

Coastal Engineering - Video course

COURSE OUTLINE

Waves in shallow waters - Refraction, Diffraction and shoaling - Coastal Sediment transport - Limits for littoral drift - Suspended and Bed Load - long shore sediment transport rate - Distribution of long shore currents and Sediment transport rates in Surf zone.

Physical modeling in Coastal Engineering. On shore offshore sediment transport - Coastal Features - Beach Features - Beach cycles - Beach Stability - Beach profiles - artificial nourishment - planning of coast protection works - Design of shore defense structures - Case studies.-Generation, propagation and effect of tsunami.

COURSE DETAIL

S.No	Topics	No.of Hours
1	Refreshing of Wave Mechanics (small and finite amplitude wave theories)	4
2	Waves in shallow waters - shoaling, refraction, diffraction and breaking- Interaction currents and waves	4
3	Sediment characteristics	2
4	Initiation of sediment motion under waves	2
5	Wave run-up and overtopping	3
6	Radiation stress-wave set-up and wave set-down	2
7	Mechanics of Coastal Sediment transport - Limits for littoral drift	4
8	Breakwaters- Classification, Design and application in coastal protection and harbor planning	4
9	Distribution of long shore currents and Sediment transport rates in Surf zone	2
10	Stability of tidal inlets	2



NP-TEL

NPTEL

<http://nptel.iitm.ac.in>

Ocean Engineering

Pre-requisites:

1. Basic fluid Mechanics.

Additional Reading:

1. **Fredsoe, J. and Deigaard, R.** Mechanics of Coastal Sediment Transport, World Scientific, 1995.
2. **Dean, R.G. and Dalrymple, R.A.,** Water wave mechanics for Engineers and Scientists, Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1994
3. **Ippen, A.T.,** Estuary and Coastline Hydrodynamics, McGraw-Hill Book Company, Inc., New York, 1978.

Coordinators:

Prof. V. Sundar
Department of Ocean Engineering IIT Madras

11	Wave forces on coastal structures	4
12	Coastal Features - Beach Features - Beach cycles - Beach Stability - Beach profiles	1
13	Coastal erosion, Planning and methods of coast protection works - Design of shore defense structures	6
14	Case studies on coastal erosion and protection	4
15	Generation, propagation and effect of tsunami	4
Total		48

References:

1. **Horikawa,K.**, Coastal Engineering, University of Tokyo press, 1978.
2. **Reeve,D., Chadwick, A. and Fleming, C.** Coastal Engineering-Processes, theory and design practice, Spon Press, Taylor & Francis Group, London & Paris,2004.
3. **Silvester,R. and Hsu,J.R.C.** Coastal Stabilisation, Advances on Ocean Engineering-Volume 14, World Scientific, 1997.
4. **Kamphius,J.W.** Introduction to coastal Engineering and Management, Advances on Ocean Engineering-Volume 16, World Scientific,2002.
5. **Coastal Engineering Manual**, U.S.Army Corps of Engineers, Washington, DC 20314-1000,, Vol. 1 to 3, July 2003.
6. **Wood,M.**, Coastal Hydraulics: Mcmillan, Civil Engineering Hydraulics, London, 1969.
7. **Sorenson, R.M.**, Basic Coastal Engineering, A Wiley-Interscience Publication, New York, 1978.