GOVT. COLLEGE OF ARTS, SCIENCE & COMMERCE
KHANDOLA, MARCELA – GOA 403 107. (INDIA)
(Affiliated to Goa University) Accredited by NAAC with 'A' Grade
POST GRADUATE DEPARTMENT OF GEOGRAPHY

CORE COURSE OF MA GEOGRAPHY PROGRAMME

Semesters	Paper Code	Title of the Paper	Credits
Sem I	GEC001	**Theory:** Principles of Geomorphology **Practical:** Practicals in Geomorphology	3T+1P
	GEC002	**Theory:** Principles of Climatology **Practical:** Practicals in Climatology	3T+ 1P
Sem II	GEC003	**Theory:** Principles of Population Geography **Practical:** Practicals in Population Geography	3T+ 1P
	GEC004	**Theory:** Principles of Economic Geography **Practical:** Practicals in Economic Geography	3T+ 1P
Sem III	GEC005	**Theory:** Development of Geographical Thought **Practical:** Quatitative Approach & Practicals in Statistical Geography	3T+ 1P
	GEC006	**Theory:** Fundamentals of Remote Sensing **Practical:** Practicals in Remote Sensing	3T+ 1P
Sem IV	GEC007	**Theory:** Regional Planning & Development **Practical:** Computer Applications in Geography & Regional Planning	3T+ 1P
	GEC008	**Theory:** Fundamentals of Geographic Information System **Practical:** Practicals in Geographic Information System	3T+ 1P

OPTIONAL COURSE OF MA GEOGRAPHY PROGRAMME

Semesters	Paper Code	Title of the Paper	Credits
Sem I	GEO001	Environmental Geography	4T
	GEO002	Disaster Mitigation & Management	4T
	GEO003	Fundamentals of Oceanography	2T
	GEO004	Fundamentals of Soil Geography	2T
Sem II	GEO005	Geography of Trade & Transport	4T
	GEO006	Political Geography	4T
	GEO007	Regional Geography of India	2T
	GEO008	Urban Geography	2T
Sem III	GEO009	Coastal Geomorphology	4T
	GEO010	Fluvial Geomorphology	4T
	GEO011	Geography of Settlements	4T
	GEO012	Industrial Geography	2T
	GEO013	Research Methodology	2T
	GEO014	Practicals in Cartography Applications	2P
	GEO015	Watershed Management	4T

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Sem IV	GEO016	Social and Cultural Geography	4T
	GEO017	Economic Geography of Globalization	4T
	GEO018	Tropical Geomorphology	2T
	GEO019	Teaching Methodology	2T
	GEO020	Field Techniques and Village Survey	2P

TITLE OF THE PAPER	**THEORY: PRINCIPLES OF GEOMORPHOLOGY**
Class	**MA**
No of Credits	**03**
Paper Code	**GEC001**
Semester	**I**
COURSE OBJECTIVES	1. The objectives of the course is to familiarize the students with the need for understanding of geomorphology with reference to certain fundamental concepts, 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. 2. Finally a few selected applications of geomorphology to societal requirements and quality of environment are dealt with.
COURSE CONTENT	1. Geo tectonics 2. Historical Geomorphology 3. Process Geomorphology 4. Theories of Geomorphology 5. Applied Geomorphology
LEARNING OUTCOMES	1. To know the fundamentals of Physical Geography. 2. Understand latitudes, longitudes and international dead line. 3. Acquire knowledge about origin of various landforms. 4. To Understand formation of rocks there types and uses. 5. Study the denudation processes.
SUGGESTED READING	1. Kale, V. and Gupta, A. 2001: Introduction to Geomorphology, Orient Longman,Kolkata 2. Chorley, R.J. 1969: Introduction to Fluvial Processes, Methuen, London 3. Chorley, R.J., Schumm, S. A. and Sugden, D.E. 1984: Geomorphology, Methuen, London 4. Cooke, R.U. and Warren, 1973: Geomorphology in Deserts, Batsford, London 5. Dayal, P. 1996: Textbook of Geomorphology, Shukla Book Depot, Patna. 6. Hallam, A. 1973: A Revolution in Earth Science: From Continental Drift to Plate Tectonics, Oxford University Press, London. 7. McCullagh, P. 1978: Modern Concepts in Geomorphology, Oxford University,Press, Oxford. 8. Morisowa, M. 1968: Streams, their Dynamics and Morphology, McGraw Hill,New York.

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TITLE OF THE PAPER	**PRACTICALS IN GEOMORPHOLOGY**
Class	**MA**
No of Credits	**01**
Paper Code	**GEC001**
Semester	**I**
COURSE OBJECTIVES	1. To understand and evaluate the concept of geomorphology and its role and relevance in field;
COURSE CONTENT	1. Drainage basin and network morphometry 2. Slope analysis 3. Geomorphic mapping 4. Size analysis of the sediment samples collected in the field (by sieving) 5. Sediment size and shape analysis 6. Field work- Measurement of channel cross-sections in the field
LEARNING OUTCOMES	1. Students would be able to understand the usefulness of morphometric techniques in the case of a drainage basin. 2. Gain knowledge about topographical maps and apply this knowledge in ground surface. 3. Identification of different types of sediment size.
SUGGESTED READING	1. Doorenbos J. (1977) and Pruitt W.O. - Crop water requirement, FAO irrigation and drainage. 2. Frere and Popov (1979) - Agro-Meteorological Crop monitoring and forecasting, FAO plant production Paper No. 17. 3. Lawrence, G. R. P.: Cartographic Methods, Mathur Co. London 4. Monkhouse, F. J. R and: Maps and Diagrams, Wilkinson, H.R. Methuen and Co., London. 5. R. L. Singh & Rana P. B. Singh: Element of Practical Geography, Kalyani Pub. New Delhi (1999)

