Outcome Based Education (D-22)

Sr. No.	Types of Paper	Code	Total Papers	Credits	Total Credit	For Whom
1	Core Theory	CT	9	4	36	Compulsory to all
2	Elective Theory	ET	4	4	16	Select Any two from them
3	Specialized Theory	ST	6	4	24	For G & E Group
4	Core Practical's	CP	4	4	16	Compulsory to all
5	Specialized Practical's	SP	2	4	8	For G & E Group
6	Geoinformatics Theory	GT	1	4	4	Compulsory to all
7	Field Project (Village Survey)	FP	1	4	4	Compulsory to all
8	Research Project (Dissertation)	RP	1	8	8	Compulsory to all
9	Multidisciplinary Theory (Constitution of India, Disasterm Management etc.	MT	2	4	8	Compulsory to all
Total			30	40	124	

Note-

G- Geomorphology, E- Economic Geography

For G (Geomorphology) and E (Economic Geography)

Sr. No.	Type of Paper	Semester - I			Semester - II			Semester - III			Semester - IV		
		Paper	Paper Title	Credit	Paper	Paper Title	Credit	Paper	Paper Title	Credit	Paper	Paper Title	Credit
1	Core Theory	GCT-1	Geomorphology	4	GCT-4	Climatology	4	GCT-6	Oceanography	4	GCT-8	Geography of Resource	4
		GCT-2	Population geography	4	GCT-5	Geographical Thought	4	GCT-7	Geography of India	4	GCT-9	Research Methodology	4
		GCT-3	Geography of Economic Geography	4	-	-	-	-	-	-	-	-	-
2	Elective Theory	-	-	-	GET-1	Geography of Environment	4	-	-	-	-	-	-
		-	-	-	GET-2	Settlement of Geography	4	-	-	-	-	-	-
		-	-	-	GET-3	Regional Planning & Development	4	-	-	-	-	-	-
		-	-	-	GET-4	Political Geography	4	-	-	-	-	-	-
3	Specialized Theory	-	-	-	-	-	-	GSTG-1	Fluvial Geomorphology	4	GSTG-3	Coastal Geomorphology	4
		-	-	-	-	-	-	GSTG-2	Arid Geomorphology	4	GSTE-3	Geography of Trade and Transport	4
		-	-	-	-	-	-	GSTE-1	Agriculture Geography	4	-	-	-
		-	-	-	-	-	-	GSTE-2	Industrial Geography	4	-	-	-
4	Core Practical's	GCP-1	Practical in PG & HG	4	GCP-3	Practical in Climatology	4	-	-	-	-	-	-
		GCP-2	Practical in GIS & GPS	4	GCP-4	Practical in Statistics	4	-	-	-	-	-	-

5	Specialized Practical's	-	-	-	-	-	-	GSP-1	Practical in Geomorphology	4	-	-	-
		-	-	-	-	-	-	ESP-1	Practical in Economic Geography	4	-	-	-
6	Geoinformatics Theory	GGT-1	Fundamentals of RS, GIS & GPS	4	-	-	-	-	-	-	-	-	-
7	Field Project (Village Survey)	-	-	-	-	-	-	-	-	-	GRMP-1	Village Survey	4
8	Research Project (Dissertation)	-	-	-	-	-	-	-	-	-	GRMP-2	Dissertation	8
9	Multidisciplinary Theory (Constitution of India, Disasterm Management etc.	GMT-1	Constitution of India	2	-	-	-	GSCT-1	Disaster Management	4	-	-	-

For G (Geomorphology) and E (Economic Geography)

Sr. No.	Type of Paper	Semester - I		
		Paper	Paper Title	Credit
1	Core Theory	GCT-1	Geomorphology	4
		GCT-2	Population geography	4
		GCT-3	Geography of Economic Geography	4
2	Elective Theory	-	-	-
		-	-	-
		-	-	-
		-	-	-
3	Specialized Theory	-	-	-
		-	-	-
		-	-	-
		-	-	-
4	Core Practical's	GCP-1	Practical in PG & HG	4
		GCP-2	Practical in GIS & GPS	4
5	Specialized Practical's	-	-	-
		-	-	-
6	Geoinformatics Theory	GGT-1	Fundamentals of RS, GIS & GPS	4
7	Field Project (Village Survey)	-	-	-
8	Research Project (Dissertation)	-	-	-
9	Multidisciplinary Theory (Constitution of India, Disasterm Management etc.	GMT-1	Constitution of India	2

For G (Geomorphology) and E (Economic Geography)

Sr. No.	Type of Paper	Semester - II		
		Paper	Paper Title	Credit
1	Core Theory	GCT-4	Climatology	4
		GCT-5	Geographical Thought	4
		-	-	-
2	Elective Theory	GET-1	Geography of Environment	4
		GET-2	Settlement of Geography	4
		GET-3	Regional Planning & Development	4
		GET-4	Political Geography	4
3	Specialized Theory	-	-	-
		-	-	-
		-	-	-
		-	-	-
4	Core Practical's	GCP-3	Practical in Climatology	4
		GCP-4	Practical in Statistics	4
5	Specialized Practical's	-	-	-
		-	-	-
6	Geoinformatics Theory	-	-	-
7	Field Project (Village Survey)	-	-	-
8	Research Project (Dissertation)	-	-	-
9	Multidisciplinary Theory (Constitution of India, Disasterm Management etc.	-	-	-

For G (Geomorphology) and E (Economic Geography)

Sr. No.	Type of Paper	Semester - III		
		Paper	Paper Title	Credit
1	Core Theory	GCT-6	Oceanography	4
		GCT-7	Geography of India	4
		-	-	-
2	Elective Theory	-	-	-
		-	-	-
		-	-	-
		-	-	-
3	Specialized Theory	GSTG-1	Fluvial Geomorphology	4
		GSTG-2	Arid Geomorphology	4
		GSTE-1	Agriculture Geography	4
		GSTE-2	Industrial Geography	4
4	Core Practical's	-	-	-
		-	-	-
5	Specialized Practical's	GSP-1	Practical in Geomorphology	4
		ESP-1	Practical in Economic Geography	4
6	Geoinformatics Theory	-	-	-
7	Field Project (Village Survey)	-	-	-
8	Research Project (Dissertation)	-	-	-
9	Multidisciplinary Theory (Constitution of India, Disasterm Management etc.	GSCT-1	Disaster Management	4

For G (Geomorphology) and E (Economic Geography)

Sr. No.	Type of Paper	Semester - IV		
		Paper	Paper Title	Credit
1	Core Theory	GCT-8	Geography of Resource	4
		GCT-9	Research Methodology	4
		-	-	-
2	Elective Theory	-	-	-
		-	-	-
		-	-	-
		-	-	-
3	Specialized Theory	GSTG-3	Coastal Geomorphology	4
		GSTE-3	Geography of Trade and Transport	4
		-	-	-
		-	-	-
4	Core Practical's	-	-	-
		-	-	-
5	Specialized Practical's	-	-	-
		-	-	-
6	Geoinformatics Theory	-	-	-
7	Field Project (Village Survey)	GRMP-1	Village Survey	4
8	Research Project (Dissertation)	GRMP-2	Dissertation	8
9	Multidisciplinary Theory (Constitution of India, Disasterm Management etc.	-	-	-

Name of the Program : M.A. I Geography		
Semester I **Theory Paper**	**Name of the Course** **GCT1: Geomorphology**	**Credits : 04**

Course Objectives:

1. It being a course at the interface of geography with earth, the students to be sensitized to background of geology and environmental sciences.
2. To familiarize the students with the need for understanding of geomorphology with reference to certain fundamental concept, focusing on the unity of geomorphology in the earth materials and the processes with or without an element of time. Process component of geomorphology is segmented into the internal and external processes of landscape evolution.
3. Finally a few selected applications of geomorphology to societal requirements and quality of environment are dealt with.

Course Outcomes:

1. Classify and describe landforms in a variety of environmental settings.
2. Explain the theories of Uniformitarianism , Catastrophism and appreciation.
3. Describe the significance of spatial and temporal scales in geomorphology.
4. Analyze geomorphological systems in terms of resisting and driving forces.
5. Explain the surface processes important in the creation of landforms.
6. Quantitatively use and evaluate geomorphological data with numerical, statistical and cartographical methods**.**
7. Ability to analyze relationships between physical and human aspects of environments and landscapes.

Course Contents:

Unit	Teaching / Learning Points	Periods	Marks
I	**A) Nature and Scope of Geomorphology:** Definition of Geomorphology, Fundamental Concepts in Geomorphology, **B) Interior of the Earth** **C) Basic Theories in Geomorphology:** Wegener's Continental Drift, Plate Tectonics, Theory of Isostasy, W M Davis's Concept of Geomorphic Cycle	20	20
II	**A) Endogenic geomorphic forces:** Epiorogenic and Orogenic Movements, Compression, Tension, Folds, Faults, earthquake and volcanoes. **B) Denudational Processes:** Weathering, Types of Weathering, Erosion Mass Movement.	15	15

III	**Land Forms:** Associated with Fluvial, Glacial, Arid, Karts and Coastal processes	15	15
IV	**Slope Morphology:** Types of Slope, Slope Formation and Processes	05	15
V	**Applied Geomorphology:** Geomorphology and Human activities- Agriculture, Industries, Settlement, Transportation and Mining	05	15
	Total	**60**	**80**

Reference Books:

1. Thornbury, W. D. (I960), Principles of Geomorphology, John Wiley and Sons, New York.
2. Chorley, R. J., Schumm, S. A. and Sugden, D. E.(1984): Geomorphology, Methuen, London.
3. Kale, V. S. and Gupta, A. (2001): Introduction to Geomorphology, Orient Longman, Calcutta.
4. Savindra Singh (2002), Geomorphology, Prayag Pustak Bhawan, Allahabad
5. Spark B. W. (1972), Geomorphology, Longman, NewYork
6. Steers, A. (1958), The Unstable Earth, Methuen,London
7. Ollier, C. D. (1981), Tectonics and Landforms, Longman , London
8. Strahler A. H and Strahler, A. N. (1992), Modern Physical Geography, John Wiley, New York
9. Wooldridge and Morgan: Geomorphology
10. Holmes: Physical Geology
11. Fairbridge, R. W. (1968), Encyclopedia of Geomorphology, Reinholdts, New York.

Web Resources:

1. **www.wikipedia.org**
2. **www.encyclopedia.com**
3. **http://jgesnet.com**

Name of the Program : M.A. I Geography		
Semester: I **Theory Paper**	**Name of the Course** **GCT-2: Population Geography**	**Credits : 04**

Course Objectives:

1. To introduce the students to the complex dimensions of population.
2. To understand and evaluate the association between demographic and socio-economic attributes of population and the resultant levels of social well- being and economic development.
3. To understand the role and relationship between population and environment in an ever changing space-time continuum.

Course Outcomes:

1. Analyze the types of data of population geography.
2. Describe the distribution and density of population.
3. Apply the theories of population in arriving at solutions to the issues.
4. Investigate Current Issues and Problems in India.

