

**DEPARTMENT OF GEOGRAPHY  
SCHOOL OF EARTH AND ATMOSPHERIC SCIENCES  
UNIVERSITY OF MADRAS, CHENNAI – 600 005**

**M.Sc APPLIED GEOGRAPHY**

Subject Code	Title of the Course	C/E /S/I	Credits				Faculty
			L	T	P	C	
<b>I SEMESTER</b>							
EAS C001	Cartography and visualisation	C	2	1	1	4	Dr.R.Jaganathan
EAS C002	Applied Geomorphology	C	3	1	0	4	Dr.G.Bhaskaran
EAS C003	Climate, Climate change and adaptation	C	3	1	0	4	Dr.M.Sakthivel
EAS C004	Practical-I Techniques of Mapping and Map Analysis	C	1	0	3	4	Dr.M.Sakthivel/ Dr.V.Madha Suresh
Elective-1		E	2	1	0	3	
Elective-2		E	2	1	0	3	
UOM S001	Soft Skill *	S	2	0	0	2	
<b>II SEMESTER</b>							
EAS C005	Geographic Information Science and Systems	C	3	1	0	4	Dr.R.Jaganathan
EAS C006	Remote Sensing and Survey Techniques	C	3	1	0	4	Dr.G.Bhaskaran
EAS C007	Coastal and Oceanographic studies	C	3	1	0	4	Dr.V.Madha Suresh
EAS C008	Practical (Lab) – II : Digital Cartography and GIS Analysis	C	1	0	3	4	Dr.R.Jaganathan
EAS C009	Field Survey and Mapping Techniques(Field Work)	C	0	1	1	2	All Faculties
Elective-3		E	2	1	0	3	
Elective-4		E	2	1	0	3	
UOM S002	Soft Skill *	S	2	0	0	2	
<b>III SEMESTER</b>							
EAS C010	Theoretical Economic Geography	C	2	1	1	4	Dr.R.Jaganathan
EAS C011	Urban Environment and Sustainability	C	3	1	0	4	Dr.M.Sakthivel
EAS C012	Natural Resource Management and sustainable development	C	3	1	0	4	Dr.V.Madha Suresh
EAS C013	Practical – III : Remote Sensing : Interpretation and Data Analysis	C	1	0	3	4	Dr.G.Bhaskaran
Elective-5		E	2	1	0	3	
Elective-6		E	2	1	0	3	
UOM S003	Soft Skill *	S	2	0	0	2	
<b>IV SEMESTER</b>							
EAS C014	Field work and spatial data analysis (Field work)	C	0	1	3	4	All Faculties
EAS C015	Project	C	0	1	5	6	All Faculties
UOM I 001	Internship	I	0	0	2	2	All Faculties
Elective-7		E	2	1	0	3	
UOM S004	Soft Skill *	S	2	0	0	2	

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**M.Sc SPATIAL INFORMATION TECHNOLOGY**

Subject Code	Title of the Course	C/E /S/I	Credits				Faculty
			L	T	P	C	
<b>I SEMESTER</b>							
EAS C001	Cartography and visualisation	C	2	1	1	4	Dr.R.Jaganathan
EAS C101	Spatial Statistics and Mathematics	C	3	1	0	4	Dr.G.Bhaskaran
EAS C102	Physical Resource Assessment	C	3	1	0	4	Dr.V.Madha Suresh
EAS C004	Practical-I Techniques of Mapping and Map Analysis	C	1	0	3	4	Dr.M.Sakthivel/ Dr.V.Madha Suresh
Elective-1		E	2	1	0	3	
Elective-2		E	2	1	0	3	
UOM S001	Soft Skill *	S	2	0	0	2	
<b>II SEMESTER</b>							
EAS C005	Geographic Information Science and Systems	C	3	1	0	4	Dr.R.Jaganathan
EAS C006	Remote Sensing and Survey Techniques	C	3	1	0	4	Dr.G.Bhaskaran
EAS C103	Socio Economic Resource Analysis	C	3	1	0	4	Dr.V.Madha Suresh
EAS C004	Practical (Lab)- II : Digital Cartography and GIS Analysis	C	1	0	3	4	Dr.R.Jaganathan
EAS C009	Field Survey and Mapping Techniques (Field Work)	C	0	1	1	2	All Faculties
Elective-3		E	2	1	0	3	
Elective-4		E	2	1	0	3	
UOM S002	Soft Skill *	S	2	0	0	2	
<b>III SEMESTER</b>							
EAS C104	Spatial Modelling and Programming	C	2	1	1	4	Dr.M.Sakthivel
EAS C 105	Analysis of Risk, Vulnerability and Disaster Management	C	3	1	0	4	Dr.R.Jaganathan
EAS C106	Natural Resource Management and sustainable development	C	3	1	0	4	Dr.V.Madha Suresh
EAS C013	Practical – III : Remote Sensing : Interpretation and Data Analysis	C	1	0	3	4	Dr.G.Bhaskaran
Elective-5		E	2	1	0	3	
Elective-6		E	2	1	0	3	
UOM S003	Soft Skill *	S	2	0	0	2	
<b>IV SEMESTER</b>							
EAS C014	Field work and spatial data analysis (Field work)	C	0	1	3	4	All Faculties
EAS C015	Project	C	0	1	5	6	All Faculties
UOM I 001	Internship	I	0	0	2	2	All Faculties
Elective-7		E	2	1	0	3	
UOM S004	Soft Skill *	S	2	0	0	2	

## ELECTIVE COURSES

Subject Code	Title of the Course		Credits				Faculty
			L	T	P	C	
<b>I SEMESTER</b>							
EAS E 001	Geographical Thought	E	2	1	0	3	Dr.V.Madha Suresh
EAS E 002	Information System Management	E	2	1	0	3	Dr.M.Sakthivel
EAS E 003	Watershed Management	E	2	1	0	3	Dr.G.Bhaskaran
EAS E 004	Geographies of Crime and Justice	E	2	1	0	3	Dr.R.Jaganathan
<b>II SEMESTER</b>							
EAS E 005	Bio-Geography	E	2	1	0	3	Dr.M.Sakthivel
EAS E 006	Environmental Impact Assessment	E	2	1	0	3	Dr.V.Madha Suresh
EAS E 007	Political Geography	E	2	1	0	3	Dr.R.Jaganathan
EAS E 008	Research Design and Methods	E	2	1	0	3	Dr.G.Bhaskaran
<b>III SEMESTER</b>							
EAS E 009	GIS Project Planning	E	2	1	0	3	Dr.G.Bhaskaran
EAS E 010	Geo-informatics for Sustainable Land Resources Management	E	2	1	0	3	Dr.R.Jaganathan
EAS E 011	India's Development and Regional Planning	E	2	1	0	3	Dr.M.Sakthivel
EAS E 012	Physical Survey and Field Techniques	E	2	1	0	3	Dr.V.Madha Suresh
<b>IV SEMESTER- (Independent Studies)</b>							
EAS E 013	Web Cartography and Spatial Information delivery	E	2	1	0	3	Dr.R.Jaganathan
EAS E 014	Microwave Remote Sensing	E	2	1	0	3	Dr.G.Bhaskaran
EAS E 015	Geography of Health Care						Dr.V.Madha Suresh
EAS E 016	Sustainable Urban Land Management	E	2	1	0	3	Dr.M.Sakthivel

