Course title: Geoinformatics for Urban Development				
Course code: MEU 172		**No. of credits:** 3	**L-T-P:** 23-2-34	**Learning hours:** 42
Pre-requisite course code and title (if any): none				
Department: Energy and Environment				
Course coordinator:		**Course instructor:** Dr Nithiyanandam Yogeshwaran		
Contact details: nithiyanandam.y@terisas.ac.in				
Course type: Compulsory		**Course offered in:** Semester 2		

Course description

Urban planning and developing are relying increasingly on spatial data acquired from remotely sensed image, analyzed by geographic information system (GIS), distributed through digital infrastructure, and visualized on computers or paper maps. The technologies supporting these processes form the core of geoinformatics and are increasingly used for planning at different scales.

Course objectives

This course will provide a strong base for understanding the concepts of this technology and also applications in sub-fields of urban planning and development. The course delivery will be using multi-disciplinary approach to develop spatial thinking and confidence among the participants to use this in problem solving and analysing geospatial database.

Course contents

Module	Topic	L	T	P
1	**Module 1: Introduction to Geoinformatics** a) Remote sensing, satellite data processing and information extractions (Practical exercises on Erdas Imagine) b) Different systems in remote sensing (non-optical, LiDAR) c) GIS (spatial and non-spatial database, life cycle of database), spatial data analysis (Practical exercises on ArcGIS) d) Global positioning system, specific uses to urban studies	10		18
2	**Module 2: Urban indicators and monitoring** a) Monitoring urban environment, Land Use Inventory, urban sprawl, urban heat island (Practical excises on Erdas Imagine/ArcGIS) b) Case studies (national initiatives/programs)	6	1	8
3	**Module 3: Spatial analysis** a) Spatial interpolation, map algebra, Site suitability, Network analysis, 3D visualization and analyses (Practical excises on ArcGIS) b) Case studies	7	1	8
	Total	**23**	**2**	**34**

Evaluation criteria

- Test 1:   20% [module 1 for test 1 and module 2 for test 2]
- Assignment: 20% [continuous]
- Practical: 30% [at the end covering practical classes of all modules]
- Test 3:   30% [all modules]

Learning outcomes

This course will enable students to apply Geoinformatics tool in lectures, case studies, discussion, hands on exercises/ urban applications planning.

Pedagogical approach

Materials

Compulsory Readings
1. Jensen J., Remote Sensing of the Environment: An Earth Resource Perspective, Pearsons, 2009.
2. Lillesand T., Kiefer R. W. and Chipman J., Remote Sensing and Image Interpretation, Wiley & Sons, 2009.
3. Lo, C.P. and Yeung, A.K.W., Concepts and Techniques of Geographic Information Systems, PHI Leaning Private Limited 2011.
4. Longley P. A., Barnsley M. J., Donnay Jean-Paul, Remote Sensing and Urban Analysis, Taylor & Francis, 2001.
5. Yang, X., Urban Remote Sensing Monitoring, Synthesis and Modeling in the urban Environment, Wiley-Blackwell, 2011.

Recommended Journals for reference
1. Remote Sensing of Environment
2. International Journal of Geographic Information Science
3. International Journal of Digital Earth

Additional information (if any): NA

Advanced Reading Material

Student responsibilities
The students are expected to submit assignments in time and come prepared with readings when provided

Course Reviewers

1. Dr Subashisa Dutta, Professor, Department of Civil Engineering, Indian Institute of Technology Guwahati, Guwahati
2. Dr Ashish Verma, Assistant Professor (Dept. of Civil Engg.) and Associate Faculty (CiSTUP), Indian Institute of Science (IISc), Bangalore
3. Dr R B Singh, Professor & Head, Department of Geography, Delhi School of Economics, University of Delhi