Republic of the Philippines
OFFICE OF THE PRESIDENT
COMMISSION ON HIGHER EDUCATION

DNV Cert. No. 2001

CHED MEMORANDUM ORDER (CMO)
NO. 13 ;
Series of 2005

SUBJECT: POLICIES, STANDARDS AND GUIDELINES (PSG) FOR MARITIME EDUCATION (2005 REVISION)

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In accordance with the pertinent provisions of Republic Act (RA) No. 7722, otherwise known as the "Higher Education Act of 1994," and by virtue of Resolution No. 134 of the Commission en banc dated March 28, 2005, and for the purpose of complying with the requirements of the International Standards of Training, Certification and Watchkeeping for Seafarers (STCW) '78, as amended and for rationalizing maritime education in the country with the end in view of keeping abreast with the latest thrusts, and demands for global competitiveness, the following policies, standards and guidelines for maritime education are hereby adopted and promulgated by the Commission, thus:

Article I. Introduction

Section 1. Rationale and Background. It is the policy of the Commission on Higher Education (CHED) to establish and maintain Policies, Standards and Guidelines (PSGs) that will promote quality maritime education programs in the Philippines. Hence, the PSGs for maritime education shall be developed, approved and reviewed in accordance with the provisions of the STCW '78, as amended and such other international laws and conventions. The 2005 revision of the maritime education PSGs emerged as a result of careful revision, review and consolidation of the three (3) PSGs implemented by CHED from 1997 to 1999. These are CMO 51, s. 1997, CMO 38, s. 1998 and CMO 10, s. 1999. Said review and revision was undertaken by qualified technical experts from the academe, industry, professional organizations, government concerned agencies and other stakeholders, making sure that the national standards and STCW requirements are incorporated. It has also undergone several public hearings and further review by the Technical Panel for Maritime Education (TPME), a consultative and recommendatory body, before it was recommended to the Commission through the Office of Programs and Standards for issuance to the maritime institutions for implementation.

Article II. Authority to Operate

Section 2. Maritime Education Programs (MEPs). The maritime education programs namely, the Bachelor of Science in Marine Transportation (BSMT) and the Bachelor of Science in Marine Engineering (BSMarE) shall be operated only by institutions of higher learning with proper authority granted by the Commission on Higher Education (CHED) and by the respective Boards in case of chartered State Universities and Colleges (SUCs).

An educational institution applying to offer new maritime program/s shall comply with all the provisions of this CMO.

Section 3. Filing and Processing of Application for New Program/s Offering

3.1. Filing of application

.1 The Chairman of the Governing Board of a duly registered educational corporation, or its president or school head when so authorized by its Governing Board, shall file with the CHEDRO concerned an application under oath for a permit to operate maritime program/s.

.2 The HEIs must submit complete application documents not later than the 1st Monday of June of the year preceding the intended year of operation.

3.2. Processing of Application

.1 The evaluation and processing of application shall be from receipt of the application but not later than January 31 of the ensuing year which includes:
a. evaluation of documentary requirements by the CHED Regional Offices (CHEDROs);
b. evaluation of documents based on this CMO by the CHED Central Office;
c. actual inspection by the CHED Technical Assessors to verify compliance; and
d. action of the CEB.

.2 If an application is disapproved only one (1) request for reconsideration shall be allowed, provided however, said request must be filed within 15 days from receipt of disapproval of the CEB.

Article III. Program Specifications

Section 4. Degree Name

4.1. Bachelor of Science in Marine Transportation (BSMT)

4.2. Bachelor of Science in Marine Engineering (BSMarE)

Section 5. Program Objectives

5.1 The objectives of the abovementioned maritime education programs shall:

.1 equip students with sufficient knowledge, skills, competencies, attitudes and values in compliance with the national as well as those with the requirements of the STCW '78, as amended and such other international laws and conventions;

.2 train students to pursue a professional career or advanced studies in any maritime field of specialization; and

.3 produce graduates that meet the minimum requirements of the STCW '78, as amended;

Article IV. Competency Standards

Section 6. As prescribed under the provisions of the STCW Convention particularly Regulation II/1 and Regulation III/1, every officer in charge of a navigational watch serving on a seagoing ship of 500 gross tonnage or more shall hold an appropriate certificate. Likewise, every officer in charge of an engineering watch in a manned engine-room or designated duty engineer officer in a periodically unmanned engine-room on a seagoing ship powered by main propulsion machinery of 750 kW propulsion power or more shall hold an appropriate certificate.

