

**K to 12 BASIC EDUCATION CURRICULUM
SENIOR HIGH SCHOOL PRE-BACCALAUREATE MARITIME SPECIALIZATION
INTRODUCTION TO MARINE TRANSPORTATION AND ENGINEERING**

Grade: 11

Subject Title: Introduction to Marine Transportation and Engineering

Semester: 2nd Semester

Number of Hours: 80 Hours

Prerequisite: Introduction to Maritime Career

Subject Description: Introduction to Marine Transportation and Engineering that focuses on the competencies that the Senior High School (SHS) student ought to possess to enhance the knowledge and understanding, optimistic attitude, and work ethics in preparation for taking Bachelor of Science in Marine Transportation (BSMT) or Marine Engineering (BSMarE). These competencies include 1) an introduction to marine transportation, 2) explain marine navigation, 3) explain basic marine meteorology, 4) explain basic ship handling, 5) explain ship operation, 6) explain shipboard communication, 7) introduction to marine engineering, 8) discuss the two primary systems on board, 9) discuss the common types of marine propulsion and ancillary machineries on board, 10) explain the components of the electric power supply system on board, and 11) discuss the basic engine watchkeeping on board.

CONTENT	CONTENT STANDARDS	PERFORMANCE STANDARDS	LEARNING COMPETENCIES	CODE
LESSON 1: Introduction to Marine Transportation and Engineering (IMTE) (1 hr)				
1. Overview of Basic Marine Transportation and Engineering 2. Duties and responsibilities of a Marine Deck Officer a. Master b. Chief Officer c. Officer in Charge of Navigational Watch (OIC-NW) 3. Duties and responsibilities of a Marine Engineer a. Chief Engineer b. Second Engineer c. Officer in Charge on an Engineering Watch (OIC-EW) 4. Relevance of the course 5. Career opportunity	The learners demonstrate an understanding of the concepts and underlying principles in marine transportation and engineering in the maritime industry	The learners shall be able to independently demonstrate an understanding of the marine transportation and engineering in the maritime industry	LO 1. Introduce marine transportation and engineering as a profession 1.1 Introduction to Basic Marine Transportation and Engineering	PMTE11IMTE-III-a-1
			LO 2. Explain the duties and responsibilities of a Marine Deck Officer and Marine Engineer 2.1 Discuss the duties and responsibilities of a Marine Deck Officer 2.2 Discuss the duties and responsibilities of a Marine Engineer 2.3 Discuss the relevance of the course 2.4 Discuss the career opportunities	PMTE11IMTE-III-a-2

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CONTENT	CONTENT STANDARDS	PERFORMANCE STANDARDS	LEARNING COMPETENCIES	CODE
LESSON 2:-EXPLAIN MARINE NAVIGATION (EMN) (11 hrs)				
1. Navigation a. Terrestrial b. Celestial c. Electronic 2. Passage Planning	The learners demonstrate an understanding of the concepts and underlying principles in marine navigation	The learners shall be able to independently demonstrate an understanding of the marine transportation	LO 1. Discuss that a ship navigates the vast ocean using 1.1 Terrestrial 1.2 Celestial 1.3 Electronic	PMTE11EMN-III-a-c-1
			LO 2. Discuss importance of passage planning Discuss the importance of passage planning to arrive at the desired destination	PMTE11EMN-III-a-c-2
LESSON 3: EXPLAIN BASIC MARINE METEOROLOGY (EBMM) (8 hrs)				
1. Meteorology a. Weather/ climate b. Storm c. Storm avoidance	The learners demonstrate an understanding of the concepts and underlying principles in basic marine meteorology	The learners shall be able to independently demonstrate an understanding of the basic marine meteorology	LO 1. Explain basic marine meteorology 1.1 Discuss weather and climate 1.2 Explain how storms develop 1.3 Explain how ships avoid storms	PMTE11EBMM-III-d-e-1
LESSON 4: EXPLAIN BASIC SHIP HANDLING (ESBH) (8 hrs)				
1. Ship Maneuver	The learners demonstrate an understanding of the concepts and underlying principles in basic ship handling	The learners independently demonstrates an understanding of the basic ship handling	LO 1. Discuss basic ship handling 1.1 Discuss how ship handling is being performed by ship personnel 1.2 Discuss the different factors affecting ship handling	PMTE11ESBH-III-f-g-1
LESSON 5: EXPLAIN SHIP OPERATION (ESO) (8 hrs)				
1. Ballasting / De-ballasting 2. Loading / Unloading Cargo 3. Ship Stability	The learners demonstrate an understanding of the concepts and underlying principles in ship operation	The learners independently demonstrate an understanding of the ship operation	LO 1. Explain basic ship operation 1.1 Explain why it is necessary to carry ballast if the ship has no cargo on board 1.2 Explain why ship de-ballast when cargo has been loaded on board 1.3 Explain the importance of maintaining ship stability at all times	PMTE11ESO-III-h-i-1