Course Contents:

Unit	Teaching / Learning Points	Periods	Marks
I	**A) Population Geography:** Definitions, Nature and Scope **B) Basic Concepts:** Population Growth, Birth rate, Death rate, Crude Birth rate, Crude Death Rate, Infant Mortality rate, Fertility, Mortality, Migration, Age, Sex ratio, Age and Sex Pyramid, Density and literacy	15	20
II	**Population Growth:** Influencing Factors 1. Terrain 2. Climate 3. Soil 4. Water Bodies, 5. Mineral Resources 6. Industries 7. Transport 8. Urbanization 9. Socio-economic and Cultural 10. Political Peace and Violence 11. Literacy	15	15
III	**Theory and Model:** Basic Concept, Scope, Applications and Relevance of 1. Malthus' Theory of Population Growth and 2. Demographic Transition Model	10	15
IV	**A) Population Distribution:** Distribution of Population in India, Pattern of World Population Distribution. B) **Migration:** Factors Affecting Migration and Types of Migration	10	15

v	**Population as a Resource:** A) Concepts: 1. Over Population, 2. Optimum Population 3. Under Population B) Various aspects of Population: 1. Size, 2. Growth, 3. Age, 4. Education 5. Health C) Population Resource Regions: 1. Plain 2. Plateau 3. Mountain 4. Coastal	10	15
Total		**60**	**80**

Reference Books:

1. Beaujeu Garnier J. – Geography of Poluation, Longman Group Ltd.
2. Chandna R. C. (2000) – A Geography of Population, Concepts, Determinants and Patterns, Kalyani Publishers, New Delhi
3. Bhende Asha and Kanitkar T. – Principles of Population Studies, Himalaya Publishing House, Bombay, 1993.
4. Clark J. I. Geography of Population Approaches and Applications, Pergamon Press Ltd., Oxford

Web Resources:

1. **www.wikipedia.org**
2. **www.encyclopedia.com**
3. **http://jgesnet.com**

Name of the Program: M.A. I Geography		
Semester: I **Theory Paper**	**Name of the Course** **GCT-3: Geography of Economic Activities**	**Credits: 04**

Course Objectives:

1. Introduce the students to the geographical mode of thinking in application to various economic phenomena.
2. Understand the genesis, development, and evolution of Economic Geography as a subfield
3. Obtain an understanding of major forms of economic activity and processes
4. Learn to critically analyze economic issues from a geographical perspective.
5. Understand the concept of economic activity, and factors affecting the location of economic activity. Gain knowledge about different types of Economic activities
6. Assess the significance of Economic Geography, the concept of economic man, and theories of choice.
7. Analyze the factors of the location of agriculture and industries.
8. Understand the evolution of varied types of economic activities.
9. Map and interpret data on production, economic indices, transport network, and flows

Course Outcomes:

1. Synthesize the concepts, techniques, and theories of economic geography.
2. Communicate effectively orally, graphically, in writing, and using quantitative methods.
3. Describe the history of economic geography.
4. Explain the importance of environmental, cultural, and other factors in determining economic activities.
5. Explain the concepts of locational analysis, spatial diffusion, and spatial interaction.
6. Explain the alternative paradigms of economic geography.
7. Apply the concepts, methods, and theories to local, regional, and global economic issues.
8. Analyse the location and viability of economic activities in local, regional, and global systems.
9. Evaluate the main global issues confronting the world economy.
10. Analyse the concepts and spatial patterns of economic development.
11. Demonstrate effective geographic research and analytical skills.

Course Contents:

Unit	Teaching / Learning Points	Periods	Marks
I	**A) Economic Geography:** Definition, nature, and scope Recent trends in Economic Geography **B) Basic Economic processes:** Production, exchange & Consumption Classification of economic Activities and their characteristics Location of Economic activities	10	20

II	**Resources:** Classification of Resources - Renewable & Non-renewable Resources and Environment - Scarcity and Sustainability Conversation of resources and their need	15	15
III	**Industries:** Classification of Industries, Principles of Industrial Location Profit maximization - Least cost location Location theories – Weber & Losch.	10	15
IV	**Trade and Transport:** Major Transport Routes - Land, Water, and Air Routes Models of transportation and transport cost Accessibility and connectivity Trade - National and International	10	15
V	**A) Economic Development:** Spatial and Temporal aspects Measures of economic development – Rostow's and Myrdal's models **B) Economic Development in India:** Regional disparity in economic Development Impact of Green Revolution, Privatization	15	15
Grand Total		**60**	**80**

Reference Books:

1. Alexander J.W. (1976): Economic Geography. Prentice Hall of India. New Delhi.
2. Hartshorne, T.A. and J.W. Alexander (1988) –Economic Geography, Prentice Hall.
3. Berry, Conkling & Ray (1988): Economic Geography Prentice Hall of India New Jersey.
4. Hurst Elliott (1986): Geography of Economic Behaviour. Unwin, London.
5. Johnson R.J. & Taylor D.J. (1989): A world in crisis. Basil-Blackwell, Oxford.
6. Losch (1954): Economics of Location. Yale University Press New York.
7. Redcliff M. (1987): Development & the environmental crisis. Methuen. London.
8. Sinha B.N. (1971): Industrial geography of India
9. Watts H.D. (1987): Industrial Geography, Longman Scientific and Technical New York.
10. Haggett, Peter: Modern Synthesis in Geography.
11. Robinson H & Bamford C. G. (1978): Geography of Transport, Macdonald & Evans USA.
12. Jones & Darkenwald : Economic geography.
13. Fairbridge, R. W. (1968): Encyclopedia of Geomorphology, Reinholdts, New York.

Name of the Program: M.A. I Geography		
Semester: I **Theory Paper**	**Name of the Course** **GGT-1: Fundaments of Remote Sensing, GIS and GPS**	**Credits : 04**

Course Objectives:

1. To introduce GIS (Geographic Information System) as a tool of spatial science.
2. To indicate the basic elements of GIS and methodology of GIS.
3. To outline the steps and areas of application of GIS.
4. To introduce to the students the basic principles of Remote Sensing;
5. To indicate the methods of visual and digital interpretations of satellite imageries.
6. To outline the application value of remote sensing.

Course Outcomes:

1. Analyze the basic concepts of GIS and GPS.
2. Describe the Data, Model and Processes of GIS
3. Apply the GPS instrument and its features.
4. Interpretation of GIS and GPS Technology and its processes.
5. Describe the basic principles of Remote Sensing.
6. Explain the EMR (Electromagnetic Radiation).
7. Describe the Aerial photography and its Classification.
8. Analyze Satellite Data Generation and Aerial Photography Products.

Course Contents:

Unit	Teaching / Learning Points	Periods	Marks
I	**Introduction to Remote Sensing:** Definition of Remote Sensing History of Remote Sensing Type and Scope of Remote Sensing Aerial Remote Sensing Satellite Remote Sensing Indian, European and US Satellite Systems	10	20
II	**EMR (Electromagnetic Radiation):** Stages in remote sensing data acquisition Electromagnetic Radiation and Electromagnetic Spectrum Spectral Quantities Black Body Radiation and Radiation Laws Spectral Signature Interaction of EMR with atmosphere and Earth's surface features	15	15

III	**Introduction to GIS:** Definition of GIS Introduction and Development of GIS Components of GIS Applications of GIS	10	15
IV	**Data, Model and Processes of GIS:** Spatial and Non-Spatial Data Raster Data and Vector Data, Advantages and Disadvantages Processes of GIS DMS (Database Management System)	10	15
V	**A) Introduction to GPS:** Definition of GPS Introduction and Development of GPS Advantages and Disadvantages of GPS and Deferential Global Positions **B) Technology and Processes:** Segments of GPS Technology Ephemeris data Trilateration Process **C) Applications of GPS**	15	15
Grand Total		**60**	**80**

Reference Books:

1. Anji Reddy, M (2008): Textbook of Remote Sensing and Geographic Information System, B.S. Publication, Hyderabad
2. Burrough P.A. and R. A. MC Donnecl (2000), Principles of Geographical Information system, Oxford University, Press.
3. Campbell, J (2002): Introduction to Remote Sensing, Taylor & Francis, London
4. Chang Kang tsug (2002) Introduction to GIS, Tata MCGRAW Hill, New Delhi.
5. Chang Kang tsug (2002) Introduction to GIS, Tata MCGRAW Hill, New Delhi
6. Drury, SA (2001): Image Interpretation in Geology, Blackwell, Oxford
7. George Joseph (2003) Fundamentals of Remote sensing University press, Hyderabad.
8. George Joseph (2003) Fundamentals of Remote sensing University press, Hyderabad
9. Joseph, G. (2004): Fundamentals of Remote Sensing, Universities Press, Hyderabad, India
10. Lillesand, TM, Kiefer, RW and Chipman, JW (2008): Remote Sensing and Image Interpretation, John Wiley & Sons, New Delhi

Web Resources:

1. www.wikipedia.org
2. www.encyclopedia.com
3. http://jgesnet.com

Name of the Program: M.A. I Geography		
Semester: I **Practical Paper**	**Name of the Course** **GCP-1: Practical in Physical & Human Geography**	**Credits: 04**

Course Objectives:

1. To understand the morphological analysis with help of calculations.
2. To understand the various demographic Methods with the help of calculations.
3. To understand the analysis of drainage network patterns.
4. To understand the various indices calculations with the help of the given example.

Course Outcomes:

1. Define the various Drainage basin and stream order.
2. Examine the hypsometric integral, cross profiles, and block diagram.
3. Understanding the population pyramid and major statistics.

❖ **Practical / field work list:**

Unit No.	Teaching and learning point	Practical	Mark
I	**Morphological analysis:** 1) Profile analysis- Longitudinal, Superimposed, Projected, Composite, and indivisibility of Terrains. 2) Calculate stream order and Bifurcation Ratio 3) Hypsometric Curve and Integral.	15	20
II	**Analysis of Drainage Network Pattern**: 1) Drainage Network-bifurcation ratio, 2) Length ratio, 3) Drainage density, 4) Drainage texture, 5) Stream Frequency;	15	20
III	**Various Demographic Indices and calculate them with suitable examples -** 1. Mean age of females at marriage and fertility 2. Mean age of females at marriage and infant mortality 3. Underweight children of 1 to 47 months and under 5-year mortality rate 4. Percentage of women married to a blood relative and infant mortality 5. Mean age of females at marriage and delivery deaths 6. Per capita income of the family and infant mortality rate 7. Level of education of mother and number of deliveries	15	20
IV	**Population Indices** 1. Age-sex pyramid 2. Child-woman ratio 3. Dependency ratio 4. Infant mortality ratio 5. Age-specific mortality 6. Population growth rate	15	20
V	**Journal and Viva**	-	20
	Total	**60**	**100**

Reference Book

1. Basu, S.R. and majumder paramita (2006), lamdaslides scenario of the Darjeeling Himalayas in West Bengal, India; Geo.Rev. Ind., V.68, No.2, june 2006.
2. Bryant, M. (1974), Digital Image Processing, Chelmsford, MA, Optronics International publications'.
3. Clarke, K.C., (1990), Analytical and Computer cartography, Englewood cliffs, N.J. Practice-Hall.
4. Chorly, R. (ed) (1987), Handling Geographic Information, London.
5. Fryirs, K. A., & Brierley, G. J. (2013). Geomorphologic Analysis of River Systems, Chichester: Wiley-Blackwell.
6. King, C. A. M. (1966). Techniques in Geomorphology. London: Edward Arnold Ltd.
7. Leopold, L. B., Wolman, M. G., & Miller, J. P. (1964). Fluvial Processes in Geomorphology. San Franscisco.
8. Pijushkanti Saha and Pratha Basu (2010), Advanced Practical Geography, Arunabha Sen, Kolakata.
9. Rogerson, P. A. (2010). Statistical Methods for Geography, London: Sage Publications.
10. Strahler, A. N. (1964). Part II. Quantitative geomorphology of drainage basins and channel networks. Handbook.

Name of the Program: M.A. I Geography		
Semester: I **Practical Paper**	**Name of the Course** **GCP: 2 Practical in GIS and GPS**	**Credit: 04**

Course Objectives:

This is a practical course offering theme based, problem solving techniques of GIS methodology from data creation to advanced GIS and GPS analysis for student's analytical skill development.

1. To impart basic knowledge about GIS & GPS
2. To learn and understand the data generation, analysis and output in GIS & GPS.

