

OE4300: OCEAN ENERGY

Course Content:

Importance of generation of Ocean Energy, Various forms of ocean energy, Generation of waves ; Wave theories Systems generating power from oceans Offshore Wind – Wind as an offshore resource, wind loads and aerodynamics. Wave load and hydrodynamics, Design loads for wind turbines- wind and wave spectra, Support structures – fixed and floating. Offshore Waves -- Major forms of ocean wave energy devices, Physics behind conversion – interaction between oscillation and waves, Hydrodynamics of devices, Wave energy resource- wave spectra analysis and design loads, Tides, Currents and Thermal gradients - Energy From Tides, Currents and Offshore Thermal Energy Conversion (OTEC), Tide and Current Generation, OTEC System Concepts – Open and Closed System. Special reference to Indian scenarios in each case

Text Books:

1. Energy Harvesting Solar, Wind, and Ocean Energy Conversion Systems: Authors: **Alroza Khaligh Omar G. Onar.**
2. Offshore Wind Power. Authors: **J Twidell and G Gaudiosi**
3. Wind Energy Explained: Theory, Design and Application. Authors: **JF Manwell, JG McGowan and AL Rogers**
4. Ocean Wave Energy: Current Status and Future Perspectives. Author: **Joao Cruz.**
5. Ocean Energy: Tide and Tidal Power. Authors: **R. H. Charlier and Charles W. Finkl**
6. Renewable Energy From the Ocean: A Guide to OTEC (Johns Hopkins University Applied Laboratory Series in Science and Engineering) 1994 Authors: **William H. Avery and Chih Wu**

Reference Books:

1. Wind Energy Handbook. Authors: **T Burton, N Jenkins, D Sharpe and E Bossanyi.**
2. Ocean Waves and Oscillating Systems: Linear Interactions Including Wave-Energy Extraction. Author: **Johannes Falnes**

Prerequisite: