DEPARTMENT OF GEO-INFORMATICS
TELANGANA UNIVERSITY
NIZAMABAD

SEMESTER - I

DEPARTMENT OF GEO-INFORMATICS						
TELANGANA UNIVERSITY,UNIVERSITY COLLEGE,CAMPUS -II						
BHIKNOOR,NIZAMABAD						
M.Sc.Geo-Informatics-Syllabus – Semester -I						
Scheme of Instruction and Examination						
Semester		Paper Code	Course	Teaching per work	Duration of Exam	Marks
Sem-I	Theory-I	GIS-101	Introduction to Geoinformatics	5	3	100
	Theory-II	GIS-102	Physical & Socio - Economic Environment	5	3	100
	Theory-III	GIS-103	Fundamentals of Remote sensing	5	3	100
	Theory-IV	GIS-104	Principles of Cartography	5	3	100
	Practical-I	GIS-151	Introduction to G.I.S	3	3	50
	Practical-II	GIS-152	Visual Image Analysis	3	3	50
	Practical-III	GIS-153	Cartographic Applications	3	3	50
	Practical-IV	GIS-154	Field Survey & G.P.S.	3	3	50
			Papers:	Marks		
			Theory	400		
			Practical	200		
			Total marks:	600		

Theory-I: Introduction to Geoinformatics

Section- A

1. Scope and Importance of Geoinformatics.
2. Geoinformatics Technologies and the technologies used in Geographical Studies.

Section-B

3. Geoinformatics and other Information Sciences.
4. Geoinformatics – Spatial and Non-Spatial data management, Spatial Information Technology.

Section-C

5. Maps & G.I.S.
6. Elements of G.I.S.- Hardware, Software, Data ware & Live ware.

Section-D

7. Approaches to the study of G.I.S.
   a). G.I.S. as a Spatial 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.

References:
1. Godchild 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 H.C. – 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- II : Physical & Socio-Economic Environment

Section- A

1. Types of Land forms.
2. Erosional & Depositional Features of Rivers, Glaciers, Wind and Underground Water.

Section-B

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

Section-C

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

Section-D

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, Mc Graw Hill Book Co.Ltd., NewYork, 1969.
4. Wooldridge & Morgan, Phisical 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- III: Fundamentals of Remote-Sensing

Section- A

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

Section-B

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

Section-C

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

Section-D

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 – Princples of Remote Sensing, English Language Book Society, London, 1998.
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 Kiefer, Remote Sensing & Image Interpretation, John Wiley & Sons, New York, 1978.
6. Deekshatalu B.L. & Rajan Y.S. (Ed), Remote Sensing, Indian Academy of Sciences, 1984.

Theory- IV: Principles of Cartography

Section- A

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

Section-B

3. Principles of Map Design.
4. Symbolization.

Section-C

5. Generalization in Cartography.
6. Colours & Patterns.

Section-D

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, Engelwood Cliff, New York,
5. Lawrence G.R.P., Cartography Methods, Methuen, London, 1974.

Practical- I: Introduction to G.I.S.

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.
5. Coverage Creation & Editing.
6. Creation of Maps – Choropleth & Dot Maps.

References:

1. Taylor D.R.F., G.I.S.: The Micro Computer and Modern Cartography, Pergamon Press, Oxford.

Practical- II: Visual Image Analysis

1. Satellite Imageries of various Scales/Bands.
2. Mapping from Satellite Imagery – Landforms, Water resources, Forest, Agricultural and other Land Use.
3. Identification of ground truth Locations on Satellite Imagery.
4. Identification of Land Cover changes – with the help of Multi-Date Imagery.
5. Area Computation methods – Dot Grid, Digital Planemeter.
6. Accuracy Estimation of Thematic Details from Satellite Imagery.
7. Introduction to Image Processing – G.I.S. Techniques.

References:

1. Curran Paul J. Principles of Remote sensing, Longman Publications.
2. Remote Sensing & Image Interpretation, John Wiley & Sons.