Section 7. The mandatory minimum requirements for certification of officers in charge of a navigational watch on ships of 500 gross tonnage or more are as follows:

7.1 Standard of Competence.

.1 Every candidate for certification shall:

a. be required to demonstrate the competence to undertake, at operational level, the tasks, duties and responsibilities listed in Column 1, Section 8,

b. at least holder of an appropriate certificate for performing VHF radio communications in accordance with the requirements of the Radio Regulations, and

c. if designated to have primary responsibility for radio communications during distress incidents, hold an appropriate certificate issued or recognized under the provisions of the Radio Regulations.

.2 The minimum knowledge, understanding and proficiency required for certification is listed in Column 2, Section 8,

.3 The level of knowledge of the courses listed in Column 2, Section 8, shall be the minimum requirements for officers of the watch to carry out their watchkeeping duties,

.4 To achieve the necessary level of Training and experience, proficiency shall be based in Section A-VIII/2, part 3-1 of the STCW Code – Principles to be observed in keeping a navigational watch, and shall also take into account the relevant requirements of this part and the guidance given in part B of the said STCW Code, and

.5 Every candidate for certification for a Bachelor's degree shall be required to provide evidence of having achieved the required standards of competence in accordance with the methods for demonstrating competence and the criteria for evaluating competence tabulated in columns 3 and 4, Section 8.

7.2 On-Board Training

.1 Every candidate for shipboard training shall be in accordance with paragraph 2.2, regulation II/1 of the STCW 78, as amended, as follows:

a. be onboard ship of 500 gross tonnage or more,
b. receives systematic practical training and experience in the tasks, duties and responsibilities,
c. monitored and evaluated by qualified officers, and
d. documented in a CHED-approved Training Record Book.

Section 8. Specification of minimum standard of competence for officers in charge of a navigational watch on ships of 500 gross tonnage or more.

8.1 Navigation at the operational level

Competence (1)	**Knowledge, Understanding and Proficiency** (2)	**Methods for Demonstrating Competence** (3)	**Criteria for Evaluating Competence** (4)
Plan and conduct a passage and determine position	*Celestial navigation* Ability to use celestial bodies to determine the ship's position *Terrestrial and coastal navigation* Ability to determine the ship's position by the use of:	Examination and assessment of evidence obtained from one or more of the following:	The information obtained from navigational charts and publication is relevant, interpreted correctly and properly applied. All potential navigational hazards are accurately identified

Competence (1)	Knowledge, Understanding and Proficiency (2)	Methods for Demonstrating Competence (3)	Criteria for Evaluating Competence (4)
	.1 landmarks .2 aids to navigation, including lighthouses, beacons and buoys .3 dead reckoning, taking into account winds, tides, currents and estimated speed	.1 approved in-service experience .2 approved training ship experience .3 approved simulator training, where appropriate .4 approved laboratory equipment training using chart catalogues, charts, navigational publications, radio navigational warnings, sextants, azimuth mirror, electronic navigation equipment, echo-sounding equipment, compass	The primary methods of fixing the ship's position is the most appropriate to the prevailing circumstances and conditions The position is determined within the limits of acceptable instrument/system errors The reliability of the information obtained from the primary method of positions fixing is checked at appropriate intervals Calculations and measurements of navigational information are accurate
Plan and conduct a passage and determine position *(continuation)*	Thorough knowledge of and ability to use navigational charts and publications, such as sailing directions, tide tables, notices to mariners, radio navigational warnings and ship's routing information NOTE: ECDIS systems are considered to be included under the term "charts" *Electronic system of position fixing and navigation* Ability to determine the ship's position by the use of electronic navigational aids *Echo-sounders* Ability to operate the equipment and apply the information correctly		The charts selected are the largest scale suitable for the area of navigation and charts and publications are corrected in accordance with the latest information available Performance checks and tests to navigation systems comply with manufacturer's recommendations and good navigational practice

