

OE 5540: CONCEPTUAL DESIGN OF MARINE STRUCTURES

Course content:

Principles of Working Stress and Load and Resistance Factor Design of steel structures; Allowable stresses and Partial Safety Factors Ship types and classification; cargo ships and passenger ships; estimation of displacement and buoyancy; sizing and structural arrangement; pontoon design; bulkheads and stiffeners; simple stability calculations Design principles of rubble mound structures; cross-section and geometry of breakwater, seawall, groins; sizing of armour layers; Layout and design berthing structures, diaphragm walls and open sea jetty, breasting, and mooring dolphins; Dry Docks, Slipways; Code Provision Concepts and design principles of fixed offshore structures and pile foundations; Design principles of floating structures such as Tension Leg Platforms, semi-submersible, and Spar.

Text Books

1. **Chakrabarti, SK.** 1994. Hydrodynamics of Offshore Structures, WIT Press, Southampton, UK. ISBN: 978-0-90545-166-4
2. **Ben C. Gerwick Jr.** 2007. Construction of Marine and Offshore Structures, CRC Press, USA, ISBN: 978-042-91-2502-7
3. **Srinivasan Chandrasekaran, Arvind Kr. Jain, Nasir Shafiq, M. Mubarak A. Wahab.** 2021. Design aids for offshore platforms under special loads, CRC Press, Florida, pp. 280, ISBN: 9781032136844.
4. **Srinivasan Chandrasekaran.** 2020. Offshore Semi-Submersible Platform Engineering, CRC Press, Florida, pp. 240, ISBN: 978-0367673307.
5. **Vallam Sundar, Sannasiraj, SA.** 2019. Coastal Engineering: Theory and Practice, Adv series on Coastal engineering, Vol. 47, World Scientific, Singapore, ISBN: 978-981-3275-90-4
6. **Srinivasan Chandrasekaran.** 2019. Advanced steel design of structures, CRC press, Florida, ISBN: 978-036-72-3290-0
7. **Chen,WF, E.M. Lui.** 1987. Structural stability: Theory and implementation, Elsevier, New York, ISBN: 0-444-01119-6.
8. **Muir Wood, AM and Fleming, CA.** 1981. Coastal hydraulics, 2nd Ed., Palgrave Macmillan, NY, ISBN: 978-033-3261-293
9. **Horikawa, K.** 1978. Coastal Engineering, University of Tokyo Press, Japan.
10. **Alonzo De F. Quinn.** 1972. Design and construction of ports and marine structures, 2nd Ed., McGraw-Hill, USA, ISBN: 978-0070510647
11. **Carl A. Thoresen.** 1988. Port design: Guidelines and recommendations, Tapir, University of California, ISBN: 9788251908399
12. **Gaythwaite, JW.** 1990. Design of marine facilities for berthing, mooring and repair of vessels, Van Nostrand Reinhold, USA, ISBN: 978-0784407264

Reference books:

1. **Chakrabarti, SK.** 2005. Handbook of Offshore Engineering, Elsevier, ISBN: 978-008-05-2381-1
2. **API-RP 2A. 2000.** Recommended Practice for Planning, Designing and Constructing Fixed Offshore Platforms - Working Stress Design, 21st Edition, Errata and Supplement 1, December 2002, Errata and Supplement 2, September 2005, Errata and Supplement 3, October 2007.
3. **Srinivasan Chandrasekaran, and A.K.Jain** 2016. Ocean structures: Construction, Materials and Operations, CRC Press, Florida, ISBN: 978-149-87-9742-9. 3

Prerequisite: