

## **Sustainable urban planning using Remote Sensing and GIS**



### **Overview**

Modern urban planning in India is confronted with major challenges such as accelerated growth and land-use change, unplanned expansion and water supply management issues in a warming climate. The rapid pace of these changes in the 21<sup>st</sup> century has made even basic information gathering on the state of Indian cities a very difficult task. In this context, effective urban management decisions properly supported by transparent evidence that can be transmitted to public stake-holders are critical. This course aims to give participants state-of-the-art remote sensing and GIS skills which will allow them to rise to the challenge of managing the rapidly changing urban environment of Indian cities. After refreshing basic knowledge of GIS and remote sensing, the course will focus on the use of open-source GIS and remote sensing in key areas of urban planning such as land-use change within cities, assessment of unplanned urban growth and the assessment of island heat effects. The course will also include the controlled use of drones in order to assess small scale structures and urban characteristics that cannot be seen from satellites. Furthermore, the course will pay particular attention to issues of water resource management, water pollution and strategic emplacements for water treatment facilities.

This course will contribute significantly to build trained manpower for the Smart Cities Mission launched by the Government of India on 25 June 2015 with an objective to promote sustainable and inclusive cities that provide core infrastructure and give a decent quality of life to its citizens, a clean and sustainable environment and application of 'Smart' Solutions. Urban planning for a smart city needs a complete understanding of physical and digital space with adequate geospatial datasets and analytical capabilities. On the other hand, the planning is also affected by stakeholders via participatory management of resources and policy interventions.



This course aims to address both the issues by encouraging the use of modern techniques of remote sensing and GIS.

### **Objectives**

The primary objectives of the course are as follows:

- i. Revise and Strengthen foundation concepts in Remote Sensing and GIS.
- ii. Give participants a set of operational skills enabling them to support urban planning and management with remote sensing and GIS-based assessments.
- iii. Instruct participants in state-of-the-art methods for land-use classification and land-use change detection.
- iv. Teach participants to assess and quantify urban expansion, both planned and un-planned, with advanced remote sensing methods and declassified satellite imagery.

## Teaching Faculty

**Dr Patrice Carbonneau (PC)** is a lecturer in the prestigious Geography department of Durham University. Systematically ranked among the world top-10 geography departments, the geography department at Durham University is at the forefront of applications of remote sensing in geography. Dr Carbonneau is a leading expert on remote sensing with notable expertise in drone-based operations, image classification and declassified imagery. He has been teaching GIS and remote sensing for more than a decade.

**Dr. Rajiv Sinha (RS)** is a professor in the Department of Earth Sciences, IIT Kanpur and he specialises in remote sensing applications in landform analysis, Landuse/landcover mapping and water quality assessment. He has been teaching a regular course on remote sensing application at IIT Kanpur for several years and has also used various remote sensing data for his research. His recent research projects have used drone based applications for LULC mapping and water quality assessment of large water bodies. He has also used remote sensing and GIS techniques for flood risk evaluation in the heavily populated Gangetic basin.

## Who can attend?

- Professionals, Researchers and scientists in government departments, academic institutions and research institutions involved in urban planning
- Student at all levels (B. Tech/ MSc/ M. Tech/ PhD) or Faculty from reputed academic institutions and technical institutions.

## Course Venue

IIT Kanpur Outreach Center, C-20/1A/8 Block C, Sector 62 NOIDA, INDIA

## Course Coordinator

### Professor Rajiv Sinha

Department of Earth Sciences, IIT Kanpur, Kanpur 208016

Ph.: +91-512-2597317 (W), +91-512-2598218 (H); Fax: +91-512-2597395, 2590260

Email: [rsinha@iitk.ac.in](mailto:rsinha@iitk.ac.in)