Course No:	Course Name:	L-T-P-Credits	Year of Introduction
SB205	INTRODUCTION TO NAVAL ARCHITECTURE AND SHIP BUILDING	3-1-0-4	2016

Prerequisites: -Nil

Course Objectives:

- To impart the basic concepts of Naval Architecture and Shipbuilding.
- To develop understanding on basic terms and fundamental definitions and laws used in Naval Architecture.

Syllabus:

Historical Review, Ship Geometry, Terms and Definitions, Role of Naval Architect in Maritime Industry; Classification of Ships; Physical Fundamentals, Ships Form, Forces Acting on a Ship; Introduction to Ship Structural Members, Shipbuilding Materials, Ship Structural Components; Propulsion Machinery, General Arrangement of Propulsion Plants, Main Engines, Auxiliary Machinery; Outfitting, Bridge.

Expected Outcome:

On successful completion of the course, students will be able to:

i. Understand fundamentals of Naval Architecture.
ii. Acquire knowledge on various types of ships.
iii. Identify various types of materials used for construction of maritime structures and to identify various major and minor structural components of a ship.
iv. Understand general arrangement of propulsion plant, and various auxiliary machinery required for efficient operation of a ship.
v. Understand various machineries / equipments required for anchoring, mooring and towing operations.

Text Books:

- Tupper, E.C.; Introduction to Naval Architecture; Butterworth-Heinemann, UK.
- D.A Taylor; Introduction to Marine Engineering.

Reference Books:

- Rawson & Tupper; Basic Ship Theory, Vol. I & II
- Lewis, E.U.; Principles of Naval Architecture; SNAME, New Jersey, U.S.A.
- Taylor, D.A.; Merchant Ship Construction; Butterworths, London.
- Taggart; Ship Design and Construction; SNAME.
- D.J Eyres; Ship Construction.
- Klaas van Dokkum; Ship Knowledge - A modern encyclopedia; DOKMAR.

Course Plan:

Module	Content	Hours	Sem. Exam Marks
I	**Historical Review** - Ancient Types of Vessels (rafts, boats, and ships), The role of Ships in the Ages of the Great Discoveries.	5	15%
	Ship Geometry - Terms and Definitions.	2	
	Role of a Naval Architect in the Maritime Industry.	2	

II	**Types of Ships** – Classification.	2	15%
	Cargo Ships- General Cargo Ships, Bulk Carriers, Container Ships, Ro-Ro Ships, Barge Carriers, Tankers.	2	
	Other Ships- Fishing Vessels, Factory Ships, Supply Ships, Cable Ships, Ice Breakers, Research Vessels, and Warships.	3	
	High Speed Crafts- Hydrofoils, Air Cushion Vehicles etc; Small Pleasure Crafts- Yachts, Ketches, etc.	3	
FIRST INTERNAL EXAM			
III	**Physical Fundamentals**- Archimedes Principle, Laws of Floatation, Stability, Six Degrees of Freedom.	3	15%
	Forces Acting on a Ship- Static Condition in Waves and During Docking & Launching.	2	
	The Ship's Form - Main Dimensions, Lines Plan, Coefficients and their Meanings.	2	
IV	**Introduction to Ship Structural Members.**	4	15%
	Shipbuilding Materials- Properties, Compositions.	4	
	Structural Components - Bottom Structure, Shell Plating and Framing, Decks, Hatches and Hatch Covers, Superstructures, Bulkheads, Tanks, Holds, Fore and Aft Structure, Stern and Rudder.	4	
SECOND INTERNAL EXAM			
V	**Propulsion Machinery** - Development of Ship Propulsion, General Arrangement of Propulsion Plants.	3	20%
	Main Engines- Diesel Engines, Steam Engines & Turbines, Gas Turbines, Diesel-Electric Drive, Nuclear Power Plants.	3	
	Auxiliary Machinery- Power Supply, Auxiliary Engines for Ship Systems Operation, Auxiliary Engines for Engine Plant Operation, Steering Gear.	3	
VI	**Outfitting** - Anchor, Mooring and Towing Equipment, Cargo Handling Equipment, Rigging, Life-Saving Appliances and Fire Fighting Equipment, Heating, Ventilation and Air-Conditioning, Refrigeration Plants, Painting, Accommodation.	5	20%
	Bridge - The Control Centre of the Ship- Bridge Arrangement and Layout, Wheel House, Navigation and Communication Equipments, Methods of Navigation, Navigational Lights.	4	
END SEMESTER EXAM			

QUESTION PAPER PATTERN: Maximum marks :100 Time : 3 hours

PART A

- Answer all 8 questions of 3 marks each.
- 1 question each from modules I to IV and 2 questions each from modules V & VI.

PART B

- Answer any 2 full questions out of 3 for each module.
- Each question from module I to IV carries 6 marks.
- Each question from module V & VI carries 7 marks.
- Each full question can have maximum of 4 sub questions, if needed.