

JADAVPUR UNIVERSITY
COMPUTER AIDED DESIGN CENTRE
Faculty Council of Engineering and Technology
Kolkata - 700 032

Certificate course on

Remote Sensing Application for Change Detection and Simulation Modelling

Change detection is the process of identifying differences in the state or condition of earth surface features by comparing images captured at different times (multitemporal images). This is perhaps the most frequently performed geospatial analysis by the researchers and administrators. Knowing the status of the earth surface for the past and present is very much important for many different applications; e.g., land-use/land-cover (LULC) analysis, forest or vegetation analysis, urban analysis, disaster (flood, landslide, earthquake) management, agricultural analysis, volcanic activity analysis, coastal analysis, and several others. In general, change detection process involves the application of multitemporal datasets to quantitatively or visually analyse the temporal effects of the phenomenon. Knowing the past and present is not adequate in many geospatial analyses; rather we want to know the future. Geosimulation techniques use the past and present status of the earth surface to simulate (predict) the future status. For example, based on the built-up map of past and present, geosimulation models can generate the future built-up map. This simulated map helps us to prepare for future planning and policy making.

This course will cover almost all change detection techniques theoretically and practically in addition to their merits and demerits. Models will be created in ERDAS Imagine Model Maker and simulation modelling will be performed in open source software. Researchers, teachers, working persons, and government administrators would appreciate this course.

The CAD Centre is the pioneer institute in the field of Geoinformatics. It maintains a state-of-the-art infrastructure for its courses. The Centre has engaged highly experienced faculty members from academic sector as well as industry. Some of our faculty members are well known figures in the field of Geoinformatics and have published huge number of books, monographs, and research articles internationally.

Course Duration: 24 hrs

Class Duration: Theory Sessions: 2 hrs each; Practical Sessions: 2 hrs each

Eligibility: BE/BTech in Engineering or equivalent; BSc in any discipline; BA/B.Sc. in Geography/Environmental Studies; 3-years Diploma in Engineering. All should have practical knowledge of remote sensing especially supervised and unsupervised classification in ERDAS Imagine.

Participants must have mobile devices running Android 4.0.3 or above; laptop/desktop computer with Windows; and stable internet connectivity. Google Meet should be preinstalled in the mobile device; and ERDAS Imagine should be installed in the laptop/desktop.

Syllabus:

CLASS NO	TOPIC
CLASS - 01	Introduction to Change Detection and Image Overlay
CLASS - 02	DN Value, Radiance, and Reflectance
CLASS - 03	DN Value, Radiance, and Reflectance
CLASS - 04	Image Differencing
CLASS - 05	Image Indexing, Spectral-Temporal Classification
CLASS - 06	Image Regression, PCT, Change Vector Analysis
CLASS - 07	Post-Classification Analysis, subtraction of classified images to generate transition matrix, ANN, decision tree analysis, HIS transformation, econometric panel
CLASS - 08	Vector-based Change Analysis, transition matrix
CLASS - 09	Concept of Geosimulation (CA and Agent)
CLASS - 10	Concept of Geosimulation (ANN)
CLASS - 11	Geosimulation
CLASS - 12	Geosimulation

Certificate: Completion certificate (in printed form) will be provided at the end of the course.