CIVIL ENGINEERING

Computational hydraulics

Type of Course : New
Course Snapshot : Elective / UG, PG
: B.E/B.Tech,M.E/M.Tech,M.S,PhD,
Pre-requisites : Basic Course of Hydraulics/ Fluid Mechanics
Course Duration : 30 hours /12 weeks
Industry Support : Central and State Government Agencies working in Water Sector, Private Sector companies involved in Hydraulic Modeling

COURSE OUTLINE:

This course is designed to introduce the computational aspects of hydraulics in the context of Civil Engineering problems, e.g., groundwater flow, open channel flow, flow in closed conduits. Going through the course one would develop first-hand knowledge on numerical simulation. This course will also help in creating a background to understand the difference between various discretization methods. The course will enable one to make appropriate choice among available standard softwares.

INSTRUCTOR:

Prof. Anirban Dhar
Department of Civil Engineering
IIT Kharagpur

ABOUT INSTRUCTOR:

Prof. Anirban Dhar is an Assistant Professor in the Department of Civil Engineering, Indian Institute of Technology Kharagpur. His teaching and research interests pertain to the domains of Groundwater Hydrology, Computational Hydraulics. He has published several research papers in various international journals.

COURSE PLAN:

Week 1 : Introduction to Computational Hydraulics
Week 2 : Numerical Methods-I: Overview and Mesh Generation
Week 3 : Numerical Methods-II: Finite Difference Method
Week 4 : Numerical Methods-III: Finite Volume Method
Week 5 : Numerical Methods-IV: Mesh Reduction Methods
Week 6 : Numerical Methods-V: Solution Process
Week 7 : Groundwater Flow
Week 8 : Surface Water Flow: Open Channel Flow
Week 9 : Surface Water Flow: Surface Flooding
Week 10 : Surface Water Flow: Over Hydraulic Structures
Week 11 : Flows in Pressurized Conduits
Week 12 : Interaction of Different Types of Flow