Competence (1)	Knowledge, Understanding and Proficiency (2)	Methods for Demonstrating Competence (3)	Criteria for Evaluating Competence (4)
Plan and conduct a passage and determine position *(continuation)*	*Compass – magnetic and gyro* Knowledge of the principles of magnetic and gyro-compasses		
	Ability to determine errors of the magnetic and gyro-compasses, using celestial and terrestrial means, and to allow for such errors		Errors in magnetic and gyro-compasses are determined and correctly applied to courses and bearings
	Steering control systems Knowledge of steering control systems, operational procedures and change-over from manual to automatic control and vice-versa. Adjustment of controls for optimum performance		The selection of the mode of steering is the most suitable for the prevailing weather , sea and traffic conditions and intended maneuvers
	Meteorology Ability to use and interpret information obtained from shipborne meteorological instruments		Measurements and observations of weather conditions are accurate and appropriate to the passage
	Knowledge of the characteristics of the various weather systems, reporting procedures and recording systems		
	Ability to apply the meteorological information available		Meteorological information is correctly interpreted and applied

Competence (1)	Knowledge, Understanding and Proficiency (2)	Methods for Demonstrating Competence (3)	Criteria for Evaluating Competence (4)
Maintain a safe navigational watch	*Watchkeeping* Thorough knowledge for the content, application and intent of the International Regulation for Preventing collisions at sea Thorough knowledge of the Principles to be observed in keeping a navigational watch Thorough knowledge of effective bridge teamwork procedures The use of routing in accordance with General Provisions on Ships' Routing	Examination and assessment of evidence from one or more of the following: .1 approved in-service experience; .2 approved training ship experience .3 approved simulator training, where appropriate .4 approved laboratory equipment training	The conduct, handover and relief of the watch conforms with accepted principles and procedures A proper look-out is maintained at all times and in such a way as to conform to accepted principles and procedures Lights, shapes and sound signals conform with the requirement contained in the International Regulations for Preventing Collisions at Sea and are correctly recognized The frequency and extent of monitoring of traffic, the ship and the environment conform with accepted principles and procedures A proper record is maintained of the movements and activities relating to the navigation of the ship Responsibility for the safety of navigation is clearly defined at all times, including periods when the master is on the bridge and while under pilotage

Competence (1)	Knowledge, Understanding and Proficiency (2)	Methods for Demonstrating Competence (3)	Criteria for Evaluating Competence (4)
Use of radar and ARPA to maintain safety of navigation Note: Training and assessment in the use of ARPA is not required for those who serve exclusively on ships not fitted with ARPA. This limitation shall be reflected in the endorsement issued to seafarer concerned.	*Radar navigation* Knowledge of the fundamentals of radar and automatic radar plotting aids (ARPA) Ability to operate and to interpret and analyse information obtained from radar, including the following: Performance, including .1 Factor affecting performance and accuracy .2 Setting up and maintaining displays. .3 Detection of misrepresentation of information, false echoes ,sea return, etc., racons and SART's Use, including: .1 Range and bearing; course and speed other ships; time and distance of closest approach of crossing, meeting overtaking ships .2 Identification of critical echoes; detecting course and speed changes of other ship's effect of changes in own ship's course or speed or both .3 Application of the International Regulations for Preventing Collisions at Sea .4 Plotting techniques and relative and true motion concepts .5 Parallel indexing	Assessment of evidence obtained from approved radar simulator and ARPA simulator training plus in-service experience.	Information obtained from radar and ARPA is correctly interpreted and analysed, taking into account the limitations of the equipment and prevailing circumstances and conditions. Action taken to avoid a close encounter or collision with other vessels is in accordance with the International Regulation for Preventing Collisions at Sea. Decisions to amend course and/or speed are both timely and in accordance with accepted navigation practice. Adjustments made to the ship's course and speed maintain safety navigation Communication is clear, concise and acknowledged at all times in a seamanlike manner Manoeuvring signals are made at the appropriate time and are in accordance with the International Regulations for Preventing Collisions at Sea

