

COURSE PACKAGE

Part A: Course Specifications

Course Code	: SEAM 2				
Course Descriptive Title	: Ship Construction				
Prerequisite	: SEAM 1		Corequisite	: None	
Year Level	: First Year		Semester Offered	: Second Semester	
Course Credits	: 3 units	Theoretical Contact Hours Per Week	: 3 hours	Demonstration/Practical Work Contact Hours Per Week	: None
Course Description	: Ship Construction deals with the principal structural members of a ship and the various parts. This is a fundamental course in order for a prospective marine deck officer to maintain the seaworthiness of the ship. Students are to be involved in interactive discussions as well as activities in the identification of parts of the ship. Students are also going to learn how to read the load lines and marks.				
STCW Reference	STCW Table	Function	Competence	Knowledge, Understanding and Proficiency	
	A-II/1	F3. Controlling the operation of the ship and care for persons on board at the operational level	C2. Maintain seaworthiness of the ship	Ship construction <i>KUP4.</i> General knowledge of the principal structural members of a ship and the proper names for the various parts	
Course Outcomes	PO-B.1 PO-C.1 PO-D.10	CO1. Determine the critical structures in order to maintain the seaworthiness of the ship in various ship operations			
	PO-B.3	CO2. Perform draught mark readings			
Course Intake Limitations	: The number of students that can be accommodated shall not exceed 40 for lecture.				



<p>Faculty Requirement</p>	<p>Instructor</p> <p>The faculty that will be assigned to handle the course must possess the following qualifications:</p> <ul style="list-style-type: none"> • graduate of Bachelor of Science in Marine Transportation; • with at least 12 months of seagoing experience as Officer-in-charge of a Navigational Watch on seagoing ships of 500 GRT or more; • completed Training Course for Instructors (IMO Model Course 6.09) • completed Training Course on Assessment, Examination and Certification of Seafarers (IMO Model Course 3.12); and • preferably with teaching experience. <p>The following may be able to teach the course:</p> <ul style="list-style-type: none"> • graduate of Bachelor of Science in Naval Architecture with completed Training Course for Instructors (IMO Model Course 6.09). <p>Assessor</p> <p>The assigned assessor to conduct the assessment for this course shall have the same qualification for the instructor as outlined above.</p>
<p>Teaching Facilities and Equipment</p>	<p>CLASSROOM</p> <p>The standard classroom size shall be a minimum of 48 square meters, no side shall be less than 6 meters for a class of 40 students. Classroom must be well-lighted and well-ventilated. It should contain the following:</p> <ul style="list-style-type: none"> • Tables and chairs or armed chairs • Whiteboards or chalkboards • Multimedia equipment <p>SHIP MODEL</p> <p><i>Showing the structural members and various parts:</i></p> <ul style="list-style-type: none"> • Physical model of the ship; • Virtual model; or • Computer-Based Training (CBT) Program. <p><i>Note: The MHEIs may use additional teaching facilities and equipment as deemed necessary to meet the learning outcomes of this course.</i></p>
<p>Teaching Aids</p>	<p>A1 PowerPoint Presentation (PPT)</p> <p>A2 Handouts</p> <p>A3 General arrangement plans for different types of ship:</p> <ul style="list-style-type: none"> • Bulk



	<ul style="list-style-type: none"> • Tanker • Car Ship • Container • Passenger Ship • General Cargo Ship • Off-shore Ship <p><i>Note: The MHEIs may use additional teaching aids as deemed necessary to meet the learning outcomes of this course.</i></p>
<p>References / Bibliographies</p>	<p>References:</p> <p>R1 International Convention on Standards of Training, Certification and Watchkeeping for Seafarers, 1978, as amended</p> <p>R2 Officer in Charge of a Navigational Watch (IMO Model Course 7.03)</p> <p>R3 International Convention for the Safety of Life at Sea (SOLAS), 1974, as amended</p> <p>R4 Lloyd’s Register Rules for the Manufacture, Testing and Certification of Materials</p> <p>R5 ISO 14726 (2008) Ships and marine technology - Identification colours for the content of piping systems</p> <p>Textbook:</p> <p>T1 Eyres, D. J., & Bruce, G. J. (2012). <i>Ship Construction</i> (7th ed.). Oxford, UK: Butterworth-Heinemann. doi: https://doi.org/10.1016/C2010-0-68324-6</p> <p>Bibliographies:</p> <p>B1 House, D. J. (2010). <i>Elements of modern ship construction</i>. Glasgow, UK: Brown, Son & Ferguson.</p> <p>B2 Tupper, E. C. (2013). <i>Introduction to Naval Architecture</i> (5th ed.). Oxford, UK: Butterworth-Heinemann. doi: https://doi.org/10.1016/C2011-0-07775-X</p> <p><i>Note: The MHEIs may use additional references/bibliographies as deemed necessary to meet the learning outcomes of this course.</i></p>



