

OE6930: COMP. AID. SURFACE DEV. FOR MARINE VEHICLES

Course Content:

Theories of wind - generated ocean waves - Wind-wave Modelling: Third generation Wind – Wave modelling: WAM, SWAN & STWAVE for wave hind-casting and forecasting. Deformation of water waves: Solution of Helmholtz and Mild slope equations; Near shore wave propagation in phase-averaging and phase-resolving models; Boussinesq wave model; applications to large bodies and harbours - computations in 2D; introduction to public domain and industry software. Ocean hydrodynamics: Circulation with Tide, Temperature & Salinity; Turbulence in Ocean; Shallow Water Equations and their solution; applications to Nearshore circulation; Storm surge & Tsunami. Modelling of scalar transport and morphodynamics.

TextBooks:

1. **Dyke, P.** Modeling Coastal and Offshore Processes. Imperial College Press, 2007.
2. **Komen, G.J., Cavaleri, L., Donelan, M., Hasselmann, K., Hasselmann, S., Janssen, P.A.E.M.** Dynamics and modeling of ocean waves, Cambridge university press, New York, 1994.
3. **Nielsen, P.** Coastal and Estuarine Processes, World Scientific, 2009.

ReferenceBooks:

1. **Mellor G.L.,** User Guide for a three-dimensional, primitive equation, numerical ocean model, 1998.

Prerequisite:

Consent of teacher