Competence (1)	Knowledge, Understanding and Proficiency (2)	Methods for Demonstrating Competence (3)	Criteria for Evaluating Competence (4)
Use of radar and ARPA to maintain safety of navigation *(Continuation)* Note: Training and assessment in the use of ARPA is not required for those who serve exclusively on ships not fitted with ARPA. This limitation shall be reflected in the endorsement issued to seafarer concerned.	Principal types of ARPA, their display characteristics, performance standards and the dangers of over-reliance on ARPA Ability to operate and to interpret and analyze information obtained from ARPA, including: .1 System performance and accuracy, tracking capabilities and limitations, and processing delays .2 use of operational warnings and system tests .3 methods of target acquisition and their limitations .4 true and relative vectors, graphic representation of target information and danger areas .5 deriving and analyzing information, critical echoes, exclusion areas and trial manoeuveres		
Respond to emergencies	*Emergency procedures* Precautions for the protection and safety of passengers in emergency situations Initial action to be taken following a collision or a grounding; initial damage assessment and control Appreciation of the procedures to be followed for rescuing persons from the sea, assisting a ship in distress, responding to emergencies which arise in port	Examination and assessment of evidence obtained from one or more of the following: .1 approved in-service experience; .2 approved training ship experience .3 approved simulator training, where appropriate .4 practical training	The type and scale of the emergency is promptly identified Initial actions and, if appropriate, manoevring of the ship are in accordance with contingency plans and are appropriate to the urgency of the situation and nature of the emergency

Competence (1)	Knowledge, Understanding and Proficiency (2)	Methods for Demonstrating Competence (3)	Criteria for Evaluating Competence (4)
Respond to a distress signal at sea	*Search and rescue* Knowledge of the contents of the IMO Merchant Ship Search and Rescue Manual (MERSAR)	Examination and assessment of evidence obtained from practical instruction or approved simulator training, where appropriate	The distress or emergency signal is immediately recognized Contingency plans and instructions in standing orders are implemented and complied with
Use the standard Marine Navigational Vocabulary as replaced by the IMO Standard Marine Communicatio n Phrases and use English in written and oral form	*English Language* Adequate knowledge of the English language to enable the officer to use charts and other nautical publications, to understand meteorological information and messages concerning ship's safety and operation, to communicate with other ships and coast stations and to perform the officer's duties also with a multilingual crew, including the ability to use and understand the Standard Marine Navigational Vocabulary as replaced by the IMO Standard Marine Communication Phrases	Examination and assessment of evidence obtained from practical instruction	English language navigational publications and messages relevant to the safety of the ship are correctly interpreted or drafted Communication are clear and understood
Transmit and receive information by visual signaling	*Visual signaling* Ability to transmit and receive signals by Morse light Ability to use the International Code of Signals	Assessment of evidence obtained from practical instruction	Communication within the operator's area of responsibility are consistently successful

Competence (1)	Knowledge, Understanding and Proficiency (2)	Methods for Demonstrating Competence (3)	Criteria for Evaluating Competence (4)
Manoeuvre the ship	*Ship manoeuvring* Knowledge of: .1 the effects of deadweight, draught, trim, speed and underkeel clearance on turning circles and stopping distances .2 the effects of wind and current on ship handling .3 manoevres and procedures for the rescue of person overboard .4 squat, shallow-water and similar effects .5 proper procedures for anchoring and mooring	Examination and assessment of evidence obtained from one or more of the following: .1 approved in-service experience; .2 approved training ship experience .3 approved simulator training, where appropriate .4 approved training on a manned scale ship model where appropriate	Safe operating limits of ship propulsion, steering and power systems are not exceeded in normal manoeuvres Adjustments made to the ship's course and speed maintain safety of navigation

8.2. Cargo Handling and Stowage

Monitor the loading, stowage, securing, care during the voyage and the unloading of cargoes	*Cargo Handling, stowage and securing* Knowledge of the effect of cargo including heavy lifts on the seaworthiness and stability of the ship Knowledge of safe handling, stowage and securing of cargoes including dangerous, hazardous and harmful cargoes and their effect on the safety of life and of the ship Ability to establish and maintain effective communications during loading and unloading	Examination and assessment of evidence obtained from one or more of the following: .1 approved in-service experience; .2 approved training ship experience .3 approved simulator training, where appropriate	Cargo operations are carried out in accordance with the cargo plan or other documents and established safety rules/regulation, equipment operating instructions and shipboard stowage limitations The handling of dangerous, hazardous and harmful cargoes complies with international regulations and recognized standards and codes of safe practice Communications are clear, understood and consistently successful

