



# Indian Institute of Technology

## Course Details Report

**Course No: OE5300**

**Course Name: Advanced Dynamics of Floating Bodies**

**Course Type:**

Theory

**Description:**

To make the students understand the basic principles of floating body dynamics

**Course Content:**

Review of Linear equations of motion; Oscillations of floating bodies – Concepts of small bodies and large bodies- Morisons for wave –current interactions- Added mass and Moment of Inertia and

hydrodynamic damping, Exciting forces and moments due to waves - Froude Krylov theory Diffraction - MacCamy and Fuchs solution - Radiation Theory -General motion analysis of floating bodies - Time and frequency domain approaches – Response amplitude operators -strip theory for slender bodies with forward speed- Symmetric and unsymmetric coupled motions

Directional spectra for waves - 3 D waves and responses

Random response theory – Random response of linear systems under wave loading – response statistics – time frequency and probabilistic approach

Introduction to multi-body structure - Two floating structures formulation

**Text Books:**

1. Chakrabarti, SK. 1994. Hydrodynamics of Offshore Structures, WIT Press, Southampton, UK. ISBN: 978-0-90545-166-4
2. Turgut Sarpkaya and Michael Isaacson. 1981. Mechanics of wave forces on offshore structures, Van Nostrand Reinhold Company, USA, ISBN: 978-044-22-5402-5

**Reference Books:**

1. Chakrabarti, SK. 2005. Handbook of Offshore Engineering, Elsevier, ISBN: 978-008-05-2381-1
2. Michael E. McCormick. 2010. Ocean Engineering Mechanics with Applications Cambridge University Press, pp. 580, ISBN: 978-052-1859-523