TITLE OF THE PAPER	**PRINCIPLES OF CLIMATOLOGY**
Class	**MA**
No of Credits	**03**
Paper Code	**GEC002**
Semester	**I**
COURSE OBJECTIVES	1. To introduce students with the basics of Climatology as a discipline. 2. To acquaint the students with various concepts, theories and models. 3. To help the students to apply the knowledge in real situations. 4. To guide students in undertaking research in the field.
COURSE CONTENT	1. Weather & Climate, Subdivisions of Climatology, Earth`s Atmosphere 2. Insolation and Heat Balance 3. Temperature, pressure, humidity and wind motion 4. Circulation of the Atmosphere 5. Atmospheric Stability

LEARNING OUTCOMES	1. Students will understand the basics of Climatology as a discipline. 2. Students will be acquainted with various concepts, theories and models. 3. Students will be able to apply the knowledge in real situations. 4. Students will be able to undertake research in the field.
SUGGESTED READING	1. Frederick K. Lutgen, Edward Tar buck: "The Atmosphere An Introduction to Meteorology" Prentice Hall,Englewood Cliffs ,New Jersey 0762 ,1998. 2. D. S. Lal: Climatology. Sharda Pustak Bhawan ,11 , University road Allahabad 211002 Edition 2003 3. Trewartha: Introduction to Weather and Climate. 4. H.J. Critchfield (Rep.2010): General Climatology. Prentice Hall, New Delhi 5. Savindra Singh (Rep.2011)Climatology

TITLE OF THE PAPER	**PRACTICALS IN CLIMATOLOGY**
Class	**MA**
No of Credits	**01**
Paper Code	**GEC002**
Semester	**I**
COURSE OBJECTIVES	The objective of this course is to provide basic practical tools in understanding weath
COURSE CONTENT	1. Temperature analysis processing of observed data 2. Calculation of relative humidity, 3. Rainfall Analysis - annual variability of rainfall. 4. Water Budget 5. Discomfort Index 6. Classification of Koppen and Thorn Thwaite's Climate, 7. Construction of crop-coefficient curve for any one crop. 8. Computation of Water Requirement Satisfaction index.
LEARNING OUTCOMES	1. Apply an understanding of synoptic processes and the ability to interpret a range 2. Analyse and interpret the relationships between large-scale ocean-atmosphere pro 3. Synthesise their understanding of climate processes at a range of scales to explain
SUGGESTED READING	1. Doorenbos J. (1977) and Pruitt W.O. - Crop water requirement, FAO irrigation 2. Frere and Popov (1979) - Agro-Meteorological Crop monitoring and forecasti 3. John F. Mather (1974) - Climatology Fundamentals and Application Oxford Univ 4. Mather J.R (1974) Climatology, Fundamentals and applications, Mc Graw Hill B 5. R. L. Singh & Rana P. B. Singh: Element of Practical Geography, Kalyani Pub. N

TITLE OF THE PAPER	**DISASTER MITIGATION & MANAGEMENT**
Class	**MA**
No of Credits	**04**
Paper Code	**GEO002**
Semester	**I**

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COURSE OBJECTIVES	1. To acquaint the students with the significance of this paper. 2. To present the scenario of major and minor disasters and understand the cause and effect of the same. 3. To help the students to apply the knowledge in real situations. 4. To guide students in undertaking research in the field.
COURSE CONTENT	1. Introduction hazard & disasters 2. Disaster Zonation of the World 3. Climatic, Geological & 4. Geomorphic Disasters 5. Man-made Hazards 6. Disaster Management and Measures 7. Strategies of risk reduction
LEARNING OUTCOMES	1. Students will understand the importance of understanding the disasters and mitigation measures. 2. Students will be able to understand the cause and effect relationship of the disasters. 3. Students will be able to help to apply the knowledge in real situations. 4. Students will be able to undertake research in the field.
SUGGESTED READING	1. Turk J. (1985) : Introduction to Environmental Studies, Saunders, College Publication, Japan 2. Singh Savindra (2000) : Environmental Geography, Parag Pustak Bhavan, Allahabad 3. Morrisawa M (Ed) (1994) : Geomorphology and Natural Hazards, Elsevier, Amsterdam 4. Hart M. G. (1986) : Geomorphology, Pure and Applied, George Allen and Unwin, London

TITLE OF THE PAPER	**FUNDAMENTALS OF OCEANOGRAPHY**
Class	**MA**
No of Credits	**02**
Paper Code	**GEO003**
Semester	**I**
COURSE OBJECTIVES	1. Understand importance of ocean. 2. Knowledge about effect of ocean Currents. 3. Understand human impacts on Ocean. 4. Study about types of tides.
COURSE CONTENT	1. Introduction to Oceanography 2. World Oceans and their formations 3. Properties of Sea- Water, Tides, Tidal Currents 4. Ocean Currents 5. Tide generating forces, Tidal effects in coastal areas 6. Thermohaline circulation
LEARNING OUTCOMES	1. At the end of this course, the students will be able to gain knowledge and understand the subject matter. 2. They will also acquire the skills to apply the knowledge to real situations around the world.
SUGGESTED	1. Sharma & Vatal (1962): Oceanography for Geographers. Chaitanya Publishing House, Allahabad

