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, Case study and Activity – **25%**

Hands-on work with PM software (MS Project) - **25%** (to build project plan and resource optimization)

Program Schedule and Venue

1 week, 13th Oct – 20th Oct, 2019 (9:30 AM – 6 PM)

IIT Kharagpur – Department of Civil Engineering.

Program Fee

Nil for AICTE-QIP sponsored participants

For others - INR 15,000/- (Fifteen thousand) + GST @18% per participant

Who will benefit (Eligibility)

Faculty members from different AICTE approved universities and working professionals.

Civil Engineering, Mechanical Engineering and Related department.

Last day of Registration

05

October 2019

Accommodation

Accommodation will be provided to the AICTE-QIP 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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AICTE QIP

QUALITY IMPROVEMENT PROGRAMME

Indian Institute of Technology Kharagpur

2019

Short Term Course

Hydrodynamics and Sediment transport in unsteady flows.

1 Week

13th – 20th October 2019

Introduction / Overview

The course proposed under this programme will examine practical and innovative topics in scour under wave and current interaction. The course will begin with teaching the most basic concepts related to these mechanisms and shall serve as a complete block course at Post-Graduate level. Besides the explicit course modules, numerous activities within the course programme will be given to stimulate competences of trainees, making them confident and innovative in creating new knowledge. The course will also give experience with freely available tools for practical hydraulic computations.

Program Objectives

The objective of this course is to give an overview of the basic physical concept and numerical modelling of hydrodynamics, sediment transport and scour processes, describing principal ideas, important features, procedures, shortfalls, a general introduction to wave, current, wave current interaction, scour, scour below pipelines, scour around a single slender pile, scour around a group of slender piles, a brief introduction to boundary layer and its nature, wave current boundary layer interaction.

What you will learn

Program Content

- Introduction to Fluid flow and Navier Stokes Equation.
- Wave Kinematics
- General concepts in Wave-current interaction.
- Introduction to boundary layer and its nature and wave-current boundary layer interaction.
- Phenomenon in streaming in seabed boundary layer
- Sediment Transport: bed load and Suspended load
- Review of scour under wave and current interaction
- Basic concepts and introduction to scour
- Basic concepts and numerical modelling of scour around a single slender pile
- Basic concepts and numerical modelling of scour around a group of slender piles
- Basic concepts and numerical modelling of scour around other complex structures like breakwaters and seawalls.
- Introduction to Computational Fluid Dynamics.
- Summing up of existing analytical and empirical formulae for scour. Summary of the entire course

About the Faculty

Dr. Mohammad Saud Afzal

Mohammad Saud Afzal is an assistant professor in Department of Civil engineering, Indian Institute of Technology, Kharagpur. He is young and dynamic researcher in the field of Hydraulics and water resources. 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). He is famous for his numerical analysis technique in the field of hydraulics and sediment transport. He is very famous for his work on Three-dimensional streaming in sea bed boundary layer.

Co-Coordinator

Dr. Subhasish Dey

Subhasish Dey is a hydraulician and educator. He is known for his research on the hydrodynamics and acclaimed for his contributions in developing theories and solution methodologies of various problems on hydrodynamics, turbulence, boundary layer, sediment transport and open channel flow. He is currently a Professor of the Department of Civil Engineering in Indian Institute of Technology, Kharagpur. He also holds an Adjunct Professor position in the Physics and Applied Mathematics Unit at Indian Statistical Institute Kolkata. Besides he has been named a Distinguished Visiting Professor at the Tsinghua University in Beijing, China. He is an Associate Editor of the Journal of Hydraulic Engineering (ASCE), Journal of Hydraulic Research (IAHR), Sedimentology, ActaGeophysica, International Journal of Sediment Research and Journal of Hydro-Environment Research. He is the author of a book titled “Fluvial Hydrodynamics” published by Springer-Verlag.

Other faculty for the course

Dr. Prashanth Reddy Hanmaiahgari

Prashanth Reddy Hanmaiahgari is an associate professor in Department of Civil engineering, Indian Institute of Technology, Kharagpur. He works in the domain of computational and experimental hydraulics. His research area focuses on Mechanics of sediment transport, Unsteady flow in pipelines, Turbulence and open channel flow Hydraulics.