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CONTENT	CONTENT STANDARDS	PERFORMANCE STANDARDS	LEARNING COMPETENCIES	CODE
LESSON 6: EXPLAIN SHIPBOARD COMMUNICATION (ESC) (4 hrs)				
1. Internal 2. External 3. Close-loop Communication	The learners demonstrate an understanding of the concepts and underlying principles in shipboard communication	The learners shall be able to demonstrate an understanding of the shipboard communication	LO 1. Discuss shipboard communication 1.1 Differentiate the two shipboard communication 1.2 Explain the importance of close-loop communication	PMTE11ESC-III-j-1
LESSON 7: DISCUSS THE TWO PRIMARY SYSTEMS ON BOARD (DTPS) (4 hrs)				
1. Mechanical propulsion system on board	The learners demonstrate an understanding of concepts and underlying theories in discussing the two primary systems on board	The learners shall be able to demonstrate an understanding of the competencies in discussing the two primary systems on board	LO 1. Discuss basic marine mechanical propulsion 1.1 Explain the basic propulsion system on board and its function 1.2 State the importance of propulsion system on board 1.3 Identify the basic mechanical installation comprising the propulsion system on board	PMTE11DTPS-IV-a-1
2. Electrical power supply on board			LO 2. Discuss the electrical power supply system 2.1 Explain the power supply and its function on board 2.2 State the importance of power supply on board 2.3 Identify the basic power distribution of ships	PMTE11DTPS-IV-a-2
LESSON 8: EXPLAIN THE COMMON TYPES OF MARINE PROPULSION AND ANCILLARY MACHINERIES ON BOARD (ECTM) (20 hrs)				
1. Marine Propulsion a. Diesel-engine driven b. Electric driven c. Steam-turbine driven	The learners demonstrate an understanding of concepts and underlying theories in discussing the common marine propulsion and ancillary machinery on board	The learners shall be able to discuss the common marine propulsion and ancillary machinery on board	LO 1. Discuss the Common Marine Propulsion on Board 1.1 Define a marine diesel engine/electric engine/steam turbine 1.2 State the function of marine diesel engine/ electric engine/steam turbine 1.3 Explain the importance of marine diesel engine/electric engine/steam turbine	PMTE11ECTM-IV-b-f-1

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CONTENT	CONTENT STANDARDS	PERFORMANCE STANDARDS	LEARNING COMPETENCIES	CODE
			1.4 Discuss the importance of correct starting procedure, monitoring, and stopping procedure in operating main and auxiliary machinery 1.5 Discuss the importance of planned-maintenance system	
2. Auxiliary Machinery a. Boiler b. Air compressor c. Steering gear d. Pumps e. Fresh-water generator f. Oily-water separator			LO 2. Discuss boiler as part of ancillary system 1.1 State the function of boiler equipment 1.2 Identify the types of boiler	PMTE11ECTM-IV-b-f-2
			LO 3. Discuss air compressor as part of ancillary system 1.1 State the function of air compressor 1.2 Identify the types of air compressor	PMTE11ECTM-IV-b-f-3
			LO 4. Discuss steering gear as part of ancillary system 1.1 State the function of steering gear 1.2 Identify the types of steering gear	PMTE11ECTM-IV-b-f-4
			LO 5. Discuss pumps as part of ancillary system 1.1 State the function of pumps 1.2 Identify the different types of pumps	PMTE11ECTM-IV-b-f-5
			LO 6. Discuss fresh-water generator as part of ancillary system 1.1 State the function of a fresh-water generator 1.2 Identify the different types of fresh-water generator	PMTE11ECTM-IV-b-f-6
			LO 7. Discuss Oily-water separator as part of ancillary system 1.1 State the function of a fresh oily-water separator 1.2 Identify the different types of oily-water separator	PMTE11ECTM-IV-b-f-7

