

**AICTE sponsored short term course
on
Numerical Ocean Hydrodynamics**

08-13 June, 2015



Under

Continuing Education Programme

Organised by

**Dept. of Ocean Engineering & Naval
Architecture**

Indian Institute of Technology,

Kharagpur, West Bengal – 721302

About the workshop

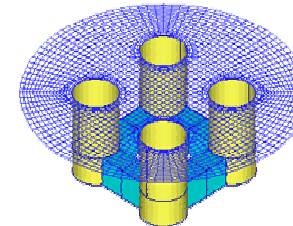
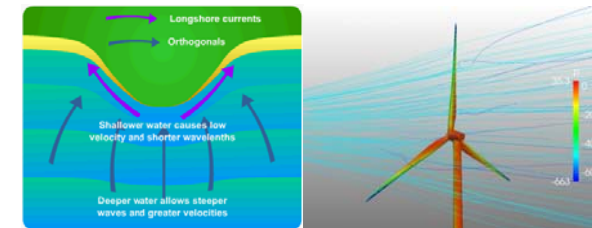
Ocean structures are always subjected to dynamic loading due to waves and current apart from other environmental loads. Assessment of the hydrodynamic performance of any structure meant to be built in the ocean environment is extremely crucial during the design and construction of the structure. Over the years, physicists and mathematicians have developed analytical solutions for wave structure interaction problems. However, because of the random and non-linear nature of the physical

problem coupled with complex geometrical structures and the dynamic air-sea interfacial boundary, the analytical solution is only available for a very few regular geometrical structures under simplified hydrodynamic model. Hence, the numerical methods are extremely essential for the practical purpose. With the advancement in the theoretical and numerical hydrodynamic models of the wave structure problems coupled with the rapid growth in the computational facilities due to advanced supercomputers, the scientific community is coming up with ready to use commercial tools for the engineers to apply in different industrial sectors. However, it is noteworthy to mention that there is no universal mathematical model that can account for all the physical aspects of the problem related to ocean engineering. Hence, the developed tools have their expertise as well as their drawbacks. In this respect, it is very important for the user to be aware about the basic physical assumptions and the mathematical theory behind the commercial tools.

Keeping this in mind, the one week long course is designed to focus on the theoretical and numerical background of the existing commercial CFD tools used by the industry. The course will be comprised of the various wave structure interaction problems and their probable solutions in the field of Ocean Hydrodynamics. The participants will have opportunity to acquire in hand practice of some of the popular commercial software such as NAPA, WAMIT, and ANSYS – CFD etc.

Key Topics of the Workshop

- Basic water wave mechanics
- Seakeeping of ship and offshore structures
- Background of commercial softwares based on potential theory, i.e. solvers based on strip theory (ANSYS AQUA, SEAKEEPER), solvers based on 3-D potential theory (WAMIT, TD, NAPA)
- General discussion on CFD (Finite Volume Method, VoF)
- Solutions of practical problems based on CFD
- Hand on experience of some commercial solvers



Venue of the Workshop

Venue: Department of Ocean Engineering and Naval Architecture, Indian Institute of Technology Kharagpur

Date: 8th-13th June, 2015

Target Participants

- Faculty and Students from department/division of Ocean Engineering, Naval Architecture, Marine Engineering, Mechanical Engineering, Civil Engineering, Applied Mathematics, or similar marine-related programmes
- Personnel from Ship/Offshore/Marine Industries/classification societies working in the area of computational hydrodynamics
- Personnel from the Govt. Organisations such as Indian Navy, NSTL, NPOL, NIOT, NIO, DRDO etc.

Resource personnel

The workshop covers lectures and tutorial from the in-house faculty members of Dept. of OE & NA, IIT Kharagpur in the area of ship and offshore hydrodynamics. Course material will be provided after the completion of the course.

Registration Details

- a. Registration for QIP candidates: Free*
- b. Registration for persons from industry/Govt. organizations: Rs. 6000/-
- c. Registration for students: Rs. 2500/-

Registration includes Registration kit, accommodation, working lunch from 8th -13th June, 2015 and to and fro Transport from Guest house to the venue.

* For participants under Category 'a', registration includes TA of maximum of AC-3 tier by train.

Registration Procedure

Interested participants should contact through email providing the following information to the workshop coordinator by **31st May, 2015**.

- i. Name and official affiliation
- ii. Contact details

The registration Fee is payable through demand draft in favor of 'CEP-STC, IIT Kharagpur' payable at Kharagpur. Scanned copy of the DD will be required to confirm the registration.

Since number of participation is limited to 30, kindly register for participation at the earliest as the selection will be based on first-cum-first served basis

About OE & NA

The Dept. of Ocean Engineering was established in 1952 as the Department of Naval Architecture. It was the first of its kind in the country. Over the next 60 years of its existence, the Department has made significant contributions in shipbuilding, shipping and marine-related industries in the country. In addition to teaching and training at the various levels of bachelor's, master's and doctoral programs, the Department is actively involved in various sponsored R & D projects.

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