

DYAL SINGH COLLEGE, KARNAL
Department of Geography

Name of the Programme : Bachelor of Arts (Geography)
Duration : Three Years

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 of geography has the following eleven PO's. The course syllabi and the overall curriculum have been designed to achieve these outcomes:

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.
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Program Specific Outcomes (PSO's):

The objective of the curriculum designed for BA Geography is to nurture the geographical aptitude of students for improving their skills, inculcating values and produce young geographers who would contribute in the areas of regional and national planning, development, environment, ethics and sustainable environment development. Hence, the department of geography has the following four PSO's. The overall curriculum have been designed to achieve these specific outcomes:

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.

Scheme of Examinations for B.A Geography

Paper Code	Nomenclature of the Paper	Int. Asse.	Ext. Asse.	Maximum Marks	Total Marks	Time
Semester-I						
101	Geography of India	20	50	70	70	3 Hours
Semester-II						
103	Physical Geography-I	20	50	70	70	3 Hours
102 & 104	Maps, Scales and Representation of Physical Features (Practical)	-	-	60	60	3 Hours
Semester-III						
201	Physical Geography-II	20	50	70	70	3 Hours
Semester-IV						
203	Human Geography	20	50	70	70	3 Hours
202 & 204	Representation of climatic Data & Map Projections (Practical)			60	60	3 Hours
Semester-V						
301	Economic Geography	20	50	70	70	3 Hours
Semester-VI						
303	Introduction to Remote Sensing, GIS and Quantitative Methods	20	50	70	70	3 Hours
302 & 304	Distribution Maps, Diagrams, Remote Sensing and Field Survey Report (Practical)			60	60	3 Hours

Int. Asse. = Internal Assessment

Ext. Asse. = External Assessment

Paper 101 Geography of India

Maximum Marks : 70
External Assessment: 50
Internal Assessment: 20
Time : 3 Hours

Course Objectives: The main aim of this course is to provide the introductory background about the geographical structures, demographical aspects, resource distribution and spatial pattern of industries in India.

Course Outcomes (COs): At the end of this course, the course provides the following outcomes:

- Paper 101.1:** Provides understanding about the physical structure of India.
Paper 101.2: Enrichment of understanding about the human resource endowment.
Paper 101.3: Acquaintance with geographical distribution of major resources.
Paper 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.

SECTION- A

1. India: Location, relief structure and drainage systems.
2. Climate, soils, natural vegetation, and natural disasters in India.

SECTION-B

3. Population: distribution, density, growth and composition.
4. Migration, human settlement types and levels of urbanization.

SECTION-C

5. Land resources, irrigation, regional variations in cropping pattern, Green revolution and problems of Indian agriculture.
6. Energy and mineral resources: coal, petroleum, hydroelectricity and nuclear energy, iron ore, manganese and mica.

SECTION-D

7. Industries- iron and steel, cotton textile, sugar and petrochemical industries; and industrial regions of India.
8. Modes of transport and communication, international trade changing pattern of export and import.

Suggested Readings

1. Deshpande, C D: India-A Regional Interpretation, Northern Book Depot, New Delhi, 1992.
2. Singh, Gopal: Geography of India, Atma Ram and Sons, 2006.

3. Shafi, M: Geography of South Asia, McMillan and Company, Calcutta, 2000.
4. Singh, RL (ed): India : A Regional Geography, National Geographical Society, India, Varanasi, 1971.
5. Spate, DHK and ATA Learmonth : Indian and Pakistan – Land, People and Economy, Methnen 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
Paper 101.1	3.0	3.0	1.0	1.0	2.0	1.0	2.0	3.0	3.0	1.0	2.0
Paper 101.2	3.0	3.0	2.0	2.0	2.0	1.0	3.0	3.0	3.0	2.0	3.0
Paper 101.3	3.0	2.0	2.0	1.0	3.0	1.0	2.0	3.0	3.0	1.0	2.0
Paper 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
Paper 101.1	3.0	2.0	3.0	2.0
Paper 101.2	3.0	3.0	3.0	3.0
Paper 101.3	3.0	2.0	3.0	2.0
Paper 101.4	3.0	3.0	3.0	2.0
Average	3.0	2.5	3.0	2.5

Paper 103 Physical Geography-I

Maximum Marks : 70
External Assessment: 50
Internal Assessment: 20
Time : 3 Hours

Course Objectives: The aim of this course is to provide knowledge about the basics of geomorphology.