Part B: Course Outline and Timetable

Term	Week	Topic	Time Allotment (in hours)	
			Theoretical	Demonstration / Practical Work
<p>Note: MHEIs shall determine the number of periods or terms the semester is divided based on their school calendar of activities such as Prelim, Midterm, and Final.</p>	1 – 3	<p>1. Ship Dimension and Forms 1.1. Principal dimensions of the ship 1.2. Structural parts of the ship 1.3. Ship types</p>	9	
	4 – 5	<p>2. Ship Stresses 2.1. Ship as a beam 2.2. Static forces 2.3. Dynamic forces</p>	6	
	6 – 8	<p>3. Hull Structure 3.1. Materials for ship construction 3.2. Shipbuilding steel 3.3. Shell plating and framing 3.4. Bulkheads and pillars 3.5. Decks, hatches and superstructures</p>	9	
	9 – 10	<p>4. Bow and Stern 4.1. Bow construction 4.2. Stern construction</p>	6	
	11 – 13	<p>5. Fittings 5.1. Hatch 5.2. Hatch cover 5.3. Cargo lifting arrangements 5.4. Piping system 5.5. Fitting and lashing in a containership</p>	9	
	14 – 15	<p>6. Rudders and Propellers 6.1. Rudder 6.2. Propeller 6.3. Bow and stern thrusters</p>	6	



Term	Week	Topic	Time Allotment (in hours)	
			Theoretical	Demonstration / Practical Work
	16 – 17	7. Load Lines and Draught Marks 7.1. Load lines and Plimsoll marks 7.2. Draught marks	6	
Sub-total (Contact Hours)			51	
Total Contact Hours			51	
Examination and Assessment				

Note:

1. The MHEIs are to develop their respective timetable according to their resources but meets with the minimum time allocation for the contact hours.
2. The MHEIs shall determine the time allotment for the conduct of summative assessments



Part C: Course Syllabus

COs	Topics Learning Outcomes	References/ Bibliographies	Teaching Aids
CO1	<p>1. Ship Dimension and Forms <i>Principal dimensions of the ship</i> 1.1. Identify the principal dimensions and the main structural members of the ship</p> <p><i>Structural parts of the ship</i> 1.2. Identify the type of ship given its structural form and arrangement</p> <p><i>Ship types</i> 1.3. Describe the functions of the type of ship and its characteristics with regards to its cargo and construction</p>	R1, R2, R3, R4, T1, B1, B2	A1, A2, A3
CO1	<p>2. Ship Stresses <i>Ship as a beam</i> 2.1. Explain how bending moments and shearing forces affects the ship's hull</p> <p><i>Static forces</i> 2.2. Calculate the hydrostatic pressure which the tank is subjected to</p> <p><i>Dynamic forces</i> 2.3. Explain how dynamic forces contribute to the stresses of the ship's hull</p>	R2, R3, R4, T1, B1, B2	A1, A2, A5
CO1	<p>3. Hull Structure <i>Materials for ship construction</i> 3.1. Explain the requirements for materials used in ship construction</p> <p><i>Shipbuilding steel</i> 3.2. Identify common steel sections used in modern shipbuilding</p> <p><i>Shell plating and framing</i> 3.3. Identify the structural component of the ship's hull 3.4. Explain the purpose, advantages and disadvantages of transverse and longitudinal framing systems</p> <p><i>Bulkheads and pillars</i> 3.5. Explain the functions of different bulkheads</p>	R2, R3, R4, T1, B1, B2	A1, A2, A3

COs	Topics Learning Outcomes	References/ Bibliographies	Teaching Aids
	Decks, hatches and superstructures 3.6. Describe the construction of hatch openings and superstructures		
CO1	4. Bow and Stern 4.1. Describe the construction of the bow and stern in relation to the need for additional strength 4.2. Identify the structural parts of the bow and stern section of the ship	R2, R3, R4, T1, B1, B2	A1, A2, A3
CO1	5. Fittings Hatch and Hatch cover 5.1. Explain the characteristics of the different types of hatchcovers 5.2. Identify the different parts and of the hatchcover construction and their functions Cargo lifting arrangements 5.3. Identify the different parts of the ship's crane 5.4. Identify the different parts of the ship's derrick system Piping system 5.5. Identify the different parts of the piping system 5.6. Identify the contents of the pipe based on its colour label Fitting and lashing in a containership 5.7. Identify the different fittings in a container ship for securing and lashing and their functions	R2, R3, R4, R5, T1, B1, B2	A1, A2, A3
CO1	6. Rudders and Propellers Rudder 6.1. Explain the characteristics of the different types of rudder 6.2. Identify the parts of the rudder construction 6.3. Explain the watertight construction of the rudder stock Propeller 6.4. Identify the different parts of the propeller 6.5. Explain the characteristics of the different types of propeller 6.6. Explain the watertight construction of the shaft tunnel Bow and stern thrusters 6.7. Identify the parts of bow and stern thrusters	R2, R3, R4, T1, B1, B2	A1, A2, A3
CO2	7. Load Lines and Draught Marks Load lines and Plimsoll marks	R2, R3, T1, B1,	A1, A2, A3

COs	Topics Learning Outcomes	References/ Bibliographies	Teaching Aids
	7.1. Explain the relevance of load lines in maintaining the seaworthiness of the ship 7.2. Determine the applicable load line from the chart of zone and seasonal areas 7.3. Draw to scale the load line marks Draught marks 7.4. Read the draught marks	B2	

Note: The MHEIs are to develop Part D: Detailed Teaching Syllabus and Instructional Materials (IMs), and Part E: Course Assessment and Assessment Tools (ATs) which satisfactorily meets with the requirements of the course as prescribed in the course outcomes and learning outcomes.