Course Outcomes:

1. Analyze the basic components of GIS
2. Classify the maps, coordinate systems and projections
3. Process spatial and attribute data and prepare thematic maps
4. Identify and rectify mapping inaccuracies
5. Formulate and solve geospatial problems
6. Identify GPS components and their functions
7. Identify error sources in GPS observations, and apply the corrections for accurate positioning

Practical / field work list:

Unit	Teaching and learning point	Practical	Marks
	Section A: Instrumental Survey		
I	**Data capture and Management:** Scanning of hardcopy maps, georeferencing and projection, data encoding, feature and geodatabase creation (point, line and area), digitization, coverage editing, topology, annotations; attribute data – joining, editing and integration, field calculation, query by attribute, query by spatial relationship and query by graphics, class interval selection, thematic mapping and output.	**10**	**10**
II	**Spatial Analysis Modeling:** Proximity analysis; Topography - Digital Elevation Model, Slope, Aspect, Hillshade, and View shed; Watershed and Morphometric – Stream order, Flow Direction, Flow Accumulation, Watershed delineation, bifurcation ratio;	**10** **10**	**10** **10**
III	**GNSS/GPS Survey:** Collection of Ground Control Points (GCP), Way Points, and transformation of GNSS/GPS data into GIS; Ground Truth	**10**	**10**
IV	**Verification of GIS data;** Precision, Vertical and Horizontal Accuracy, inputting GPS data into computer. Mobile based survey using Open data kit (form building, XML generation, data collection, and mapping)	**20**	**40**
V	Journal and Viva	**-**	**20**
	Total	**60**	**100**

Reference Book

1. Burrough, P.A and Racael A. McDonnell, Principles of Geographical Information Systems, Oxford University Publications, 1998.
2. C.P.Lo, Albert K., and W.Yeung, Concepts and Techniques of Geographic Information Systems, Prentice Hall India Pvt.Ltd, New Delhi, 2002.

3. ArcGIS 10.1 User Manuals, ESRI, 2013.
4. Kraak, M. and Brown, A. Web Cartography: Development and Prospects, Taylor and Francis, London, 2001.
5. Tereshenkov, A. Web GIS Application in Local Government, VDM Verlag, 2009.
6. Bradford W. Parkinson & James Spilker., Global Positioning System: Theory and Applications, Vol I,1996
7. Hofmann W.B & Lichtenegger, H. Collins., Global Positioning System – Theory and Practice, Springer-Verlag Wein, New York,2001.
8. Gunter Seeber., Satellite Geodesy Foundations-Methods and Applications,2003.

Name of the Program : M.A. I Geography		
Semester: I **Multidisciplinary Theory Paper**	**Name of the Course** **Foundation / Bridge Course** **Introduction of Geography**	**Credits : 02**

Course Objectives:

1. Possess basic skills for map reading and interpretation. Students should become familiar with and proficient in the use of: map symbols, scale, direction, and distance; various types of maps and their distinctive properties; maps to present geographic information and to interpret and
2. Possess a somewhat detailed "mental map" of the world. Students should know the locations of Earth's most important physical and human features and conditions, the chief agents responsible for their formation
3. Understand the basic relationships that exist between humans and the natural environments they occupy. Students should recognize the different fundamental ways by which various societies culturally adapt to, use, and modify the natural environment(s) they occupy. They also should understand and appreciate the concept of natural resources and the need for an enhanced global environmental ethic.

Course Outcomes:

1. Classify and describe landforms.
2. Explain the theories of Climate.
3. Describe the significance of spatial and temporal scales in topology.
4. Analyze geomorphological systems in terms of resisting and driving forces.
5. Explain the surface processes important in the creation of landforms.

Course Contents:

Unit	Teaching / Learning Points	Periods	Marks
I	**Introduction of Geography** Meaning of Geography Definition of Geography Scope of Geography	05	10
II	**Branches of Geography,:** **Physical Geography:** Geomorphology, Climatology, Oceanography, Biogeography etc. **Human Geography:** Population, Economics, Social, Cultural, Political etc.	05	10
III	**Fundamental Concept in Physical Geography:** Latitudes, longitudes, Grid, International Date line, Interior of the earth, Structure of the atmosphere, Ocean bottom relief, Climate Change , Carbon sink etc.	07	10

IV	**Fundamental Concept in Human Geography:** **Population:** Density, Sex ratio, Growth, Literacy, Migration etc. **Economics:** Economic activity, Transportation and Communication, Human Settlements etc.	07	10
V	**Identification of Maps:** Physical maps: Mountain Ranges, Rivers, Oceans, and Deserts Political Maps: Continents, Selected Countries, National Highways etc.	06	10
	Total	**30**	**50**

Reference Books:

1. Chandana R.C. (2000), A Geography of Population, concepts, determinants and Patterns, Kalyani publications, New Delhi.
2. Fundamental of Physical Geography, Class XII by NCERT.
3. Fundamental of Human Geography, Class XII by NCERT.
4. Navneet School Atlas.
5. The Orient school Atlas.

Web Resources:

1. **www.wikipedia.org**
2. **www.encyclopedia.com**
3. **http://jgesnet.com**

Name of the Program: M.A. I Geography		
Semester: II **Theory Paper**	**Name of the Course** **GCT-4: Climatology**	**Credits : 04**

❖ **Course Objectives:**

The aim of the course is to provide an understanding of weather phenomena; dynamics of global climates and generation of climatic information and their application.

❖ **Course Outcomes:**

1. Describe the meteorology and climatology
2. Describe the scientific problems addressed by metrology and climatology.
3. Describe the methods and techniques of the data gathering
4. Perform meteorological measurements and use meteorological data for climatic analysis.
5. Describe/implement the basic meteorological process in the Earth atmosphere.
6. Describe the climate diversity over the Earth and knowledge of the basic climatic zones.
7. Perform climatic analysis on the basis of meteorological data.

❖ **Course Contents:**

Unit	Teaching / Learning Points	Periods	Marks
I	**Basic Concepts:** Nature and Scope of Climatology, Development of Modern Climatology, Weather and Climate,	10	15
II	**Earth's Atmosphere:** Composition and Vertical Structure, Heat Balance and Budget of Earth	10	15
III	**A) Temperature and Air Pressure:** Distribution of Temperature: Vertical and Horizontal Distribution of Pressure, Atmospheric pressure & general circulation of winds **B) Humidity:** Evaporation, Humidity, Condensation Formation of Clouds and their types Precipitation – types and characteristics.	10	20
IV	**A) Air Masses and Fronts:** Source Regions, Classification Frontogenesis and Frontolysis, Types of Fronts. **B) Atmospheric Disturbances:** Cyclones, Anticyclones, Storms, Water spouts, thunderstorms and tornadoes.	15	15
V	**Classification of Climate:** Bases of Classification Kop pen's Classification of Climate	15	15
Grand Total		**60**	**80**

Reference Books:

1. Frederick K. Lutgen, Edward Tar buck: "The Atmosphere An Introduction to Meteorology" Prentice Hall, Englewood Cliffs, New Jersey 0762 ,1998
2. 4. Sellers W.D : "Physical Climatology"University of Chicago Press. 1965
3. 5. Trewartha G.T: An Introduction to climate "McGraw Hill BK Co. New York, 1968.
4. 6. Das P. K. : The Mansoon, Prayag pustak Bhavan, Allahabad.
5. Shastri Rama: Weather and Weather Forecasting, Ministry & Information NBT Delhi.
6. Lal D. S.: Climatology. Prayag pustak Bhavan, Allahabad.
7. Ramashatri: Weather & Weather forecasting, Ministry of Information & Broadcasting.
8. Savindra Sing (2000) : Climatology, Prayag Pustak Bhavan, Allahabad.
9. Mather JR (1975): Climatology : Fundamentals & Applications. Mc Gray Hills Book, New York.
10. Hobbs J.E. (1980) : Applied Climatology, Butterworth, London
11. Crist Field : Principles of Climatology; Prentice Hall, London.
12. Oliver J. E. (1973) : Climate & Mans Environment, John Wiley & Sons; New York.
13. Byers R.H. : "General Meteorology "McGraw Hill BKCo New York 1974

- **Web Resources:**
  1. www.wikipedia.org
  2. www.encyclopedia.com
  3. http://jgesnet.com
  4. http://www.imd.gov.in

Name of the Program: M.A. I Geography		
Semester II **Theory Paper**	**Name of the Course** **GCT-5 Geographical Thoughts**	**Credits : 04**

Course Objectives:

1. Define the geographical thoughts.
2. Describe the contribution of modern geographers.
3. Solve the paradigms and philosophy in geography.
4. Examine laws theories and models in geography.
5. Judge the major approaches in geography.
6. Assemble laws and theories in geography**.**

Course Outcomes:

1. Students will understand the philosophical and methodological foundations of the subject and its place in the world of knowledge.
2. Student Familiaritive with the major landmarks in development of geographic thoughts of different periods of time.

Course Contents:

Unit	Teaching / Learning Points	Periods	Marks
I	**Introduction** Historical Development Contributions: Greek, Roman, Arab, Indian, Impact of Explorations and Discoveries,	15	20
II	**Founders of Modern Geographical Thought:** Alexander von-Humboldt, Carl Ritter, Friedrich Ratzel, Vidal de la Blache, Richard Hartshorne,	15	15
III	**A) Dualism and Dichotomies in Geography:** Determinism verses Possibilism Systematic versus Regional Geography **B) Conceptual and Methodological development:** Paradigms and philosophy in Geography	10	15
IV	**A) Measurements and explanation in Geography:** Laws, theories, and models **B) Areal differentiation and Spatial Organization:** Structure, Pattern & Process	10	15
V	**Approaches:** Positivism, Humanism, Radicalism, Behavioralist Quantitative revolution in Geography	10	15
Total		**60**	**80**

❖ **Reference Books:**

1. Abler, Adms J.& Gould P.(1971): Spatial organization. The Geographer's view of the world. Prentice Hall, Engle wood cliff, New Jersey.
2. Adhikari Sudeepta(1972): Fundamentals of Geographic Thought. Chaitanya Pub,lishing House, Allahabad.
3. Dickinson R.E.(1969) : The makers of modern Geography. Rout/edge & kegan Paul, London.
4. Dixit R.D. (1999): Development of Geographic Thought Longmans India Limited.
5. Free Man T.w.(1965): Geography As social science. Harper International Edition Harper & Row, Publishers, New York.
6. Harvey D. (1969): Explanation in Geography. London, Edward Arnold.
7. Hartshorne R.(1959): Perspective on the Nature of Geography. Rand McNally, Chicago.
8. Majid Hussain (1999): Geographic Thought. Rawat Publishing House, Jaipur.
9. Richard Peet (1977): Radical Geography - Alternative view points on contemporary social issue. Methuen & Co. Ltd. London.
10. Holt Jensen, Arid: (1998) Geography: History and Concepts, Sage publication, New Delhi.

❖ **Web Resources:**

1. www.wikipedia.org
2. www.encyclopedia.com
3. http://jgesnet.com

Name of the Program: M.A. I Geography		
Semester: II **Theory Paper**	**Name of the Course** **GET-1 : Geography of Environment**	**Credits: 04**

Course Objectives:

1. Students will learn how human, physical and environmental components of the world interact.
2. Able to conduct basic analysis of how environmental change is occurring at different geographic scales.
3. Able to explain the relationships between biosphere, lithosphere, hydrosphere, and atmospheric systems.
4. Students will learn the regional geography of the world, particularly from the perspective of how human, physical and environmental components of the world interact.

Course Outcomes:

1. To educate students in the contents and methods of Geography of Environment as an academic and professional discipline.
2. To understand elements of the environment and acquire knowledge about biodiversity
3. To get knowledge about natural hazards and management
4. To understand the various environmental issues and policies.