Competence (1)	Knowledge, Understanding and Proficiency (2)	Methods for Demonstrating Competence (3)	Criteria for Evaluating Competence (4)
Inspect and report defects and damage to cargo spaces, hatch covers and ballast tanks	Knowledge* and ability to explain where to look for damage and defects most commonly encountered due to: .1 loading and unloading operations .2 corrosion .3 severe weather conditions Ability to state which parts of the ship shall be inspected each time in order to cover all parts within a given period of time Identify those elements of the ship structure which are critical to the safety of the ship State the causes of corrosion in cargo spaces and ballast tanks and how corrosion can be identified and prevented Knowledge of procedures on how the inspections shall be carried out Ability to explain how to ensure reliable detection of defects and damages Understanding of the purpose of the "enhanced survey programme"	Examination and assessment of evidence obtained from one or more of the following: .1 approved in-service experience; .2 approved training ship experience .3 approved simulator training, where appropriate	The inspections are carried out in accordance with laid-down procedures and defects and damage are detected and properly reported Where no defects or damage are detected, the evidence from testing and examination clearly indicates adequate competence in adhering to procedures and ability to distinguish between normal and defective or damaged parts of the ship

**It should be understood that deck officers need not be qualified in the survey of ships.*

8.3. Controlling the operation of the ship and care for persons on board

Competence *(1)*	***Knowledge, Understanding and Proficiency*** *(2)*	***Methods for Demonstrating Competence*** *(3)*	***Criteria for Evaluating Competence*** *(4)*
Ensure compliance with pollution-prevention requirements	*Prevention of pollution of the marine environment and anti-pollution procedures* Knowledge of the precautions to be taken to prevent pollution of the marine environment Anti-pollution procedures and all associated equipment	Examination and assessment of evidence obtained from one or more of the following: .1 approved in-service experience; .2 approved training ship experience	Procedures for monitoring shipboard operations and ensuring compliance with MARPOL requirements are fully observed
Maintain seaworthiness of the ship	*Ship stability* Working knowledge and application of stability, trim and stress tables, diagrams and stress-calculating equipment Understanding of fundamental actions to be taken in the event of partial loss of intact buoyancy Understanding of the fundamentals of watertight integrity *Ship construction* General knowledge of the principal structural members of a ship and the proper names for the various parts	Examination and assessment of evidence obtained from one or more of the following: .1 approved in-service experience; .2 approved training ship experience .3 approved simulator training, where appropriate .4 approved laboratory equipment training	The stability conditions comply with the IMO intact stability criteria under all conditions of loading Actions to ensure and maintain the watertight integrity of the ship are in accordance with accepted practice

Competence (1)	Knowledge, Understanding and Proficiency (2)	Methods for Demonstrating Competence (3)	Criteria for Evaluating Competence (4)
Prevent, control and fight fires on board	*Fire prevention and fire-fighting appliances* Knowledge of fire prevention Ability to organize fire drills Knowledge of classes and chemistry of fire Knowledge of fire-fighting systems Knowledge of action to be taken in the event of fire, including fires involving oil systems	Assessment of evidence obtained from approved fire-fighting training and experience as set out in section A-VI/3 of the STCW 78, as amended	The type and scale of the problem is promptly identified and initial actions conform with the emergency procedure and contingency plans for the ship Evacuation, emergency shutdown and isolation procedures are appropriate to the nature of the emergency and are implemented promptly The order of priority, and the levels and time-scales of making reports and informing personnel on board, are relevant to the nature of the emergency and reflect the urgency of the problem
Operate Life-saving appliances	Life-saving Ability to organize abandon ship drills and knowledge of the operation of survival craft and rescue boats, their launching appliances and arrangements, and their equipment, including radio life-saving appliances, satellite EPIRBs, SARTs, immersion suits and thermal protective aids. Knowledge of survival at sea techniques	Assessment of evidence obtained from approved training and experience as set out in section A-VI/2, paragraphs 1 to 4 of the STCW 78, as amended	Actions in responding to abandon ship and survival situations are appropriate to the prevailing circumstances and conditions and comply with accepted safety practices and standards

