

Hydrodynamics of Riverbed Erosion and Scour at Structures

Overview

The phenomenon of lowering the riverbed level due to sediment removal is called riverbed erosion. The sediment removal also takes place locally at a structure with the formation of a local scour hole. This course will provide a comprehensive discussion on riverbed erosion, scour within channel contractions, downstream of structures, below horizontal pipelines, at bridge piers and abutments. Further, scour countermeasures is of paramount importance. This issue will also be covered. The purpose of the present course is to describe both the physical and mathematical modeling of riverbed erosion and local scour at structures. This course will present a good overview of the fundamentals and as well as latest developments of riverbed erosion and local scour at structures. Most of the lectures will be delivered by an international faculty and remaining lectures will be delivered by an expert faculty from a reputed University in India and the faculties of IIT Kharagpur. Therefore, students can learn various aspects of the subject within the duration of two weeks.

Modules	A: Hydrodynamics of Riverbed Erosion : Dec 1 - Dec 5, 2023 B: Scour at Structures : Dec 6 - Dec 10, 2023 Number of participants for the course will be limited to fifty.
You Should Attend If...	<ul style="list-style-type: none">▪ This course is designed for B. Tech (final year) / M. Tech / MSc / PhD students of Department of Civil Engineering, School of Water Resources, CORAL, Department of Geology and Geophysics, Agricultural & Food Engineering and Department of Ocean Engineering and Naval Architecture who will be benefited to learn the experimental, analytical and computational aspects of erosion of riverbeds and scour at structures from an international faculty. This is an excellent opportunity for the students to learn the detailed of hydrodynamics of erosion to pursue further studies and/or research in subjects related to river engineering.▪ This course will also provide an excellent opportunity to the professionals/engineers to comprehensively learn the erosion and scour processes including scour countermeasures to pursue with the field applications more effectively.
Fees	The participation fees for taking the course is as follows: Participants from abroad: US \$500 Industry/ Research Organizations: INR 30000 Academic Institutions: INR 10000 The above fee includes all instructional materials, computer use for tutorials and assignments, laboratory equipment usage charges, 24 hr free internet facility. The participants will be provided with accommodation on payment basis.

The Faculty



Prof. Dr. Roberto Gaudio is a hydraulician and educator. He is known for his research on hydrodynamics throughout the world, acclaimed for his contributions in developing theories and solution methodologies of various problems on hydrodynamics, turbulence, scour phenomenon, sediment transport and open channel flow.

He is currently Professor, Dipartimento di Ingegneria Civile, Università della Calabria, Italy, where he teaches river hydraulics, hydraulic modelling etc. Presently, he is engaged in studying turbulence characteristics over sediment beds and other turbulence related problems. His general areas of research interests encompass analytical hydrodynamics, sediment transport, scour, open-channel flows, coherent motion in turbulent flow. He has published about 100 research papers in international journals and conference proceedings, such as Physical Review E, Water Resources Research, Journal of Hydraulic Research, Journal of Hydraulic Engineering, Acta Geophysica etc.



Prof. 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 Geophysical research earth sciences and Journal of Hydraulic Engineering (ASCE), Journal of Hydraulic Research (IAHR), Sedimentology, Acta Geophysica, 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. He holds the JC Bose Fellowship. He holds the post of Vice President in the Council of World Association for Sedimentation and Erosion Research (WASER) (2019-2022).



Dr. Mohammad Saud Afzal is an assistant professor in Department of Civil engineering, Indian Institute of Technology, and Kharagpur. He is young and dynamic researcher in the field of Hydraulics and water resources. His research area focuses on Computational Fluid Dynamics, Scour, 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).

Course Co-ordinator

Dr. Mohammad Saud Afzal

Department of Civil Engineering, IIT Kharagpur
Kharagpur 721 302, West Bengal

Phone: +91-3222-304622

E-mail: saud@civil.iitkgp.ac.in

.....
<http://www.gian.iitkgp.ac.in/GREGN>