Course Contents:

Unit	Teaching / Learning Points	Periods	Marks
I	**Introduction:** Meaning and Scope Basic principles Composition and types of the environment; Ecological principles; Man – environment relationship.	10	20
II	**Ecosystem** Concept and components, Trophic levels, Food chains, and food webs Energy flow in the ecosystem, Circulation of matter in the ecosystem, Geo-bio-chemical cycle, Ecosystem productivity, Ecosystem stability	10	15
III	**Environmental degradation** Extreme events- hazards and disasters (earthquakes, volcanoes, cyclones, floods) Environmental pollution- (air, water, solid waste, soil, and noise pollution) Environmental pollution in India Environmental Problems – global warming, ozone depletion, land degradation, and reduction in biodiversity.	10	15
IV	**Environmental management** Concept and approaches Environmental dimension in planning – sustainable development Environmental consciousness, Environmental policy, environmental legislation, Environmental impact assessment, Disaster management	15	15
V	**Environmental management** Management of forest, soil, wildlife, energy and mineral resources, Environmental education, monitoring, and mapping, conservation of natural resources.	15	15
	Total	**60**	**80**

Reference Books:

1. Batel, B.(ed): Management of Environment, Wiby eastern Ltd. New Delhi, 1980.
2. BrijGopal: Elements of Ecology
3. Centre for Science & Environment: The State of India Environment: A citizen's Report, 1982, 1985, New Delhi.
4. DeshBandhu (ed.): Environmental Management, Indian Environment Society, New Delhi.
5. Gupta &Gurjar: sustainable Development, Rawat, Jaipur.
6. Kaswan, N.R. : Man and Environment (Hindi), Malik & Co. Jaipur, 1999.
7. Mathur, H.S.: Biogeography
8. Park, C.C: Ecology and Environmental Management, Butterworths, London, 1980.
9. P.D. Sharma: Ecology and Environment, Rastogi, Meerut, 2010.
10. Peter Cotgreave& Irwin Forseth: Introductory Ecology, Blackwell, 2002.
11. Savinder Singh: Geography of Environment, allahbad
12. Singh & Singh (ed.): Geography of Environment, Concept, New Delhi
13. Strahler, A.N.: Geography and Man's Environment, John Willey, New York, 1976.
14. V.K. Srivatava: Paryavaran Bhoogolevm Paristhitiki, Vasundhara, Gorakhpur.

Name of the Program: M. A. I Geography		
Semester: II **Theory**	**Name of the Course** **GET-2: Settlement Geography**	**Credits: 04**

Course Objectives:

1. Acquire knowledge about Rural settlements- Definition, nature, and characteristics
2. Analyze the morphology of rural settlements
3. Learn the rural house types, census categories of rural settlements, and idea of social segregation
4. Learn the census definition and categories of urban **s**ettlements

Course Outcomes:

1. Acquire clear concepts of rural and urban settlements.
2. A Greater understanding of the origin and distribution of settlements; their classifications; settlement structure and settlement hierarchy; models and theories explaining the morphology of rural and urban centers.
3. Fosters an ability to think in spatial terms, using geographic principles to understand the past as well as the present growth of settlements.
4. Inculcate a greater understanding of the man-land relationship that is crucial for sustainable development.
5. Development of theoretical and methodological approaches in settlement geography by helping correlate various land use related to urban morphological theories with any urban centers in reality.
6. Enable students to develop research questions and make a critical assessment based on both primary and secondary data.

Practical / field work list:

Unit	Teaching and Learning points	Practical's	Marks
I	**Introduction:** i. Nature, scope, significance, and approaches to study Settlement Geography ii. Development of Settlement Geography iii. Theories of the evolution of settlements and Geographical factors affecting the growth of settlement distribution iv. Types of Settlement: Rural and Urban Rural-urban dichotomy and continuum	15	20
II	**Rural settlement:** i. Site, location, types, and pattern ii. Morphology of rural settlement iii. Rural House types: planned and architectural styles in different geographical environments iv. Types and patterns of rural settlements with reference to North East India	15	20
III	**Urban Settlement:** i. Origin of the cities: Ancient and Medieval ii. Industrial growth and urban expansion iii. Functional classification of urban centers: Harris and Nelson iv. Functional classification of Indian cities: Ashok Mitra and others	15	20
IV	**Settlement Hierarchy and Policies:** i. Rural service center ii. Central Place theory (Christaller) iii. Theory of Losch and its application iv. Issues and policies of Settlements, settlement planning	15	20
V	Morphological characteristics of rural and urban settlements with	-	20

	special reference to India, Concentric zone and multiple nuclei models of urban growth; problems of urban housing and the emergence of status.		
	Total	**60**	**100**

Reference Book

1. Bogue, D J : Principles in Demography, John Willey, New York, 1969.
2. Census of India: India-A State Profile, 1991.
3. Chandana, R C : Geography of Population, Concept, New Delhi, 2000.
4. Chisolm, : Rural Settlement and Land use.
5. Clark, John I : Population Geography, PergamonPress, Oxford, 1973.
6. Garnier, B J : Geography of Population, Longman, London, 1970.
7. Hudson, E S : Geography of Settlement
8. Jones: A Population Geography.
9. Mamoria C B : India's Population Problem, KitabMahal, New Delhi, 1981.
10. Mitra Ashok: Indi's Population: Aspects of Quality and Control, Vol. I & II, Abhinav, New Delhi, 1978.
11. Sharma, R C : settlement Geography of Indian Desert, Kumar Brothers, New Delhi, 1972.
12. Singh, R L : Meaning, Objective, Scope of Settlement Geography, B.H.U.
13. Smailes, A E : The Geography of Towns, HutchinsonUniversity Library, London, 1953.
14. Srinivasan, K : Basic Demographic Techniques and Applications, Sage, N. Delhi, 1998.
15. Sundram, K V and SudeshNangia (ed.): Population Geography, Heritage , Delhi, 1986.
16. Woods, R : Population Analysis in Geography, Longman, London, 1979.
17. Zelinsky, W: A Prologue to Population Geography, Prentice Hall, 1966.
18. Verma: AdhivasBhoogol, RajasthanHindiGranthAcademy, Jaipur.

Name of the Program: M.A. I Geography		
Semester: II **Theory Paper**	**Name of the Course** **GET-3: Regional Planning and Development**	**Credits: 04**

Course Objectives:

1. To understand and evaluate the concept of region in geography and its role and relevance in regional planning;
2. To identify the issues relating to the development of the region through the process of the spatial organization of various attributes and their interrelationship.
3. To identify the causes of regional disparities in development, perspectives, and policy imperatives.

Course Outcomes:

1. Define the major concepts of regional planning and development.
2. Classify theories and models of regional planning and development.
3. Solve the regional imbalances in India.
4. Examine the regional planning in India.
5. Investigate the geographical need and feasibility.

❖ **Course Contents:**

Unit	Teaching / Learning Points	Periods	Marks
I	**Basic Concepts:** Concept of Region, Types, and hierarchy of regions Concept of Planning, Types of planning Concept of Approach, Different Approaches to Regional Planning Concept of Geographical Indication, its relation with Planning Concept of Growth and Development. Indicators of development Measures of regional development	10	20
II	**Theories and Models:** a) Models of economic growth: Rastows stages of economic growth Gunnar Myrdal's concept of internal growth b) Theoretical framework for regional planning: Central Place Theory Growth Pole Theory	15	15
III	**Regional imbalances in India** Industrial Imbalances Agricultural Imbalances Rural-Urban ratio Imbalances Infrastructural Development and its Imbalances	10	15
IV	**Regional Planning in India** Metropolitan planning Rural development planning Tribal area development planning	10	15

V	**Geographical Need and Feasibility** a) Geographical Factors affecting on Planning and Development b) Urgent Needs for Planning and Development Watersheds Solid and Liquid Domestic Wastes Disaster and Hazard Drinking Water and Health Services	15	15
	Total	**60**	**80**

Reference Books:

1. Bhandari S (1992): Transport and Regional Development, Concept Publication, New Delhi
2. Bhat, L. S. (1973): Regional Planning in India, Statistical Publishing Society, Kolkata
3. Chandana, R. C. (2000): Regional Planning - A Comprehensive Text, Kalyani Publishers, Ludhiana
4. Dube K. N. (ed) (1990): Planning and Development in India, Asia Publishing House, New Delhi
5. Friedmann, J Alanso W (1967): Regional Development and planning - A Reader, MIT Press Mass
6. Govt. of India (1986), Regional Plan 2001 - National Capital Region, NCRPB, Ministry of Urban Development, New Delhi
7. Hall P. (1992) Urban and Regional Planning, Routledge, London
8. Mishra R. P (Ed.) (1992): Regional Planning, Concepts, Techniques, Policies and Case Studies, Concept Pub. New Delhi.
9. Vaidya B C (eds)(1998): Reading in Transport Geography: A Regional Perspective, Devika Publications, New Delhi

Web Resources:

1. www.wikipedia.org
2. www.encyclopedia.com
3. http://jgesnet.com

Name of the Program: M.A. I Geography		
Semester II **Theory Paper**	**Name of the Course** **GET-4: Political Geography**	**Credits : 04**

Course Objectives:

1. To familiarize the students with the geographical factors which have a bearing on the political/administrative organization of space.
2. To enhance awareness of multi-dimensional nature of geo-political space**.**
3. To examine the role of Political geography in development of nation and its deferent sectors. The course further aims to familiarize the students with the application of various theories, models and classification schemes in Political geography.
4. Its objectives are also to discuss environmental, technological and social issues in Political sector with special reference to India.

Course Outcomes:

1. Define the basic concepts of political geography.
2. Describe the structure and elements of modern world political map.
3. Examine the Territorial aspects of international relations and world politics.
4. Investigate the Problems & Prospects of Political and geographical organization of the state.
5. Interpreter Political and social problems using geographical models.

Course Contents:

Unit	Teaching / Learning Points	Periods	Marks
I	**a) Introduction to Political Geography:** Nature, scope and significance. Land Classification in India Subject matter of political geography Political geography and geopolitics. **b) Different Approaches to study the subject:** Morphological, functional and unified field theory. Role of physical, demographic, economic, socio-cultural and historical factors in the emergence of States.	15	20
II	**State as a politico-territorial phenomenon::** Changing nature of location, size and shape in political geography of States; Political and administrative framework and its hierarchical relationship to unitary and federal forms of governance. Boundaries and frontiers. Functions and classification of international boundaries.	15	15
III	**Global strategic views:** Mackinder Spykman de. Seversky Mahan Their relevance to contemporary world situation.	10	15

IV	**Underdevelopment and international policies:** The North-South dialogue; SAARC and ASEAN the New International Economic order; International tensions; identification of tension areas and factors contributing to tension in different areas; West Asia, and Indian Ocean region; Regionalism in International relations.	10	15
V	**Politics of Displacement & Political Geography of Resource Conflicts** Issues of relief, compensation and rehabilitation: with reference to Dams, Highways and Special Economic Zones Water Sharing Disputes, Disputes and Conflicts Related to Forest Rights and Minerals.	10	15
Total		**60**	**80**

Reference Books:

1. Bhagwati, J.N. (ed.): New International Economic Order - The North-South Debate, M.I.T. Press, London, 1976.
2. Dikshit, R.D.: Political Geography: A Contemporary Perspective, Tata McGraw-Hill Publishing Co., New Delhi, 1982 (also latest edition).
3. Glassner M.I.: Political Geography, John Wiley, New York, 1993.
4. Panikkar, K.M. Geographical factors in Indian History. Bharatiya Vidya Bhavan, Bombay 1956.
5. Pounds N.T.: Political Geography Mc Graw Hill, New York, 1972.
6. Prescott, J.R.V.: Political Geography, Methuen & Co., London, 1972.
7. Schwartzberg, J.E.: A Historical Atlas of South Asia, University of Chicago Press, U.S.A. 1993.
8. Short, J.R. : An Introduction to Political Geography, Routledge and Kegan Paul, London, 1982.
9. Taylor P.J (ed.): Political Geography of the 20th Centuary - A Global Analysis. New York, 1993.
10. Taylor, Peter: Political Geography, Longman, London, 1985.
11. William C.H. (ed.): Political Geography of the New World Order Halsted Ben, New York, 1993.

Web Resources:

1. www.wikipedia.org
2. www.encyclopedia.com
3. http://jgesnet.com

Name of the Program: M. A. I Geography		
Semester: II **Practical Paper**	**Name of the Course** **GCP-3: Practical in Climatology**	**Credits: 04**

Course Objectives:

1. To understand the basic units of scientific notation for conversion.
2. To familiarize the students with the weather instruments techniques of weather elements.
3. To prepare the climatic maps using different methods.
4. To identify the climatic sign and symbols, and weather reports by IMD.