## I SEMESTER

<b>EAS C001</b>	<b>Cartography and visualisation</b>	<b>C</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>4</b>	<b>Dr.R.Jaganathan</b>
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1. Development of Cartography- Information age and mapping, Web Cartography, Cartography as language and communication
2. Shape of the Earth - Geographical Data, Geographic Coordinates, Map projections- Scale, Reference and Plane Coordinate System- Survey methods, Remote Sensing, Global Positioning System- accuracy and reliability
3. Compilation process- Generalization- Map Design and Symbolization: Map content, design and implementation- Pattern creation; feature attributes, point, line, areas and volumes; Qualitative and Quantitative symbols
4. Thematic Mapping-Layout and Display-Map elements- typography and lettering; portraying land surface form
5. Web mapping resources and mapping – spatial Visualization- cartography and spatial information policy

### Text Books

1. Robinson, A.H., J.L.Morrison, P.C., Muehrcke, A.J.Kimerling and S.C.Guptill (1995). Elements of Cartography, 6<sup>th</sup> Edition. New York., John Wiley & Sons. USA.
2. Misra, R.P. and A.Ramesh (1989). Fundamentals of Cartography, Concepts Publishing Company, New Delhi.
3. MacEachren, Alan, M., 1995, How Maps Work, Representation, Visualization and Design, Guilford Press

### References

4. Kraak, M.J. and F.J.Ormeling (1996). Cartography : Visualisation of Spatial data, Longman Ltd., England.
5. Tyner, J. (1992). Introduction to Thematic Cartography, Prentice-Hall, Englewood Cliff, New Jersey.

### Web resources

6. <http://www.fes.uwaterloo.ca/crs/geog165/cart.htm>
7. [http://www.colorado.edu/geography/gcraft/notes/cartocom/cartocom\\_ftoc.html#3.0](http://www.colorado.edu/geography/gcraft/notes/cartocom/cartocom_ftoc.html#3.0)
8. <http://www.earthsensing.com/cart/resources/carthelp.html>

<b>EAS C002</b>	<b>Applied Geomorphology</b>	<b>C</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>Dr.G.Bhaskaran</b>
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1. Scope of Applied Geomorphology: Scale and landscape analysis – land systems and units for systematic analysis- terrain evaluation
2. Energy flow in geomorphic system: System concepts – availability of power – solar radiation- rotation of energy-heat, relative energy and surface processes-climatic and tectonic changes and impacts
3. Weathering, mass wasting and development of Hillslopes: Mechanical, chemical and biological weathering- structure, process and time in weathering- soil formation-mass wasting- causes and classes of mass wasting-hill slope evolution-Penk and Davisian views

4. Process geomorphology: Drainage basin, erosion, sedimentation and structural adjustments in the fluvial system; waves, evolution of shores and construction and destruction of coastal region; arid landforms and its evolution- karst and speleology; glacial process, erosion and depositional landforms
5. Methodological Issues: Mapping and statistical analysis; Morphometric, landscape and land evaluation, Hazard analysis

### Text Books

1. Ruhe, R.V. (1982), Geomorphology, Boston : Houghton Mifflin Company
2. William D. Thornbury (1954); Principles of Geomorphology; John Willy & sons, Inc., London.

### References

1. Arthur L. Bloom (2002); Geomorphology – A Systematic Analysis to Late Cenozoic landforms; Prentice – Hall of India Pvt., Ltd., New Delhi.
2. Arthur. N. Strahler, Alan H. Strahler (1989); Elements of Physical Geography; John Wiley & sons, Inc., London.
3. Derbyshire, E. (1980). Geomorphology and Climate, London : John Wiley & sons.

### Web resources

4. <http://www.colorado.edu/geography/gcraft/notes>
5. <http://www.staff.amu.edu.pl/~sgp/gw/gwsto.htm>

<b>EAS C003</b>	<b>Climate, Climate change and adaptation</b>	<b>C</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>Dr.M.Sakthivel</b>
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1. Atmosphere: Its composition (gaseous) and structure; Insolation and Radiation, heating of land and water; Temperature and pressure: variations in temperature and pressure; temperature zones, heat balance, and pressure belts
2. Global wind circulation: Tricellular meridional circulation; trade winds, easterlies and westerlies and polar winds; Air masses: Continental and maritime; fronts and their types; clouds; Precipitation: thunderstorms, cyclones (tropical and temperate) and anti-cyclones
3. Climatic classifications; Indian climates and climatic zones; micro climates, agro climates and urban climates; Global climate change; global warming and their likely impacts on human life on earth
4. Oceans: Ocean relief, temperature and salinity distribution; ocean deposits and their types; ocean currents: theories on movements; El Nino, La Nino.
5. Climate change case studies – effects of climate change – land use and land use planning-GIS for climate change –GIS based Action Plan - decision making, and application to climate science-comprehensive climate information system

### References

1. R.C. Sharma and M. Vatal (1987); Oceanography for Geographers; Chaitanya Publishing House, Allahabad.
2. Tom Garrison (1996); Oceanography – An Invitation to marine science; Wadsworth Publishing co., Washington.

3. Roger G. Berry & Richard J. Chorley (1998); Atmosphere, Weather and Climate; Routledge London & New York.
4. Howard J. Critch field (1995); General Climatology; Prentice, Hall of India Pvt. Ltd., New Delhi.
5. Elizabeth Kolbert, (2006) Field Notes from A Catastrophe: Man, Nature and Climate Change, Bloomsbury Publishing Plc.
6. Lisa F. Schipper and Ian Burton (Ed.) (2008) Adaptation to climate Change, Earthscan Reader Series,

<b>EAS C101</b>	<b>Spatial Statistics and Mathematics</b>	<b>C</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>Dr.G.Bhaskaran</b>
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1. Nature of spatial data- Tables and graphs- scales of measurement and nature of data- statistical summaries- sampling procedures and probability distribution
2. Statistical Analysis: Basics of simple correlation and regression – hypothesis testing, parametric and non-parametric methods-regression, multiple regression and models – multivariate analysis – factor analysis and correspondent analysis
3. Basics Mathematics: Algebra, Matrix Algebra - Fundamentals and applications - Problems of simultaneous equations - Boolean algebra and set operations
4. Geographic data: Data cube - Spatial problems of sampling and data gathering - data collection by field methods - attribute data by socio-economic surveys - representing. univariate, bi-variate and multivariate data by maps.
5. Representing patterns: Class interval for mapping - natural break, equal interval and other methods - enhancement and generalisation principles - Mapping variations and residuals. Arithmetic and geometric distributions for mapping

### References

1. Richard I. Levin and David S.Rubin (1996) Statistics for Management, Prentice- hall of India, New Delhi
2. Earl Gose and Richard Johnson Baugh and Steve Jost (1999) Pattern Recognition and Image Analysis, Prentice- hall of India, New Delhi
3. A.G.Wilson, M.J.Kirkby (1975); Mathematics for Geographers and Planners – Contemporary problems in Geography; Clarendon Press – oxford.
4. Arthur Getis, Barry Boots (1978); Models of spatial Process; Cambridge University Press, Cambridge.
5. Peter Hagget, Andrew D.Cliff and Allan Fray (vol.I & II) (1979); Locational Methods; Aronold – Heinemann Publishers, India.
6. George Simpson, & Fritz Kafka (1965); Basic Statistics; Oxford & IBH Publishing Co.