Course Outcomes (COs): At the end of this course, the course provide the following outcomes:

Paper 103.1: Provides knowledge about the basics of physical geography

Paper 103.2: Enrichment of knowledge about tectonic activities.

Paper 103.3: Enhancement of knowledge about processes controlling weathering and mass movement

Paper 103.4: 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.

SECTION- A

1. Definition, Nature, scope and fields of Physical Geography.
2. Interior of the earth, Geological time scale and rocks.

SECTION- B

3. Earth movements; organic, eperogenic, earth quakes and volcanoes.
4. Theory of Isostasy; Wegner's theory of continental drift and Plate tectonic theory.

SECTION- C

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

SECTION- D

7. Concept of cycle of erosion; cycle of erosion by W.M. Davis and
8. Process of Wind, River, Underground water, Glaciers and Sea waves.

Suggested Readings

1. Sharma H.S. Perspective in Geomorphology, Concept, New Delhi 1980.
2. Singh Savinder, Geomorphology, Prayag Publication, Allahabad 1998.
3. Singh Savinder, Physical Geography Prayag Publication, Allahabad, 1998.
4. Sparks B.W. Geomorphology, Jojngman, London, 1960.
5. 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
Paper 103.1	3.0	2.0	2.0	1.0	3.0	2.0	2.0	3.0	3.0	1.0	1.0
Paper 103.2	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0
Paper 103.3	3.0	3.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	2.0	3.0
Paper 103.4	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
Paper 103.1	3.0	2.0	1.0	1.0
Paper 103.2	3.0	3.0	3.0	3.0
Paper 103.3	3.0	3.0	3.0	3.0
Paper 103.4	3.0	3.0	3.0	3.0
Average	3.0	2.8	2.5	2.5

Paper 102 & 104 Maps, Scales and Representation of Physical Features (Practical)

Maximum Marks: 60

Time : 3 Hours

Distribution of Marks

Exercises = 36

Record File = 12

Viva-voce = 12

Note for Paper Setters:

There will be four questions in all and candidate has to attempt three exercises selecting at least from each unit. All questions carry equal marks.

Paper 102 Maps & Scale

Course Objectives: The aim of this course is to provide knowledge about the basics of cartographic skills.

Course Outcomes (COs): At the end of this course, the course provide the following outcomes:

Paper 102.1: Knowledge about cartographic skills.

Paper 102.2: Provides understanding about map scales.

Paper 102.3: Measurement skills of distances and areas on maps.

Paper 102.4: Enhancement of knowledge about enlargement and reduction of maps.

UNIT-I

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

Paper 104 Representation of Physical Features

Course Objectives: The aim of this course is to provide introductory knowledge about the different types of topographical maps and techniques of relief representation.

Course Outcomes (COs): At the end of this course, the course provide the following outcomes:

Paper 104.1: Knowledge about different types of topographical maps.

Paper 104.2: Provides understanding about methods of relief representation.

Paper 104.3: Enhancement of skills of relief representation.

Paper 104.4: Knowledge of drawing of landform profiles.

UNIT-II

	Exercise
1. Introduction to Topographical Sheets. India and adjacent countries. Degree Sheet. Half Degree Sheet. Quarter Degree Sheet. Conventional Signs.	3
2. Methods of representing relief.	1
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
4. Drawing of Profiles (a) Cross Profiles: Serial, Superimposed, Projected and Composite profiles. (b) Longitudinal profiles.	5

Suggested Readings

1. FJ Monkhouse and H.R. Wilkinson (1972) Maps and Diagrams, Mothuen and Co. Ltd., London
2. LR Singh and Raghuvander Singh (1973), Map Work and Practical Geography, Central Book Depot, Allahabad.
3. RI Singh and PK Dutt (1968), Elements of Practical Geography, Students Friends, Allahabad.
4. Singh Gopal (2004) 4th edition, Map Work and Practical Geography, Viksa Publication House.