Course Outcomes:

1. Apply an understanding of synoptic processes and the ability to interpret a range of graphical and visual data to the explanation of weather events and forecasting.
2. To identify various sources of climate data
3. To understand the formats of Indian daily weather reports and reading of weather signs and symbols
4. To represent meteorological elements diagrammatically and interpretation of results.
5. To know methods of measurement of meteorological elements
6. To analyze the interrelationship between various meteorological elements
7. To analyze present and future trends of meteorological elements.

❖ **Practical / field work list:**

Unit	Teaching and Learning points	Practical's	Marks
I	1) Scientific notation and conversion of different units 2) Instrumentation and measurement techniques of weather elements and processing of weather data	15	20
II	1) Preparation of climatic maps and diagrams: wind roses, circular graph, climograph and water budget diagram	15	20
III	**Climatology Practical:** 1) Conventional Sing and Symbols of Weather 2) Climatic map analysis: Daily IMD weather reports 3) Preparations of Climatic maps and Diagrams- Circular Graph, Climograph and Wind rose.	15	20
IV	Preparation of climatic maps and diagrams: wind roses, circular graph, climograph and water budget diagram Statistical analysis of climatic data	15	20
V	**Journal and Viva**	-	20
	Total	**60**	**100**

Reference Book

1. Oliver, J. E. (1981): Climatology: Selected Applications, V. H. Winston and Sons, London
2. Keith, S. (1975): Principles of Applied Climatology, Wiley the University of Michigan
3. Griffiths, J. F. (1966): Applied Climatology: An introduction, Oxford University Press, London
4. Hobbs, J. E. (1980): Applied Climatology: A Study of Atmospheric Resources, W. Dawson, University of California, California
5. Fitzroy, R. (2012): The Weather book, A manual of Practical Meteorology, Green, Longman, Cambridge
6. Daily and weekly weather reports of IMD.

Name of the Program: M. A. I Geography		
Semester: II **Practical Paper**	**Name of the Course** **GCP-4: Practical in Statistics**	**Credits: 04**

Course Objectives:

1. To learn the significance of statistics in geography.
2. Understand the importance of the use of data in geography
3. Recognize the importance and application of Statistics in Geography
4. Interpret statistical data for a holistic understanding of geographical phenomena.
5. Know about different types of sampling.
6. Develop an idea about theoretical distribution.
7. Learn to use tabulation of data.
8. Gain knowledge about association and correlation.

Course Outcomes:

1. To understand the importance and use of statistical techniques in geography
2. Form frequency distribution tables and graphically interpret the results.
3. To measure central tendency and dispersion of data.
4. To examine the relationship between two or more variables with correlation and regression analysis.
5. To apply comprehensive knowledge of statistics for the analysis of geographical data

Practical / field work list:

Unit	Teaching and Learning points	Practical's	Marks
I	**Introduction to Statistical Techniques in Geography** Definition of statistics, Importance, and use of statistical techniques in geography, Statistical data, Various types of averages, Measures of dispersion and their calculation, Normal frequency distribution, Curve and its uses, Binominal and poisons frequency distributions	15	20
II	**Sampling** Characteristics of samples, Methods of sampling, Statistical significance, Standard error of the difference, Significance test in small samples, Student's't's test, Snedecor's variance ratio test (F test).	15	20
III	**Measures of Statistics** Measures of central tendency using simple, discrete, and continuous data: Mean, Median and Mode. Measures of position: Estimation of quartiles, deciles, and percentiles. Measures of dispersion: Absolute measurements- Mean deviation, Quartile deviation, and Standard deviation. Relative measurements: Coefficient of mean deviation, Coefficient of quartile deviation, Coefficient of variations, Index variability and Relative variability.	15	20
IV	**Analysis of Statistical Relationship** Skewness: Karl Pearson's and Bowley's methods Kurtosis, Correlation analysis: Rank order correlation and Product moment correlation, Kendall's coefficient Regression analysis: Simple and Multiple Regression Least square method.	15	20
V	**Journal and Viva**	-	20
	Total	**60**	**100**

Reference Book

1. Gregory S: Statistical methods and the geographer, Longman, London, 1978.
2. Growzon& Cowden: Applied General Statistics, Prentice Hall.
3. Hagget, P: Locational Analysis in Human Geographical Studies, Sanjay Enterprises, New Delhi.
4. John Silk: Statistical Concepts in Geography, George Allen &Unwin, London.
5. Johnston, R J: Multivariate Statistical Analysis in Geography, Longman, London,1973.
6. King, T J: Statistical Analysis in Geography, Prentice Hall.
7. Mahmood A: Statistical Methods in Geographical Studies, Rajesh Publications, New Delhi,1977.
8. Saroj K Pal: Statistics for Geosciences- Techniques and Applications, Concept, New Delhi, 1998.

Name of the Program : M.A. II Geography		
Semester III **Theory Paper**	**Name of the Course** **GCT-6: Oceanography**	**Credits : 04**

Course Objectives:

The objectives of the course are to introduce students to the many facets of Oceans, such as, evolution of the oceans, physical and chemical properties of sea water, atmospheric and oceanographic circulation, the fascinating world of marine life and the characteristic of marine environment and the impact of man on the marine environment.

Course Outcomes:

1. Define the major concepts in oceanography.
2. Describe the oceanic floor.
3. Interpreter the properties of sea water.
4. Examine the waves in oceanic region.
5. Appraise the tides.

Course Contents:

Unit	Teaching / Learning Points	Periods	Marks
I	**Introduction to Oceanography:** • Meaning of Oceanography: Definition, nature and scope • Historical background and development of oceanography A) Golden B) Dark C) Modern • Distribution of Sea and Ocean	10	15
II	**The Morphology of the Ocean Bottom:** • Continental Margin: Shelf, Slope and Rise. • Oceanic Ridges • Oceanic Landforms: Abyssal Plains, Seamounts and Guyots. • Oceanic Deep and Trenches	10	15
III	**Properties of Ocean Water:** • Temperature: 1) Source of Heat 2) Distribution of Temperature : Horizontal and Vertical 3) Factor affecting on ocean temperature • Density: 1) Distribution of Density of sea water 2) Controlling factors of Density of Seawater • Salinity: 1) Composition of sea water 2) Sources of Oceanic Salinity 3) Distribution of Salinity 4) Controlling factors of Salinity	15	15

	• Relationship between Density, Temperature and Salinity.		
IV	**Ocean Movements:** • Wave: 1) Formation of Sea Wave 2) Characteristics of Wave: Height, Length, Period, Frequency, Velocity and Steepness. • Tide: 1) Origin of Tide 2) Types of Tide 3) Equilibrium Theory 4) Tidal Effect in Coastal Areas • Current: 1) Origin of Ocean Current 2) Types of Ocean Current 3) Distribution of Ocean Current 4) Indian Monsoon: El Nino, La Nina.	15	20
V	**Ocean Deposits** • Sources and Types of Marine Deposits 1) Terrigenous 2) Volcanic Matter 3) Biotic 4) Abiotic • Classification of Ocean Deposits • Coral Reefs 1) Condition of Coral Growth 2) Types of Coral Reefs 3) Distribution of Coral Reefs.	10	15
Total		**60**	**80**

❖ **Reference Books:**

1. Basu S.K. (2003) (ed): Handbook of Oceanography, Global Vision, Delhi
2. Davis Richard A. (1972): Oceanography, Addition Wesley Publishing Co.
3. Garrison Tom (1999): Oceanography, Brooks/ Cole Wadsworth, New York
4. Garrison Tom (2004): Essentials of Oceanography. Thompson, Australia
5. Grant Gross M. (1982): Oceanography, Prentice hall, Ince, New Jersey
6. King Cuchlain A. M (1962): Oceanography for Geographers (ED) Edward Arnold
7. Sharma & Vatal (1962): Oceanography for Geographers. Chaitanya Publishing House, Allahabad
8. Thurman Harold V. (1985): Introductory Oceanography. Bell & Howell Co. London
9. Weisberg J. and Howard P. (1974): Introductory Oceanography. McGraw Hill, Kogakusha, Tokyo.

❖ **Web Resources:**

1. www.wikipedia.org
2. www.encyclopedia.com
3. http://jgesnet.com

Name of the Program: M.A. II Geography		
Semester III **Theory Paper**	**Name of the Course** **GCT-7: Geography of India**	**Credits: 04**

Course Objectives:

1. To acquaint the students with the geography of our Nation.
2. To make the student aware of the magnitude of problems and Prospects at the National level.
3. To help the students to understand the interrelationship between the subject and society.
4. To help the students to understand the recent trends in regional studies.

Course Outcomes:

1. Define the Areal Differentiation in India.
2. Describe the Physical and Human Phenomena.
3. Interpreter the Co-relation of Physical and Human factors in India.
4. Examine Social and Cultural Issues in India.
5. Appraise the development of People.

Course Contents:

Unit	Teaching / Learning Points	Periods	Marks
I	**Introduction** • Location and Extent • Historical Background • International Boundaries of India and Related Issues • States and Union territories	10	15
II	**Physiography:** • The Northern Mountains • The North Indian Plains • The Peninsular Plateau • The Coastal lowlands and Islands	10	15
III	**Drainage System:** • Himalayan Rivers: The Indus, The Ganga, The Brahmaputra • East Flowing Rivers: Mahanadi, Godavari, Krishna, Kaveri • Major West Flowing Rivers: Narmada,Tapi, Mahi • Minor West Flowing Rivers originating in Western Ghat	15	15
IV	**Climate Soil and Natural Vegetation:** • Various Seasons and Weather Associated With them • Types of Soil and its Distribution • Soil Degradation and Conservation • Types of Natural Vegetation and its Distribution (Classification)	15	20
V	**Socio-Economical and cultural environment:** • Population Pattern- Distribution, Growth, and Structure • Economic - Mineral and power resources distribution and utilization iron, coal, petroleum, gas	10	

	• Agricultural Production- rice, wheat, and major crops. • Social identity- race, cast, religion, language, tribe etc. • The current issues in India		15
Total		**60**	**80**

❖ **Reference Books:**

1. Deshpande C. D., 1992: India: A Regional Interpretation, ICSSR, New Delhi
2. Johnson, B. L. C., ed. 2001. Geographical Dictionary of India. Vision Books, New Delhi.
3. Mandal R. B. (ed.), 1990: Patterns of Regional Geography – An Intenational Perspective. Vol. Indian Perspective.
4. Sdyasuk Galina and P Sengupta (1967): Economic Regionalisation of India, Census of India
5. Sharma, T. C. 2003: India - Economic and Commercial Geography. Vikas Publ., New Delhi.
6. Singh R. L., 1971: India: A Regional Geography, National Geographical Society of India.
7. Singh, Jagdish 2003: India - A Comprehensive & Systematic Geography, Gyanodaya Prakashan, Gorakhpur.
8. Spate O. H. K. and Learmonth A. T. A., 1967: India and Pakistan: A General and Regional Geography, Methuen.
9. Tirtha, Ranjit 2002: Geography of India, Rawat Publs., Jaipur & New Delhi.
10. Pathak, C. R. 2003: Spatial Structure and Processes of Development in India. Regional Science Assoc., Kolkata.
11. Tiwari, R.C. (2007) Geography of India. Prayag Pustak Bhawan, Allahabad
12. Sharma, T.C. (2013) Economic Geography of India. Rawat Publication, Jaipur

❖ **Web Resources:**

1. www.wikipedia.org
2. www.encyclopedia.com
3. http://jgesnet.com

Name of the Program : M.A. II Geography		
Semester: III **Theory Paper**	**Name of the Course** **GSTG-1: Fluvial Geomorphology**	**Credits : 04**

Course Objectives:

1. The rivers being the major geomorphic agent of erosion, the course assumes significance as it mainly deals with an understanding of the fluvial forms and processes. The evolution of drainage pattern and alluvial channels are governed by the forces resisting and driving the flow of water. The students are introduced to the activities of these two forces and their resultant effects on the flow patterns, sediment load and channel patterns.
2. The use of rivers and the landscape develop certain feedback mechanism within the system which has the ability to alter the human vis-à-vis fluvial environments.