READING	2. Thurman Harold V. (1985): Introductory Oceanography. Bell & Howell Co. London

TITLE OF THE PAPER	**FUNDAMENTALS OF SOIL GEOGRAPHY**
Class	**MA**
No of Credits	**02**
Paper Code	**GEO004**
Semester	**I**
COURSE OBJECTIVES	1. This is a basic course that focuses on understanding of soil formation, development and distribution. 2. They will also be equipped with basics of soil structure, composition, content and conservation practices.
COURSE CONTENT	1. Introduction - Soil Formation 2. Hydrology and soils, 3. Soils and Agriculture, 4. Problems related to soils 5. Soil Horizons 6. Soil Properties & Quality 7. Soil degradation and conservation 8. World soil distribution, Factors responsible to the distribution of soil
LEARNING OUTCOMES	1. On completion of this course, the students will be able to identify and differentiate between various soils profiles and types. 2. This will develop understanding amongst students how different types of soil formations, characteristics and importance in agricultural practices.
SUGGESTED READING	1. Pitty A.F. (1978): Geography and Soil Properties, Methuen and Company Ltd., London. 2. Thomas J.B. and Brunsden D (1977): Geomorphology and Time, Methuen and Company Ltd.

TITLE OF THE PAPER	**PRINCIPLES OF POPULATION GEOGRAPHY**
Class	**MA**
No of Credits	**03**
Paper Code	**GEC003**
Semester	**II**
COURSE OBJECTIVES	1. To introduce students with the basics of Population Geography as a discipline. 2. To acquaint the students with various concepts, theories and models. 3. To help the students to apply the knowledge in real situations.
COURSE CONTENT	1. Population as a Geographic Subject 2. Human Population over Time and Space, Determinants of population growth 3. Dynamics of Migration: trends and patterns

	4. Population and Resources 5. Population Issues - Global and India
LEARNING OUTCOMES	1. Students will understand the basics of the subject matter 2. Students will be acquainted with various concepts, theories and models. 3. Students will be able to apply the knowledge in real situations.
SUGGESTED READING	1. Bose Ashish , India's Billion Plus People -2001 Census Highlights, Methodology and Media Coverage, B R Publishing Corporation, New Delhi,2001 2. Bose, Ashish et. al.: Population in India's Development (1947-2000): Vikas Publishing House, New Delhi 1974. 3. Census of India, India: A State Profile, 2001. 4. Chandna, R.C.Geography of Population: Concept, Determinants and Patterns, Kalyani Publishers, New Delhi 2002. 5. Clarke, John I., Population Geography, Pergamon Press. Oxford 1973.6

TITLE OF THE PAPER	**PRACTICALS IN POPULATION GEOGRAPHY**
Class	**MA**
No of Credits	**01**
Paper Code	**GEC003**
Semester	**II**
COURSE OBJECTIVES	**1.** The objective of this course is to provide basic practical tools in understanding the various components of population.
COURSE CONTENT	1. Basic sources of population data, collection and processing of demographic data, Methods of Calculation of population data 2. Methods of representation of population data 3. Dependency ratio, calculation of human development Index. 4. Pie chart, Age and sex pyramid and types 5. Model testing: Demographic Transition model, rank size rule, nearest neighbourhood index
LEARNING OUTCOMES	1. Apply an understanding of synoptic processes and the ability to interpret a range of graphical and visual data. 2. Analyse and interpret the relationships between the data using simple statistical techniques.
SUGGESTED READING	1. Bose, Ashish et. al.: Population in India's Development(1947-2000): Vikas Publishing House, New Delhi 1974. 2. Census of India, India : A State Profile, 2001. 3. Chandna, R.C. Geography of Population : Concept, Determinants and Patterns, Kalyani Publishers, New York 2000. 4. Clarke, John I., Population Geography, Pergamon Press. Oxford 1973. 5. Garnier, B.J. Geography of Population Longman, London 1970.

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TITLE OF THE PAPER	**PRINCIPLES OF ECONOMIC GEOGRAPHY**
Class	**MA**
No of Credits	**03**
Paper Code	**GEC004**
Semester	**II**
COURSE OBJECTIVES	1. To introduce students with the basics of Economic Geography as a discipline. 2. To acquaint the students with various concepts, theories and models. 3. To help the students to apply the knowledge in real situations. 4. To guide students in undertaking research in the field.
COURSE CONTENT	1. Introduction to Economic Activities 2. Agricultural regions 3. Industries 4. Transportation 5. Economic development of India
LEARNING OUTCOMES	1. Students will understand the basics of Economic Geography as a discipline. 2. Students will be acquainted with various concepts, theories and models. 3. Students will be able to apply the knowledge in real situations. 4. Students will be able to undertake research in the field.
SUGGESTED READING	1. Berry J.L. Geography of Market Centres and Retail Distribution, Prentice Hall , New York, 1967. 2. Chatterjee, S.P. : Economic Geography of Asia, Allied Book Agency, Calcutta, 1984. 3. Chorley, R.J. and Haggett, P. (ed.): Network Analysis in Geography, Arnold, 1969. 4. Dreze, J. and Sen, A. : India-Economic Development and Social Opportunity, Oxford University Press, New Delhi, 1996. 5. Eckarsley, R.(ed.): Markets, the State and the Environment, McMillan, London, 1995. 1. 6. Garnier. B.J. and Delobez, A Geography of Marketing, Longman, London, 1979.

