M.Sc. Geo-informatics - syllabus(2011-12 Academic Year Onwards)as per CBCS
Scheme of Instruction and Examination

SEMESTER-I		C O U R S E	Teaching	Marks	Credits
S.No.	Subject Code		per week	20+80 for Theory	
1.	GI101T	Introduction to Geoinformatics	4	100	4
2.	GI102T	Physical & Socio – Economic Environment	4	100	4
3.	GI103T	Fundamentals of Re mote Sensing	4	100	4
4.	GI104T	Principles of Cartography	4	100	4
5.	GI105P	Cartographic Techniqes& Field Survey	6	75	3
6.	GI106P	Introduction to GIS	6	75	3
7.	GI107P	Spatial Statistics	6	75	3
	Total			625	25
SEMESTER-II					
1.	GI201T	Advanced G.I.S.	4	100	4
2.	GI202T	Business G.I.S.	4	100	4
3.	GI203T	Environmental Studies	4	100	4
4.	GI204T	Programming Languages	4	100	4
5.	GI205P	Computer Programming Lab&Visual Computing	6	75	3
6.	GI206P	G.I.S. Applications	6	75	3
7.	GI207P	Map & Aerial Photo Interpretation	6	75	3
	Total			625	25
SEMESTER-III					
1.	GI301T	Urban and Regional Planning	4	100	4
2.	GI302T	Resource Management	4	100	4
3.	GI303T	Web G.I.S.	4	100	4
4.	GI304T	Principles of GPS	4	100	4
5.	Seminar		2	25	1
6.	GI305P	Cartographic Applications (Terrain ,Agricultural and Urban)	9	100	4
7.	GI306P	GIS & Map Customization and Web Technology	9	100	4
	Total			625	25
SEMESTER-IV					
1.	GI401T	Digital Image Processing.	4	100	4
2.	GI402T	Photogrammetry	4	100	4
3.	GI403T	Information Systems and Management	4	100	4
4.	GI404T C B - I	RS & GIS Applications for Agriculture and Rural Development	4	100	4
5.	GI404T C B - II	Geography of Tourism			
6.	Seminar		2	25	1
7.	GI405P	Image Analysis	9	100	4
8.	GI406PJ(Project Work)	(Dissertation and Viva Voce)	9	100	4
	Total			625	25
	Grand Total Marks and Credits			2500	100

M.Sc. GEO-INFORMATICS

SEMESTER-I

THEORY PAPER-I (GI101T) INTRODUCTION TO GEOINFORMATICS

UNIT-I

1. Scope and Importance of Geoinformatics

2.Geoinformatics technologies and the technologies used in Geographical Studies

UNIT-II

3.Geoinformatics and other Information Sciences.

4.Geoinformatics-Spatial and Non –Spatial data Management.Spatial information Technology

UNIT-III

5.Maps & G.I.S.

6.Hardware, Software & Livewire.

UNIT-IV

7. Approaches to the study of G.I.S.
   a). G.I.S. as a Special Field of Academic study.
   b). G.I.S. as a Branch of Information Technology
   c). G.I.S. as a Spatial Data Institution and its Social Implications.

8. G.I.S. Terminology.

9.Information and Communication Technologies: Internet,Web Technology and Geoinformatics-MIS-DBMS.

References:

1. Goodchild M.F. and Kemp K – 'Developing a curriculum in GIS: The NCGIA Core Curriculum Project', University of California, Santa, Barbara 1990.
2. Ian Haywood Cornelius and Steve Carver – An introduction to GIS, Longman, New York, 2000.
3. Misra HC – A Handbook on GIS, GIS India, Hyderabad, 1995.
4. Smith T.R. and Piquet, GIS, London Press, London, 1985.
5. Taylor DRF – GIS: The Micro computer and Modern Cartography, Pergamon Press, Oxford, 1991.
6. Heywood I, et al, An Introduction to Geographical Information System, Longman, New Delhi, 1998.
7. Lo CP & Young AKW, Concepts & Techniques of Geographical Information System, Prentice Hall of India, New Delhi – 2003.

THEORY PAPER-II (GI102T)

PHYSICAL & SOCIO-ECONOMIC ENVIRONMENT

UNIT-I

1. Types of Landforms.
2. Erosional & Depositional Features of Rivers, Glaciers, Wind and Underground water.

UNIT-II

3. Structure and Composition of the Atmosphere.
4. Ocean Relief & Oceanic Circulation

UNIT-III

5. Distribution and Characteristics of World Population.
6. Growth Trends and Density of Population.

UNIT-IV

7. Factors for Location of Agriculture.
8. Factors for Location of Industry.

References:

1. W.D.Thornbury, Principles of Geomorphology, Wiley Eastern Ltd., New Delhi, 1993.
2. P.G. Worcester, A Test Book of Geomorphology, East – West Press Pvt. Ltd. New Delhi, 1961.
3. A.K.Lobeck – Geomorphology, M.C.Graw Hill Book Co. Ltd, New York 1969.
4. Wooldridge & Morgan, Physical Basis of Geography, Longman, London, 1937.
5. A.N.Strahler, Physical Geography, John Wiley & Sons, New York, 1965
6. .Clark, J.L. Population Geography, Pergamon Press, Oxford, 1972.
7. Garnier, J.B. Geography of Population, Longman, Harlow, 1966.