Mapping of Course Outcomes to Program Outcomes (Maps & Scale)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
Paper 102.1	3.0	1.0	1.0	1.0	1.0	2.0	1.0	3.0	1.0	1.0	1.0
Paper 102.2	3.0	2.0	1.0	1.0	2.0	3.0	2.0	3.0	1.0	1.0	2.0
Paper 102.3	3.0	2.0	2.0	2.0	3.0	3.0	2.0	3.0	1.0	1.0	3.0
Paper 102.4	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 & Scale)**

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

**Mapping of Course Outcomes to Program Outcomes
(Representation of Physical Features)**

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
Paper 104.1	3.0	2.0	1.0	2.0	3.0	2.0	2.0	3.0	1.0	2.0	3.0
Paper 104.2	3.0	3.0	3.0	3.0	3.0	2.0	2.0	3.0	1.0	2.0	3.0
Paper 104.3	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0	3.0
Paper 104.4	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)**

COs/PSOs	PSO1	PSO2	PSO3	PSO4
Paper 104.1	3.0	2.0	3.0	3.0
Paper 104.2	3.0	3.0	3.0	3.0
Paper 104.3	3.0	3.0	3.0	3.0
Paper 104.4	3.0	3.0	3.0	3.0
Average	3.0	2.8	3.0	3.0

Paper 201 Physical Geography–II

Maximum Marks : 70
External Assessment: 50
Internal Assessment: 20
Time : 3 Hours

Course Objectives: The main aim of this course is to provide knowledge about the basics of climatology and oceanography.

Course Outcomes (COs): At the end of this course, the course provide the following outcomes:

Paper 201.1: Provides knowledge about the basics of climatology.

Paper 201.2: Enrichment of knowledge about atmospheric circulation and humidity.

Paper 201.3: Augmentation of knowledge about weather disturbances.

Paper 201.4: 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.

SECTION- A

1. Weather and Climate; Origin, composition and structure of atmosphere.
2. Insolation, Global heat budget, Horizontal and vertical distribution of temperature, inversion of temperature.

SECTION-B

3. Atmospheric pressure- measurement and distribution, pressure belts, planetary winds, Monsoon, Jet Streams EL NINO- La Nina Phenomenon and Local winds.
4. Humidity- measurement and variables, evaporation, condensation, precipitation forms and types and distribution, hydrological cycle.

SECTION-C

5. Air masses- concept and classification; Fronts- type and characteristics, Weather disturbances- tropical and extra-tropical cyclones.
6. Climate classification by Koppen; climatic change and global warming.

SECTION-D

7. Configuration of oceanic floors and surface relief of Pacific, Atlantic and Indian Oceans; temperature and salinity of oceans.
8. Tides, waves and oceanic currents; circulation in Pacific, Atlantic and Indian Oceans; Oceanic resources.

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
Paper 201.1	3.0	3.0	2.0	2.0	1.0	1.0	2.0	3.0	2.0	1.0	2.0
Paper 201.2	3.0	3.0	2.0	2.0	2.0	1.0	2.0	3.0	2.0	1.0	2.0
Paper 201.3	3.0	3.0	2.0	2.0	2.0	1.0	2.0	3.0	2.0	1.0	2.0
Paper 201.4	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
Paper 201.1	3.0	1.0	1.0	3.0
Paper 201.2	3.0	1.0	1.0	3.0
Paper 201.3	3.0	1.0	1.0	3.0
Paper 201.4	3.0	1.0	1.0	3.0
Average	3.0	1.0	1.0	3.0

Paper 203 Human Geography

Maximum Marks: 70

External Assessment: 50

Internal Assessment: 20

Time: 3 Hours

Course Objectives: The main aim of this course is to introduce the fundamentals of human geography and the basics of man environment relationship.

Course Outcomes (COs): At the end of this course, the course provide the following outcomes:

Paper 203.1: Provides knowledge about the fundamentals of human geography and division of mankind.