<b>EAS C102</b>	<b>Physical Resource Assessment</b>	<b>C</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>Dr.V.Madha Suresh</b>
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1. Objectivity in field surveys; Field work and surveys, measurement and recording

2. Field work design and sampling issues; Equipment in geomorphic and soil surveys; GPS for site fixing, routing and contouring
3. Hydrology and water quality data; Ground truth collection for remote sensing support
4. Village survey principles and methods; Urban land use surveys; Land system and land use surveys-Assessment strategies
5. Computer support for data management, interpretation and surface modelling; Data integration and GIS- Assessment tools

### References

1. Garson, G.D. and R.S. Biggs (1992). Analytic Mapping and geographic databases, SAGE Publications, London.
2. Hanwell, J.D. & M.D.Newson (1973). Techniques in Physical Geography MacMillan, London.
3. Worthinton, B.D.R. and R,Gant (1975). Techniques in Map Analysis, Macmillan, London
4. Rabenhorst, T.D. and Paul D.McDermott (1989). Applied Cartography : Source Materials fro Map Making, Merrill Publishing Company, London.
5. Rabenhorst, T.D. and Paul D.McDermott (1989). Applied Cartography : Introduction to Remote Sensing, Merrill Publishing Company, London.
6. Mitchell, C.W. (1991). Terrain Evaluation, London Scientific and Technical Co., John Wiley & Sons, Inc. New York.

<b>EAS C004</b>	<b>Practical-I Techniques of Mapping and Map Analysis</b>	<b>C</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>4</b>	<b>Dr.M.Sakthivel/ Dr.V.Madha Suresh</b>
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1. Map Appreciation and interpretation: Thematic, topographic and atlas maps- Mapping and Analysis : Relative relief and slope maps; height and hypsometric curves; stream Analysis
2. Climate and Hydrology: Climo and climatograph; rainfall variability intensity maps temperature and rainfall profiles; dispersion deviation graph ; aridity and water balance
3. Population and Economic Data Mapping: Dot maps, density maps-colour and grey scale patterns; index of concentration and diversification; transport network analysis
4. Quantitative Symbolisation and Location Maps: Located representation of tourism and facilities; point and line pattern analysis; cartograms and 3D maps
5. Scanning-Digitization - Map preparation -Database creation- Base map preparation- - Selection of geographical co-ordinates-Symbolization-Map Design and Layout using GIS software

### References

1. Monkhouse, F.J., and Wilkinson, H.R. (1976) : Maps and Diagrams, Methuen & Co., London.

2. Worthington, B.D.R. and Robert Gent (1975): Techniques in Map Analysis, Ebenzer Baylis and Sons, USA.
3. Anson, R.W. (Ed.) (1984) Basic Cartography for Students and Technicians, Volume 2, International Cartographic Association, Elsevier Applied Science Publishers, London.
4. Dorling, D. and David Fairbairn (1997), Mapping: Map of representing the world, Addison Wesley Longman Ltd., U.K.
5. Lawrence, G.R.P. (1971). Cartographic Methods, Methuen & Co., Canada
6. Kang-tsung Chang (2002) Introduction to Geographical Information Systems, Tata McGraw-Hill Publishing Company Limited, New Delhi.

### Web resources

1. [www.sevenoaks.wa.edu.au/linkpage/geog/copy.html](http://www.sevenoaks.wa.edu.au/linkpage/geog/copy.html)
2. [www.gisdevelopment.net/books/mapping/bmap0010.htm](http://www.gisdevelopment.net/books/mapping/bmap0010.htm)
3. <http://www.esri.com/>

### II SEMESTER

<b>EAS C005</b>	<b>Geographic Information Science and Systems</b>	<b>C</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>Dr.R.Jaganathan</b>
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1. Basic concepts of Spatial science and GIS: Geographic spaces, Spatial data and information, Reference systems and datums, GIS definition, Approaches and Components; History and Development of GIS
2. Data Models and Management: Spatial Data Models – Vector and Raster data models; Data Models – DBMS and GIS- data qualities
3. Data Capture and Geoprocessing: Sources of geographic data, capturing methods, topology, geometric Transformation, scales in GIS, precision and accuracy
4. Manipulation and Analysis: Basic spatial operations-vector and raster based point, line and area analysis; Digital Elevation Models
5. Geospatial Technology: GIS, Remote Sensing, GPS and Cartography for spatial modelling and applications

### Text Books

1. Ian Heywood, Sarah Cornelius and Steve Carver(2000),An Introduction to Geographical Information Systems, Addison Wesley Longman Limited, New York.
2. Aronoff, S. (1991) Geographic Information Systems: A Management Perspective, WDL Publications, Ottawa, Canada.
3. Dr. K. Elangovan (2006)GIS - Fundamentals, Applications and Implementations, New India Publishing Agency, New Delhi

### References

4. Kang-tsung Chang (2002) Introduction to Geographical Information Systems, Tata McGraw-Hill Publishing Company Limited, New Delhi.



- David J Maguire, Michael F Goodchild, and David W Rhind ed.(1991) Geographical Information Systems, Longman Scientific & Technical Co-published in the USA with John Weiley & sons, Inc. New York.

### Web Resources

- <http://www.gsd.harvard.edu/pbcote/courses/gsd6322/lectures.htm>
- [http://www.soi.city.ac.uk/~dk708/part\\_1.htm](http://www.soi.city.ac.uk/~dk708/part_1.htm)
- [www.ncgia.ucsb.edu/education/curricula/giscc](http://www.ncgia.ucsb.edu/education/curricula/giscc)

<b>EAS C006</b>	<b>Remote Sensing and Survey Techniques</b>	<b>C</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>Dr.G.Bhaskaran</b>
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- Introduction to surveying: principles of surveying – measurement technology – traditional survey methods – automated survey systems.
- Concepts of energy and radiation - principles, components of remote sensing systems, energy interactions, atmospheric windows; Interactions of earth surface features, spectral regions and principal methods of data acquisition, active and passive methods of sensing, concepts of resolutions
- Platforms, sensors, radiation records, format of photographic, digital imagery and non-imagery data, Data Products and Limitations; Photographic system of sensing; Satellite system of sensing
- Sensors and sensing, optical mechanical and electronic sensor systems, microwave sensing, thermal scanning
- Interpretation basics and methodology; *In-situ* support, collateral; Digital Image Processing; Classification and maps; Measurements and Instruments - Remote Sensing Applications in Resources

### References

- Avery, T.E. and G.L. Berlin, (1992), Fundamentals of Remote Sensing and Air Photo Interpretation, Macmillan Publishing Company, New York.
- James B. Campbell (1996); Introduction to Remote Sensing; Taylor & Francis, London
- Lillesand and Keifer (2000) : Introduction to Remote sensing and Image Interpretation; John Willy & sons Ltd., New York.
- Lillesand, T.M. & R.W.Kiefer (1987), Remote Sensing and Image Interpretation, John Wiley and Sons, Canada
- Paul. J. Gibson (2000) : Introductory Remote Sensing; Routledge; New York.