THEORY PAPER-III (GI103T)

FUNDAMENTALS OF REMOTE SENSING

UNIT-I

1. History of Remote Sensing
2. Energy flow from source to the sensor – Electromagnetic Energy.

UNIT-II

3. Spectral Reflectance Curve – Spectral Signatures.
4. Scanning – Multi – Spectral, Push broom, Thermal.

UNIT-III

5. Characteristics of Remote Sensors – Spectral, Temporal, Radiometric, Spatial.
6. Characteristics of I.R.S. LANDSAT & IKONOS.

UNIT-IV

7. Ground Truth.
8. Interpretation of Satellite Imageries – Supervised and Un-supervised Classification

References:

1. Nejel Veziroglu – Remote Sensing: Energy, Related Studies – Hemisphere Publishing Corporation, Washington, 1975.
2. Paul Curran – Principles of Remote Sensing, English Language Book Society, London, 1988.
3. Robert, G.R. (Ed), Manual of Remote Sensing vol.I & II, American Society of Photogrammetry, New York, 1978.
4. Swain & Davis, Remote Sensing; The Quantitative approach, Mc Graw Hill, 1978.
5. Thomas M.Lillesand & Ralph W. Kiefer, Remote Sensing & Image Interpretation, John Wiley & Sons, New York 1987.
6. Deekshatalu B.L. & Rajan Y.S. (Ed) Remote Sensing, Indian Academy of Sciences, 1984

THEORY PAPER-IV (GI104T)

PRINCIPLES OF CARTOGRAPHY

UNIT-I

1. History of Cartography
2. Types of Maps – General Purpose, Special Purpose.

UNIT-II

3. Principles of Map Design .
4. Symbolization.

UNIT-III

5. Generalization in Cartography.
6. Colours & Patterns

UNIT-IV

7. Attribute data for Thematic Mapping
8. Types of Graphs.

References:

1. Robinson A.H. et al Elements of Cartography, John Wiley & Sons. New York, 1978.
2. Monk house F.J. & Wilkinson, Maps & Diagrams, Methuen & Co. London, 1967.
3. Raisz, Erwin, Principles of Cartography, MC. Graw Hill, New York, 1962.
4. Campbell, John, Introductory Cartography, Prentice Hall, Inc. Englewood Cliff, New. Lawrence G.R.P. Cartographic Methods, Methuen, London, 1974

PRACTICAL PAPER-I (GI105P)

CARTOGRAPHIC TECHNIQUES AND FIELD SURVEY

1. Map Scale – Types of Scales
2. Map Projections, Graphic representation of Cylinderical, Conical & Zenithal projection.
3. Techniques of Mapping – Choropleth , Flow Diagram , Interpolation Techniques , Isopleth Mapping , Triangular Graphs.
4. Symbolization - Point, Line, Area
5. Importance of Field Survey – Principles & Application of selected Survey Instruments.
6. Chain & Tape Survey – Triangulation method.
7. Plane Table Survey, Plan Preparation, Resection
8. Prismatic Compass Survey – Open & Closed Traverse; Elimination of error – Bowdich method.

References:

1. Monkhouse , F.J.1967 – Maps and Diagrams , Methuen and Co., London.
2. Robinson , A.H. –1982 Elements of Cartography, John Willey and Sons , New York .
3. Sing R.L. – Elements of Practical Geography , Kalyani Publishers , New Delhi , 1994.
4. Lewis , Peter – Maps and Statistics , Methuen and Co., Ltd., London , 1977.
5. Dickinson , G.C. – Maps and Air Photos , Edward Arnold Ltd., London , 1969.
6. Cuff , D.J. and Mattson , M.J. – Thematic Maps : Their Design and Production , Methuen , New York 1982.
7. Misra R. P. and Ramesh A – Fundamentals of Cartography – Concept Publishing Company, New Delhi , 1989.

PRACTICAL PAPER-II (GI106P)

INTRODUCTION TO GIS

1. Brief history of Computer and Computing.
2. Fundamentals of Computers, Components of Computers; Input unit, memory unit, Central processing unit & Output unit.
3. Computer Software Operating Systems & Commands.
4. Scanning and Digitization of Maps
4. Georeferencing & Editing of layers
5. Creating Attribute Data and Editing
6. Creation of Maps – Choropleth & Dot Maps.
7. GPS Satellites, Fundamentals of GPS, Space, ground and control Segments.
8. Identification of Location & Altitude with G.P.S.
9. Position fixing and route navigation using hand held GPS.
10. GPS for GIS and Mapping.