Paper 203.2: Enrichment of knowledge about the human adaptation and resource classification.

Paper 203.3: Familiarization with population attributes.

Paper 203.4: Augmentation of knowledge about the settlements, 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.

SECTION- A

1. Nature and scope of Human Geography, Branches of Human Geography, Approaches to the study of Human Geography.
2. Division of Mankind: Spatial distribution of race and tribes of India; concept of man environment relation: A historical approach.

SECTION-B

3. Human adaptation to the environment (i) Cold region – Eskimo (ii) Hot region- Bushman (iii) Plateau–Gonds (iv) Mountains–Gujjars
4. Meaning, nature and components of resources; Classification of resources – renewal and non- renewable ; biotic and abiotic, recyclable and non recyclable. Distribution, utilization and conservation of biotic (flora and fauna) and abiotic (water, minerals and energy) resources.

SECTION-C

5. Distribution and density of world population, population growth, fertility and mortality patterns.
6. Concept of over, under and optimum population; Population theories: Malthus, Ricardo and Marx.

SECTION-D

7. Rural settlements: Meaning, classification and types. Urban settlements: Origin, classification and functions of towns.
8. Population pressure, resource use and environment degradation; sustainable development, concept of deforestation, soil erosion, air and water pollution.

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. Global Environment Outlook: Earthscan, London, 2000.
9. McBride, P.J. Human Geography; Systems Patterns and Change, Nelson, UK and Canada, 1996.
10. Michael, Can: New Patterns : Process and Change in Human Geography, Nelson, 1996.

Mapping of Course Outcomes to Program Outcomes (Human Geography)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
Paper 203.1	3.0	2.0	1.0	1.0	2.0	1.0	1.0	3.0	2.0	1.0	1.0
Paper 203.2	3.0	3.0	2.0	1.0	3.0	1.0	2.0	3.0	2.0	2.0	2.0
Paper 203.3	3.0	3.0	2.0	2.0	3.0	1.0	2.0	3.0	2.0	2.0	2.0
Paper 203.4	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)

COs/PSOs	PSO1	PSO2	PSO3	PSO4
Paper 203.1	3.0	2.0	2.0	1.0
Paper 203.2	3.0	2.0	3.0	3.0
Paper 203.3	3.0	2.0	3.0	3.0
Paper 203.4	3.0	2.0	3.0	3.0
Average	3.0	2.0	2.8	2.5

Paper 202 & 204 Representation of Climatic Data & Map Projections (Practical)

Maximum Marks: 60

Time : 3 Hours

Distribution of Marks

Exercises = 36

Record File = 12

Viva-voce = 12

Note for Paper Setters:

There will be four questions in all and candidate has to attempt three exercises selecting at least from each unit. All questions carry equal marks.

Paper 202 Representation of Climatic Data

Course Objectives: The main aim of this course is to introduce the basics about measurement of climatic data and chain and enrichment of surveying skills.

Course Outcomes (COs): At the end of this course, the course provide the following outcomes:

Paper 202.1: Capability of measurement of climatic data.

Paper 202.2: Ability to represent the temperature and rainfall data.

Paper 202.3: Development of skill to read and interpret the weather maps.

Paper 202.4: Acquaintance with skills of chain and tape survey.

UNIT-I

	Exercise
1. Measurement of temperature, rainfall, pressure and humidity.	
2. Representation of temperature and rainfall.	
(i) Line and Bar Graph	1
(ii) Distribution of temperature (180 therms)	1
(iii) Distribution of rainfall (180 hytes)	1
(iv) Hythergraph	1
(v) Rainfall deviation diagram	1
3. Climograph (wet and dry places)	2
4. Distribution of pressure (180 bars)	2
5. Weather map Interpretation (January & July)	2
6. Change and tape survey	2

Paper 204 Map Projections

Course Objectives: The aim of this course is to introduce the basics about map projections.

Course Outcomes (COs): At the end of this course, the course provide the following outcomes:

Paper 204.1: Acquaintance with nature and significance of projections system.

Paper 204.2: Augmentation of skills to make cylindrical and conical projections.

Paper 204.3: Capability to construct zenithal and world map projections.

Paper 204.4: Enrichment of surveying skills using plane table.

UNIT-II

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

Suggested Readings

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

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

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
Paper 202.1	3.0	3.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0
Paper 202.2	3.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0
Paper 202.3	3.0	3.0	2.0	2.0	2.0	2.0	2.0	3.0	2.0	2.0	2.0
Paper 202.4	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)**

COs/PSOs	PSO1	PSO2	PSO3	PSO4
Paper 202.1	3.0	2.0	2.0	3.0
Paper 202.2	3.0	3.0	3.0	3.0
Paper 202.3	3.0	3.0	3.0	3.0
Paper 202.4	2.0	2.0	2.0	2.0
Average	2.8	2.5	2.5	2.8

**Mapping of Course Outcomes to Program Outcomes
(Map Projections)**

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
Paper 204.1	3.0	1.0	3.0	2.0	1.0	3.0	3.0	3.0	1.0	1.0	1.0
Paper 204.2	3.0	2.0	3.0	2.0	1.0	3.0	3.0	3.0	1.0	1.0	1.0
Paper 204.3	3.0	1.0	3.0	2.0	2.0	3.0	3.0	3.0	1.0	2.0	1.0
Paper 204.4	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)**

COs/PSOs	PSO1	PSO2	PSO3	PSO4
Paper 204.1	3.0	2.0	2.0	3.0
Paper 204.2	3.0	3.0	2.0	3.0
Paper 204.3	3.0	3.0	3.0	3.0
Paper 204.4	3.0	3.0	3.0	3.0
Average	3.0	2.8	2.5	3.0

Paper 301 Economic Geography

Maximum Marks : 70

External Assessment: 50

Internal Assessment: 20

Time : 3 Hours

Course Objectives: The aim of this course is to provide knowledge about the basics concepts of economic geography.

Course Outcomes (COs): At the end of this course, the course provide the following outcomes:

Paper 301.1: Provides knowledge about the fundamental concepts of economic geography.

Paper 301.2: Acquisition of knowledge about resources and their conservation.

Paper 301.3: Enrichment of knowledge about distribution of crops, minerals and energy resources.

Paper 301.4: 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.

SECTION- A

1. Nature, scope and relationship of economic geography with economics and other branches of social sciences.
2. Classification of economic activities and their impact on environment.

SECTION-B

3. World natural resources: Types, bases and classification.
4. Conservation and utilization of natural resources.

SECTION-C

5. Spatial distribution of food (rice and wheat), commercial (cotton and sugarcane) and plantation crops (tea, rubber and coffee).
6. Classification of mineral resources (ferrous and non-ferrous), distribution and production of coal, iron ore, petroleum and natural gas.

SECTION-D

7. Classification of industries, world distribution and production of iron and steel and textile industry, major industrial complexes of the world.
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. Hartshorne TN and Alexander JW. 1988. Economic Geography, Prentice Hall,

New Delhi.

2. Jones CF and Darkenwald GG. 1975. Economic Geography. McMillan Company, New York
3. Thomas, RS. 1962. The Geography of Economic Activities. McGraw Hill, New York.
4. Wheeler J et al. 1995. Economic Geography. John Wiley, New York.

Mapping of Course Outcomes to Program Outcomes (Economic Geography)

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
Paper 301.1	3.0	2.0	1.0	1.0	1.0	1.0	1.0	3.0	2.0	2.0	2.0
Paper 301.2	3.0	3.0	3.0	2.0	1.0	1.0	2.0	3.0	2.0	2.0	2.0
Paper 301.3	3.0	2.0	2.0	2.0	2.0	1.0	2.0	3.0	2.0	2.0	2.0
Paper 301.4	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
Paper 301.1	2.0	1.0	2.0	1.0
Paper 301.2	3.0	3.0	3.0	3.0
Paper 301.3	3.0	2.0	3.0	3.0
Paper 301.4	3.0	2.0	3.0	3.0
Average	2.8	2.0	2.8	2.5

Paper 303 Introduction to Remote Sensing, GIS & Quantitative Methods

Maximum Marks : 70

External Assessment: 50

Internal Assessment: 20

Time : 3 Hours

Course Objectives: The aim of this course is to provide knowledge about the fundamentals concepts of remote sensing, GIS and statistics and their applications.