Competence (1)	Knowledge, Understanding and Proficiency (2)	Methods for Demonstrating Competence (3)	Criteria for Evaluating Competence (4)
Apply medical first aid on board ship	*Medical aid* Practical application of medical guides and advice by radio, including the ability to take effective action based on such knowledge in the case of accidents or illnesses that are likely to occur on board ship	Assessment of evidence obtained from approved training as set out in section A-VI/4, paragraphs 1 to 3 of the STCW 78, as amended	The identification of probable cause, nature and extent of injuries or conditions is prompt and treatment minimizes immediate threat to life
Monitor compliance with legislative requirements	Basic working knowledge of the relevant IMO conventions concerning safety of life at sea and protection of the marine environment	Assessment evidence obtained from examination or approved training	Legislative requirements relating to safety of life at sea and protection of the marine environment are correctly identified

Section 9. The mandatory minimum requirements for certification of officers in charge of an engineering watch in a manned engine-room or as designated duty engineers in a periodically unmanned engine-room on a seagoing ship powered by main propulsion machinery of 750 kW propulsion power or more are as follows:

9.1 Standard of Competence.

.1 Every candidate for certification as officer in charge of an engineering watch in a manned engine-room or as designated duty engineer in a periodically unmanned engine-room on a seagoing ship powered by main propulsion machinery of 750 kW propulsion power or more shall be required to demonstrate ability to undertake, at the operational level, the tasks, duties and responsibilities listed in Column 1, Section 10.

.2 The minimum knowledge, understanding and proficiency required for certification is listed in Column 2, Section 10.

.3 The level of knowledge of the material listed in column 2, Section 10, shall be sufficient for engineer officers to carry out their watchkeeping duties

.4 to achieve the necessary training and experience, proficiency shall be based on section A-VIII/2, part 3-2 of the STCW Code – Principles to be observed in keeping an engineering watch, and shall take into account the relevant requirements of this part and the guidance given in part B of the STCW Code.

.5 Every candidate for certification shall be required to provide evidence of having achieved the required standard of competence in accordance with the methods for demonstrating competence and the criteria for evaluating competence tabulated in columns 3 and 4, Section 10.

9.2 On-Board Training

.1 Every candidate for shipboard training shall be in accordance with the regulation III/1 of the STCW 78, as amended, as follows:

a. be onboard ship powered by main propulsion machinery of 750 kW propulsion power or more,

b. receives systematic practical training and experience in the tasks, duties and responsibilities,

c. monitored and evaluated by qualified officers, and

d. documented in a CHED-approved Training Record Book.

Section 10. Specification of minimum standard of competence for officers in charge of an engineering watch in a manned engine-room or designated duty engineers in a periodically unmanned engine-room on a seagoing ship powered by main propulsion machinery of 750 kW propulsion power or more as follows:

10.1 Marine Engineering at the operational level

Competence (1)	**Knowledge, Understanding and Proficiency** (2)	**Methods for Demonstrating Competence** (3)	**Criteria for Evaluating Competence** (4)
Use appropriate tools for fabrication and repair operations typically performed on ships	Characteristics and limitations of materials used in construction and repair of ships and equipment Characteristics and limitations of processes used for fabrication and repair Properties and parameters considered in the fabrication and repair of systems and components	Assessment of evidence obtained from one or more of the following: .1 approved workshop skills training; .2 approved practical experience and tests	Identification of important parameters for fabrication of typical ship related components is appropriate Selection of material is appropriate Fabrication is to designed tolerances

Competence (1)	Knowledge, Understanding and Proficiency (2)	Methods for Demonstrating Competence (3)	Criteria for Evaluating Competence (4)
Use hand tools and measuring equipment for dismantling, maintenance, repair and reassembly of shipboard plant and equipment	Application of safe working practices in the workshop environment Design characteristics and selection of materials in construction of equipment Interpretation of machinery drawings and handbooks Operational characteristics of equipment and systems	Assessment of evidence obtained from one or more of the following: .1 approved workshop skills training; .2 approved practical experience and tests	Use of equipment and machine tools is appropriate and safe Safety procedures followed are appropriate Selection of tools and spare gear is appropriate Dismantling, inspecting, repairing and reassembling equipment is in accordance with manuals and good practice Re-commissioning and performance testing is in accordance with manuals and good practice
Use hand tools, electrical and electronic measuring and test equipment for faulty finding, maintenance and repair operations	Safety requirements for working on shipboard electrical systems Construction and operational characteristics of shipboard AC and DC electrical systems and equipment Construction and operation of electrical test and measuring equipment	Assessment of evidence obtained from one or more of the following: .1 approved workshop skills training; .2 approved practical experience and tests	Implementation of safety procedures is satisfactory Selection and use of test equipment is appropriate and interpretation of results is accurate Selection of procedures for the conduct of repair and maintenance is in accordance with manuals and good practice Commissioning and performance testing of equipment and systems brought back into service after repair is in accordance with manuals and good practice