References:

1. Taylor D.R.F, GIS: The Micro Computer and Modern Cartography, Pergamon Press, Oxford
2. Lo C.P., and Yeung A.W., - Concepts and Techniques of Geographical Information Systems, Prentice Hall of India Pvt. Ltc., 2002.
3. Heywood I., Cornelius S., Carrer S., An Introduction to Geographical Information Systems, Pearson Education Pvt. Ltd., 2002.
4. Kang-Stung-Chang, Introduction to Geographical Information Systems, Tata McGraw Hill Publishing Co., 2002.
5. Agarwal, A.K., Fundamentals of Global Positioning System.

Hfmann W., GPS Tehroy and Practice, H.Lichtenegger & J.Collins, Springer-wien, New York

PRACTICAL PAPER-III (GI107P)

SPATIAL STATISTICS

1. Introduction to Spatial Statistics.
2. Measurement Scales: Nominal, Ordinal, Interval, Ratio.
3. Spatial distributions – Nearest Neighbour Analysis, Rank Size Rule.
4. Simple Correlation and tests of significance.
5. Regression and Ration of variation.
6. Residuals from regression – Maps of residuals.
7. Measures of inequality – Location quotient, Lorenz curve.
8. Network Analysis – Measures of centrality and connectivity.
9. Multivariate Analysis.

REFERENCES:

1. Elhance, D.N. – Fundamentals of Statistic, Kitab Mahal Allahabad, 1972
2. Gregory, S – Statistical Method and the Geographer, Longman, London, 1963
3. Cole, J.P. & Kind, C.A.M. – Quantitative Methods in Geography, John Willey & Sons, New York, 1968.
4. Kafka,F & G.Simpson – Basic Statistics, Oxford & I.B.H. Publishing Co.,Calcutta, 1971.
5. Jones, P.A. – Field Work in Geography, Longman, London, 1968
6. Johnston, R.A. Multivariate Statistical Analysis in Geography, Longman, London, 1978

7.King ,L.J.-Statistical Analysis in Geography, Prentice Hall, Englewood Cliffs, New Jersey, 1978

M.Sc. Geoinformatics SEMESTER II

THEORY PAPER-I (GI201T)

ADVANCED G.I.S.

UNIT-I

1. Functions and use of G.I.S.
2. Types of Data used in G.I.S. – Spatial (Raster and Vector) and non-spatial (Relational, Network and Hierarchical).

UNIT-II

3. Geo-referencing and Geo-coding
4. Spatial Data Analysis

UNIT-III

5. Digital Elevation Model.
6. Global Positioning Systems.

UNIT-IV

7. G.I.S. Application areas – Resource Management, Urban Planning, LIS, FM, Demographic & Network applications.
8. Decision making in a G.I.S. Context.

References:

1. Goodchild M.F. and Kemp K – 'Developing a curriculum in GIS: The NCGIA core curriculum project, University of California, Santa, Barbara 1990.
2. Ian Haywood Cornelius and Steve Carver – An introduction to GIS, Longman, New York, 2000.
3. Misra HC – A Handbook on GIS, GIS India, Hyderabad, 1995.
4. Smith T.R. and Piquet, GIS, London Press, London, 1985.
5. Taylor DRF – GIS: The Micro computer and Modern Cartography, Pergamon Press, Oxford, 1991.
6. Heywood I, et al, An Introduction to Geographical Information System, Longman, New Delhi, 1998.
7. Lo CP & Young AKW, Concepts & Techniques of Geographical Information System, Prentice Hall of India, New Delhi – 2003.

THEORY PAPER-II (GI202T) BUSINESS G.I.S.

UNIT-I

1. G.I.S. Capabilities – uses & Implementation.
2. Spatial Data Generation for Industry and Business – Decision Support and G.I.S.

UNIT-II

3. Industry Applications: Property development and Real Estate Information Management.
4. Wholesale and Retail outlets – Rural and Urban Marketing

UNIT-III

5. Trade and Tourist Information – Travel Plan and Query - Social Facilities.
6. Cartographer as consultant – Map designing and printing..

UNIT-IV

7. Property development & L.I.S
8. E. Governance and Internet G.I.S.

References:

1. Efrain Turban Decision Support & Expert Systems: Management Support systems, Macmillan, New York 1993.
2. Kim T.J.Wiggins LL & Wright J.R, Expert System Applications to Urban Planning, Springer, New York, 1990.

THEORY PAPER-III (GI203T)

ENVIRONMENTAL STUDIES

UNIT-I

1. Environmental Studies – Content, Scope and Relationship with other disciplines.
2. Environmental Types and Components.

