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 – **50%**

Numerical/ Problem solving Activity using MATLAB– **25%**

Hands-on work with HEC-RAS and FLUENT software - **25%**

Program Schedule and Venue

1 week, February 04-08, 2020 (9:30 AM – 6 PM)

IIT Kharagpur – CIC, Takshashila

Program Fee

Nil for TEQIP-III sponsored participants

For others - INR 5,000/- (Five thousand) **+ GST** @18% per participant

Who will benefit (Eligibility)

BTech/ MTech/ MSc/ PhD in Civil Engg., Mechanical Engg, Water Resources and Agricultural Engg. Faculty members and Research Associates from reputed academic institutions and Practitioners from Industry.

Last day of Registration

15

January 2020

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 – KNOWLEDGE INCUBATION FOR TEQIP

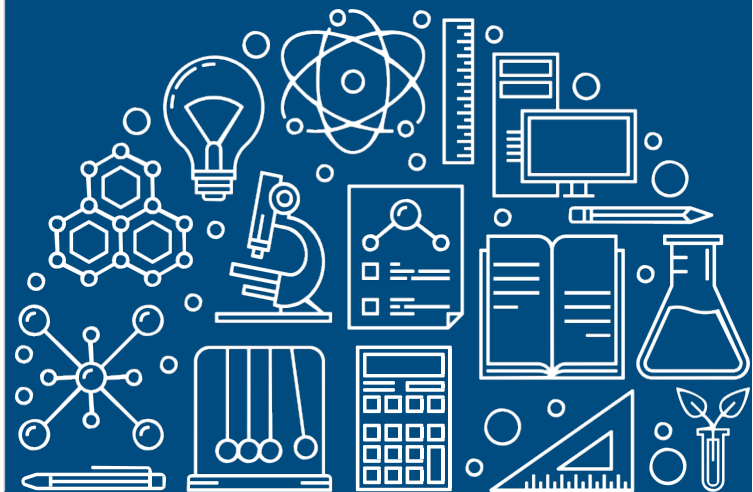
NPIU - A Unit of MHRD, Govt of India for Implementation of World Bank Assisted Projects in Technical Education

Indian Institute of Technology Kharagpur

Fluvial Hydrodynamics and Thermo Fluids

1 Week

04 – 08 February 2020



Introduction / Overview

Turbulent flow and sediment transport in rivers are interdependent and utmost important to design and predict the fluvial processes, e.g. reservoir sedimentation, aggradations and degradations of riverbed, scour / erosion, etc. The purpose of the present short term course is to describe both the physical and mathematical modelling in river hydrodynamics, sediment transport, and flow characteristics related to fluvial processes. The course includes bluff body hydrodynamics and resulting vortex dynamics. This course presents a good overview of the fundamentals and as well as latest developments in modeling of fluvial hydrodynamics.

Program Objectives

The course would help the academicians as well as practicing managers and professionals to learn fundamentals of turbulent fluid flow, sediment transport and thermos fluids. Exposing the participants to the practical aspects of hydraulic modeling. Building motivation amongst the participants in analyzing hydraulic engineering problems using numerical modelling techniques. Providing exposure to practical problems of hydraulic engineering. Enhancing capability of the participants to develop innovative approaches in hydraulic engineering. At the end of the course, participants will be quite knowledgeable on the vortex dynamics and bluff body flows.

What you will learn

Program Content

Introduction to Turbulence

Sediment transport dynamics

Aggradation and degradation of sediment bed

Similitude of fluvial systems

Meandering and braiding

Basics of Bank erosion

Latest technology advances in hydraulic structures

Advanced Computational Hydraulics

Basics of Finite Volume Method

Shallow Water Equations

Jet Scour

Numerically Solving St Venant

Equations Using FD methods

Basics of Thermo-fluids,

Bluff body flow-induced vibration and its control

Wake transition to turbulence

Vortex dynamics

Resonant collapse of rotating flows

Vortex-wave interaction

Hydrodynamics and Sediment transport due to wave-current interaction in bottom boundary layer

Internal waves in Coastal areas and fjords

Course Coordinator

Dr. Prashanth Reddy Hanmaiahgari

Dr. Prashanth Reddy Hanmaiahgari is an Associate Professor in the department of Civil Engineering, Indian Institute of Technology Kharagpur. His research interests include experimental and numerical modeling of free surface flow in open channels and pressurized flow in closed conduits. He has published journal papers on turbulence, unsteady flows and sediment transport.

Course Co-coordinator

Dr. Mahendra Vanteru

Dr. Mahendra Vanteru is an Assistant Professor in Department of Mechanical Engineering at IIT Kharagpur. His research areas are Computational Fluid dynamics, Swirling flows, reacting flows and Experimental Combustion.

Other faculty for the course

Professor Subhasish Dey

Prof. Subhasish Dey is a Professor in the Department of Civil Engineering, Indian Institute of Technology Kharagpur. He is an Associate Editor of the Journal of Hydraulic Engineering (ASCE), Journal of Hydraulic Research (IAHR), Sedimentology, Acta Geophysica, International Journal of Sediment Research and Journal of Hydro-Environment Research. His research interests include analytical hydrodynamics, turbulence, sediment transport and scour. He is the author of a book titled “Fluvial Hydrodynamics” published by Springer-Verlag.

Prof. Dhrubha Jyothi Sen

Prof. Dhrubha Jyothi Sen is a senior Professor in the Department of Civil Engineering, Indian Institute of Technology Kharagpur. Prof. Sen is specialized in water resources, hydraulics and hydraulic structures. Prior to joining in IIT KGP, Prof. Sen worked in Central Water Commission for about 10 years and has a vast practical experience. Prof. Sen is regularly consulted by various water related government agencies.

Dr. Anirban Dhar

Dr. Anirban Dhar is currently an Associate Professor of Civil Engineering at Indian Institute of Technology Kharagpur. Earlier, he served as a visiting scholar at James Cook University, Australia. He specializes in analysis of water and environmental systems. His other research interests are groundwater hydrology and computational hydraulics. He has published widely in his chosen areas of academic endeavor.

Dr. Saud Afzal

Dr. Mohammad Saud Afzal is an Assistant Professor in Department of Civil engineering, Indian Institute of Technology Kharagpur. His research area focuses on Computational Fluid Dynamics, Hydraulics of sediment transport, Coastal Engineering and machine learning and artificial intelligence in Hydraulics. He is an alumnus of IIT Kanpur, Tu Delft and Norwegian university of science and Technology (NTNU).