TITLE OF THE PAPER	**PRACTICALS IN ECONOMIC GEOGRAPHY**
Class	**MA**
No of Credits	**01**
Paper Code	**GEC004**
Semester	**II**
COURSE OBJECTIVES	The objective of this course is to provide basic practical tools in understanding the various components of economics in relation to Geography.
COURSE CONTENT	1. Crop Concentration 2. Crop Diversification

	3. Crop Combination 4. Agricultural efficiency. 5. Lorenz Curve 6. Transport Network 7. Models of Spatial Interaction
LEARNING OUTCOMES	1. Apply an understanding of synoptic processes and the ability to interpret a range of graphical and visual data. 2. Analyse and interpret the relationships between the data using simple statistical techniques.
SUGGESTED READING	1. Hussain M. (1996): Systematic Agricultural Geography, Rawat Publication, Jaipur. 2. Singh Jasbir (1987): Agricultural Geography, Tata McGraw Publication New Delhi. 3. Yeats M.H(1978): An Introduction to Quantitative Analysis in Human Geography New York 4. Chorley R.J. and Hagget P (1971) : Models in Geography, Methuen Co. London. 5. Lloyd and Dickens (1972): Location in Space Theoretical Approach to Economic Geography, Harper and Raw Publication London.

TITLE OF THE PAPER	**TRADE AND TRANSPORT GEOGRAPHY**
Class	**MA**
No of Credits	**04**
Paper Code	**GEO005**
Semester	**II**
COURSE OBJECTIVES	1. To provide clarity about elements of transport as an infrastructure that facilitates linkages among locations. 2. To acquaint the students with scope, content and theoretical framework relating to transport routes, hierarchies, accessibility (physical and economic). 3. To understand the spatial variations in movement of commodities, and trade relations within and between regions. 4. To relate the characteristics of flow pattern and their intensity with levels of functional economic organization in space.
COURSE CONTENT	1. History and Development of Transport 2. Approaches & Development and distribution of different modes 3. Nodes and routes: Hierarchies, Hinterlands, Models of network changes, Graph theoretic measures, Traffic flow, Gravity models. 4. Growth of urban transportation in developing countries, Transport and environmental degradation, Vehicular pollution and congestion. 5. Theory of comparative advantage-Neo-classical theory, Modern theory 6. International trade
LEARNING OUTCOMES	1. To study the transport and its basics, physical, economic, social and cultural and modes of transportation, land ways, water ways, and airways and all its functions. 2. Examining the transportation network, measurement of accessibility, its hierarchies, hinterlands, models of network changes, gravity models and

	transport network and economic development. 3. Understand the problems and urban transport with growth of urban transportation in developing courtiers.
SUGGESTED READING	1. Chorely R. J. and Haggett P. (1968): Network Analysis Edward Arnold, London 2. Taffe, E. J. and Gauthier H. L. (1973): Geography of Transportation, Prentice-Hall 3. Sealy (1968): Geography of Air Transportation. Hutchinson University

TITLE OF THE PAPER	**POLITICAL GEOGRAPHY**
Class	**MA**
No of Credits	**04**
Paper Code	**GEO006**
Semester	**II**
COURSE OBJECTIVES	1. To acquaint the students with the significance of this paper. 2. To present the scenario geo-politics among various nations and states. 3. To help the students to apply the knowledge in real situations. 4. To guide students in undertaking research in the field.
COURSE CONTENT	1. Definition, Geography & Politics, History & Development of Political Geography. 2. Territoriality, State & Nation, State formation. 3. Resource Development & Power 4. Significance of Indian ocean, Geopolitics of border nations, SAARC, Strategic significance of India 5. Political Geography of India
LEARNING OUTCOMES	1. Students will realise the importance of the subject. 2. Students will be able to understand the cause and effect relationship of the politics between different states and narions. 3. Students will be able to help to apply the knowledge in real situations. 4. Students will be able to undertake research in the field.
SUGGESTED READING	1. Alexander L.M (1963): World Political Patterns, Ram McNally, Chicago. 2. Political Geography By Sudeepta Adhikari, Rawat Publication. 3. Dikshit R.D (1996): Political Geography: A Contemporary Perspective, Tata McGraw Hill, Delhi. 4. Dikshit R.D (1999): Political Geography: A Century of Progress, Sage, New Delhi. 5. De Blij. H. J And Glassner, M. (1968) Systematic political Geography, John Wiley, New York.

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TITLE OF THE PAPER	**DEVELOPMENT OF GEOGRAPHICAL THOUGHT (Theory)**
Class	**MA**
No of Credits	**03**
Paper Code	**GEC005**
Semester	**III**
COURSE OBJECTIVES	1. The course provides information about development of core geographical thought processes. 2. It familiarizes students with development of the discipline of geography in various locations. 3. It aims at detailing the dynamic nature of the discipline, from theoretical and descriptive to practical and quantitative. 4. It enables the student to apply the knowledge of geography with the help of quantitative statistical methods/techniques.
COURSE CONTENT	1. Development of geography – ancient period and medieval period 2. Development of geography in modern period, Dualism in geography 3. Geography in 21st century, Applied Geography 4. Measures of Central Tendency, Measures of Dispersion, Correlation, Skewness, Probability, Kurtosis. Graphical Representation of data and Sampling techniques.
LEARNING OUTCOMES	1. At the end of this course, the students will be able to gain knowledge about various pioneers of geography and their contributions. 2. It will help students understand the various approaches to studying geography. 3. It will help students explore various methods of quantitative and qualitative techniques used in planning, management and research.
SUGGESTED READING	1. Hartshorne, R. (1959): Perspectives of Nature of Geography, Rand MacNally and Co. 2. Frazire, J. W. (1982): Applied Geography, Prentice Hall, Englewood Cliffs. 3. Hussain, M. (1995) : Evolution of Geographical Thought, Rawat Pub., Jaipur 4. Coffey, W. J. (1981) : Geography : Towards a general spatial systems approach, Mathuen, London 5. Cooke, R. U. and Doornkamp, J. C. (1974): Geomorphology in Environmental Management, Clarendon Press, Oxford. 6. Dikshit, R. D. (1997): Geographical Thought: A Contextual History of Ideas, Pub. By A. K. Ghosh, Prentice – Hall of India Pvt. M 97, New Delhi.

TITLE OF THE PAPER	**QUATITATIVE APPROACH & PRACTICALS IN STATISTICAL GEOGRAPHY**
Class	**MA**
No of Credits	**01**
Paper Code	**GEC005**

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Semester	**III**
COURSE OBJECTIVES	1. To introduce some basic statistical procedures to the students to be applied to various themes in geography. 2. To indicate the assumptions, limitations and interpretation of these procedures and results. 3. To train the students to handle these statistics towards analysing the geographical problems.
COURSE CONTENT	1. Frequency Distribution & Sampling and data collection: 2. Measures of Central Tendency. 3. Measures of Dispersions & Skewness and Kurtosis. 4. Correlation and Regression Analysis (Properties and Interpretation). 5. Introduction to probability.
LEARNING OUTCOMES	1. Understand the representation of Statistical data. 2. Know the Importance of Statistic in Geography. 3. Compute of Measures of Central tendency of dispersion. 4. Calculation and plotting moving Average. 5. Compute the Correlation of Pearson's and Spearman's methods. 6. Statistical data Analysis of simple regression.
SUGGESTED READING	1. David Unwin, Introductory Spatial Analysis, Methuen, London, 1981. 2. Gregory, S. Statistical Methods and the Geographer, Longman, London, 1978. 3. Hammond R and P. S. McCullagh Quantitative Techniques in Geography: An Introduction, Clarendan Press, Oxford, 1974. 4. John P.cole and Cuchlaine A. M. King: Quantitative Geography, John Wiley, London, 1968. 5. Johnston R.J. : Multivariate Statistical Analysis in Geography, Longman, London, 1973. 6. Koutsoyiannis: Theory of Econometrics, Macmillan, London, 1973. 7. Maurice Yeats: An introduction to Quantitative Analysis in Human Geography, MacGraw Hill, New York, 1974.

TITLE OF THE PAPER	**FUNDAMENTALS OF REMOTE SENSING (THEORY AND PRACTICAL)**
Class	**MA**
No of Credits	**03 + 01**
Paper Code	**GEC006**
Semester	**III**
COURSE OBJECTIVES	1. To orient the students to the skills of remote sensing and techniques. 2. To develop qualitative knowledge of subject and they can sustain in the competitive market. 3. To help the students to apply the knowledge in solving practical problems. 4. To guide students in undertaking research and can use Remote sensing software to prepare maps etc.
COURSE CONTENT	1. Introduction to Remote Sensing & Satellites 2. Electro-magnetic Radiation

	3. Resolution and Spectral Signatures 4. Satellite Data Products & Image Interpretation 5. Introduction Aerial photography 6. Introduction to Photogrammetry 7. Introduction to Remote Sensing & Satellites 8. Electro-magnetic Radiation 9. Data Representation 10. Spectral Signatures 11. Image Interpretation Satellite Data Products & Image Interpretation 12. Image Classification & Change Detection 13. Aerial Stereoscopy and Accessing Web Resources
LEARNING OUTCOMES	1. Students will be able to understand the importance of the Remote sensing and its applications. 2. The students will acquire confidence in remote sensing and GIS related activities which is expanding everywhere across the world. 3. The will be able to apply the knowledge in day to day life.
SUGGESTED READING	1. **Mandatory:** Thomas M. Lillesand and Ralph W. Kefer, Remote Sensing and Image Interpretation, John Wiley & sons, New York, 1994. 2. Barrett E.C. and L.F. Curtis: Fundamentals of Remote Sensing and Air Photo Interpretation, Mcmillan, New York, 1992. 3. Compbell J.: Introduction to Remote Sensing, Guilford, New York, 1989. 4. Curran, Paul J: Principles of Remote Sensing, Longman, London, 1985. 5. Luder D: Aerial Photography Interpretation: Principles and Application, McGraw Hill, New York, 1959.

TITLE OF THE PAPER	**COASTAL GEOMORPHOLOGY**
Class	**MA**
No of Credits	**04**
Paper Code	**GEO009**
Semester	**III**
COURSE OBJECTIVES	1. The basic objective of this course is to enlighten the students about the mechanism of landform development resulting from coastal and marine processes. 2. In view of the fact that about one-third of the world population lives in coastal areas. Thus coastal geomorphology becomes relevant to geographers.
COURSE CONTENT	1. Introduction Coastal systems 2. Coastal Processes 3. Sea level 4. Coastal environments 5. Applied Coastal Geomorphology
LEARNING OUTCOMES	1. This branch involves reinterpretation of coastal environment through geomorphological viewpoints. 2. Since this study has both academic as well as applied interests, the objective is to train the students in both to prepare them as better academicians and better researches.