UNIT-II

3. Environmental Pollution – Air, Water, Soil and Noise
4. Environmental Impact Assessment

UNIT-III

5. Environmental Information System
6. Application of G.I.S. and Remote Sensing in Environmental Studies.

UNIT-IV

7. Environmental Problems and Policies in India.
8. Environmental Movements and Conventions.

References:

1. Savindra Singh Environmental Geography, P.P.B. 2000
2. Gadgil, M. G. Guha, R, This Fissured Land, An Ecological History of India, O.U. Publications 1995.
3. David Harvey, Justice, Nature and Geography of Difference, Blackwell, 2000

John Bellamy Foster, The Valuable Planet, Monthly Review Press, 1994

THEORY PAPER-IV (GI204T)

PROGRAMMING LANGUAGES

UNIT-I

1. C. Language: - Introduction to C, Variables, Data types, if statements, if-else, nested its statements (Conditional Statement), Interactive, Statements (Programs using Interactive Statements),
2. Concept of Arrays, 1-D, 2-D, 3-D, arrays, Concept of functions (functions) Recursive functions (Programs using these concepts).

UNIT-II

3. Structures, Unions, Files concept, Graph concept. (Plotting concepts) {Enumerated Data Types}.
4. Visual Basic: Date types, G.U.I's concept (Designing Screens)

UNIT-III

5. VB.Net - Data Base connectivity concept(connecting the front end tool with backend).
6. VB.Net - Writing procedures for retrieval of data

UNIT-IV

7. VB.Net - Developing Applications.
8. Arc Macro Language (A.M.L.) in Arc Info, Avenue (in ARC VIEW)

Reference Books:

1. "Let us C" by Yashwanth Kanithkar
2. ESRI Publications
3. C Programming by Balaguru Swamy
4. C Programming by Kochan
5. Complete reference using C – C.C.R.
6. Practical V.B. 6 – Bob Reselmanu and Richard Peasley.
7. The complete reference VB 6 – Noel Jeske.

PRACTICAL PAPER-I (GI205P)

COMPUTER PROGRAMMING LAB(C and C++) AND VISUAL COMPUTING (VBA and ArcObjects)

1. C program that evaluates an algebraic expression after reading necessary values from the user

2. C program that prints the given 3 integers in ascending order using IF-ELSE

3. C program Using WHILE statement to find the sum of 1 + 2 + 3+ 4 +…n

4. C program using FOR statement to find the following from a given set of 20 integers

5. C procedures to add, subtract, multiply and divide two complex numbers (x + y) and (a + ib). Also write the main program that uses these procedures.

6. Creating a class with private and public variables and declare constructors with and without parameters to the class.

7. C++ program that declares two classes as friends to each other and uses data from the friend class.

8. Arc GIS Applications

9. Using controls to build a form

10. Branching and Looping in VBA

11. Working with Variables and Functions in VBA

12. Adding layers to a map

13.Defining layer symbology

14. Querying data.

15. Creating ActiveX DLLs and added to the ArcGIS applications.

16. Coding in VB.Net

17. Introduction to ArcGIS Engine

18. Using the Map Control, TOC Control, Toolbar control.

Reference Books:

1. "Let us C" by Yashwanth Kanithkar
2. ESRI Publications
3. C Programming by Balaguru Swamy
4. C Programming by Kochan
5. Complete reference using C – C.C.R.
6. Practical V.B. 6 – Bob Reselmanu and Richard Peasley.
7. The complete reference VB 6 – Noel Jeske.

PRACTICAL PAPER-II (GI206P)

G.I.S. APPLICATIONS

1. GIS Single layer operations - Clip, Split, Dissolve, Map Join, Buffering.
2. Overlay Functions in G.I.S. – Union, Intersect, Identity,
3. Simple and complex querying using GIS Data.
4. Network Analysis
5. Techniques of Interpolation.
6. Digital Elevation Models.

References:

1. Taylor D.R.F, GIS: The Micro Computer and Modern Cartography, Pergamon Press, Oxford
2. Lo C.P., and Yeung A.W., - Concepts and Techniques of Geographical Information Systems, Prentice Hall of India Pvt. Ltc., 2002.
3. Heywood I., Cornelius S., Carrer S., An Introduction to Geographical Information Systems, Pearson Education Pvt. Ltd., 2002.
4. Kang-Stung-Chang, Introduction to Geographical Information Systems, Tata McGraw Hill Publishing Co., 2002.

PRACTICAL PAPER-III (GI207P)

MAP AND AERIAL PHOTO INTERPRETATION

1.Interpretation of Indian Topographical Sheets

2.Interpretation of Weather Maps

3.Viewing Photographs Stereoscopically

4. Principle of floating Mark.

5. Drawing of flight line.

6. Air Photo interpretation.

7. Mapping with stereoscope.

8. Digital Aerial Photo Interpretation

Reference:

1. Monkhouse , F.J.1967 – Maps and Diagrams , Methuen and Co., London.
2. Robinson , A.H. –1982 Elements of Cartography, John Willey and Sons , New York
3. Sing R.L. – Elements of Practical Geography , Kalyani Publishers , New Delhi , 1994

4 .Mejal Veziroglu – Remote Sensing: Energy related studies – Hemisphere Publishing Corporation, Washington, 1975.