Practical- III: Cartographic Applications

1. Map Scale – Types of Scales.
2. Map Projections, Graphic representation of Cylindrical, Conical & Zenithal Projections.
3. Map Compilation.
4. Symbolization – Point, Line, Area.
5. Map Reproduction.
6. Relief Profiles.

References:

1. Practical Geography by R.L. Singh.

Practical- IV: Field Survey and G.P.S.

1. Importance of Field Survey – Principles & Applications of selected Survey Instruments.
2. Chain & Tape Survey –Triangulation Method.
3. Plane Table Survey, Plan Preparation, Resection.
4. Prismatic Compass Survey – Open & Closed Traverse; Elimination of Error – Bowdich Method.
5. G.P.S. Satellites, Fundamentals of G.P.S., Space, Ground and Control segment.
6. Identification of Location & Altitude with G.P.S.

References:

1. Clendenning, J. Principles and use of Surveying Instruments, 2nd Edition, Blokie.A 1958.
2. Clinding, J Principles of Surveying, 1960.
3. Hotine, Major, The Re-Triangulation of Great Britain, Empire Survey Review, 1935.
4. Mishra R.P. and Ramesh A. 2002, Fundamentals of Cartography Revised Edition, Concept Publication, New Delhi.
5. Sandover, J.A. Paine Surveying, Arnold, 1961.
6. Singh & Kanaujia – 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.

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			M.Sc.Geo-Informatics-Syllabus			
			Scheme of Instruction and Examination			
Semester		Paper Code	Course	Teaching per work	Duration of Exam	Marks
Sem-II	Theory-I	GIS-201	Advanced G.I.S	5	3	100
	Theory-II	GIS-202	Regional Planning & Development Studies	5	3	100
	Theory-III	GIS-203	Environmental Studies	5	3	100
	Theory-IV	GIS-204	Programming Languages	5	3	100
	Practical-I	GIS-251	Computer Programming Lab	3	3	50
	Practical-II	GIS-252	G.I.S Application	3	3	50
	Practical-III	GIS-253	Map analysis and Interpretation	3	3	50
	Practical-IV	GIS-254	Project Report -40 marks: viva -voce -10 marks	3		50
			Papers:	Marks		
			Theory	400		
			Practical	200		
			Total marks:	600		

II.SEMESTER

Theory-I: Advanced G.I.S

Section- A

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

Section-B

3. Geo-referencing and Geo-coding.
4. Data Quality and Data Errors in G.I.S.
5. Spatial Data Analysis.

Section-C

6. Digital Elevation Model.
7. Global Positioning System.

Section-D

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

References:
1. Godchild 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 H.C. – 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- II : Regional Planning & Development Studies

<u>Section- A</u>

6. Spatial and non Spatial Theories of Development.
7. Planning – Definition, Principles and Perspectives.

<u>Section-B</u>

8. Regional Concepts types and regionalization.
9. Resource and Socio-Economic, and Agricultural aspects of Regional Planning.

<u>Section-C</u>

10. Application of G.I.S, Remote sensing and G.P.S. in Regional Planning.
11. Multi-Level (Village, Mandal, District) Planning and Regional Information System.

<u>Section-D</u>

12. Rural Development Programmes in India.
13. Regional Planning in India with special reference to Telangana.

References:

1. Robert E. Dickinson, Regional Concepts: The Anglo- American Leader, Routledge & Kelgan Paul, London,1976.
2. Government of A.P., Vision 2020, Hyderabad, 1998. R.R Desai, Rural Socialogy in India, Popular Prakashan, Bombay, 1987.
3. R.P. Misra & K.V Sunderam,Multi- level Planning and Integrated Rural Development in India. Heritage Publishers, New Delhi, 1980.
4. S.Simhadri, Spatial Understanding for District Development, CTS, Hyderabad, 2000.
5. S.Simhadri & P.L.V.Rao, Telangana: Dimentions of Development, CTS, Hyderabad, 1997.
6. R.C. Chandana, Regional Planning – A comprehensive Text, Kalyani Publishers, 2003.
7. K.S. Singh, People of India, Andhra Pradesh.
8. Ch. Hanumantha Rao & S. Mahendra Dev, Andhra Pradesh Development, CESS,2004.
9. Paul Chaval, An Introduction to Regional Geography, Black Well Publishers Oxford, 2002.