SUGGESTED READING	1. Davis J L (1980): Geographical variation in coastal development, Longman, New York 2. Embelton and Thornes (1979): Process in geomorphology, Arnold, London 3. Hails J and Carr A (1975): Nearshore sediment dynamics and sedimentation, Wiley, London 4. Karlekar Shrikant (1993): Coastal geomorphology of Konkan, Aparna Publication, Pune 5. Masselink G, Hughes M G (2003): Introduction to coastal processes and geomorphology, Arnold, London 6. Pethick John (1984): An Introduction to coastal geomorphology, Arnold Heinemann, London 7. Tooley M M and Shennan I (1987): Sea level changes, Basil Blackwell, Oxford, U K

TITLE OF THE PAPER	**FLUVIAL GEOMORPHOLOGY**
Class	**MA**
No of Credits	**04**
Paper Code	**GEO010**
Semester	**III**
COURSE OBJECTIVES	1. To understand the major geomorphic agent of erosion, the course assumes significance as it mainly deals with an understanding of the fluvial forms and processes. 2. To study the evolution of drainage pattern and alluvial channels are governed by the forces resisting and driving the flow of water.
COURSE CONTENT	1. Introduction to Fluvial Geomorphology 2. Fundamentals of river mechanics 3. Hydraulic geometry 4. Channel Morphology 5. Applied Fluvial Geomorphology
LEARNING OUTCOMES	1. The students are introduced to the activities of riverine morphology 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.
SUGGESTED READING	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. Kingston D. Fluvial Forms and Processes Edward Arnold, London, 1984. 5. Leopold C.B. et.al..: Fluvial Processes in Geomorphology; Freeman, London 1964. 6. Morisawa M.(ed.) Fluvial Geomorphology. George Allen & Unwin, 1981.

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TITLE OF THE PAPER	**GEOGRAPHY OF SETTLEMENTS**
Class	**MA**
No of Credits	**04**
Paper Code	**GEO011**
Semester	**III**
COURSE OBJECTIVES	1. Understand the Nature and Scope of Settlement Geography Characteristics of Rural and Urban Settlements according to Indian Census and nature, scope, evolution and study methods. 2. Understand the settlement types, pattern and nature and process of urban settlement and some basic concept related to settlement geography.
COURSE CONTENT	1. Introduction to Settlement - Changes in the approaches to the study of Settlement. 2. Growth and Distribution 3. Morphogenesis of 4. Rural Settlements and Transformation 5. Rural House Types 6. Settlement Patterns
LEARNING OUTCOMES	1. Build an idea about urban and rural settlements, and its relationship with environment and also different theories related to settlement geography. 2. Know about classification and morphology of settlements. 3. Understand the trends and patterns of world urbanization. 4. Know about different theories of urban growth
SUGGESTED READING	1. Beaujeu Garnier J. – Geography of Population, Longman Group Ltd. 2. Chandna R. C. (Rep.2010) – A Geography of Population, Concepts, Determinants and Patterns, Kalyani Publishers, New Delhi 3. Clark J. I. (1973) – Population Geography, Pergamon Press Ltd., Oxford 4. Clark J. I. Geography of Population Approaches and Applications, Pergamon Press Ltd., Oxford 5. Singh R. L. – Readings in Settlement Geography. The National Geographical Society of India.

TITLE OF THE PAPER	**REGIONAL PLANNING & DEVELOPMENT**
Class	**MA**
No of Credits	**03**
Paper Code	**GEC007**
Semester	**IV**
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 spatial organization of various attributes and their inter relationship. 3. To identify the causes of regional disparities in development, perspectives and policy imperatives.

COURSE CONTENT	1. Concept and Types of regions 2. Approaches to delineation of different types of regions and their utility in planning. 3. Planning for a region's development and multi-regional planning in a national context. Regional Development and Planning, Regional Policies in the Indian Five Year Plans, experience of Regional Planning in India 4. Regional Development and Planning Strategies 5. Concept of Multi-level planning & decentralized planning
LEARNING OUTCOMES	1. Students are expected to have obtained the skills in understanding a region, its dynamics, and planning complexities, once they undergo this course. 2. Students are expected to have obtained the skills in understanding the District Planning, integrated district planning, participatory district planning, rural development in all its dimensions.
SUGGESTED READING	1. Bhat, L.S.: Regional Planning in India, Statistical Publishing Society, Calcutta, 1973. 2. Bhat, L.S. et al: Micro-Level Planning: A Case Study of Karnal Area, Haryana, K. B. Publications, New Delhi, 1976. 3. Friedmann, J and Alonso, W.: Regional Development Policy – A case Study of Venezuela, M.I.T. Press Cambridhge, Mass, 1966. 4. Glikson, Arthur: Regional Planning and Development, Netherlands Universities foundation for International Co-operation, London, 1955. 5. Kuklinski, A.R. (ed.): Growth Poles and Growth Centres in Regional Planning, Mouton, The Hague. 1972. 6. Kundu, A. and Raza, Moonis: Indian Economy-The Regional Dimension, Spectrum Publishers, New Delhi, 1982. 7. Misra, R.P.: Regional Planning: Concepts, Techniques and Policies, University of Mysore, Mysore, 1969. 8. Misra, R.P. and Others (editors): Regional Development Planning in India-A Strategy, Institute of Development Studies, Mysore, 1974. 9. Richardson, H.W.: Regional Economics, Weidenfeld and Nicolson, London, 1969. 10. Sundaram, K.V. (ed.): Geography and Planning, Essays in Honour of V.L.S. Prakasa Rao. Concept Publishing Co. New Delhi, 1985.