5. David P. Paine – Aerial Photography and Image Interpretation for Resource Management, John Wiley & Sons, New York, 1981.

6. G. Dury & J.A. – The land from the Air – A Photographic Geography, London, 1978.

7 .Gautam, N.C. – Urban land use studies through Aerial photo interpretation techniques, Pink Publishing House, 1978

M.Sc. Geoinformatics SEMESTER III

THEORY PAPER-I (GI301T)

URBAN AND REGIONAL PLANNING

UNIT-I

1.Spatial theory and Urban Land Use Models
Growth Pole, Core periphery,Basic needs Strategy
2Concepts- Urban,Urbanism,Urbanisation
Regional Concept and Types
3.Planning process,presentation and preparation

UNIT-II

4.Origin and Growth of Urbanisation in the World
5.Urban Problems:Pollution,Slum,Housing,Social wellbeing
6.Urban Planning traditions: Anglo- American and European

UNIT-III

7.Globalisation,Regional spaces and Development
8.Regional/Rural Development practices- India and China
9.Regional/Multilevel Planning and Vision 2020- A case Study of A.P.

UNIT-IV

10.Application of GIS,GPS and RS in Urban and Regional Planning
11.Research Methods in Urban and Regional Studies
12.Preparation of Master Plan- A Case Study of Hyderabad

References:

1. R.J.Chorley and P.Hayget, Socio-economic models in geography, 1967.
2. Lo, F and K.salih, growth pole strategy and regional development policy, oxford; pergaman press, 1978.
3. Harry W.Richardson, regional and urban economics, 1978.
4. R.P.Misra and K.V.Sundaram, Multilevel planning and integrated rural development in India, Heritage publishers, 1980.
5. Sartaz Aziz, road to rural to rural development in china.
6. Lewis Keeble, principles and practice of town and country planning, the estimates gazette Ltd., London, 1964.
7. Gideon Sjoberg, The origin and evolution of cities, scientific American, 1965.
8. John N. Jackson, the urban future, George Allen and Unwin Ltd., London, 1972.
9. Charles Korea, Report on the national commission on urbanization, 1988.
10. Peter hall, Urban and Regional planning, Penguin books, Middlesex, 1976.
11. Gordon E. Cherry, Urban Planning problems. Leonard Hill, London, 1974.
12. P.E.James and C.F. Jones, American geography: Inventory and Prospect, Rawat, Jaipur.
13. Hyderabad 2020, Master plan for HMA, 2003.
14. Leonard Riesman, The urban process, free press, London, 1964.
15. Harold M.Mayer and Clyde F.Kohn, Readings in urban geography, university of Chicago, 1967.
16. Stanley D.Brunn and Jack F. Williams, Cities of the world, World regional urban development, Harper and Row publishers, New York, 1983.
17. A.C, Mohapatra and Jay ant K.Routray, Regional development and planning, Rawat, Jaipur, 1998.
18. Vision 2020, Government of AP, Hyderabad, 1998.
19. Alam, SM, Hyderabad – Secunderabad, Twin Cities, Asia publishing House, Bombay, 1964.
20. Curran Paul J, Principles of R.S, English Language book society, London, 1988.
21. Gibbs, Jack P., Urban Research Methods, East West Edition, New Delhi, 1966.
22. Many Globalizations.

THEORY PAPER-II (GI302T)

RESOURCE MANAGEMENT

UNIT-I

1. Land Resources – Concept of Land, land units & resources – Land evaluation.
2. Land capability and limitations.
3. World distribution of minerals.

UNIT-II

4. Water Resources- Management and use.
5. Land classifications, Land use system - sustainable management model.

UNIT-III

6. Rural – Urban Sector – Land use planning.
7. Land Information Management (LIM), DSS for Land use Planning & Management.

UNIT-IV

8. Approaches to Land Information Management & Problem solving at National & International level.
9. Capacity Building, an approach to People centred Development.

References:

1. Ali S.A. Resources for Future Economic Growth, Vikas Publishing House, New Delhi, 1979.
2. Ress J. Natural Resources, Allocation, Economics & Policy, Rout ledge, London, 1990.
3. Turner R.K. Sustainable Environmental Management, Belhaven Press, London, 1988.
4. Zimmerman, E.W. Introduction to World Resources, Harper & Row, New York 1964.

THEORY PAPER-III (GI303T)

WEB GIS

UNIT - I

Internet Technology:

The Internet and World Wide Web – A brief History of the Internet – Intranets – Controlling Traffic on the Internet (TCP/IP) – Fundamentals of computer networking – network environment – network communication models – IP Addresses – Routers and Packets

Controlling Text Markup – Default settings – The HR Element and HTML attributes - HTML Attributes in General – Paragraph Alignment – Attributes, Image markup.

UNIT-II

Databases, XML, ASP:

SQL: Organizing data in tables, Designing a database using an entity relationship diagram, Identifying keys in Tables, Querying database

XML - Extensible markup language, Introduction to XML.

