

Marine Construction and Welding - Video course

COURSE OUTLINE

Introduction to ships & offshore structures; Characteristics of shipbuilding industry; Structural Requirement - Longitudinal strength, Transverse strength, Torsional strength, Local strength; Framing system / stiffening arrangement - Longitudinal framing, Transverse framing; Basic structural components – Stiffeners, Longitudinal, Transverse, Girders & Transverses, Hatch side girder, Hatch end beam, Stringers, Brackets;

Structural sub assemblies - Flat stiffened panel, Curved stiffened panel, Floors - Longitudinally framed, Transversely framed; Bulkheads - Transverse water tight bulkhead, Non water tight bulkheads, Flat stiffened bulkhead, Corrugated bulkhead; Decks & shells;

Bottom shell, Side shell, Inner bottom plating; Structural assemblies - Double bottom construction, Wing tanks & duct keels, Fore & Aft end construction, Midship sections of various ship types - General cargo carrier, Bulk carrier/OBO, Container ship, Oil tanker, RO-RO ship;

Structural alignment & continuity: Steel material preparation - Shot blasting, Acid pickling; Plate & Section forming - Mechanical methods, 3-point hydraulic press, Universal press, Line heating; Plate cutting – Mechanical, Thermal - Oxy-fuel, Plasma; Fusion Welding & Power Source; Welding parameters and their effects;

Fusion Welding Methods – MMAW, GMAW, GTAW, SAW, Electroslag Welding, Electrogas welding; Single side welding; Solid state welding - Friction stir welding; Welding distortions; Distortion prevention; Distortion mitigation; Welding defects; Nondestructive testing

COURSE DETAIL

Lecture No.	Topic/s
1	Introduction to ships & offshore structures
2	Characteristics of shipbuilding industry
3	Structural Requirement
4	Basic structural components
5	Structural subassemblies
6	Bulkheads
7	Decks & shells
8	Double bottom construction



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

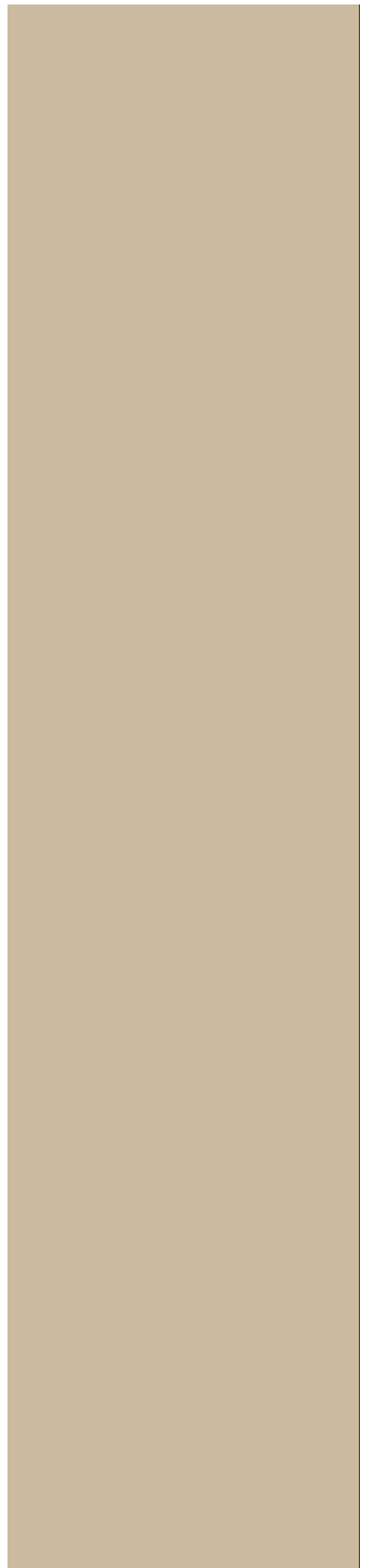
Ocean Engineering

Coordinators:

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9	Wing tanks & duct keels
10	Fore & Aft end construction
11	General cargo carrier
12	Bulk carrier/OBO
13	Container ship
14	Oil tanker
15	RO-RO ship
16	Structural alignment & continuity
17	Steel material preparation
18	Shot blasting
19	Acid pickling
20	Plate & Section forming Mechanical methods
21	Line heating
22	Plate cutting mechanical
23	Thermal
24	Plasma, water jet
25	Fusion Welding & Power Source
26	Welding parameters & their effects
27	Fusion Welding Methods
28	Manual metal arc welding
29	Gas metal arc welding



30	Gas tungsten arc welding
31	Submerged arc welding
32	Electroslag Welding
33	Electrogas welding
34	Single side welding
35	Solid state welding
36	Welding distortions
37	Distortion prevention
38	Distortion mitigation
39	Welding defects
40	Nondestructive testing
Total=40 lectures	

References:

- Ship Construction 6th Edition, by D.J. Eyres
- Aluminum Welding 2nd Edition Narosa Publishing House, New Delhi ,by N. R. Mandal
- Welding Techniques, Distortion Control and Line Heating. Narosa Publishing House, New Delhi, by N R Mandal
- Ship Design and Construction, Edited by: Robert Taggart, SNAME publication