About IIT Kharagpur

Kharagpur - a dusty town tucked away in the eastern corner of India, famous until 1950 as home to the longest railway platform in the world - became the nursery where the seed of the IIT system was planted in 1951. IIT Kharagpur started its journey in the old Hijli Detention Camp in Eastern India, where some of the country's great freedom fighters toiled and sacrificed their lives for India's independence. Spurred by the success of IIT Kharagpur, four younger IITs sprouted around the country in the two following decades, and from these five came thousands of IITians, the brand ambassadors of modern India. It was the success of this one institution at Kharagpur that wrote India's technological odyssey.

The Institute takes pride in its relentless effort to provide the best platform for both education as well as research in the areas of science and technology, infrastructure designs, entrepreneurship, law, management, and medical science and technology. IITKGP is not just the place to study technology, it is the place where students are taught to dream about the future of technology and beam across disciplines, making differences enough to change the world.

Program Features/ Structure

Classroom lectures – **55%**

Problem solving, Case study and Activity – **20%**

Hands-on exercise with GIS software, Spectral fusion algorithm and vulnerability mapping - **25%**

Program Schedule and Venue

5 Days, 9 – 13 September 2019 (9:30 AM – 6 PM)

IIT Kharagpur – School of Water Resources

Program Fee

Nil for TEQIP-III sponsored participants

For industry personnel - INR 20,000/- (Twenty thousand) **+ GST** @18% per participant

For students- INR 10,000/- (Ten thousand) per participant

Who will benefit (Eligibility)

You have a basic degree as ME / MTech / MSc in Water Resources, Remote Sensing, Geography

Last day of Registration

03

September 2019

Accommodation

Accommodation will be provided to the TEQIP-III sponsored participants at the campus Guesthouse. For other participants, the same will be provided on chargeable basis as per rule.

How to Apply

Use the link: **https://erp.iitkgp.ac.in/CEP/courses.htm** to apply ONLINE.

Signup → Login → Profile Fillup → Choose a Program → Apply Now

Payment if applicable is to be done **ONLINE** after getting short listed for the program.

Contact Us

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NPIU

TEQIP-KIT

TECHNICAL EDUCATION QUALITY IMPROVEMENT PROGRAMME FOR TEQIP KNOWLEDGE INCUBATION

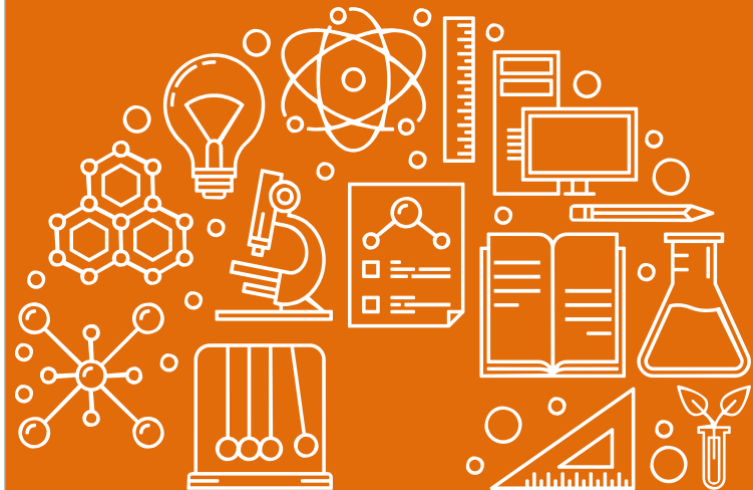
NPIU - A Unit of MHRD, Govt of India for Implementation of World Bank Assisted Projects in Technical Education

Indian Institute of Technology Kharagpur

Advances in Remote Sensing Techniques for Water Quality Estimation

5 Days

9 – 13 September 2019



Introduction / Overview

Water pollution has emerged as a major environmental issue worldwide in recent times. For environmental pollution control and policy planning, there is a need of water quality data at various spatiotemporal scales. As the conventional water quality measuring networks are too expensive to maintain, advanced remote sensing based techniques could be the next generation tools for water quality monitoring and pollution vulnerability analysis.

Program Objectives

This course has been devised to train the academicians and water managers on the basic concept of GIS and Remote Sensing techniques to process the optically sensitive parameters of water pollutants both in the stagnant and moving water bodies, the physics behind the integration of pollutant concentrations with the band-specific reflectance of the satellite images, direct and indirect spectral fusion algorithms for spatiotemporally downscaling the remote sensing data to assess pollution at daily scale with a spatial resolution of 30 m or finer, and hands-on exercises to assess the water quality in real-time through real case study.

What you will learn

Program Content

- Introduction to water quality parameters in rivers and lakes
- Pollutants in water and their optical properties
- Concept of quantitative estimation of pollutants based on their optical properties
- Concept of remote sensing and data processing using GIS
- Satellite data sources for water quality estimation and pre-processing
- Direct approach of spectral algorithm for estimating pollutant concentrations
- Indirect approach of spectral fusion technique for estimating pollutant concentrations
- Pollution vulnerability analysis
- Knowing the basic GIS operations through hands-on exercises (Raster and vector analysis, River shape file orientation, satellite band selection, Raster calculator application)
- Delineation of water bodies using LULC classification: hands-on exercise
- Downloading the satellite imageries and their pre-processing: hands-on exercise
- Remote sensing based water quality estimation through a real case study
- Simplified pollutant transport models
- Integrating physically-based models with remote sensing data for real-time pollution assessment

About the Faculty

Principal Coordinator

Dr. Bhabagrahi Sahoo

Dr. Sahoo is an Associate Professor of Water Engineering and Management in the School of Water Resources, Indian Institute of Technology Kharagpur. His research areas include: • Real-time mapping of riverine pollution, source-identification & vulnerability assessment; • Runoff quantification using deterministic, conceptual & next-generation Remote-Sensing-based approaches; • Real-time streamflow & groundwater level forecasting as a non-structural measure to manage water surplus / deficits; and • Sustainable water management involving eco-hydrology, surface water-groundwater-climate interaction in rural/ peri-urban/ urban areas, water-energy-food-society-climate nexus, and hydroinformatics. He has developed novel spectral fusion models using LANDSAT/MODIS Remote-Sensing (RS) imageries to assess concentrations of non-reactive pollutants at 30-m×1-day spatiotemporal resolutions along the Brahmani River (Odisha). Developed hydrodynamic-based VPMM-AD-RS embedded-model framework and MIKE11-AD model for real-time assessment of these pollutant concentrations and river flows in ungauged river reaches to aid for river cleaning and pollutant source management. He has published more than 80 research papers in different journals, conferences and book chapters.

Co-Coordinator

Dr. Manoj Kumar Tiwari

Dr. Tiwari is an Assistant Professor of Water Engineering and Management in the School of Water Resources, Indian Institute of Technology Kharagpur. His research interests are multidisciplinary with a focus on water quality engineering and management integrating physicochemical and biological aspects of engineering and sciences. His ongoing projects focus on wastewater treatment for reuse application, water treatment and contaminated site management, water supply systems advancements including water loss detection and control, and water quality sensors development. Also, he is engaged in exploring natural fate and attenuation of persistent organic pollutants (POPs) and emerging contaminants, and engineering design of reactors for their degradation. All of these areas are with tremendous scope for development, and are highly relevant for national and international water management issues.