Course Outcomes:

1. Analyze the basic concepts of Fluvial Geomorphology.
2. Describe the Features of channel morphology.
3. Interpret of fluvial erosion and its landforms.
4. Examine the Sediment Transportation of Fluvial system.
5. Explain the Fluvial Deposition and its landforms.

Course Contents:

Unit	Teaching / Learning Points	Periods	Marks
I	**Fluvial Geomorphology and Geography;** • Definition and scope • Hydrological cycle and Sub-cycle • Drainage pattern evolution • Limits of drainage development • Channel changes with time	10	15
II	**Fundamentals of river mechanics:** • Types of flow and flow discrimination • Forces acting in channels • Low regimes • Sediment load of streams. • Sediment transport • Competent velocity; • Lift force; • Critical tractive force.	20	20

III	**Hydraulic geometry of streams at a station and down-stream:** • Channel thalweg • Causes of concavity; • Channel patterns, • Equilibrium profile - straight, meandering and braided.	10	15
IV	**Drainage basin as a fundamental geomorphic unit.** • Drainage basin - form and process • Drainage basin morphometry • Morphometric interrelations	10	15
V	**Applied fluvial geomorphology;** • Human adjustment to flood plain, • Alluvial fans and deltaic environments (case studies). • Effects of reservoirs on fluvial systems. • Remote sensing and GIS application to fluvial environments.	10	15
Total		**60**	**80**

Reference Books:

1. Chorley R.J. (ed) ' Introduction of Fluvial Processes Methuen & Co., London, 1973.
2. Coates D.R. and Vitek J.I. Thresholds in Geomorphology. George Allen Unwin, London 1980.
3. Gregory K.J. 'River Channel Changes' John Wiley & Sons, New York, 1977.
4. Gregory K.J. and Walling, D.E.: Drainage Basin: Forms and Process- A Geomorphological Approach. John Wiley & Sons, New York, 1985.
5. Kingston D. Fluvial Forms and Processes Edward Arnold, London, 1984.
6. Leopold C.B. et.al..: Fluvial Processes in Geomorphology; Freeman, London 1964.
7. Morisawa M.(ed.) Fluvial Geomorphology. George Allen & Unwin, 1981.
8. Gleick, P.H. (ed.): Water in Crisis Oxford University Press, New York 1993.
9. Morisawa M: 'Streams - Their Dynamics and Morphology' McGraw Hill, New York, 1968.
10. Leopold, L. B., Wolman, M. G. and Miller, P. (1954) Fluvial processes in Geomorphology, Freeman and Co., San Francisco.
11. Schumm, S. A. (1977). Fluvial Systems. Wiley, New York.
12. Richards, K. (1982). River: Forms and processes in alluvial channels. Methuen and Co. London Morisawa, M. (1985). Rivers: Forms and Processes, Longman
13. Dr. Kale, V. S. and Gupta, A. (2001). Introduction of Geomorphology, Orient Longman, Kolkata.

Web Resources:

1. **www.wikipedia.org**
2. **www.encyclopedia.com**
3. **http://jgesnet.com**

Name of the Program : M.A. II Geography		
Semester III **Theory Paper**	**Name of the Course** **GSTG-2: Arid and Karst Geomorphology**	**Credits : 04**

Course Objectives:

1. As the arid and semi—arid climatic regions occupy a major portion of the continents, it becomes essential to understand the deserts in detail as they hold a key to the natural resource evaluation.
2. Aeolian environments are particularly sensitive to aridity, bio-mass and human interferences. All these activities affect wind shear in different degrees, set time in motion the processes of erosion and deposition. These processes and their resulting forms are highlighted in the course content.
3. Aeolian activities are not restricted to the present day conditions but also to the past environmental stress conditions. These palaeo- environments are discernible by using established dating techniques which have enabled the interpretation of past climates and pre-historic cultures. A direction is set for the application of Aeolian geomorphic principles for the efficient management of land-based human economic activities through advanced monitoring technique with special reference to India.
4. Understand the Karst Geomorphology & Its formation.

Course Outcomes:

1. Define the major concepts in Arid Geomorphology.
2. Described the desert landscape surfaces.
3. Interpret the arid and desert terrain.
4. Examine the water in the arid region.
5. Understanding of Karst Topography & Land features.

Course Contents:

Unit	Teaching / Learning Points	Periods	Marks
I	**Wind Environments:** • Introduction; desert wind systems; directional variability and • Resultant drift potential; • Scope of Aeolian geomorphology. Grain in motion: • Fluid flows - flow types; interaction of the wind and the bed - wind shear; entrainment – lift and drag; Thresholds of movement: static and dynamic; • Modes of transport: saltation, creep, reptation and suspension; transport rates.	10	15
II	**Wind erosion and landforms:** • Processes: abrasion, deflation and aerodynamic erosion; • Landforms: ventifacts, yardangs, pans, stone pavements, deflation hollows; • Desert varnish; processes and significance. Dusts-Sources; - contemporary and proximal, mineral composition; • Dust-generating and dust yielding systems, gross spatial patterns of production and removal;	15	20

	• Deposition: loess, types, palaeo -environmental significance.		
III	**Forms of wind deposition:** • Sand ripples, obstacle dunes; • Dune- classification schemes; • Morphodynamics of the crescentic, longitudinal and complex dunes.	10	15
IV	**Karst Geomorphology:** • Ground water: meaning and concept; • Geomorphic work of groundwater • Erosional work • Depositional work • limestone (karst) topography	15	15
V	**Karst Features** • Distribution of karst areas • Erosional landforms • Karst cycle of erosion.	10	15
Grand Total		**60**	**80**

Reference Books:

1. Abrahams, A.D. and Parsons, A.J. (eds.), Geomorpology of Desert Environments Chapman & Hall, London, 1994.
2. Goudie,A and Hegde : Palaeo-geography and Pre-history of Indian Desert, Academic Press, London,1980. .
3. Baumont, P.: Drylands-Environment, Management and Development, Routledge, New York,1993.
4. Bagnold, R.A. The Physics of Blown Sand and Desert Dunes, Methuen, London, 1941.
5. Cook, R.U., Waren, A. and Goudie, A.S. Desert Geomorphology, London, UCL Press, London, 1993.
6. Embleton, C. and Thornes, J. (eds.), Process in Geomorphology, Arnold -Heinemann, New Delhi, 1980.
7. Greeley, R and Iversen, J.D., Wind as a Geological Process. Cambridge University Press, Cambridge, 1985.
8. Lancaster, N: Geomorphology of Desert Dunes Routledge, New York,1995.
9. Livingstone I. and Warren, A. Aeolian Geomorphology ,Adison Wesley, Longman, Essex, 1996.
10. Mckee, E.D. (ed.) A Study of Global Sand Seas, Castel House, Kent, 1980.
11. Nickling, W.G. (ed.) Aeolian Geomorphology. Allen & Unwin, Boston, 1986. Curriculum Development Committee in Geography 106
12. Singhvi, A.K. and Derbyshire, E.(eds.) Palaeo—environmental Reconstruction in Arid Lands, Oxford & IBH, New Delhi, 1999.
13. Tchakerian, V.P. (ed.) Desert Aeolian Process ,Chapman & Hall, London, 1995.

❖ **Web Resources:**

1. www.wikipedia.org
2. www.encyclopedia.com
3. http://jgesnet.com

Name of the Program: M.A. II Geography		
Semester: III **Theory Paper**	**Name of the Course** **GSTE-1: Agriculture Geography**	**Credits : 04**

Course Objectives:

1. To familiarize the students with the concept, origin, and development of agriculture.
2. To examine the role of agricultural determinants towards changing cropping patterns, intensity, productivity, diversification and specialization. The course further aims to familiarize the students with the application of various theories, models and classification schemes of cropping patterns and productivity.
3. Its objectives are also to discuss environmental, technological and social issues in agricultural sector with special reference to India.

Course Outcomes:

1. Define the basic concepts of agriculture geography.
2. Describe the Land Classification in India.
3. Examine the Agricultural Patterns.
4. Investigate the Problems & Prospects of Agriculture.
5. Interpreter Agricultural Regionalization and Methods.

Course Contents:

Unit	Teaching / Learning Points	Periods	Marks
I	**A) Introduction to Agricultural Geography:** Meaning, scope, & Development of Agricultural Geography, Significance Approaches of study – commodity, systematic, regional and systems **B) Land use:** General and Agricultural Land use Land use surveys Land Classification in India	10	20
II	**Determinants of Agriculture:** Physical, economic, political, technological, socio-cultural, Cropping pattern, Crop Concentration, Cropping intensity, Degree of commercialization, Diversification and Specialization, Efficiency and productivity	10	15
III	**Agricultural Types:** Shifting cultivation Intensive subsistent farming. Mixed farming Plantation agriculture Commercial grain farming	15	15

IV	**Problems & Prospects of Agriculture:** Definition and characteristics of arid and semi-arid regions. Droughts and famines Role of irrigation and dry farming.	10	15
V	**Theories of Agriculture Location** 1) Von Thunen's model and its modification 2) Concept of the agricultural region 3) Whittlesey's classification of agricultural regions 4) Agricultural typology Agro-climatic regions of India	15	15
Total		**60**	**80**

Reference Books:

1. Aiyer, A.K.Y.N.(1949) – Agricultural and Allied Arts in Vedic India.
2. Grigg. D.G. (1974) – The Agricultural Systems of the world An Evolutionary Approach.
3. Grigg. D.G.(1964) – An Introduction to Agricultural Geography Hutchinson & Co.Ltd.,
4. Illbery, B.W. (1985) – Agricultural Geography, Social & Economic Analysis, Oxford University Press.
5. Morgan. W.B. & S.C. Monton (1971) – Agricultural Geography Methuen, London.
6. Randhawa, M.S. (1980) – An History of Agriculture in India Vols. I, II, III,IV ICAR, New Delhi.
7. Singh. J. and Dhillon S.S. (1994) – Agricultural Geography. Tata McGraw Hill, Publishing Co. Ltd.
8. Symons, Leslie (1970) – Agricultural Geography, G. Belt and Sons Ltd., London.
9. Tarrent, J.R. (1970) – Agricultural Geography, David and Charles, Newton Abbot.
10. Majjid Hussain (2021)- Agriculture Geography, second Edition.

Web Resources:

1. www.wikipedia.org
2. www.encyclopedia.com
3. http://jgesnet.com

Name of the Program: M.A. II Geography		
Semester III **Theory Paper**	**Name of the Course** **GSTE-2: Industrial Geography**	**Credits: 04**

Course Objectives:

1. Introduce the students to the development of industry.
2. To explain the theories and models in Industrial geography
3. To study the different industrial regions in the world.
4. Explain the influence and problems of industrial development.

Course Outcomes:

1) On completion of the course the student will be able to understand comprehensively stages of the economic process and development of Industries.
2) It will help them to identify industrial problems and consequences.
3) It will help them to understand the development and significance of manufacturing Industries and its links with the world economy.
4) Students will understand the location of major manufacturing activities with the support of various industrial location theories and models.