<b>EAS C007</b>	<b>Coastal and Oceanographic studies</b>	<b>C</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>Dr.V.Madha Suresh</b>
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1. Coastal Studies: Definitions, Meaning and Scope - Coastal zone as a Resource Base – Marine Living and Nonliving Resources - Components that concern us - Sustainable coastal zone management - Rivers to the Sea Concerns – Coastal Development Activities - Coastal Pollution
2. Coastal zone: land-water interface, international initiatives for coastal zone protection; international assessments of needs and priorities of coastal zone; UN Conventions; UNEP and national programmes for coastal zone – Fisheries and Aquaculture Management
3. Defence of the coastal areas and coastal zone management: principles, bases for decisions on coastal zone development; essential national and international linkages; Land use zoning on the land and in the coastal waters; use of land use planning principles in the coastal zone; difficulties and constraints.
4. Coastal habitats and community modifications: fisheries and other living resources; unsustainable exploitation of fisheries, coral reefs; Coastal Zone Analysis for sub-regional applications: Indian ocean scenarios and policy options – Wetland Ecosystems
5. Planning and management of coastal zone: coastal zone regulation (CZR) in India; successes and failures of coastal zone management; A resource management strategy for India's coastal region – Integrated Coastal Zone Management – Principles, Needs, Policy and Legislation – Remote Sensing Application in ICZM - Coastal Zone Information System - EIA

## References

1. Global International Waters Assessment (GIWA) Reports by UNEP and other International Organisations ([www.giwa.net](http://www.giwa.net); [info@giwa.net](mailto:info@giwa.net))
2. Burton, I., R. Kates and R. Snead 1969: The Human Ecology of Coastal Flood Hazard in Megalopolis, Chicago: University of Chicago Department of Geography.
3. Proceedings of Coastal Canada 1996 and 1998.
4. World Meteorological Organisation/UNESCO 1997: The World Waters, Paris.
5. UNCED 1992: Agenda 21: Programme of Action for Sustainable Development, New York: United Nations Department of Public Information, Chapter 17.

<b>EAS C103</b>	<b>Socio Economic Resource Analysis</b>	<b>C</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>Dr.V.Madha Suresh</b>
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1. The basis of socio-economic resources : The components of socio-economic environment – population, economic base and economic activities – social groups and cultures – technology and development.
2. Human resource: population distribution, density, growth and fertility changes – settlements and rural and urban continuum – cities, urban agglomerations and urban regions – world cultural regions.
3. Primary economy : Primary economic activities and general world patterns agriculture and its determinants.

4. Locational principles for manufacturing and patterns of manufacturing – manufacturing heart lands and regions – determinants of trade and transport – import, exports and world trade
5. Regionalism : Principles of regions and regionalism – A factors growth and development – developed and developing world – segregation at local, national and international level and conflict – economic and cultural regions of the world.

### References

1. Ronald, Reed Boyce (1974) . The bases of economic geography, Holt, Rinehart and Winston, Inc. New York.
2. Goh Cheng Geog. Gilliam C.Morgan (1982). Human and economic geography, Oxford University Press, Delhi
3. Fred, E. Dohrs and Lawrence M. Sommers (1970) Economic Geography, Crowell, New York

<b>EAS C008</b>	<b>Practical (Lab) – II : Digital Cartography and GIS Analysis</b>	<b>C</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>4</b>	<b>Dr.R.Jaganathan</b>
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1. Digitization – creation of spatial data- Point, Line, Polygon features -Building topology – geo-referencing-measuring distance and area
2. Attribute data editing and integration, class interval selection, thematic mapping and output-labelling
3. Buffering, Overlay and Network analysis- 3D Analysis - TIN and DEM
4. Spatial interpolation- Thematic mapping-located bar diagrams- spatial modelling
5. Ground truth support: Use of GPS for siting and routing; GPS with field data attributes

### Text books

1. Ian Heywood, Sarah Cornelius and Steve Carver (2000), An Introduction to Geographical Information Systems, Addison Wesley Longman Limited, New York.
2. Aronoff, S. (1991) Geographic Information Systems: A Management Perspective, WDL Publications, Ottawa, Canada.

### References

3. Kang-tsung Chang (2002) Introduction to Geographical Information Systems, Tata McGraw-Hill Publishing company Limited, New Delhi.
4. Chrisman, N. (1997) : Exploring Geographic Information systems, New York : John Wiley & Sons., Inc.

### Web Resources

4. [www.ncgia.ucsb.edu/education/curricula/giscc](http://www.ncgia.ucsb.edu/education/curricula/giscc)
5. <http://www.esri.com/>

<b>EAS C009</b>	<b>Field Survey and Mapping Techniques(Field Work)</b>	<b>C</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>2</b>	<b>All Faculties</b>
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The students will submit report based on fieldwork in the second semester. This course work contains - Plan and schedule of the work carried out and comprehensive report on the fieldwork. The students will go for a field work in the second semester, which is compulsory and on the basis of that, each student has to submit a field work report as part of the second semester course work containing (a) Plan and schedule of the work carried out (50 marks) and (b) Comprehensive report (50 marks).

### III SEMESTER

<b>EAS C010</b>	<b>Theoretical Economic Geography</b>	<b>C</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>4</b>	<b>Dr.R.Jaganathan</b>
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1. The principles of location, distance and resource utilisation are dealt with along side economic principles of demand, supply price and transaction
2. Basic concepts: location, distance, space, spatial analysis and spatial organisation; economic activity, interaction and economic landscape
3. Principles of demand, supply, market, economies of scale; Scale agglomeration, cost and price; The principles of heterogeneous landscape and resource variation
4. Economic activities: primary - location and interaction mechanism –Von-Thunen location theory – application in time-space environment; Manufacturing activity- Smith, Weber and Isard; Tertiary activity- Christaller, Losch and Perrou.
5. Pole of transport in spectral development; regional planning- concepts of growth centres, area and sectoral plans.
6. Data, mapping and GIS implementation in economic geography; Recent trends and scope of economic geography

#### Text Books

1. Lloyd, P.E., and P.Dicken (1992). “Location in Space: A Theoretical Approach to Economic Geography”, Harper International Edition.
2. Boyce, R.R. (1974). “The Basis of Economic Geography”, Holf Rinehart and Winston Inc. New York.

#### References

3. Smith, D.E. (1971) Industrial Location: An Economic Geographical Analysis, John Wiley and Sons., New York.
4. Abler, Adam and P.Gould (1972). Spatial Organisation : A Geographer’s View of the World. Englewood Cliff. New Jersey.

<b>EAS C011</b>	<b>Urban Environment and Sustainability</b>	<b>C</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>Dr.M.Sakthivel</b>
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1. Urban system and Indian Urbanisation - objectives of urban development, national and international policies in urban planning-historical trends, patterns of growth of urban population and urban centres, Concept of Sustainability –Sustainability measurement – Indicators of Sustainability - Sustainability Application to cities and urban areas.
2. Environmental justice, social equity and social dimensions of sustainability: Urban sprawl and smart growth - Urban sprawl and smart growth – Definitions - Trends and Projections - Factors affecting and driving urban sprawl - Case studies of cities - - Discussion about the social dimension of sustainability in cities. Environmental health risks and vulnerable populations, environmental justice, income, Inequality, crime rates and trends
3. Green buildings and sustainable housing: Green building and housing-Green Building Rating System - Potential of green building in developing countries. Sustainable transportation: sustainable transportation systems and vehicles - Trends in transportation use and modes of transportation- developing countries learn from developed country experiences - The role of Intelligent Transportation Systems - innovative case studies in developing countries -The bus rapid transits system of India cities and public health-Past, current and projected trends in energy production and consumption.
4. Sustainable use of materials and waste management: Trends of material use and waste production - Factors affecting waste production - re-use and recycling - Introduction to eco-efficiency Sustainable water use: Differences in access to water in urban areas in developed and developing countries - Access to clean water and sanitation, water pollution and public health in urban areas
5. Urban areas, parks, public spaces and biological diversity - Rates of urbanization India and the world - sub - urban areas growth and replace natural areas - urban areas: biodiversity hotspots. Urban areas and global climate change: Global climate change and its impact on cities and urban areas - Sea level rise, extreme weather events and changes in temperature