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CONTENT	CONTENT STANDARDS	PERFORMANCE STANDARDS	LEARNING COMPETENCIES	CODE
LESSON 9: EXPLAIN THE COMPONENTS OF THE ELECTRIC POWER SUPPLY SYSTEM ON BOARD (ECEP) (12 hrs)				
1. Generating plant a. Generator	The learners demonstrate an understanding of concepts and underlying theories in discussing the basic components of the power supply system on board	The learners shall be able to discuss the basic components of the power supply system on board	LO 1. Discuss generator as source of electricity generation on board 1.1 Identify the types of generator as to voltage produced 1.2 Explain the functions of a generator	PMTE11ECEP-IV-g-i-1
2. Power distribution system a. Emergency switch Board b. Bus bars c. Transformers d. Distribution board e. Circuit breakers			LO 2. Explain the basic power distribution system on ships 1.1 Identify main and emergency switch boards, and explain distribution board 1.2 Explain the function of main and emergency switch boards 1.3 Explain the function of bus bars 1.4 Explain the function of a transformer 1.5 Identify the main circuit breakers 1.6 Explain the function of circuit breakers	PMTE11ECEP-IV-g-i-2
3. Power-supply consumers a. Lightings b. Motors			LO 3. Explain the power-supply consumers/loads on board 1.1 Explain fluorescent lamp installation 1.2 Explain theories of motors 1.3 Explain types of motors	PMTE11ECEP-IV-g-i-3
LESSON 10: DISCUSS THE BASIC ENGINE WATCHKEEPING ON BOARD (DBEW) (4 hrs)				
1. Overview of Engineering Watchkeeping on board	The learners demonstrate an understanding of concepts and underlying theories in discussing the basic engine watchkeeping	The learners shall be able to discuss basic engine watchkeeping	LO 1. Watchkeeping 1.1 Define engine watchkeeping 1.2 Explain the importance of watchkeeping	PMTE11DBEW-IV-j-1

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Glossary

Auxiliary machines	Includes pumps, compressors, and blowers for circulating fuel and the fresh water and seawater used in cooling systems
Ballast	Heavy weights packed in the bottom of a boat or ship to give stability
Diesel propulsion	The most commonly used system which converts mechanical energy from thermal forces
Chief engineer	The senior engineer officer responsible for the satisfactory working and upkeep of the main and auxiliary machinery, and boiler plant on board a ship
Marine propulsion	The mechanism or system used to generate thrust to move a ship or boat across water
Officer of the watch	The officer in charge of the watch
Steam propulsion	Involves the use of coal or other steam-generating fuels to propel the vessel
Watch officer	An officer taking his or her turn as officer of the watch

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Code Book Legend

Sample: PMTE11EMN-III-a-c-1

LEGEND		SAMPLE	
First Entry	Learning Area and Strand/ Subject or Specialization	Introduction To Marine Transportation and Engineering (STEM)	PMTE 11
	Grade Level	Grade 11	
Uppercase Letter/s	Domain/Content/ Component/ Topic	Explain Marine Navigation	EMN
			-
Roman Numeral <i>*Zero if no specific quarter</i>	Quarter	Third Quarter	III
Lowercase Letter/s <i>*Put an en dash (–) in between letters to indicate more than a specific week</i>	Week	Week One to Three	a–c
			-
Arabic Number	Competency	Discuss that a ship navigates the vast ocean using	1

DOMAIN/ COMPONENT	CODE
Introduction to Marine Transportation and Engineering	IMTE
Explain Marine Navigation	EMN
Explain Basic Marine Meteorology	EBMM
Explain Basic Ship Handling	EBSH
Explain Ship Operation	ESO
Explain Shipboard Communication	ESC
Discuss the Two Primary Systems on Board	DTPS
Explain the Common Types of Marine Propulsion and Ancillary Machineries on Board	ECTM
Explain the Components of the Electric Power Supply System on Board	ECEP
Discuss the Basic Engine Watchkeeping on Board	DBEW

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Reference

International Maritime Organization. *International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (STCW) and STCW Code including the 2010 Manila Amendments*. London: International Maritime Organization, 2011.