Competence (1)	Knowledge, Understanding and Proficiency (2)	Methods for Demonstrating Competence (3)	Criteria for Evaluating Competence (4)
Maintain a safe engineering watch	Thorough knowledge of Principles to be observed in keeping an engineering watch, including: .1 duties associated with taking over and accepting a watch .2 routine duties undertaken during a watch .3 maintenance of the machinery space log-book and the significance of the readings taken .4 duties associated with handing over a watch Safety and emergency procedures; change-over of remote/automatic to local control of all systems Safety precautions to be observed during a watch and immediate actions to be taken in the event of fire or accident, with particular reference to oil systems	Assessment of evidence obtained from one or more of the following: .1 approved in-service experience .2 approved training ship experience .3 approved simulator training, where appropriate .4 approved laboratory equipment training	The conduct, handover and relief of the watch conforms with accepted principles and procedures The frequency and extent of monitoring of engineering equipment and systems conforms to manufacturers' recommendations and accepted principles and procedures, including Principles to be observed in keeping an engineering watch A proper record is maintained of the movements and activities relating to the ship's engineering systems
Use English in written and oral form	Adequate knowledge of the English language to enable the officer to use engineering publications and to perform engineering duties	Examination and assessment of evidence obtained from practical instruction	English language publications relevant to engineering duties are correctly interpreted Communications are clear and understood

Competence (1)	Knowledge, Understanding and Proficiency (2)	Methods for Demonstrating Competence (3)	Criteria for Evaluating Competence (4)
Operate main and auxiliary machinery and associated control systems	Main and auxiliary machinery: .1 preparation of main machinery and preparation of auxiliary machinery for operation .2 operation of steam boilers, including combustion systems .3 methods of checking water level in steam boilers and action necessary if water level is abnormal .4 location of common faults in machinery and plant in engine and boiler rooms and action necessary to prevent damage	Examination and assessment of evidence obtained from one or more of the following: .1 approved in-service experience .2 approved training ship experience .3 approved simulator training, where appropriate .4 approved laboratory equipment training	Operations are planned and carried out in accordance with established rules and procedures to ensure safety of operations and avoid pollution of the marine environment Deviations from the norm are promptly identified The output of plant and engineering systems consistently meets requirements, including bridge orders relating to changes in speed and direction The causes of machinery malfunctions are promptly identified and actions are designed to ensure the overall safety of the ship and the plant, having regard to the prevailing circumstances and conditions
Operate pumping systems and associated control systems	Pumping systems: .1 routine pumping operations .2 operation of bilge, ballast and cargo pumping systems	Examination and assessment of evidence obtained from one or more of the following: .1 approved in-service experience .2 approved training ship experience .3 approved simulator training, where appropriate .4 approved laboratory equipment training	Operations are planned and carried out in accordance with established rules and procedures to ensure safety of operations and avoid pollution of the marine environment

10.2 Electrical, electronic and control engineering

Competence (1)	Knowledge, Understanding and Proficiency (2)	Methods for Demonstrating Competence (3)	Criteria for Evaluating Competence (4)
Operate alternators, generators and control systems	*Generating plant* Appropriate basic electrical knowledge and skills Preparing, starting, coupling and changing over alternators or generators Location of common faults and action to prevent damage *Control systems* Location of common faults and action to prevent damage	Examination and assessment of evidence obtained from one or more of the following: .1 approved in-service experience .2 approved training ship experience .3 approved simulator training, where appropriate .4 approved laboratory equipment training	Operations are planned and carried out in accordance with established rules and procedures to ensure safety of operations
Maintain marine engineering systems, including control systems	*Marine systems* Appropriate basic mechanical knowledge and skills *Safety and emergency procedures* Safe isolation of electrical and other types of plant and equipment required before personnel are permitted to work on such plant or equipment	Examination and assessment of evidence obtained from one or more of the following: .1 approved in-service experience .2 approved training ship experience .3 approved simulator training, where appropriate .4 approved laboratory equipment training	Isolation, dismantling and reassembly of plant and equipment is in accordance with accepted practices and procedures. Action taken leads to the restoration of plant by the method most suitable and appropriate to the prevailing circumstances and conditions