### **References**

1. Bharadwaj, R.H. (1974) . Urban Development in India. N.N. Publishing House, New Delhi.
2. Singh, K. and F.Steinberg (eds.) (1996). Urban India in Crisis, New Age International Limited Publishers, New Delhi.
3. Harold Carter (1995); The study of Urban Geography; Arnold, London.
4. Rakesh Mohan (1994); Understanding the Developing Metropolis; Oxford University Press, New York.
5. The Sustainable Urban Development Reader, “The Next American Metropolis,” pages 73-80. Taking Sustainable Cities Seriously, Chapters 4 and 7, pages 101-123 and 177-219. Web, “Who Sprawls Most? How Growth Patterns Differ Across the U.S.
6. BRE: Climate and site development. Part 2: Influence of microclimate. Building Research Establishment 1990. ISBN: 0-85125-429-2
7. BRE: Climate and site development. Part 3: Improving microclimate through design. Building Research Establishment 1990.
8. Gehl, J(2001) Life Between Buildings Using Public Space. The Danish Architectural Press
9. Givoni, B(2008): Climate Considerations in Building and Urban Design. Van Nostrand Reinhold

<b>EAS C104</b>	<b>Spatial Modelling and Programming</b>	<b>C</b>	<b>2</b>	<b>1</b>	<b>1</b>	<b>4</b>	<b>Dr.M.Sakthivel</b>
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1. Digital Map Analysis: Concepts and Principles, spatial data handling and accuracy-, digital cartography and Boundary issues
2. Dynamic/Interactive Cartography, VRML, hyper maps, Open GIS: Implementation – generic and knowledge based mapping, Inter-operable and Entrepreneur GIS
3. Facility Management principles: Cost distances capacity and accessibility concepts and standards Single facility versus multiple facility location -Multi-criteria evaluation and decisions
4. Map algebra and spatial modelling - data driven and knowledge driven models, fuzzy logic for spatial analysis
5. Spatial information for modeling and decision making C++ Programming: Statements, data types, functions, and pointers – data arrays, structures, and classes – inheritance and polymorphism – extension to JAVA, html and VRML concepts and applications- Case studies and applications

### References

1. Ghosh, A. and G. Rushton (1987). Spatial analysis and Location-Allocation Models, van Nostrand Reinhold Company, New York..
2. Tomlin, C.D. (1990). Geographic Information Systems and Cartographic Modelling. Prentice Hall, Englewood Cliff, New Jersey
3. Worrall, L. (1991). GIS – Spatial Analysis and Spatial Policy using Geographic Information System, Belhaven Press, London.
4. Scholten, H.J. and J.C.H. Stillwell (1990) Geographical Information Systems for Urban and Regional Planning, Khewar Academic Publishers, The Netherlands
5. Densham, P.J. and G. Rushton, 1988. "Decision support systems for locational planning," in R. Golledge and H. Timmermans, (ed), Behavioural Modelling in Geography and Planning. London.
6. Armstrong, M.P. and P.J. Densham, 1990. "Database organization alternatives for spatial decision support systems," International Journal of Geographical Information Systems, Vol 3(1): Describes the advantages of the extended network model for network-based problems.

<b>EAS C 105</b>	<b>Analysis of Risk, Vulnerability and Disaster Management</b>	<b>C</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>Dr.R.Jaganathan</b>
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1. Introduction to natural hazards, risks and vulnerabilities - ethical and legal considerations for governments, businesses, non profit organizations and the community:
2. Identifying risks, hazards and vulnerabilities risk/hazard/vulnerability estimation, and assignment of priorities – Survey and assessment tools and methodologies
3. GIS, Remote sensing, GPS and other tools for hazard, risk and vulnerability assessment- Field vulnerability assessments- UN procedures

4. Emergency Management: Special tasks of risk/vulnerability assessments: medical, veterinary, business/industrial, education, local government
5. Disaster Management: Identification and examination of options to deal with risk and vulnerabilities and disaster management- Case studies

### References

1. FEMA (2002) Are You Ready? Your Guide to Disaster Preparedness, Federal Emergency Management agency, Washington, DC (available on-line)
2. NFPA 1600 Standard on Disaster Emergency Management and Business Continuity Programms 2000 Edition, Technical Committee on Disaster Management, National Fire Protection Association, Quincy, MA: NFPA.
3. Sisi zlatanova & Andrea Fabbri jonathanli, Geometrics solutions for Disaster management, Springer Verlag, 2007.
4. C.Emdad Haque, Mitigation of natural Hazards & disasters, Kluwer Academic publishers, 2005.
5. Linda C. Bottersll & ponald A.wilhite, From Disaster response to Risk management. Kluwer Academic publishers group, 2005.

<b>EAS C012</b>	<b>Natural Resource Management and C</b>	<b>3</b>	<b>1</b>	<b>0</b>	<b>4</b>	<b>Dr.V.Madha Suresh</b>
	<b>sustainable development</b>					

1. Introduction to Resources: Concepts, classification and appraisal- Natural resources – natural resource economics - management of natural resources-Sustainability and resources
2. Resource Assessment-I : Land evaluation methods- land classification methods-soil and water conservation- land use and Land cover mapping- land use planning and sustainable development
3. Resource Assessment-II: sustainable water resource assessment- watershed analysis and management-coastal and ocean resources and management- fisheries management
4. Risk assessment: Wildlife, forest, recreational, agricultural and rangeland assessment - Ecological Risk Assessments - Natural Resource Damage Assessments- damage of natural resources
5. Natural resource surveys and monitoring– strategies for sustainable natural resource management-millennium eco-system assessment project-resources utilization and conservation in India.

### References

1. Holechek, J. L., R. A. Cole, J. T. Fisher, and R. Valdez (2003) Natural Resources: Ecology, Economics and Policy (2<sup>nd</sup> Edition). Prentice Hall Education.
2. Knight, Richard L., and Sarah F. Bates (1995). A New Century for Natural Resource Management. Island Press Publishing.
3. Lilesand and Keifer (2000) : Introduction to Remote sensing and Image Interpretation; John Willy & sons Ltd., New York
4. Colin W.Mitchell (1991) Land Evaluation, Longman scientific& Technical, copublished with John Wiley & sons Inc, New York.

- Burrough, P.A. (1986). Principles of Geographical Information Systems for Land Resource Assessment, Clarendon Press, Oxford, New York.

