GUJARAT TECHNOLOGICAL UNIVERSITY, AHMEDABAD, GUJARAT

Course Curriculum

SHIP CONSTRUCTION TECHNOLOGY
(code: 3331803)

Diploma Programmes in which this course is offered	Semester in which offered
Marine Engineering	3rd Semester

1. RATIONALE

In the field of shipping and marine engineering, ship construction has an important place because latest technology is being employed in the field of construction and repair of ships. The knowledge of shipping terms, hull construction, hull dynamics and launching is required for the marine engineer.

2. COMPETENCIES

At the end of the study of III Semester the student will be able to

- Understand the terms related to ship, movement of ships and the various materials used in ship building.
- Acquire knowledge about different types of ships.
- Acquire broader ideas about shell & deck plating and stresses acting on the hull.
- Understand about hull dynamics and paintings.
- To study bulkheads, water tight doors, deep tanks and hatches.

3. TEACHING AND EXAMINATION SCHEME

Teaching Scheme (In Hours)			Total Credits (L+T+P)	Examination Scheme				
				Theory Marks		Practical Marks		Total Marks
L	T	P	C	ESE	PA	ESE	PA	
3	2	0	5	70	30	0	0	100

Legends: L -Lecture; **T** -Tutorial/Teacher Guided Student Activity; **P** -Practical; **C** - Credit; **ESE**- End Semester Examination; **PA** -Progressive Assessment

4. COURSE DETAILS

Unit	Major Learning Outcomes	Topics and Sub-topics
Unit I **Introduction**	**1.a Ship types** **1.b Terms and General Use** **1.c Stresses in ship structure**	1.1 :Passenger ships - cargo liners - cargo tramps - oil tankers - bulk carriers - container ships - roll-on/roll-off vessels - liquefied gas carrier - chemical carrier. 1.2 : Forward – Aft - port side - starboard side – draught – freeboard – Length overall – length between perpendiculars – camber - tumble home – bilge radius – sheer – tonnage – displacement – light weight and dead weight. 1.3 Longitudinal bending in still water and waves – Transverse bending - stresses when docking – panting and pounding.
Unit II **Framing and Plating**	**2.a Bottom and side framing:** **2.b Shell and decks:**	2.1 Double bottom – internal structure – duct keel – double bottom in machinery space. Side framing – tank side brackets – beam knees – web frames. 2.2 Shell plating – bulwarks – deck plating – beams – deck girders and pillars – discontinuities – Hatches – steel hatch covers – water tight hatches.
Unit III **Fore and Aft Structures**	**3.a Fore part** **3.b Aft part**	3.1 Plating – arrangement to resist panting and pounding – bulbous bow – anchor and cable Stem arrangement. 3.2 Cruiser stern – transom stern – stern frame and rudder – fabrication of stern frame – cast steel stern frame – unbalanced rudder – balanced rudder – open water stern – spade rudder – rudder and stern frame for twin screw ship – bossing – shaft tunnel – kort nozzle – fixed nozzle rudder – tail flaps and rotary cylinders.
Unit IV **Ship Dynamics**	**4.a Ship dynamics**	Propellers – wake distribution blade loading – controllable pitch propeller – contra rotating propellers – vertical axis propellers – bow thrusters – controllable pitch bow thrusters – hydraulic thrust units – rolling and stabilisation – reduction of rolling – bilge keels – fin stabilisers – tank stabilisers – passive tanks – controlled passive tanks – active controlled tanks.
Unit V **Bulkheads & Tanks**	**5.a Bulk heads and deep tanks** **5.b Ship maintenance**	5.1 Water tight bulkheads – water tight doors – deep tanks for water ballast and oil – non water tight bulkheads – corrugated bulkheads. 5.2 Insulation of ships – corrosion prevention – surface preparation – painting – cathodic protection – impressed current system – fouling

5. SUGGESTED SPECIFICATIONTABLE WITH HOURS & MARKS (THEORY)

Unit	Unit Title	Teaching Hours	Distribution of Theory Marks			
			R Level	U Level	A Level	Total Marks
I	Introduction	05	02	03	00	05
II	Framing and Plating	04	05	05	00	10
III	Fore and Aft Structures	05	06	07	07	20
IV	Ship Dynamics	08	05	05	10	20
V	Bulkheads & Tanks	06	02	08	05	15
Total		**28**	**20**	**28**	**22**	**70**

Legends: R = Remember; U = Understand; A = Apply and above levels (Bloom's revised taxonomy)

Note: This specification table shall be treated as a general guideline for students and teachers. The actual distribution of marks in the question paper may vary slightly from above table.

6. LIST OF EXERCISES/PRACTICAL

Not Applicable

7. SUGGESTED LIST OF STUDENT ACTIVITIES

Make charts on any two of the units with detailed drawings.

8. SPECIAL INSTRUCTIONAL STRATEGIES (If Any)

Not Applicable

9. SUGGESTED LEARNING RESOURCES

List of Books:

Text Book : Reeds ship construction – E.A. Stroke

Reference Book : Ship construction- Edrich Fernands
Publishers: Pro-Navigator books
Reference Book: Notes on ship construction - Capt. Dara E. Driver By Rumar Publicatio