TITLE OF THE PAPER	**PRACTICAL: COMPUTER APPLICATIONS IN GEOGRAPHY & REGIONAL PLANNING**
Class	**MA**
No of Credits	**01**
Paper Code	**GEC007**
Semester	**IV**
COURSE OBJECTIVES	1. To apprise the student with latest trends in the development of cartography as a tool in mapping thematic and quantitative data to facilitate spatial analysis and synthesis. 2. To provide training in application of modern tools and techniques to data in a variety of topical and regional studies at local, regional and national levels.
COURSE CONTENT	1. Introduction to computer system

	2. Geographic data management 3. Geographic data analysis 4. Geographic data representation 5. Presenting geographic analysis 6. Internet applications in geography
LEARNING OUTCOMES	1. Students understand the Microsoft Excel, work sheet and learn the basic about the preparation of graphs, maps, in software for Presentation Techniques 2. To evaluate and investigation the population date in Microsoft excel software. 3. Applied and understand the data analysis techniques to prepare the adequate maps, various graphs. **4.** Organize the field work and collect the authentic and appropriate data about selected village and analysed that data help with Microsoft Excel, work sheet and prepare slide and the village report for presentation.
SUGGESTED READING	1. D.J.Unnwin & J.A. Dawson (1987): Computer Programming for Geographers, Longman, London. 2. Monmonier, M.S. (1982): Computer Assisted cartography, Prentice Hall. 3. David J. Maguire (1989): Computers in Geography, Longman scientific & Technical, London. 4. Paul M.mather (1993): Computer application in geography John Wiley & Sons, New York U.S.A.

TITLE OF THE PAPER	**THEORY: FUNDAMENTALS OF GEOGRAPHIC INFORMATION SYSTEM**
Class	**MA**
No of Credits	**03**
Paper Code	**GEC008**
Semester	**IV**
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
COURSE CONTENT	1. Introduction to GIS 2. Geospatial Data 3. Types of GIS & GIS software 4. Data visualization & Integration 5. Applications of GIS 6. Global Positioning System (GPS)
LEARNING OUTCOMES	1. Acquire Knowledge about Indian Remote sensing. 2. Investigate components and function of GIS 3. Study GIS Data models. 4. Introduce GPS and Its Functions. 5. Make use GIS & GPS software.
SUGGESTED	1. Burrough P.A. Principles of Geographic information Systems for

READING	Land Resource Assessment Oxford University Press, New York, 1986 2. Fraser Taylor D.R. Geographic information Systems Pergamon Press, Oxford, 1991. 3. Maquire D.J.M.F. Goodchild and D.W. Rhind(eds.) Geographic information Systems: Principles and Application. Taylor & Francis, Washington. 1991. 4. Mark S. Monmonier. Computer-assisted Cartography. Prentice-Hall, Englewood Cliff, New Jersey, 1982. 5. Peuquet D.J. and D.F. Marble, Introductory Reading in Geographic Information Systems. Taylor & Francis, Washington, 1990.

TITLE OF THE PAPER	**PRACTICAL: PRACTICALS IN GEOGRAPHIC INFORMATION SYSTEM**
Class	**MA**
No of Credits	**01**
Paper Code	**GEC008**
Semester	**IV**
COURSE OBJECTIVES	1. Understand the introductory part of GIS software, its tool, functions, data import, scale factors, and basics of digitization 2. Use this software for prepare the various types of maps in geography with the help of cartographic Techniques of GIS software.
COURSE CONTENT	1. Geospatial Data Access 2. Digitization 3. Attribution 4. Data Retrieval 5. Vector Operations 6. GPS Survey
LEARNING OUTCOMES	1. Use this software for prepare the various types of maps in geography with the help of cartographic Techniques of GIS software. 2. Applied this software and cartographic techniques for analysis. 3. Understand the cartographic techniques and its tools, functions, applied in geography for assessment and visualization purpose.
SUGGESTED READING	1. Burrough P.A. Principles of Geographic information Systems for Land Resource Assessment Oxford University Press, New York, 1986 2. Fraser Taylor D.R. Geographic information Systems Pergamon Press, Oxford, 1991. 3. Maquire D.J.M.F. Goodchild and D.W. Rhind(eds.) Geographic information Systems: Principles and Application. Taylor & Francis, Washington. 1991. 4. Mark S. Monmonier. Computer-assisted Cartography. Prentice-Hall, Englewood Cliff, New Jersey, 1982.

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TITLE OF THE PAPER	**WATERSHED MANAGEMENT**
Class	**MA**
No of Credits	**04**
Paper Code	**GEO015**
Semester	**IV**
COURSE OBJECTIVES	1. The objectives of this course are to bring an awareness among the students about the finite nature of watershed. 2. It stresses the need for better management of water resources through appropriate methods and conservation of water resources.
COURSE CONTENT	1. Introduction to Watershed Management 2. Groundwater - Movement of Groundwater, Factors affecting movement of groundwater, aquifers, Aquitard porosity, permeability, and sources of ground water, Ground water recharge. Issues related to watershed 3. Watershed Management Practices - Erosion control measures for non-agricultural lands 4. Water conservation and harvesting- conservation problem and techniques of soil water conservation 5. Watershed Management using GIS - management issues and problems. Floodplain, Flood inundation mapping etc.
LEARNING OUTCOMES	1. Recognise the fundamentals concepts related to watershed, significances of watershed development, demarcation of watershed, types of watershed according to area and shape 2. Study about the physical parameters of watershed, channel geometry and basin morphology. 3. Understand the hydrological parameters, rainfall, aerial precipitation, evaporation and transpiration, infiltration, run off and drainage.
SUGGESTED READING	1. Mutreja K.N. (1987) – Applied Hydrology, Tata Mckraw Hill. 2. Tideman E.M. (1996) – Watershed Management: Guidelines for Indian conditions, Omega, N. Delhi 1996. 3. Todd D.K.(1959) - Ground Water Hydrology, John wiley, New York. 4. Pereira H.C. (1973) – Land use and water Resources Cambridge University Press, Cambridge

