **B-GEO-101**)/3

For B-GEO-201-PO1 Cell:

PO1 attainment value = (Mapping factor of **B-GEO-201**-PO1 from **Table 3** × Overall CO attainment value for the course **B-GEO-201**)/3

Similarly, values for each cell **of the abovetable**can be obtained. The direct attainment of POs is average of individual PO attainment values.

In order to obtain the PO attainment using indirect method, a student exit survey based on the questionnaire of POs may be conducted at end of last semester of the program. The format for the same is given **in the following table**. Average of the responses from the outgoing students for each PO is estimated.

The overall PO attainment values are obtained by adding attainment values estimated using direct and indirect methods in the proportion of 80:20 as follows:

Overall attainment value for PO1 = 0.8 × average attainment value for PO1 using direct method **(from above table)**+ 0.2 × average response of outgoing students for PO1. Similarly, overall attainment value can be obtained for each PO.

Questionnaire for indirect measurement of PO attainment(For outgoing students)

At the end of my degree program I am able to do:

	Please tick any one		
Statement of PO1	3	2	1
Statement of PO2	3	2	1
Statement of PO3	3	2	1
Statement of PO4	3	2	1
Statement of PO5	3	2	1
Statement of PO6	3	2	1
Statement of PO7	3	2	1
Statement of PO8	3	2	1
Statement of PO9	3	2	1
Statement of PO10	3	2	1
Statement of PO11	3	2	1
3: Strongly Agree; 2: Agree; 1: Average			

Overall PO attainment values can be written as shown **in the following Table.**

Overall PO attainment Values

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
Direct PO attainment											
Indirect PO attainment											
Overall PO attainment											
Target	2	2	2	2	2	1.5	2	2	2	2	1.5

The overall PO attainment values obtained above are compared with set target.The set target for each PO may be different and can be finalized by the staff councils of the departments/institutes. If overall PO attainment value is less than the set target value then an action plan may be prepared for improvement in the subsequent academic session.

The overall PSO attainment level based on CO-PSO mapping values and overall CO attainment values can be obtained in a similar manner.