CURRICULUM - M.TECH IN OCEAN STRUCTURES

Stream 1: Offshore and Ship Structures
Stream 2: Port, Harbour & Coastal Structures

SEMESTER I (COMMON TO BOTH STREAMS)

OE5525: BASICS OF OCEAN ENGINEERING

Course Content:

Physical oceanography; Ocean currents and circulation; seabed features; Coastal regions and special economic zones; Sea level rise and climate change effects; Sediments and minerals; Variation along the depth. Introduction to ocean structures; Fixed and floating structures for oil and gas exploration; Coastal structures such as breakwater, groin, and jetties for port and harbour development; Steel and RC structures; Floating structures for passenger and RoRo/RoPax facilities Basics of offshore wind, wave, current; tidal variations; regular and random waves; Tidal and wind-driven currents; Design water levels; Tide and storm surge; Deck and crest elevation for coastal and offshore structures; Joint Probability distribution between wave and current; Load combinations and risk assessment. Wave slamming and slapping effects Design life; encounter probability; Relationship between return period and encounter probability; Selection of design parameters for fixed and floating structures; Probability distributions; Weibull and Rayleigh distribution; Extreme wave prediction; Design wind, wave, and current.

Text Books:

1. **Turget Sarpkaya and Michael Isaacson**, Mechanics of wave forces on offshore structures, Van Nostrand Reinhold Company, USA, ISBN: 978-044-22-5402-5
2. **Turget Sarpkaya,** Wave forces on offshore structures, Cambridge university press, UK, ISBN: 978-113-91-9589-8, 2014
3. **Robert G Dean and Robert A Dalrymple**, Water wave mechanics for engineers and scientists, Advanced series on Ocean Engineering: Vol. 2, World Scientific, Singapore, ISBN: 978-981-02-0420-4, 1991
4. **Chakrabarti, SK,** Hydrodynamics of Offshore Structures, WIT Press, Southampton, UK. ISBN: 978-0-90545-166-4, 1994
5. **Chakrabarti, SK,** Handbook of Offshore Engineering, Elsevier, ISBN: 978-008-05-2381-1, 2005
6. **Ben C. Gerwick Jr,** Construction of Marine and Offshore Structures, CRC Press, USA, ISBN: 978-042-91-2502-7, 2007
7. **Barltrop, NDP and Adams, AJ.**, Dynamics of fixed marine structures, Butterworth-Heinemann, ISBN: 978-0-7506-1046-9, 1991
8. **Barltrop, NDP, ,** Floating structures: A guide for design and analysis, Marine Technology Directorate Ltd, USA, ISBN: 978-187-05-5335-3, 1998
9. **Journee, JMJ and Massie, WW.,** Offshore Hydromechanics, Delft University of Technology, pp. 570, 2001
10. **Srinivasan Chandrasekaran, and A.K. Jain, 2016,** Ocean structures: Construction, Materials and Operations, CRC Press, Florida, ISBN: 978-149-87-9742-9, 2001

Reference Books:

1. **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.
2. **IS 1893- Part 1 to V, 2002,** Criteria for Earthquake resistant design of structures, Bureau of Indian Standards, New Delhi.

Prerequisite:

Nil