<b>EAS C013</b>	<b>Practical – III : Remote Sensing : Interpretation and Data Analysis</b>	<b>C</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>4</b>	<b>Dr.G.Bhaskaran</b>
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- Spectral reflectance Profiles, features and wavelength regions; Interpretation of Photomorphoc / image products: use of black/white, color, FCC, thermal, radar images.
- Geometrical characteristics: scale and projection; Use of Instruments and equipment: stereoscopes, planimeter, stereometer and interpretation equipment.
- Digital Image Manipulation: Raster data: display' enhancement and filters; Raster map: overlay analysis and multi-image manipulation; Bit map studies and training sites; Supervised and unsupervised classification
- Statistical Mapping: Graphs z scores, index construction, correlation, regression and residuals.
- Geospatial analysis- Spatio-temporal analysis - Map modeling and Applications

### References

- Dury, G.H. (1952). Map Interpretation. Sir Issac Pitman & Sons., Ltd., UK
- Jensen, J.R. (1996). "Introductory Digital Image Processing, Prentice Hall. New Jersey.
- MapInfo Professional Users Guide (1995). MapInfo Corporation, New York.

### IV SEMESTER

<b>EAS C014</b>	<b>Field work and spatial data analysis (Field work)</b>
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The students will submit report based on fieldwork in the Fourth semester. This course work contains - Plan and schedule of the work carried out and comprehensive report on the fieldwork. The students will go for a field work in the second semester, which is compulsory and on the basis of that, each student has to submit a field work report as part of the fourth semester course work containing (a) Plan and schedule of the work carried out (50 marks) and (b) Comprehensive report (50 marks).

<b>EAS C015</b>	<b>Project</b>	<b>C</b>	<b>0</b>	<b>1</b>	<b>5</b>	<b>6</b>	<b>All Faculties</b>
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The project can be taken highlighting any issue relating to geographic knowledge and analysis. The project is for addressing problems relating to spatial data gathering, mining, warehousing and or raster / vector analysis and modelling. Programming or script writing can also be theme for the project, If it involves spatial data handling or analysis or modelling or in combinations of all. All data analysis and survey related projects shall necessarily present in a series of thematic maps. The data analysis mapping and documentation shall be conducted in the Remote Sensing and Computer Applications Laboratory of the Department

<b>UOM I 001</b>	<b>Internship</b>	<b>I</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>	<b>All Faculties</b>
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Each candidate has to spend at least 8 weeks in an institution / industry /educational Institution/ business house where mapping or GIS or remote sensing or a combination of these above is the main activity which



may also include marketing of such products. At the end of the internship the candidate has to produce an experience certificate and a report.

<b>EAS E 001</b>	<b>Geographical Thought</b>	<b>E</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>Dr.V.Madha Suresh</b>
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1. Intellectual Challenge and Philosophy of Geography: The urgency of teaching history and philosophy of geography; The Four Traditions in Geography; Dualism: geography as a science: ideographic and homothetic; against geography.
2. The Importance of Geographic Viewpoint: Why place and geography matter; paradigms and revolutions in geography; Approaches in geography: Determinism, Voluntarism, Possibilism, Probablism, Existentialism, Phenomenology, and Humanism.
3. Geography and Geographers: Values in Geography and Anne Buttimer; Diffusion and time geography and Torsten Hagerstrand; Models and modelling in geography and Peter Haggett; Indian geographers: S.P. Chatterjee, C.D. Deshpande; R.L. Singh; R.P. Misra; R. Vaidyanathan; A. Ramesh and little known geographers.
4. Geography and Theorising: Deduction, Induction and Paradeduction; Description, Explanation, Prediction and Prescription; Types of Explanation: Genetic, deductive, inductive and functional; Quantitative and Qualitative Revolutions in geography: Positivistic and humanistic methods.
5. Geographical Research and Future of Geography: Applied geography and applied research; interdependence and uniformity among social and other sciences; The future of geography and geographers.

### References

1. Hartshorne, Richard 1939: Nature of Geography, USA: Association of American Geographers.
2. Hartshorne, Richard 1959: Perspectives on the Nature of Geography, USA: Association of American Geographers.
3. Bunge, William 1966: Theoretical Geography, Lund Studies in Geography, Lund, Sweden: The Royal university of Lund, Gleerup.
4. Harvey, David 1969: Explanation in Geography, London: Arnold.
5. McBoyle, G.R. (ed) 1989: Geography Unfolding, Department of Geography: University of Waterloo, Waterloo, Canada.

<b>EAS E 002</b>	<b>Information System Management</b>	<b>E</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>Dr.M.Sakthivel</b>
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1. Information Technology: Meaning, scope and developments in information technology; Information technology firms: What they are and how they do things; IT industries and development
2. Information Systems: Concepts and overview of information systems; A systematic framework for Information Systems; Components of information systems; Information systems design, analysis and management
3. Database Management Systems for Information Systems: Data resources, structure and functional aspects; graphic database, data storage and hypermedia; Data models
4. Internet and Information Management: Internet, Intranet, and Extranet; Electronic communication tools: electronic mail, e-conferencing, web-publishing and file transfers;
5. Information Systems – Management information systems: needs, design and action; library resource information systems; human information systems- Information decision support system: Knowledge-based search process; Artificial intelligences and Expert Systems.

#### **References**

1. O'Brien, J.A. 1999: Management Information Systems, New York: Irwin-McGraw Hill.
2. Turban, E., R.K. Rainer Jr., and R.E. Potter 2000: Introduction to Information Technology, New Delhi: John Wiley.
3. Laurini, R. 2001: Information Systems for Urban Planning: A Hypermedia Co-operative Approach, London and New York: Taylor and Francis.

<b>EAS E 003</b>	<b>Watershed Management</b>	<b>E</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>Dr.G.Bhaskaran</b>
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1. Watershed: Philosophy and Concept of Watershed - Delineation and codification of watershed – Watersheds and administrative decisions.
2. Structure and functions: Geomorphic, meteorological and hydrological Parameters: Rainfall intensity, runoff characteristics, sedimentation rate and discharge rate, soil, landuse characteristics on runoff and infiltration.
3. Natural resources and human responses in watershed: soil, forest, water as natural resources and population interaction with them
4. Integration of watershed functions, processes and human interactions - Resource management: (Water conservation and water Harvesting – Soil conservation - Joint forestry management – landuse management).
5. Maintenance and We: Participatory Rural Appraisal in Watershed programme - Empowerment of Women and other gender issues - Equity issues in Watershed management – Financial management and Accounting procedures – Monitoring and Evaluation in Watershed

#### **References**

1. Elango, L. and R. Jayakumar (2001), “Modeling in Hydrology”, UNESCO, New Delhi.

2. Murty, JVS (1994), "Watershed Management in India", Wiley Eastern Ltd., New Delhi.
3. Rajesh Rajora (2002), "Integrated Watershed Management", Rawat Publications, New Delhi

<b>EAS E 004</b>	<b>Geographies of Crime and Justice</b>	<b>E</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>Dr.R.Jaganathan</b>
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1. Crime and Geography Approaches to Psycho-geography of Crime: Ecological Approach Approaches to Psycho-geography of Crime:
2. Environmental Criminology Approaches to Psycho-geography of Crime: Environmental Psychology
3. Mapping Crime Geographic Profiling Offenders Spatial Decision Making Geography and Crime Investigation
4. Analysis of crime data – Geographical approach –Mapping of Crimes
5. Geospatial technology and Crime mapping-Applications-Case studies

### References

1. Ainsworth, P. B (2001), Offender Profiling and Crime Analysis, Willan Publishing
2. Y Rossomo, K., Geographic Profiling, CRC Press, 2000, Y Weisburd, D. and McEwan, T. (1998)
3. Introduction: crime mapping and crime prevention, n/a, Y Shaw, C. R., & McKay, H. D. (1972), Juvenile Delinquency and Urban Areas., University of Chicago Press.
4. Y Brantingham, P., & Brantingham, P. (1991), Environmental Criminology,
5. Y Canter, D. V., & Larkin, P. (1993), The Environmental Range of Serial Rapists. Journal of Environmental Psychology

## II SEMESTER

<b>EAS E 005</b>	<b>Bio-Geography</b>	<b>E</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>Dr.M.Sakthivel</b>
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1. Mapping Distribution: Sources of Information – Methods of Survey – Methods of Mapping Distribution – Mapping Vegetation.
2. Biotic resources use and misuse – ecosystem stability and disturbance; human impact – ecosystem and environmental pollution, managed and urban eco-system.
3. Distribution as a geographical quantity: Patterns of distribution in small territories – Patterns of distribution at continental scale – clustered and dispersed distributions – Comparison of regional and continental distribution – The Historical perspective
4. Vegetation classification and correlation: structural classification functional classification – humid temperate climates and forest types – Raunkiaer Analysis – Altitudinal compassion of life- Desert climates and vegetation types.
5. Migration and dispersal: seasonal and periodic migration – permanent migration – Goods theory of plant migration – effect of topography – inter-continental migration.

### References

1. Joytivy (1993) Biogeography : A study of Plants in the Ecosphere, Longman Scientific & Technical Co-published in the USA with John Wiley & sons, Inc. New York.

2. Brian Seddon (1971) Introduction to Biogeography, Gerald Duckworth and Co. Ltd., London.
3. Jean Tricart and Conrad Kiewietde Jonge (1992) Eco Geography and rural Development. Longman Scientific & Technical Co-published in the USA with John Wiley & sons, Inc. New York.

<b>EAS E 006</b>	<b>Environmental Impact Assessment</b>	<b>E</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>Dr.V.Madha Suresh</b>
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1. The Concept of Environment and Ecosystem: The Problem - Environmental Impacts of Human Actions - Environmental Changes Natural and Man Made - Environmental Impacts and the stage of Technological Development
2. Administrative Procedure: Designing Administrative Procedure – Sequence of Environmental Planning – Decision-making
3. EIA: Definition – Need - Initial Environmental Initiation – Steps in EIA – Systematic Approach for using EIA – EIA Methodologies
4. Assessment of Impact: on Development Activities and Land use – on Surface Water Environment – Prediction and Assessment of Impacts – Environmental Audit
5. Environmental Planning and Management: Concept of Environmental Management, Aspects and Approaches to Environmental Management

#### References

1. Eugene P. Odum (1997); Ecology – A Bridge Between Science and Society; Sinauer Associates, Inc., Massachusetts, U.S.A.
2. Andrew R.W. Jackson and Julie M. Jackson (1996); Environmental science – (The natural environment and human impact); Longman, London.
3. Gilbert M. Masters (1990); Introduction to Environmental Engineering and science; Prentice, Hall of India Pvt. Ltd., New Delhi.
4. John S. Dryzek & David Schlosberg (1999); Debating the Earth – The Environmental Politics Reader; Oxford University Press, New York.
5. Anjaneyulu, Y. 2002: Environmental Impact Assessment Methodologies, BSP Publications, Hyderabad.
6. Munn, R.E. 1979: Environmental Impact Assessment Principles and Procedures, SCOPE 5, John Wiley & Sons, New York.

<b>EAS E 007</b>	<b>Political Geography</b>	<b>E</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>Dr.R.Jaganathan</b>
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1. Political Geography : Definition and scope of Political geography – Geo-politics – Global strategic views ( Heartland and Rimland theories)
2. Concept of Nation, State and Nation-State – Boundaries and frontiers – Politics of world resources – Geography of Federalism
3. political actions on social and economic conditions, and with the significance of geographical factors behind political situations, problems, and conflicts

4. Electoral Geography and Mapping techniques
5. Geopolitics and sustainable solutions- case studies

### References

1. Glassner and Fahrer, Political Geography, 2004 (3rd ed.)
2. Agnew, John. 1987. Place and Politics. The Geographic Mediation of State and Society
3. Herbst. Jeffrey. 2000. States and Power in Africa: Comparative Lessons in Authority and Control, Princeton University Press
4. Fenno, Richard. 1978. Homestyle: House Members in their Districts. Little Brown and Company
5. Diehl, Paul. 1999. A Road Map to War. (Vanderbilt University Press)
6. Monmonier, Mark. 1991. How to Lie With Maps. (University of Chicago Press)
7. Glassner, Martin and Chuck Fahrer. 2004. Political Geography Rd Edition (Wiley)

<b>EAS E 008</b>	<b>Research Design and Methods</b>	<b>E</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>Dr.G.Bhaskaran</b>
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1. The Scientific Method : Alternatives of scientific research- inductive and deductive reasoning- paradigms, models and theories- strategies of descriptive, experimental and historical and problem solving research
2. Research Design : Problem identification and analysis- methods of acquiring knowledge- methods, techniques and tools in research- statement of objectives and hypothesis- data and measurements- sampling and data collection
3. Methods of Study and Analysis: Pilot surveys – case study methods- field work for socio- economic survey and tools- objectives of analysis- analysis design- hypothesis testing and reliability.
4. Report Writing and Publishing : Reports, seminar papers (short and long) and dissertations – style manuals for formatting and citations – presentation and use of computer and multimedia resources- basics of manuscript editing for the press

### References

1. H.N.Misra, and Vijai P.Singh (1998); Research Methodology Social, Spatial and Policy Dimensions; Rawat Publications, New Delhi.
2. Douglas Amedeo, Reginald G.Golledge (1975); An Introduction to Scientific Reasoning in Geography; John Wiley & sons Inc. New York.
3. Humbert M. Blacock, J.R,Ann B. Blalock (1971); Methodology in Social Research; Mc GRAW HILL – London.
4. Anthony C. Winkler & Jo Ray McCuen (1994); Harcourt Brace College Publishers; London.

<b>EAS E 009</b>	<b>GIS Project Planning</b>	<b>E</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>Dr.G.Bhaskaran</b>
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1. Meaning of accounting for spatial variations – establishing laws and theories in geography - nature and function of Theories, Models -meaning of model- multiple variable Linear Models – procedure for developing Models, Measurement and Statistics
2. Spatial manifestations of choice process – locations and migrations; gaming simulation as a mechanism for illustrating the process of locational decision making – spatial choice process and migration decisions
3. Research Design and Qualitative and Quantitative Techniques in GIS research projects and implementation
4. Current and potential approaches to GIS project management-GIS and related spatial technologies in selected applications.-GIS data handling and spatial analysis
5. Diverse of application areas : business, health and social services, the environment, municipalities-GIS data handling and spatial-analysis

#### References

1. Douglas Amedeo and Reginald G.Golledge (1975), An introduction to scientific reasoning in geography, John Wiley & Sons Inc. Newyork.
2. Birkin, M., Clarke, G., Clarke, M. and Wilson, A. (1996) Intelligent GIS: Location Decisions and Strategic Planning. GeoInformation International.
3. Chainey, S., and J. Ratcliffe, 2005, GIS and crime mapping, Chichester, West Sussex, England ; Hoboken, NJ : Wiley & Sons
4. Chang, Kang-Tsung, 2004, Introduction to geographic information systems, McGraw-Hill, Boston, 400p.
5. Church,R., and A. Murray, 2009, Business site selection, location analysis, and GIS, Hoboken, N.J. : John Wiley & Sons
6. Clarke, G., and Stillwell, J., Ed), 2004, Applied GIS and spatial analysis, John Wiley, Hoboken
7. Cope M. and S. Elwood, 2009, Qualitative GIS: a mixed methods approach, Los Angeles ; London