Course Contents:

Unit	Teaching / Learning Points	Periods	Marks
I	• **Introduction:** Nature, scope, and recent developments, Factors of industrial location, Centralization and decentralization of industries, Horizontal, vertical, and diagonal linkages of modern industries. Methods of measuring the spatial distribution of manufacturing industries,	05	15
II	• **Theories and models of industrial location:** Theories and models of industrial location: The least coast school, The transport coast school, the market area school, the marginal location school, the behavioral school, Modern refinements to least coast theory, New trends in industrial geography. Distribution and spatial pattern of major industries Major industrial regions of the world.	10	15
III	• **Important industrial regions of the world** Selecting one each of USA, Russia, Japan, Britain and West Europe. Important industrial regions of India,	15	

	The changing character of geographical concentration and impact of technological change, (i) The Hooghly side industrial region. (ii) The Damoder valley industrial region. (iii) The Ruhr basin industrial region. (iv) The Great Lakes industrial region. (v) Industrial centres of Rajasthan: Bhiwadi, Bhilwara, Jaipur and Luni Basin.		15
IV	• **Influence of power and geographical inertia in manufacturing industries** : The textile industry, Multi-location industries: Iron & steel, Aluminium, Oil refining, Footloose Industries: Automobile, Commercial ship building; Raw material oriented industries-Copper, pulp & paper, cement.	15	15
V	• **Problems of industrial development;** Industrial development and environmental degradation, Industries and economic development, Impact of globalisation on industrial development, Industrial decentralization and its impact on urban fringe, Changing industrial policy	15	20
Grand Total		**60**	**80**

Reference Books:

1. Alexanderson, C: Geography of Manufacturing, Prentice Hall Bombay, 1967.
2. Chauhan, M L &Khandelwal, M K : Dyeing, Printing and Textile, Ritu Publication, Jaipur, 2005.
3. Choudhary, M R : Industrial Geography of India.
4. Estall, R C & Buchanan, R O : Industrial Activity and Economic Geography, Hutchinson & Co.London.
5. Hartshorne, T A & Alexander, J W : Economic Geography, Prentice Hall, New Delhi, 2000.
6. Hoover, E M : The Location of Economic Activity, McGraw Hill, New York.
7. Isard, W : Methods of Regional Analysis, The Techno. Press of MIT & John Willey, New York, 1956.
8. Lloyed, Peter E &Dicken, P: Location in Space: A Theoretical Approach to Economic Geography, Harper & Row, New York, 1972.
9. Miller, E : A Geography of Manufacturing, Prentice Hall, Englewood Cliffs, New Jersey, 1962.

Name of the Program: M.A. II Geography		
Semester: III **Practical Paper**	**Name of the Course** **GSP-1: Practical in Geomorphology**	**Credit : 04**

Course Objectives:

1. To study the costal landform, drainage basin and sub basin
2. To determine the distance and angle between different objects.
3. To Understand the various river basin aspect.
4. To apply soil and sediment analysis techniques to understand geographical phenomena.
5. To familiarize the students with identification of slope and methods.

Course Outcomes:

1. Define the coastal landform with the help of topographic map and satellite image.
2. Judge the drainage basin in the SOI toposheet.
3. Apply the statistical methods of river basin analysis.
4. Understand the hill slopes of various tools.
5. Define the hills and slopes of them with help of couture lines in the SOI toposheet.
6. Understanding the land slopes in the SOI toposheet.

Practical / field work list:

Unit No.	Teaching and learning point	Practical	Marks
I	**Morphologic Analysis:** 1) Coastal landforms using Topographic maps and Satellite image. 2) Measurement of river channel cross section in the field. 3) Demarcate selected drainage basin and its sub-basins by using hilly region's SOI Toposheet. **River Basin Analysis** 1. Measure the Drainage Density of given basin. 2. Measure the Stream Frequency of given basin. 3. Measure the Drainage Intensity of given basin. 4. Measure the Drainage Texture of given basin.	**15**	**20**
II	**Hill slope Analysis** 1) The functions and uses of the Brunton Clino Meter. 2) Measuring vertical angles, height, and distance using by the Brunton Clino Meter. 3) Calculation of slope from Contour Lines in a Topographic Map of given region. 4) Measure the degree of slope by using simple Protractor method. 5) Measurement of the degree of slope by using simple measuring tape and staff method.	**15**	**20**
III	**Sediment Analysis** 1) To prepare for soil sampling and collect soil samples for analysis / testing. 2) To analyze sandy sample, using by Sieving Method. 3) To analyze clayey sample, using by Sieving Method. 4) To plot the data on probability graph paper.	**15**	**20**

	5) To analyze soil sample, using by Pipette Method. 6) To measure the grain size and plot the graph.		
IV	**Soil Testing** 1) To understand different purposes and basics parameters of soil with their methods of testing (Major, Secondary and Minor Nutrients). 2) To measure the soil pH using a ratio of 2:5 soil/ Water paste in soils 3) To measure the soil EC (Electrical conductivity) using a ratio of 2:5 soil/ Water paste in soils 4) To estimate the soil texture by hydrometer method. 5) To estimate the soil moisture by Gravimetric method 6) To estimate soil Bulky density (Db) from situ undisturbed soil method 7) To estimate the soil porosity	**15**	**20**
V	**Journal and Viva**	**-**	**20**
	Total	**60**	**100**

Reference Book

1. Bloom, A. L. (2002). Geomorphology: A Systematic Analysis of Late Cenozoic, Landforms, New Delhi: Prentice-Hall of India.
2. Downs, P. W., & Gregory, K. J. (2004). River Channel Management, London: Arnold
3. King, C. A. M. (1972). Beaches and Coasts, London: Edward Arnold.
4. Pethick, J. (1984). An Introduction to Coastal Geomorphology. London: Arnold-Heinemann.
5. Pijushkanti Saha and Pratha Basu (2010), Advanced Practical Geography, Arunabha Sen, Kolakata.
6. Smith, M. J., Paron, P., & Griffiths, J. (2011). Geomorphological Mapping. Amsterdam: Elsevier.
7. Strahler, A. N. (1964). Part II. Quantitative geomorphology of drainage basins and channel networks. Handbook

Web Resources:

1. **www.wikipedia.org**
2. **www.encyclopedia.com**
3. **http://jgesnet.com**

Name of the Program: M.A. II Geography		
Semester: III **Practical Paper**	**Name of the Course** **ESP-1: Practical in Economic Geography**	**Credit: 04**

Course Objectives:

1. To study the various agricultural techniques using statistical methods.
2. To determine the techniques in industrial geography.
3. Apply the statistical methods of trade and transport.
4. To apply cartographic techniques for using data.

Course Outcomes:

1. Inculcate the knowledge of changing dynamics in the industrial and agricultural sectors that will help them in their research studies
2. To gain in-depth knowledge of the concepts of crop concentration, diversification, combination; agricultural productivity and efficiency; industrial geography theories; industrial regions and spatial variation in production and transport costs.
3. To gain knowledge on transport and marketing geography

Practical / field work list:

Unit No.	Teaching and learning point	Practical	Marks
I	**Techniques in Agricultural Geography** i. Crop Combination- Thomas Method ii. Crop Diversification- Bhatia Method iii. Crop Concentration- Jasbir Singh Method iv. Measures of Agricultural Efficiency: Kendall Method v. Productivity Index- Enyedi Method	**15**	**20**
II	**Techniques in Industrial Geography** Lorenz Curve: Calculation	**15**	**20**
III	**Techniques in Trade and Transport Geography** i. Techniques in Network Structure: Ratio Measure Alpha, Beta, Gamma, and Associate Number and Cyclometric Number ii. Gravity Potential Population Surface iii. Break Point Theory iv. Law of Retail Trade Gravitation	**15**	**20**
IV	**Cartographic Techniques in Economic Geography** i. Use of Thematic Maps in Economic Geography ii. Use of GIS in Economic Geography	**15**	**20**
V	**Journal and Viva**	**-**	**20**
	Total	**60**	**100**

Reference Book

1. Ali, M. (1979): Dynamics of Agricultural Development in India, Concept Publication, New Delhi
2. Hussain, M. (1978): Agricultural Geography, Rawat Publication, Jaipur

3. Singh, J. and Dhillon, S. S. (1994): Agricultural Geography, Tata-McGraw Hill Publication, New Delhi
4. Yeats, M. H. (1978): An Introduction to Quantitative Analysis in Human Geography, John and John Company, Chicago
5. Alexander, J. W. (1993): Economic Geography, Prentice Hall, New Jersey
6. Taffee, S. G. and Gawtheir, T. S. (1973): Geography of Transportation, Prentice Hall, New Jersey
7. Thomas, S. L. and Conkling, V. (1971): Geography of International Trade, McGraw Hill, New York
8. Thomas, S. L. and Conkling, V. (1974): The Geography of Economic Activity, McGraw
   Hill, New York
9. White, H. P. and Senior, M. L. (1984): Transport Geography, John and John Company,
   Chicago

Name of the Program : M.A. II Geography		
Semester III **Service Course**	**Name of the Course** **GSCT-1: Disaster Management**	**Credits : 04**

Course Objectives:

1. Understanding foundations of hazards, disasters and associated natural/social phenomena
2. Introduce knowledge about existing global frameworks and existing agreements (e.g. Sendai)
3. Give introduce Technological innovations in Disaster Risk Reduction: Advantages and problems
4. Experience on conducting independent DM study including data search, analysis and presentation of disaster case study

Course Outcomes:

1. State the major concepts about disaster management.
2. Classify the major cyclonic regions.
3. Solve the problems of arrival cyclones.
4. Examine the major flood Disaster regions.
5. Design the Disaster warning system**.**

Course Contents:

Unit	Teaching / Learning Points	Periods	Marks
I	Meaning of disaster, calamity, Hazards, Major characteristics of disasters. Physical and cultural disasters. Major regions of the world of such disasters and loss of life and property.	15	15
II	Hazards-cyclone, Hurricanes Tornado, Typhoons, causes for the formation of cyclones. Regions of the cyclones.	15	15
III	Precautions before the arrival of cyclones. Effect of cyclonic hazards. Thunder storm, lightening, hail storms and cloud burst calamities.	10	15
IV	Flood disaster. Reasons and types of flood disasters. Wet draught areas. Consequences of floods. Major rivers of heavy floods, measures of flood controls.	10	20
V	Disaster warning system. Rehabilitations, Prevention, Social Response measures for disasters.	10	15
Total		**60**	**80**

Reference Books:

1. Dhara S : Natural disaster, Minimizing Risks the Hindu survey of Environment (2001)
2. Daoglas I and Spencer T : Environmental change and Tropical Geomorphology (Edited) George Allen and Unwin London (1985)
3. Embleton C: Natural Hazards and Global change, ITC Journal 1989 ¾ pp 169-175, Erickson S. L and King B. J. Fundamental of Environmental Management wiley New York (1999)
4. Gupta H. K. Dons and Earthquakes Elsevier Amsterdam (1976)
5. Press F. Need for Action Reduction copying with Natural Hazards, UNESCO (1993)
6. Sinha D. K. towards Basic of Natural disasters, University of Calcutta (1990)
7. Verstappen H. T. Geomorphology, Natural disaster and Global disaster. Proceeding of the symposium sept- 14-16 1989, Enschede Netherlands PP 159- 164.

Web Resources:

1. www.wikipedia.org
2. www.encyclopedia.com
3. http://jgesnet.com

Name of the Program: M.A. II Geography		
Semester IV **Theory Paper**	**Name of the Course** **GCT-8: Geography of Resources**	**Credits: 04**

Course Objectives:

1. Understand the concept and classification of resources
2. Understand the approaches to resource utilization
3. Appreciate the significance of resources
4. Assess the pressure on resources
5. Analyze the problems of resource depletion with special reference to forests, water, and fossil fuels
6. Understand the concept of Sustainable Resource Development
7. Understand the distribution, utilization, problems, and management of metallic and non-metallic mineral resources
8. Analyze the contemporary energy crisis and assess the future scenario
9. Understand the concept of Limits to Growth, resource sharing, and sustainable use of resources
10. Develop the skill of mapping forest cover from satellite images
11. Develop the skill of mapping water bodies from satellite images
12. Analyze the decadal changes in state-wise production of coal and iron ore

Course Outcomes:

1. Students will become sensitized to the concept of resources.
2. Students will become sensitized to the classification of resources.
3. Learn about the use and misuse of resources.
4. Will learn conservation methods and techniques.
5. Showing awareness and responsibility for the environment.