ASP (Active Server Pages) – Introduction, scripting in ASP.

UNIT - C

Server-side and Client-Side Strategies:

Web Servers: Microsoft IIS, Apache, Proxy Service

Open Source: About OGC-WMS, WFS, WRS, GML, CGI, PERL, PHP, DHTML

UNIT - D

WEB GIS Applications:

Vehicle Tracking System, Mobile mapping, Location Based Services, Intelligent transportation systems, Urban Planning, Resource management, Real Estate.

References:

1.Introduction to Interactive Programming on the Internet - By CRAIG D KNUCKLES. Published by John Wiley & sons Inc.

2.Internet GIS: Distributed Geographic Information Services for the Internet and Wireless Networks,authored by Dr. Zhong-Ren Peng and Dr. Ming-Hsiang Tsou

3.Korte,G. B., (2001) The GIS book: 5th Edition, Onward press, Australia.
4.Cartwright, W., M.P. Peterson, G. Gartner (Eds) Multimedia Cartography, Berlm: Springer.
5.Kraak,M., and A.Brown (2001) Web Cartography: Development and Prospects, London: Taylor and Francies.
6.Kraak, M. and F. Ormeling (2003) Cartography: Visualization of Geospatial Data, Delhi: Pearson Education.

Theory Paper-IV (GI304T) -Principles of GPS

UNIT-I

1. GPS and its utilities Historical – Various GPS Software products and peripherals- recent trends.

2. System overview: GPS satellites systems- signal structure – tracing of satellites.

UNIT-II

3. GPS segments –space segment – control segment –user segment.

4. Working principles of GPS: Simple navigation –satellite ranging; calculating the distance to the satellites –error sources; differentially corrected position- reference receiver –the rover receiver.

UNIT-III

5. Geodetic Aspects: GPS coordinate system –local coordinate system – map projections and plane coordinates – the universal transverse Mercartor Projection.

6. Surveying with GPS: GPS Measuring techniques- static surveys –rapid static surveys- kinematic surveys.

UNIT-IV

7. GPS Applications in Different Fields.

8. Integration of GPS and GIS- Role of GPS and GIS in Remote sensing.

References:

1. ESRI Arc Pad Manual.
2. Introduction to GPS (Global Positioning System) 1. by Leica.
3. Essentials of GPS – by N.K.Agarwal.

Websites:

1. www.gpsworld.com
2. www.gps society.org
3. www.esri.com.

PRACTICAL PAPER-I (GI305P)

CARTOGRAPHIC APPLICATIONS

(Terrain,Agricultural and Urban)

(Terrain)

1. General maps and Specific maps
2. Mapping techniques for Thematic Analysis
3. Relief Analysis-Profiles
   a.Slope b.Hypsometry c.Altimetric and Relative Relief
   d.Drainage Analysis
   i.Identification of Basins(Delimitation)
   ii.Stream Orders & Numbers
4. DEM representation

(Agricultural)

5. Determination of crop combination regions.
6. Crop concentration (Location Quotient Method).
7. Agricultural efficiency and Productivity.
8. Determination of cropping intensity.
9. Determination of crop diversification.
10. Agricultural Productivity analysis.

(Urban)

11. Techniques of Analysis of Settlement Distribution – Rank size Rule, Primate city Index – Nearest Neighbour Analysis
12. Functional Classification of Settlements (Nelson's Method)
13. Measurement of Centrality of Settlements – Index of Centrality.
14. Centro Graphic Analysis – Mean Center and Median Center.
15. City Region Relationships – Gravity and Potential Models

References:

1.Singh R I, and Singh, RBP, 1923, Elements of Practical Geography, Kalyani Publishers, New Delhi.
2.Mishra, RP and Ramesh, 2002, Fundamentals of Cartography, Concept, New Delhi
3 Majid Hussain, Agricultural Geography, Inter-India Publications, Delhi, 1979.
4 Noor Mohammed (ed), Perspective in Agricultural Geography, Vol.I, II, III, IV, V. Concept Publishing Co., New Delhi, 1981.
5 Chorley, B.J. & Hagget, P. Models in Geography, London, Methuen, 1971.
6 Mohammed Ali., Studies in Agricultural Geography, Rajesh Publications, New Delhi, 1978.
7 Hall, Tim, 1998, Urban Geography, Routledge, London
8 Cherry, Gordan, E1974, Urban Planning Problems, Leonard Hills Books, London.
9. Naidu, Ratna, 1990, Old Cities, New Predicaments, A Study of Hyderabad, Sage, New Delhi.
10. Alam, S.M.& Khan, W.1972, Metropolitan Hyderabad and its Region, Allied, Bombay.
11 Carter H 1972,The Study of UrbanGeography, Edward Arnold, Lond

PRACTICAL PAPER-II (GI306P)

G.I.S. & MAP CUSTOMIZATION AND WEB TECHNOLOGY

MAP CUSTOMISATION

(Arc Objects and Map Objects)

1. Drawing Layers on maps and attaching data to layers.
2. Adding vector data, adding shape file, Arc/Info coverage, CAD, Adding Raster Data.
3. Applying Co-ordinates and Geometry (COGO).
4. Rendering and selecting features on the maps & retrieving information.
5. Matching addresses & locating places.
6. Deploying applications.
7. Creating ActiveX DLLs and added to the ArcGIS applications.
8. Introduction to ArcGIS Engine
9. Using the Map Control, TOC Control, Toolbar control.