<b>EAS E 010</b>	<b>Geo-informatics for Sustainable Land Resources Management</b>	<b>E</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>Dr.R.Jaganathan</b>
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1. Land Resources: Concept of land, land units and resources- land evaluation- land information requirements-land Management environmental and institutional perspectives-sustainability
2. Principles of Physical Regionalisation: Regional concepts – boundary delimitation- classification types- geomorphological and ecological concepts
3. Systems for land resource assessment: Parametric and physiographic systems-landscape systems – land unit concepts
4. Assessment and Management: Land classifications, land use system, IT and Sustainable Management Model (SLM)- rural-urban sector – land use planning

5. Sustainable Land Information Management: LIM, DSS for land use planning and land management- Approaches to problem solving-LIM programmes in national and international level-UN Organizations

### Text Books

1. Dale, P.F. and J.D. Mclaughlin (1990). Land Information Management, ELBS, Oxford Press, Oxford
2. Colin W.Mitchell (1991) Land Evaluation, Longman scientific & Technical, copublished with John Wiley & sons Inc, New York.

### References

3. Burrough, P.A. (1986). Principles of Geographical Information Systems for Land Resource Assessment, Clarendon Press, Oxford, New York.
4. Tomlin, C.D. (1990). Geographic Information Systems and Cartographic Modelling. Prentice Hall, Englewood Cliff, New Jersey

### Web Resources

1. [www.worldbank.org/land](http://www.worldbank.org/land)

EAS E 011	India's Development and Regional Planning	E	2	1	0	3	Dr.M.Sakthivel
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1. Resources are not, but they become', the nature, resources and culture relations; Economic Development: meaning and principles; Indian development: one or several paths?; social organisation and technology mix in India: phases of economic development and positioning of India
2. The physical and Human environment of India: land, relief, structure, physiographic divisions; monsoons and climate, water resources, soils and vegetation -human resources, neighborhoods and communities; human competition and conflicts; human capacity building for development; urbanization
3. Land uses and land utilisation in rural and urban areas; Agricultural development in India; stages of development; problems and prospects: agriculture is a gamble on monsoon; land holds the future for India
4. Industrial development in India: factors and stages of development in select industries: cottage industries, textile and steel industries; Infrastructures: power, energy, irrigation, trade and transport development
5. Economic development and Planning in India: community economic development and regional development; integrated rural and urban development; Regional disparities: causes and consequences; towards bridging the gap; Development planning for agriculture, industry and infrastructures: what and how; where to put what and how; Sustainable development Planning for a sustainable India

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<b>EAS E 012</b>	<b>Physical Survey and Field Techniques</b>	<b>E</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>Dr.V.Madha Suresh</b>
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1. Objectivity in field surveys; Field work and surveys, measurement and recording
2. Field work design and sampling issues; Equipment in geomorphic and soil surveys; GPS for site fixing, routing and contouring
3. Hydrology and water quality data; Ground truth collection for remote sensing support
4. Village survey principles and methods; Urban land use surveys; Land system and land use surveys
5. Computer support for data management, interpretation and surface modelling; Data integration and GIS

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<b>EAS E 013</b>	<b>Web Cartography and Spatial Information delivery</b>	<b>E</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>Dr.R.Jaganathan</b>
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1. Need for Web Cartography and GIS: New mapping environment- web maps-New cartographic realm-GIS and Web GIS-Internet and World Wide Web
2. Web map Publishing and Design: Basic publishing and web map functionality – web map design-colour-symbol design – placement of names-factors
3. Advanced mapping environment: Web Atlases– maps and multimedia systems-animated maps and multi- dimensional display-Web maps in geo-spatial infrastructure- Open GIS Web Mapping Activities
4. Visual thinking and cyberspace: Visualization and exploratory data analysis- strategies-visualizing spatial data in the Web-spatial Visualization through Cartographic Animation



5. Web map and Decision Making: Web cartography and weather, road traffic and tourism - maps, GIS and the need for rule based cartography-on-line mapping resources and mapping - spatial information policy

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<b>EAS E 014</b>	<b>Microwave Remote Sensing</b>	<b>E</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>Dr.G.Bhaskaran</b>
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1. Microwave Fundamentals: EMR and Microwave Bands – Microwave interaction with atmospheric and earth’s surface features – System parameters of principles – Remote Sensing Radars.
2. Passive microwave remote sensing: Basics of emissivity – Theory of radiometry – Sensors - applications in atmospheric, land and ocean studies.
3. RADAR Imaging: Radar equation on measurements and discrimination - geometry of Radar image – Imaging and products - Image processing, SAR interferometry.
4. Radar Applications in Geomorphology, Hydrology and Geology – Oceanography – Agriculture – Rural and Urban landuse
5. Radar Applications in Soil moisture analysis – Rural landuse and land development – Urban structure – Quality assessment – Population estimation – Urban Heat Island.

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<b>EAS E 015</b>	<b>Geography of Health Care</b>					<b>Dr.V.Madha Suresh</b>
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1. Approaches to Health Care Analysis: Medical Geography: Scope, Meaning and Developments; Contemporary Geography of Health Care: Approaches: Location, Social Indicator and Behavioural Approaches; Spatial Levels and Approaches.
2. Diseases and Health: Infectious, Degenerative, Chronic, Inherited, Genetic and Disorders; Disease Ecology and Epidemiology; Organic, Inorganic, Bacterial and Fungal Factors of Health.
3. Deficiencies and Health: Nutrition and Food Habits; Nutritional Deficiencies and Diseases; Disease Patterns in India and Tamil Nadu.
4. Society, Culture and Health: Sanitation, Modernisation, ways of Living and Emerging Health Issues in Indian Society and in Tamil Nadu; Food Habits, Family and Community Life, Tradition, Religion and Health.
5. Health Care and Delivery Systems: Health Care Systems and Delivery in India and Tamil Nadu; Medical Services and Facilities, Health Information and Planning; Issues and Prospects – Ecosystem Approach, The issue, The Approaches, Lessons and Successes – Future Directions

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<b>EAS E 016</b>	<b>Sustainable Urban Land Management</b>	<b>E</b>	<b>2</b>	<b>1</b>	<b>0</b>	<b>3</b>	<b>Dr.M.Sakthivel</b>
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2. Landscape ecology – city landscape elements – Hierarchical format of city landscape – system approach to city landscape studies and Urban management.
3. Human components of the urban areas – people and housing patterns – basic and non-basic activities on city landscape – transportation network, city movement and commuting – social facilities and social welfare
4. Urban Public administration –urban revenue system – municipalities facilities and services – crime and police administration – entertainment and shopping – public health and health care system
5. Urban survey and data management – survey equipment, GPS and Total station for field survey – Household surveys and sampling – perceptual services – GIS, Remote Sensing and GPS for Sustainable Urban Information Management.

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4. Indian Cities, towards next millennium Ed. By R.Rammohan Rao and S.Simhadri, Rawat Publication, New Delhi