TITLE OF THE PAPER	**SOCIAL AND CULTURAL GEOGRAPHY**
Class	**MA**
No of Credits	**04**
Paper Code	**GEO016**
Semester	**IV**
COURSE OBJECTIVES	1. To familiarize the students with the understanding of the society through concepts and Social theory, philosophical approaches and spatial processes; 2. To examine the process of social region formats in India with the help of social cultural and historical factors; to examine social distortion and regionalise the various components of social well- being in.

COURSE CONTENT	1. Introduction- trends and development 2. Philosophical Bases and Concepts - origin and diffusion of culture 3. Space and Society- interaction and social relations 4. Social Groups - group in society, social structure, models of assimilation 5. Social – Culture - role of race, religion, cast, ethnicity 6. Regions - Cultural regions of the World and India
LEARNING OUTCOMES	1. Understand the nature, scope, and concept, relationship between culture and social Environment, and right of information act. 2. To examining the cultural complex and traits of culture and its concepts. 3. Evolution to civilization and various cultural development and cultural system 4. According to religion, language and geography, and global cultural changes. 5. To study the origin and growth of culture and agriculture and its basic concepts. 6. Understand the concept of space and social process and present status.
SUGGESTED READING	1. Anand Aijazuddin (1999): Social Geography, Rawat Publications, New Delhi. 2. Bulsara, J. F. (1970): Patterns of Social Life in Metropilitan Areas, Popular Prakashan, Bombay. 3. Coates, B. E. et. al. (1977): Geography and Inequality, Oxford University Press, London. 4. Jordon and Lester, G. (1995): The Human Mosaic, Harper and Row, New York. 5. Orang, Mike (1998): Cultural Geography. Routledge Publication, London

TITLE OF THE PAPER	**TROPICAL GEOMORPHOLOGY**
Class	**MA**
No of Credits	**02**
Paper Code	**GEO018**
Semester	**IV**
COURSE OBJECTIVES	1. The purpose of this course is to understand geomorphological processes and landform development under tropical environment.
COURSE CONTENT	1. Introduction: peculiar features of tropical climate. 2. Tropical Terrain and Weathering- Processes and products. 3. Denudation- various processes in tropics surface. 4. Quaternary in the tropics - Climate change and Sea-level change. 5. Anthropogenic changes - Anthropogenic alteration of geomorphic processes.
LEARNING OUTCOMES	1. To examining the topographic maps, air photos and imageries with a view to identification of tropical landforms, planning a local field work and appreciating the landforms.
SUGGESTED READING	1. Faniran, A. and Jeje, L. K. (1983): Humid Tropical Geomorphology, Longman, London. 2. Thomas, M. F. (1994): Geomorphology in the Tropics: A study of weathering and denudation in low latitudes. John Wiley and Sons, Chichester.

	3. Kale, V. S. and Gupta, A. (2001): Introduction to Geomorphology, Orient Longman, Calcutta. 4. Goudie, A. (1985): Duricrusts in tropical and sub-tropical landscapes. Alien Unwin 5. Savindra Singh (2002): Geomorphology, Prayag Pustak Bhawan, Allahabad 6. Bloom, A. L. (2002). Geomorphology: A systematic analysis of late Cenozoic landforms. Prentice-Hall of India, New Delhi 7. Avijit Gupta (2011) "Tropical Geomorphology" - Cambridge University press Cambridge, UK.

TITLE OF THE PAPER	**FIELD TECHNIQUES AND VILLAGE SURVEY**
Class	**MA**
No of Credits	**02**
Paper Code	**GEO020**
Semester	**IV**
COURSE OBJECTIVES	1. The main objective of the field work (Physical) is to conduct an extensive survey of a contiguous wider region and identify salient landforms; their genesis and their impact on human life, flora and fauna.
COURSE CONTENT	1. Introduction to Field Survey 2. Chain and Plane Table Survey 3. Prismatic compass method 4. Dumpy level and Theodolite Survey 5. Village Survey
LEARNING OUTCOMES	1. Understand the different surviving techniques. 2. Knowledge about preparation of layout. 3. Understand the socio economic condition of the villages. 4. Acquire knowledge of preparation of drawing of profile with the help of Dumpy level.
SUGGESTED READING	1. Clendinning , J. Principles and use of Surveying Instruments. 2nd edition, Blockie. A 1958. 2. Hotine, Major M. The re-triangulation of Great Britain. Empire survey review 1935. 3. Mitra,R.P. and Ramesh A : Fundamentals of Cartography Revised Edition, Concept Publication, New Delhi. 4. Negi, Balbir Singh. Practical Geography Third revised Ed. Kedar Nath and Ram Nath, Meerut &Delhi, 1994-95. 5. Sandover, J.A. Plane Surveying. Arnold 1961. 6. Singh & Karanjta - Map work and Practical Geography Central Book Dept Allahabad 1972. 7. Singh, R.L. and Dutt, P.K. Elements of Practical Geography, Students Friends, Allahabad.1968.