

Course No:	Course Name:	L-T-P-Credits	Year of Introduction
SB207	BASIC SHIP THEORY	2-1-0-3	2016
Prerequisites: -Nil-			
Course Objectives:			
<div>1. To impart basic knowledge on ship's geometry and lines plan.</div> <div>2. To illustrate application of approximate integration methods to hull form calculations.</div> <div>3. To impart the basic concepts of hydrostatics and fundamentals of stability.</div>			
Syllabus:			
Representation of Ship's Hull Geometry– Offset Table, Lines Plan, Fairing; Approximate Integration Rules– Applications to Hull Form Calculations; Bonjean Calculations– Sectional Area Curves; Hydrostatic Calculations and Curves; Buoyancy and Weight; Watertight Subdivision of Ships – Causes of Damage and their Effects, Permeability, Floodable Length Curve.			
Expected Outcome:			
On successful completion of the course, the student will be able to:			
<div>1. Geometrically define the hull form and draw lines plan.</div> <div>2. Apply the procedures of numerical integration and calculate hydrostatic properties.</div> <div>3. Understand and plot sectional area curves, bonjean curves, and hydrostatic curves.</div> <div>4. Understand the concept of weight and buoyancy of a ship.</div> <div>5. Understand the concept of subdivision and floodable length curves.</div>			
Text Book:			
<div>• Rawson and Tupper; Basic Ship Theory.</div> <div>• Eric Tupper; Introduction to Naval Architecture.</div>			
Reference Books:			
<div>• Edward V. Lewis; Principles of Naval Architecture, Vol 1.</div> <div>• Adrian B. Biran; Ship Hydrostatics and Stability.</div> <div>• Capt D.C. Derret; Ship Stability for Masters and Mates.</div>			
Course Plan:			
Module	Content	Hours	Sem. Exam Marks
I	Representation of Ship's Hull Geometry– Introduction.	2	15%
	Lines Plan- Profile, Body Plan, Half Breadth Plan and Diagonal Plan.	3	
	Table of Offsets- Fairing Process.	2	
II	Integration Rules– Calculation of Areas, Volumes and Moments.	2	15%
	Trapezoidal Rule.	1	
	Simpson's Rules- 1-4-1, 1-3-3-1, 5, 8,-1 and 3, 10,-1 Rule.	3	
	Tchebycheff's Rule.	1	
FIRST INTERNAL EXAM			
III	Bonjean Area and Moments.	3	15%
	Sectional Area Curves– Calculation and Drawing.	2	

	Bonjean Curves – Calculation and Drawing.	2	
IV	Hydrostatics – Definition and Relevance.	1	15%
	Definition of Properties – Volume of Displacement/ Displacement, Centre of Buoyancy, Centre of Floatation, KM_T And BM_T Metacentric Radius, TPC 1cm, MCT 1cm, Form Coefficients (C_B , C_P , C_M And C_W), LCF.	3	
	Hydrostatic Calculations.	3	
	Hydrostatic Curves.		
SECOND INTERNAL EXAM			
V	Buoyancy and Weight of Ship – Definitions, Components of Weight.	2	20%
	Centre of Gravity and Centre of Buoyancy.	1	
	Archimedes Principle and Laws of Floatation, Equilibrium Conditions.	2	
	Effect of Change of Water Density, Fresh Water Allowance.	2	
VI	Causes and Effects of Damage of Ships.	1	20%
	Watertight Subdivisions – Need and Types.	1	
	Concept of Bulkhead Deck, Margin Line and Permeability.	1	
	Factor of Subdivision, Compartment Standard, Criterion Numeral.	2	
	Floodable Length – Concept, Curves.	2	
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.