WEB TECHNOLOGY

Simple Programs Using

10.HTML, JAVA Script, VB Script
11.HTML EDITORS
12.XML
13.GML
14.ASP
15.MAP SERVER
16.Map display, Pan, Zoom using client server.

References:

1.Andrew Ford and Tim Dixon,Spinning the Web,2/e. International Thomson Computer Press,1996.

2. James A. Mohler, How to become Webmaster,Techmedia,New Delhi,1997.

M.Sc. Geoinformatics SEMESTER IV

Theory Paper-I (GI401T)

DIGITAL IMAGE PROCESSING

Section-A

1. Image Overview: Data acquisition, Processing, Analysis and output concepts and components.
2. Hardware, Software & Processing Principles.

Section-B

3. Data Acquisition and Digital Image format: Pre-Processing, Enhancement, Contrast Manipulation, Density Slicing and Colour Coding.
4. Image Rectification – Noise removal.

Section-C

5. Un-supervised Classification – Filtering, Generalization & Thematic Map Extraction.
6. Supervised, Classification – Training Sites, Classifier's Accuracy of Estionates.

Section-D

7. In Situ Support – Field Data Collection, Equipment in Field Data collection – Radiometers & G.P.S.
8. Post Classification – Design and Layout Principles, Map output.

References:

1. Jensen, J.R. Interdiction to Digital Image Processing, Prentice Hall.
2. Bernstein R (Ed) Digital Image Processing of Remotely Sensed Data, I.E.E.E. Press, 1978.
3. E.L.Hall, Computer Image Processing & Recognition, Academic Press, New York, 1979.
4. Hord R.M. Digital Image Processing of Remotely Sensed Data, Academic Press, 1982.
5. Tou J.T. & Gonzalez R.C. Pattern Recognition Principles, Addison - Wesley 1974.
6. Jain A.K. Fundamentals of Digital Image Processing Prentice Hall, 1989.
7. Rosenfeld A & Kak A.C. Digital Image Processing, Academic Press, New York, 1982.
8. Marr D, Vision, Freeman, San Francisco, 1980.

Theory Paper-II (GI402T)

PHOTOGRAMMETRY

UNIT-I

1. History of Photogrammetry
2. Electromagnetic Spectrum with application in Aerial Photogrammetry.

UNIT-II

3. Classification of Aerial Photographs.
4. Geometric Aspects of Aerial Photos

UNIT-III

5. Stereoscopic Vision & Depth Perception.
6. Orthophoto Mosaics.

UNIT-IV

7. Flight Planning & Acquisition of Aerial Photographs.
8. Application of Aerial Photographs – Land use land cover mapping, Urban studies.

References:

1. David P.Paine – Aerial Photography &Image Interpretation for Resource Management, John Wiley & Sons, New York, 1981.
2. Dickinson G.G. Maps and Aerial Photographs, Edward Arnold Ltd., London,1969.
3. Wolf P.R. Elements of Photogrammetry, McGraw Hill, New York, 1983.
4. Sloma C.C. Manual of Photogrammetry, American Society of Photogrammetry, Virginia, 1980.

Theory Paper-III (GI401T)

INFORMATION SYSTEMS AND MANAGEMENT

UNIT-I

1. Information Technology Meaning, Scope & Developments in I.T.
2. Information Systems: Concepts & Overview, Components of Information System, Design Analysis & Management,

UNIT-II

3. Managerial Overview of Hardware, Software, People, Data & Institutional Linkage.
4. Data base Management Systems for Information Systems: Data Resources, Structure & Functional Aspects, Data Design Issues & Output Designs.

UNIT-III

5. Internet & Information Management: Internet, Intranet & Extranet,
6. Electronic Communication Tools, Web Publishing & File Transfers.

UNIT-IV

7. Management Information System: Needs, Design & Action – Library Resource Information - Systems, Human Information Systems.
8. Information Decision Support System, Knowledge based Search Process.

Reference Books

1. Introduction to Information Technology – Alexis Leond Mathews Leen .
2. Fundamentals of Informtion Technology – Deepak Bharikhoke.
3. Modern Systms Analysis & Design – J.A. Hoffer, Tocy F. George and Joseph S. Velacich.
4. Fundamentals of Information Technology – Srivastava.