Theory- III: Environmental Studies

Section- A

1. Environmental Studies – Concept, Scope and Relationship with other disciplines.
2. Environmental Types and Compositions.

Section-B

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

Section-C

5. Environmental Information System.
6. Applications of G.I.S. and Remote sensing in Environmental Studies.

Section-D

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

Theory- IV: Programming Languages

Section- A

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

Section-B

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

Section-C

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

Section-D

7. VB- Developing Applications.
8. Arc Macro Languages (A.M.L.) in Arc Info, Avenue (in Arc View)

References:

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- I: Computer Programming Lab(C and C++)

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+b). also write the main program that uses these procedures.

6. Creating a class with private and public variable 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.

Practical- II: G.I.S. Applications

1. Overlay Functions in GIS – Intersect, Identity, Dissolve, Clip, Split, Union, Buffer.

2. Network Analysis.

3. Techniques in Interpolation.

4. Digital Elevation Model.

Practical- III: Map Analysis & Interpretation

1. Map Appreciation of thematic, topographic & Atlas maps.

2. Relief Mapping & Analysis: Relative Relief and Stop Maps, Height & Hypsometric Curves.

3. Analysis of Climate & Hydrology- Climograph, Rainfall, variability intensity maps, dispersion deviation graph; aridity & water balance.

4. Urban analysis- centrality, gravity, potential models, rank-size rule, nearest neighbor analysis.

Practical- IV: Project work & Report

- Group Project Report for a batch of 4 students.

III.SEMESTER

Semester		Paper Code	Course	Teaching per work	Duration of Exam	Marks
**DEPARTMENT OF GEO-INFORMATICS**						
TELANGANA UNIVERSITY,UNIVERSITY COLLEGE,CAMPUS -II						
BHIKNOOR,NIZAMABAD						
M.Sc.Geo-Informatics-Syllabus						
Scheme of Instruction and Examination						
Sem-III	Theory-I	GIS-301	Urban & Metropolitan Studies	5	3	100
	Theory-II	GIS-302	Resource Management	5	3	100
	Theory-III	GIS-303	Business GIS	5	3	100
	Theory-IV	GIS-304	Spatial Statistics	5	3	100
	Practical-I	GIS-351	Urban Information System	3	3	50
	Practical-II	GIS-352	Techniques in Mapping	3	3	50
	Practical-III	GIS-353	G.P.S Application	3	3	50
	Practical-IV	GIS-354	Visual Computing	3	3	50
			Papers:	Marks		
			Theory	400		
			Practical	200		
			Total marks:	600		

III.SEMESTER

Theory-I: Urban & Metropolitan Studies

Section- A

1. Historical trends, patterns of growth of Urban population and Urban centers, regional variations.
2. Economic, Social, Demographic and Behavioral approaches to the study of Urban areas.

Section-B

3. Urban Morphology & Urban Planning.
4. Urban functions, functional classification of towns.

Section-C

5. Metropolitan systems, processes, functions & delimitation.
6. Rural Urban Transformation- Urban fringe.

Section-D

7. Urban Social areas- Slums & Squatter settlements.
8. Urban problems- Urban pollution, waste management, Urban crime, Political segregation, Poverty, Housing and Public transport.

References:

1. Berry B.J.L. & Horton. F.E. (Ed), Geographic Perspectives on Urban systems, Prentice Hall, New Jersy,1970.
2. Ramachandran. H "Urbanization, and Urban systems in India", Oxford University Press, 1980
3. Bresse.G (Ed), The City in Newly Developing Countries, Prentice Hall,1972.
4. Carter – The study of Urban Geography ,Edward Arnold, London, 1972.
5. Haggett.P. Cliff A.D. & Frey.A, Locational Models, Vol.I & Vol.II, Arnold Heinemann, New Delhi,1979.
6. Rao.V.L.S.P Urbanization in India- Spatial Dimensions, concept, New Delhi, 1983.
7. Robson T. Urban Growth: An Approach Methuen & Co.London, 1973.
8. Yeates & Garner B.J. The North American City, Harper & Row, New York, 1971.
9. Northam R.M. Urban Geography, John Wiley, New York, 1975.