Course Outcomes (COs): At the end of this course, the course provide the following outcomes:

Paper 303.1: Provides knowledge about the fundamental concepts of photogrammetry.

Paper 303.2: Acquaintance with fundamentals of remote sensing and understanding its applications.

Paper 303.3: Understanding the basics and applications of GIS.

Paper 303.4: Development of capability to understand the basics of statistics.

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.

SECTION- A

1. Introduction to Aerial Photographs: their advantages and types.
2. Elements of aerial Photo interpretation.

SECTION-B

3. Introduction to Remote Sensing; Electromagnetic spectrum, stages in remote sensing, type of satellites.
4. Types of Imageries and their application in various fields such as agriculture, environment and resource mapping.

SECTION-C

5. Introduction to Geographical Information System: Definition, purpose, advantages and software and hardware requirements.
6. Application of GIS in various fields of geography.

SECTION-D

7. Measure of Central Tendency: Mean, Median and Mode.
8. Measure of Dispersion: Range, Quartile deviation and Mean deviation, Standard deviation, Coefficient of variation.

Suggested Readings

1. Aslam Mahmood 1993. Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi.
2. John R. Jensen 2009. Remote Sensing of the Environment;, An Earth Resource

- Perspective, Pearson Education, (India Edition) 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
(Introduction to Remote Sensing, GIS & Quantitative Methods)**

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
Paper 303.1	3.0	2.0	3.0	2.0	3.0	3.0	2.0	2.0	3.0	2.0	2.0
Paper 303.2	3.0	1.0	3.0	2.0	2.0	3.0	3.0	3.0	3.0	2.0	2.0
Paper 303.3	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	3.0
Paper 303.4	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
(Introduction to Remote Sensing, GIS & Quantitative Methods)**

COs/PSOs	PSO1	PSO2	PSO3	PSO4
Paper 303.1	3.0	2.0	3.0	3.0
Paper 303.2	3.0	3.0	2.0	3.0
Paper 303.3	3.0	3.0	3.0	3.0
Paper 303.4	3.0	3.0	3.0	3.0
Average	3.0	2.8	2.8	3.0

Paper 302 & 304 Distribution Maps, Diagrams, Remote Sensing and Field Survey Report (Practical)

Maximum Marks: 60

Time : 3 Hours

Distribution of Marks

Exercises = 27

Record File = 9

Viva-voce = 9

Field Survey Report = 10

Viva-voce = 5

Note for Paper Setters:

There will be four questions in all and candidate has to attempt three exercises selecting at least from each unit, while unit III is compulsory. All questions carry equal marks.

Paper 302 Distribution Maps and Diagrams

Course Objectives: The aim of this course is to provide knowledge about different types of thematic maps and prismatic compass survey.

Course Outcomes (COs): At the end of this course, the course provide the following outcomes:

Paper 302.1: Knowledge about different types of thematic maps.

Paper 302.2: Skill acquisition for construction of qualitative distribution maps.

Paper 302.3: Ability to construct quantitative thematic maps.

Paper 302.4: Capability to carry out prismatic compass survey.

UNIT-I

	Exercise
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	
• Choroschematic maps	1
• Chorochromatic maps	2
(ii) Quantitative distribution Maps	
• Isopleth maps	3
• Choropleth maps	3
• Dot maps	3
• Diagrammatic maps	3
6. Prismatic Compass Survey	2

Paper 304 Remote Sensing

Course Objectives: The aim of this course is to familiarize the students with measurements and visualization on aerial photographs and develop the capability to interpret the satellite imageries.

Course Outcomes (COs): At the end of this course, the course provide the following outcomes:

Paper 304.1: Familiarization with the skill of measurements on aerial photographs.

Paper 304.2: Development of art of visualizing 3-D surface on photographs.

Paper 304.3: Capability to read and interpret physical and cultural features on photographs.

Paper 304.4: Ability to extract features from satellite imageries.