M.Sc Geo-informatics IV-Semester

Theory Paper IV (GI404T-CB-I)

RS and GIS Applications for Agriculture and Rural Development

Unit I

1. Concept of Rural Development – Globalization and its impact on Agriculture and Rural Development
2. Significance of agriculture – growth and development – types of agriculture
3. Livestock (types of agriculture)

Unit II

4. Use of RS and GIS technologies for Rural Development
5. Use of RS and GIS for agriculture and watershed management

Unit III

6. Use of RS and GIS for Socio economic Information Analysis
7. Agricultural Information System- Land Holdings – Irrigation, Land Use, Land Reforms

Unit IV

8. Application of RS and GIS in rural problem solving situation – Village Information System and planning.
9. Planning in India – Development policies (Five Year Plans)
10. Geo-informatics for Precision Farming- Importance and relevance to Indian Agriculture.

Theory Paper-IV (GI404T – CB-II)

Geography of Tourism

UNIT-I

1. History, nature, scope and approaches – Definition & types of Tourism.
2. Geographical Factors influencing Tourism: Physical, Socio-Cultural, Economic.

UNIT-II

3. Growth and development of Mass Tourism-Tourism Industry & Infrastructure Development –Transport, Communication, Services.
4. International Tourism in Developed and Developing Countries.

UNIT-III

5. Environmental and Cultural Tourism in India.
6. International & Domestic Tourism in India, Tourist Circuits-Spatial Patterns.

UNIT-IV

7. Tourism Development in Andhra Pradesh. Tourist Centres in A.P. with special reference to Hyderabad, Tirupathi and Vishakapatnam.
8. Impact of Tourism – Tourism Policies.

References:

1. Bezbaruah, M.P. 1990,Indian Tourism Beyond the Millenium", Gyan Publishing House, New Delhi.
2. Bhatia A K 1996, Tourism Development: Principles and Practices, Sterling, New Delhi.
3. Bell, D & Williams S.W.Eds. "Tourism Geography" Routledge, London.
4. Chattopadhyaya, Kunal,1995, " Economic impact of Tourism Development. An Indian Experience". Kanishka Publishers, New Delhi.
5. Dhar,Premnath, 1997 " Development of tourism and travel industry", Kanishka publishers, New Delhi.
6. Milton D 1993, Geography of world Tourism, Prentice Hall, New York.
7. Robinson,H.A.1996, A Geography of Tourism, Macdonald and Evans, London.
8. Sharma JK 2000, Tourism Planning and Development : A New Perspective, Kanishka, New Delhi.
9. Shaw G & Williams, AM, 1994, Critical Issues in Tourism : A Geographical Perspective, Oxford, Blackwell.
10. Singh, Tejvir et al, Eds, 1982, " Studies in Tourism & Wildlife, Parks Conservation", Metropolitan Book Co. New Delhi.
11. Sinha PC, 1998, Tourism Impact Assessment , Anmol, New Delhi.

Practical Paper-I (GI405P)

IMAGE ANALYSIS

1. Elements of image characteristics and interpretation of image
2. Comparison between aerial photographs and satellite imageries
3. Visual Interpretation of Satellite Imagery-Mapping Land use/Land Cover in Urban areas
4. Image Rectification-Geometric and Radiometric correction.
5 .Image Enhancement- Contrast and BandRatioing
6 .Digital Image Classification-Supervised and Unsupervised
7. Introduction to Digital Photogrammetry
8. Accuracy estimation.
9. Identification of Ground Truth locations on Satellite Imagery.
10. Identification of Land Use/Land Cover changes with Multi Date Imagery

Reference:

1. Curran Paul J Principles of Remote Sensing, Longman Publications.
2. Remote Sensing & Image Interpretation, John Wiley & Sons.
3. Green, W.B.Digital Image Processing, Von Nas-Ir & ReinTold Co.
4. Castleman, J.M.Digital Image Processing, Englewood Cliff.

GEO-INFORMATICS

II-SEMESTER

1.	**GI201T**	Advanced G.I.S.	4	100	4
2.	**GI202T**	Business G.I.S.	4	100	4
3.	**GI203T**	Environmental Studies	4	100	4
4.	**GI204T**	Programming Languages	4	100	4
5.	**GI205P**	Computer Programming Lab & Visual Computing	6	75	3
6.	**GI206P**	G.I.S. Applications	6	75	3
7.	**GI207P**	Map & Aerial Photo Interpretation	6	75	3
	Total			625	25

IV-SEMESTER

1.	**GI401T**	Digital Image Processing.	4	100	4
2.	**GI402T**	Photogrammetry	4	100	4
3.	**GI403T**	Information Systems and Management	4	100	4
4.	**GI404T C B - I**	RS & GIS Applications for Rural Development & Planning	4	100	4
5.	**GI404T C B - II**	Geography of Tourism			
6.	**Seminar**		2	25	1
7.	**GI405P**	Image Analysis	9	100	4
8.	**GI406PJ (Project Work)**	(Dissertation and Viva Voce)	9	100	4
	Total			625	25
	Grand Total Marks and Credits			2500	100