

## **OE4600: ADVANCED SHIP HYDRODYNAMICS**

### **Course Content:**

i. Introduction. Review of basic hydrodynamics, wave mechanics and complexities of practical Ship Hydrodynamics problems. ii. Navier-Stokes Equation: Formulation and derivation of ship hydrodynamics in real fluids. Some exact solutions including of impulsively started plate. Boundary-Layer theory. Blasius solution. Friction lines of ships. iii. Computational Fluid Dynamics: Introduction to boundary-integral and finite-difference methods applied for ship hydrodynamics problems. Application of vortex-lattice and panel methods for lifting surface hydrodynamics. iv. Approximate Methods: Slender body theory; Strip theory for determining ship motion in waves. Michell's thin ship theory to determine wave resistance.

### **Text Books:**

1. **Faltinsen, M.O.** Hydrodynamics of High Speed Marine Vehicles, Cambridge Press, 2005
2. **Newman J.N;** 'Marine Hydrodynamics', MIT Press, USA, 1977

### **Reference Books:**

1. **Newman J.N;** 'Theory of Ship Motions', Advances in Applied Mechanics, Vol., 1980.

### **Prerequisite:**