UNIT-II

1. Demarcation of Principal Point, Conjugate Principal point and Flight line on Aerial Photographs.	Exercise 1
2. Determination of Scale of Aerial Photographs.	1
3. Interpretation of Single Vertical Photographs.	1
4. Use of Stereoscope and Identification of Features.	1
5. Identification of Features on IRSID, LISS III imagery (Mark copy of FCC).	1

Paper 304 Socio-economic Survey and Report Writing

Course Objectives: The aim of this course is to provide knowledge about retrieval, analysis and interpretation of socio-economic field data.

Course Outcomes (COs): At the end of this course, the course provide the following outcomes:

Paper 304.1a: Makes students confident in handling field situations.

Paper 304.2b: Gives opportunity to identify socio-economic problem.

Paper 304.3c: Awareness about sampling techniques for data collection in the field.

Paper 304.4d: Training of retrieval, analysis and interpretation of socio-economic field data.

UNIT-III

1. Socio-economic Survey and Report Writing

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
5. John R. Jensen, Remote Sensing of the Environment; An Earth Resource Perspective, Pearson Education, (India Edition) New Delhi, 2009.
6. Lillesand and R.W.Kiefer, Remote Sensing and Image Interpretation, John Wiley and Sons, 1994.

**Mapping of Course Outcomes to Program Outcomes
(Distribution Maps and Diagrams)**

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
Paper 302.1	3.0	3.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	1.0	2.0
Paper 302.2	3.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	2.0	1.0	2.0
Paper 302.3	3.0	3.0	3.0	2.0	2.0	2.0	2.0	3.0	2.0	1.0	2.0
Paper 302.4	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
(Distribution Maps and Diagrams)**

COs/PSOs	PSO1	PSO2	PSO3	PSO4
Paper 303.1	3.0	2.0	2.0	2.0
Paper 303.2	3.0	2.0	2.0	2.0
Paper 303.3	3.0	2.0	2.0	2.0
Paper 303.4	3.0	1.0	1.0	1.0
Average	3.0	1.8	1.8	1.8

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

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
Paper 304.1	3.0	2.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	1.0	2.0
Paper 304.2	3.0	2.0	3.0	3.0	3.0	3.0	2.0	3.0	2.0	2.0	2.0
Paper 304.3	3.0	3.0	3.0	2.0	3.0	3.0	3.0	3.0	3.0	2.0	2.0
Paper 304.4	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
(Remote Sensing)**

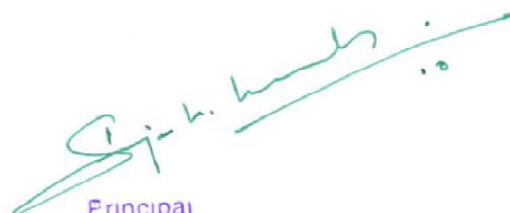
COs/PSOs	PSO1	PSO2	PSO3	PSO4
Paper 304.1	3.0	3.0	3.0	2.0
Paper 304.2	3.0	2.0	3.0	3.0
Paper 304.3	3.0	3.0	3.0	3.0
Paper 304.4	3.0	3.0	3.0	2.0
Average	3.0	2.8	3.0	2.5

**Mapping of Course Outcomes to Program Outcomes
(Socio-economic Survey and Report Writing)**

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
Paper 304.1	1.0	1.0	1.0	3.0	3.0	2.0	2.0	3.0	1.0	2.0	2.0
Paper 304.2	1.0	1.0	3.0	3.0	3.0	2.0	3.0	3.0	2.0	2.0	2.0
Paper 304.3	3.0	2.0	3.0	3.0	3.0	2.0	3.0	3.0	3.0	2.0	2.0
Paper 304.4	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 Survey and Report Writing)**

COs/PSOs	PSO1	PSO2	PSO3	PSO4
Paper 304.1	2.0	2.0	3.0	3.0
Paper 304.2	2.0	3.0	3.0	3.0
Paper 304.3	3.0	3.0	3.0	3.0
Paper 304.4	3.0	3.0	3.0	3.0
Average	2.5	2.8	3.0	3.0



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