Design of Offshore Structures - Web course

COURSE OUTLINE

Loads on Offshore Structures
Wind Loads; Wave and Current Loads; Calculation based on Maximum base Shear and Overturning Moments; Design Wave heights and Spectral Definition; Hydrodynamic Coefficients and Marine growth; Fatigue Load Definition and Joint Probability distribution; Seismic Loads.

Concepts of Fixed Platform Jacket and Deck
Jacket concepts, redundant framing arrangement; Launch and Lift jackets; Simple Deck configurations for Lift and float-over installations; In-service and Pre-service Loads and analysis.

Steel Tubular Member Design
Principles of WSD and LRFD; Allowable stresses and Partial Safety Factors; Tubular Members, Slenderness effects; Column Buckling, Design for Hydrostatic pressure; Design for combined axial and bending stresses (API RP 2A guidelines).

Tubular Joint Design for Static and Cyclic Loads
Simple tubular joints, design using allowable loads; stress concentration factors; S-N curves and fatigue damage calculations.

Submarine Pipelines and Risers
Route selection and Diameter / wall thickness calculations; Pipeline stability, free span calculations; Concrete coated pipelines and pipe-in-pipe insulated pipelines; Design using DNV 81 code.

Design against Accidental Loads (Fire, Blast and Collision)
Behavior of steel at elevated temperature; Fire Rating for Hydrocarbon fire; Design of structures for high temperature; Blast Mitigation-Blast walls; Collision of Boats and energy absorption; Platform survival capacity and Plastic design methods.

COURSE DETAIL

S.No	Topics	No.of Hours
1	Loads on Offshore Structures	8
2	Concepts of Fixed Platform Jacket and Deck	6
3	Steel Tubular Member Design	6
4	Tubular Joint Design for Static and Cyclic Loads	6
5	Submarine Pipelines and Risers	8
6	Design against Accidental Loads (Fire, Blast	8

NP-TEL

NPTEL

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Ocean Engineering

Pre-requisites:

1. Basic structural mechanics.
2. Basic hydrodynamics.

Coordinators:

Dr. S. Nallayarasu
Department of Ocean EngineeringIIT Madras

	and Collision)	
	Total	**42**

References:

Text Books:

1. Hydrodynamics of Offshore Structures by S.K. Chakrabarti, Springer-Verlag
2. Handbook of Offshore Engineering by S.K. Chakrabarti, Elseviers, 2005.
3. Offshore pipelines by B. Gou, S. Song, J. Chacko and A. Ghalambor, GPP Publishers,2006
4. Structural Stability - Theory and Implementation by W.F.Chen and E.M.Lui by Elsevier

Reference:

1. Interim Guidance Notes for the design of and protection of topside structures agains explosion and fire, Joint Industry Research, UK.