Theory- II : Resource Management

Section- A

1. Land Resources- Concept of Land, Land units & Resources- Land evaluation.
2. Land Capability and Limitations.
3. World distribution of Minerals.

Section-B

4. Water Resources- Management and Use.
5. Land classifications Land use system- sustainable management Model.

Section-C

6. Rural-Urban sector- Land use planning.
7. Land Information Management (LIM), DSS for Land use planning & Management.

Section-D

8. Approaches to Land Information Management & Problem solving at National & International level.
9. Capacity Building, an approache to people centered Development.

References:

1. Ali S.A. Resources for Future Economic Growth, Vikas Publications 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- III : Business G.I.S.

Section- A

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

Section-B

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

Section-C

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

Section-D

7. Property Development & L.I.S.
8. e-Governance and Internet G.I.S.

References:

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

Theory- IV: Spatial Statistics

Section- A

1. Introduction to Spatial Statistics.
2. Measurement Scales: Nominal, Ordinal, Interval, Ratio.

Section-B

3. Simple Correlation and tests of significance.
4. Regression & Ratio of Variation.

Section-C

5. Map Residuals.
6. Multivariate Analysis- Cluster Analysis, Factor Analysis.

Section-D

7. Log Normal Distribution.
8. Network Analysis.

References:

1. Elhance, D.N., Fundamentals of Statistics, Kitab Mahal, Allahabad, 1972.
2. Gregory S. Statistical Method and Geographer, Longman, London, 1963.
3. Cole, J.P. & Kind, C.A.M. Quantitative Methods in Geography, John Wiley & 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 Analysis in Geography, Longman, London, 1978.
7. King L.J. Statistical Analysis in Geography, Prentice Hall, Englewood Cliffs, New Jersey, 1978.

Practical- I: Urban Information System

1. Functional Regions of Cities.

2. City Landscape Elements- System Approach to City Landscape Studies.

3. Basic and non basic activities in cities – Techniques for measurement.

4. Transport Network Analysis in Urban Areas – Measures of Centrality & connectivity.

5. Urban Survey & Data management.

Practical- II: Techniques in Mapping

1. Colour Theory and Models.
2. Colour and Pattern creation & Specification.
3. Typography and lettering of Map.
4. Generalization in Cartography.
5. Map Reproduction.
6. Map Production.

References:

1. Elements of Cartography – Arthur H. Robinson.
2. Elements of Practical Geography – R.L. Singh & R.P.B. Singh.
3. Elements of Practical Geography – Ramesh and Mishra.

Practical- III: G.P.S. Applications

1. Types of G.P.S. Positioning.

2. Position fixing and route navigation using hand held G.P.S.

3. G.P.S. use in Static mode for Generic Mapping.

4. G.P.S. use in Pseudo – Kinematic Survey for large scale Mapping – case studies.

5. Limitations of G.P.S. Survey.

6. G.P.S. for G.I.S. and Mapping.

Practical- IV: Visual Computing
(VBA, JAVA and .NET)

1. Arc GIS Applications.

2. Using controls to build a form.

3. Branching and Looping in VBA.

4. Working with Variables and Functions in VBA.

5. Adding layers to Map.

6. Defining layers Symbology.

7. Querying data.

8. Coding in VB .NET.

9. Introduction to JAVA.

IV.SEMESTER

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TELANGANA UNIVERSITY,UNIVERSITY COLLEGE,CAMPUS –II						
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M.Sc.Geo-Informatics						
Scheme of Instruction and Examination						
Semester		Paper Code	Course	Teaching per work	Duration of Exam	Marks
Sem-IV	Theory-I	GIS-401	Digital Image Processing	5	3	100
	Theory-II	GIS-402	Photogrammetry	5	3	100
	Theory-III	GIS-403	Perspectives in Spatial Science	5	3	100
	Theory-IV	GIS-404	Information system and Management	5	3	100
	Practical-I	GIS-451	Aerial Photo Interpretation	3	3	50
	Practical-II	GIS-452	Map Customization	3	3	50
	Practical-III	GIS-453	Digital Image Analysis	3	3	50
	Practical-IV	GIS-454	Project Report -40 marks: viva -voce -10 marks	3		50
			Papers:	Marks		
			Theory	400		
			Practical	200		
			Total marks:	600		

IV. SEMESTER
Theory-I: 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 Estoniates.

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, JR. Introduction 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, San Fransisco, 1980.
9. Casleman K.R. Digital Image Processing, Prentice Hall, 1979.
10. Lillesand T.M. & Kiefer R.W. Remote Sensing & Image Interpretation, Wiley, 1987.
11. Mather Paul M., Computer Processing of Remotely Sensed Images: An Introduction, John Wiley, New York, 1987.

Theory- II : Photogrammetry

Section- A

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

Section-B

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

Section-C

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

Section-D

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. Solma C.C. Manual of Photogrammetry, American Society of Photogrammetry, Virginia, 1980.

Theory- III: Perspectives in spatial Science

Section- A

1. Theory of Space – Time Process.
2. Geography as a Behavioral Study.

Section-B

3. Description, Explanation and prediction in Geography.
4. Spatial diffusion Studies.

Section-C

5. Welfare Geography and Human Development.
6. Marxism in Geography.

Section-D

7. Post Modernism in Geography.
8. Gender & Geography.

References:

1. Holt, Jensen A. Geography: Its History & Concepts, Longman, 1980.
2. Hartshorne, R. Perspectives in the Nature of Geography, Annals of the Association of American Geographers, Washington D.C. 1959.
3. M.E. Harvey, Themes in Geographical Thought, 2002.
4. Johnson R.J. Spatial Structure, Methune, London, 1973.
5. Hagget P. Geography: A Modern Synthesis, Harper & Row, New York, 1972.
6. Hagget P. et al: Locational Models vol. I & II Arnold Heinemann, New Delhi, 1979.

Theory- IV: Information Systems and Management

Section- A

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

Section-B

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.

Section-C

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

Section-D

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

References:

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

Practical- I: Aerial Photo Interpretation

1. Viewing Photographs Stereoscopically.

2. Stereoscopic Depth perception.

3. Photographic flight line access for parallax measurement.

4. Principle of floating Mark.

5. Stereoscopic Method of Parallax Measurement.

6. Mapping with stereoscope and parallax bar.

7. Digital Aerial Photo Interpretation.

References:

1. Wolf P.R. Elements of Photogrammetry, McGraw Hill, New York, 1983.

Practical-II: Map Customization

1. Drawing Layers on Maps.

2. Attaching Data to Layers.

3. Adding vector data, adding shape file adding Arc Info coverage, adding CAD

4. Drawing/Adding Raster Data.

5. Applying Co-ordinates.

6. Applying Geometry.

7. Rendering features on the Maps.

8. Selecting features & retrieving information.

9. Matching addresses & Locating Places.

10. Deploying applications.

11. Creating ActiveX DLLs and added to the Arc GIS applications.

12. Introduction to Arc GIS Engine.

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

Practical-III: Digital Image Analysis

1. Image Rectification: Geometric and Radiometric Corrections.

2. Image Enhancement – Contrast & Band Ratioing.

3. Unsupervised Classification and Supervised Classification.

4. Land use Applications.

References:

1. Green W.B Digital Image Processing, Von Nasr & Reinnold Co.
2. Castle man J.M. Digital Image Processing, Engel wood Cliff.
3. Mather Paul M. Computer Processing of Remotely sensed Images: An Introduction, John Wiley, New York, 1987.
4. Shapiro L.G. & Rosenfeld (Eds) Computer Vision & Image Processing, Academic Press, New York, 1992.
5. Tou J.T. & Gonzalez R.C. Pattern Recognition Principles, Addison, Wiley, 1974.

Practical- IV: Project work & Report

Individual Project Report by every Student.