Course Contents:

Unit	Teaching / Learning Points	Periods	Marks
I	**Introduction:** Consciousness and Definition of Resources: The Concept of Resource- Wealth- Resistance and Neutral Stuff. Land as a resource, resource creating Factors, Classification of Resources.		15
II	**Soil**: Soil Formation, Factors Influencing Soil Formation, Soil Characteristics, and Soil Profile, Classification of Soil (zonal types) Soil erosion, Soil Conservation.		15
III	**Forest Resources:** Types & distribution, Forest Products-Timber, and Paper, Forest Decay, Forest Conservation.		15
IV	**Water and Forest Resources:** Water Resources and its Development in India, Ground and surface water, water cycle and water budget; Conservation of water.		20

	Livestock: Livestock Rearing in the World and Live Stock Regions, Livestock Products: Milk, Meat, and Wool. **Marine resources;** Major fishing Grounds of the world.		
V	**Mineral Resources:** Classification of Major Minerals, their Distribution, and Production, Petroleum, Coal, Iron Ore, Bauxite, and Copper. Mineral conservation and Mineral Policy. Energy sources and alternate energies.		15
Total		**60**	**80**

References:

1. Guha J.L. and Chattoraj (2004), A New approach to economic geography, A study of Resources, the world Press pvt. Ltd. Calcutta.
2. Zimmerwan- World resources and industries
3. Khanna K.K. and Gupta V.K (1993) Economic and Commercial Geography, Sultan Chand, New Delhi.
4. Mallappa P. (2004) Udyam Saupahmagalu, Chetan Book House, Mysore
5. Roy. PR. (2001) Economic Geography- A study of Resources, New Central Book Agency, (p) ltd. Calcutta.
6. P. Hagget (1997), Geography, A Modern Synthesis, Haper and Roo publications, New York.
7. Dubey RN. And Negi BS (2002) - Economic Geography of India, Kitabmahal, Allahabad.

Name of the Program: M.A. II Geography		
Semester IV **Theory Paper**	**Name of the Course** **GCT-9: Research Methodology**	**Credits: 04**

Course Objectives:

1. The main goal of the research is to improve the quality and level of living in society.
2. The purpose of a research study is to find out the hidden facts about a business phenomenon
3. Identifying the cause-and-effect relationship
4. To innovate new ideas and improve quality.

Course Outcomes:

1. Demonstrate the ability to choose methods appropriate to research aims and objectives
2. Understand the limitations of particular research methods
3. Develop skills in qualitative and quantitative data analysis and presentation
4. Develop advanced critical thinking skills
5. Demonstrate enhanced writing skills

Course Contents:

Unit	Teaching / Learning Points	Periods	Marks
I	**Research:** Meaning, definitions, objectives, characteristics, types, steps involved in Research, Research ethics, approaches, significance, research and scientific methods, research Process, criteria of good research, and research problems faced by the researchers in India. Review of literature, need for a review of the literature.	10	15
II	**Forms of Research:** what is the research problem, selecting the research problem, the necessity of defining the problem, Research paper, article, workshop, Seminars, Conference, and Symposia?	10	15
III	**Research design:** Meaning, need important concepts relating to research design, different research designs, and developing a research plan. Research methods versus methodology, research, and scientific methods. Sampling methods: Need for sampling some fundamental definitions, sampling theory	10	15
IV	**Methods of data collection:** Collection of Primary data, observation method, interview method, questionnaire methods, Collection of secondary data, selection of appropriate method for collection of data, case study method. Hypothesis, Basic concepts concerning testing of hypothesis, limitations of the tests of Hypothesis.	15	20

V	**Interpretation and report writing:** Meaning of interpretation, why interpretation, techniques of interpretation, precaution in interpretation, the significance of report writing, different steps in report writing, the layout of the research report, types of reports, oral Presentation, conclusion, findings, and suggestions. Bibliography and reference, field Photographs.	15	15
Total		**60**	**80**

References:

1. Krishna Swamy K.N., Siva Kumar A.I., Mathirajan M., "Management Research Methodology (2006), Pearson Education, New Delhi.
2. Kothari C.R., "Research Methodology, Methods and Techniques, Second edition, (2008), New Age International Publication.
3. Ranjit Kumar: Research Methodology, A step by step guide for beginners, Pearson Education, Sixth Edition 2009.
4. Mark Saunders, Philip Lewis, Adrain Thornhiu: Research Methods for Business Students, Pearson Education.
5. Ram Ahuja, "Research Methods", (2001), Rawat Publications, New Delhi.
6. Cooper D., Schindler P., Business research methods", (2003) Tata Mc-Graw Hill, New Delhi.

Name of the Program: M.A. II Geography		
Semester IV **Theory Paper**	**Name of the Course** **GSTG-3: Coastal Geomorphology**	**Credits: 04**

Course Objectives:

1. Acquire an understanding of the dynamism of the coastal zone
2. Understand how coastal processes operate
3. Acquire an understanding of how coastal landforms develop and change
4. Gain practical skills and knowledge to quantify processes and changes in the coastal environment
5. Understand how Geomorphology can contribute to managing coastal environments

Course Outcomes:

1. To understand the coastal processes which configure the coastal zone and coastal landforms as well as coastal management issues.
2. To understand coastal processes, that act along the coastline as well as the coastal landforms which are the main result of these processes
3. Explain the formation of coastal landforms and how they can be used for coastal reconstruction
4. Explain how coastal processes and landforms are affected by climate changes and human interventions
5. Analyze coastal landforms and landscapes
6. Perform paleo-environmental reconstructions

Course contents:

Unit	Teaching / Learning Points	Periods	Marks
I	**Significance of coastal geomorphology;** • Classification of coasts and shore; coastal • Processes - waves in shallow and deep water, wave energy, wave-induced currents, • Tides and tidal waves; coastal materials - sand and shingle, organic reefs.	10	15
II	**Coastal erosion-** • Movement of materials, sorting; beach profile. • Coastal landforms: Sand dunes and sand ridges, spits, barriers, lagoons, cliffs - their origin and distribution.	10	20
III	**Classification :** • Classification of coasts by Johnson, Shepard, and Cotton. Submarine morphology, • Continental shelf, continental slope, submarine canyons, and oceanic ridges.	10	15

IV	**Tidal landforms;** • Tidal landforms; mudflats- processes and morphology. • Salt Marsh- Processes and Morphology. • Formation of estuaries and mangroves.	15	15
V	**Applied coastal geomorphology;** • Mechanism of sea-level changes, and eustatic movements; • Evolution of Eastern and Western Coasts of India, Coast Zone Management.	15	15
Grand Total		**60**	**80**

Reference Books:

1. Ahmad, E.: Coastal Geomorphology of India. Orient Longmans, Bombay, 1973.
2. Bose, A. et. al: Coastal Zone Management of West Bengal, Pub. Sea Explorers Institute, Calcutta, 1985. Curriculum Development Committee in Geography 113
3. Bird, E.C.: Coasts -An Inroduction to Coastal Geomorphology. Basil-Blackwell, Oxford,1984
4. Davis, J.L.: Geographical Variation in Coastal Development. Hafner Pub. Co., New York, 1973.
5. French, P.W.: Coastal and Estuarine Management, Routledge, London, 1997.
6. John, P: An Introduction to Coastal Geomorphology. Arnold- Heinemann, London,1984.
7. King, C.A.M; Beaches & Coasts, Edward Arnold, London, 1972.
8. Scientific American : Readings in Earth Sciences, Vols I-III. Taraporevala Pub., Bombay, 1975..
9. Shepard, F.P. and Wanless, N.R.: Our Changing Coastlines. Oxford University Press, 1971.

Web Resources:

1. **www.wikipedia.org**
2. **www.encyclopedia.com**
3. **http://jgesnet.com**

Name of the Program: M.A. II Geography		
Semester: IV **Theory Paper**	**Name of the Course** **GSTE-3: Geography of Trade and Transportation**	**Credits: 04**

Course Objectives:

1. Students will learn about the role of transport in entire economic and social processes.
2. To make students understand the locational advantage of different economic and social institutes based on transport principles.
3. To be aware of the role of public transport in addressing the problems of congestion and air pollution.
4. To understanding may help them in formulating a plan for regional development and economic regeneration through proper transport planning.

Course Outcomes:

1. Students shall learn about the significance of transport in multifaceted development.
2. Significance of various models.
3. Role of theories related to transport network.
4. About the Accessibility, connectivity, and policy interventions.
5. They will be applying the various approaches of transport in daily life

Course Contents:

Unit	Teaching / Learning Points	Periods	Marks
I	**Introduction:** Nature, scope, significance, and development of transport geography, Factors associated with the development of the transport system; economic, social, cultural, and institutional. Economic and regional development and transport development.	15	15
II	**Accessibility of Transport** Characteristics and relative significance of different models of transport: Railways, roads, ways, waterways, pipelines, etc. Structure- accessibility and flow models; network Structure, graph theoretic measures, measurement of accessibility,	15	20
III	**Theories and Models:** of spatial interaction (Edward Ullman and M. E. Hurst) Measures and Indices of connectivity and accessibility; Spatial Flow Models: Gravity Model and its variants, World Trade Organization, Globalization and Liberalization, and World Trade Patterns. Problems and Prospects of Inter and Intra Regional Cooperation and Trade.	10	15
IV	Theories related to freight route structure. Bases of spatial interaction, complementarity, Intervening opportunities and transferability. Patterns of movement: the type, patterns of Movement and transport modes. Transport network; the function, pattern of movement, Geometry and transport development.	10	15

V	**Policy and Development** Transport policy and planning in India. National Highways and Golden Quadrilateral, State and District Roads, Pradhan Mantri Gram Sadak Yojana, National Freight corridor, Green corridor	10	15
Grand Total		**60**	**80**

References:

1. Chorley R.J. &Hogget P.: Models in Geography Methuen & Co. London. 1967.
2. Hurst, M.E.(ed.): Transportation Geography, McGraw-Hill, 1974.
3. Hogget, F and Chorley, R.J. Network Analysis', Edward Arnold, London, 1968.
4. Hay, A.: Transport Economy, MacMillan, London, 1973.
5. Hoyle, B.S.(ed): Transport and Development, MacMillan, London, 1973.
6. Raza, M. and AgrawalY.P. : Transport Geography of India, Concept, New Delhi, 1985.
7. Robison H &Bam ford C.G.: Geography of Transport MacDonald& Evans. London 1978.
8. Toffee, E.J. & Gauthier (Jr.) H.L. Geography of Transportation, Prentice-Hall, Englewood Cliffs, N.J., 1973.
9. Ullman E.L.: American Commodity Flow University of Washington Press 1957.
10. White H.P. and Senior, M.L. Transport Geography, Longman, London, 1983.
11. Mukherjee

Name of the Program: M.A. II Geography		
Semester: IV **Field Project**	**Name of the Course** **GRMP- Village survey**	**Credits: 04**

- **Physical Survey:**
  1. Location on toposheet (lat. & long),
  2. Extension,
  3. Grid reference if available,
  4. Height above mean sea level, area,
  5. Site and situation
  6. Physical features surrounding the village Position of the village on the cross-section line
  7. Drainage System
  8. Land-use
- **Socio-Economic Survey:**
  Population,
  Population structure,
  Facilities available Information regarding households - based on at least 10% sample survey
- **Data Analysis and Mapping:**
  Primary and Secondary Data Analysis
  Preparation of Various Maps showing present status
  Prepared of Developmental Plan with Description
- **Report Writing:**
  Report writing Preparation of Results

Reference Book

1. Ramamurthy, K. (1982): Map interpretation, Madras
2. Dury G.H. (1960), Map Interpretation. Sir Isaac Pitman and Sons Limited, Pitman House Bath.
3. Meux A. H. (1960), Reading Topographical Maps. University of London Press Limited
4. Jones P. A. (1968), Field work in Geography. Longmans, Green and Company Limited
5. Archer J. E and Dalton T. H. (1968), Field work in Geography B.T. Batsford Limited London
6. Wheeler K.S. Ed (1970), Geography in the field. Blond Educational, London.
7. Gupta, KK & Tyagi VC (1992): Working with maps, Survey of India Publication, Dehradun
8. Vaidyanadhan. R. 1968). Index to a set of 60 topographical maps, CSIR, New Delhi