10.3 Controlling the operation of the ship and care for persons on board

Competence (1)	Knowledge, Understanding and Proficiency (2)	Methods for Demonstrating Competence (3)	Criteria for Evaluating Competence (4)
Ensure compliance with pollution-prevention requirements	*Prevention of pollution of the marine environment* Knowledge of the precautions to be taken to prevent pollution of the marine environment Anti-pollution procedure and all associated equipment	Examination and assessment of evidence obtained from one or more of the following: .1 approved in-service experience .2 approved training ship experience	Procedures for monitoring shipboard operations and ensuring compliance with MARPOL requirements are fully observed

Competence (1)	Knowledge, Understanding and Proficiency (2)	Methods for Demonstrating Competence (3)	Criteria for Evaluating Competence (4)
Maintain seaworthiness of the ship	*Ship stability* Working knowledge and application of stability, trim and stress tables, diagrams and stress-calculating equipment Understanding of the fundamentals of watertight integrity Understanding of fundamental actions to be taken in the event of partial loss of intact buoyancy *Ship construction* General knowledge of the principal structural members of a ship and the proper names for the various parts	Examination and assessment of evidence obtained from one or more of the following: .1 approved in-service experience; .2 approved training ship experience .3 approved simulator training, where appropriate .4 approved laboratory equipment training	The stability conditions comply with the IMO intact stability criteria under all conditions of loading Actions to ensure and maintain the watertight integrity of the ship are in accordance with accepted practice
Prevent, control and fight fires on board	*Fire prevention and fire-fighting appliances* Knowledge of fire prevention Ability to organize fire drills Knowledge of classes and chemistry of fire Knowledge of fire-fighting systems Knowledge of action to be taken in the event of fire, including fires involving oil systems	Assessment of evidence obtained from approved fire-fighting training and experience as set out in section A-VI/3 of the STCW 78, as amended	The type and scale of the problem is promptly identified and initial actions conform with the emergency procedure and contingency plans for the ship Evacuation, emergency shutdown and isolation procedures are appropriate to the nature of the emergency and are implemented promptly The order of priority, and the levels and time-scales of making reports and informing personnel on board, are relevant to the nature of the emergency and reflect the urgency of the problem

Competence (1)	Knowledge, Understanding and Proficiency (2)	Methods for Demonstrating Competence (3)	Criteria for Evaluating Competence (4)
Operate Life-saving appliances	*Life-saving* Ability to organize abandon ship drills and knowledge of the operation of survival craft and rescue boats, their launching appliances and arrangements, and their equipment, including radio life-saving appliances, satellite EPIRBs, SARTs, immersion suits and thermal protective aids. Knowledge of survival at sea techniques	Assessment of evidence obtained from approved training and experience as set out in section A-VI/2, paragraphs 1 to 4 of the STCW 78, as amended	Actions in responding to abandon ship and survival situations are appropriate to the prevailing circumstances and conditions and comply with accepted safety practices and standards
Apply medical first aid on board ship	*Medical aid* Practical application of medical guides and advice by radio, including the ability to take effective action based on such knowledge in the case of accidents or illnesses that are likely to occur on board ship	Assessment of evidence obtained from approved training as set out in section A-VI/4, paragraphs 1 to 3 of the STCW 78, as amended	Identification of probable cause, nature and extent of injuries or conditions is prompt and treatment minimizes immediate threat to life
Monitor compliance with legislative requirements	Basic working knowledge of the relevant IMO conventions concerning safety of life at sea and protection of the marine environment	Assessment evidence obtained from examination or approved training	Legislative requirements relating to safety of life at sea and protection of the marine environment are correctly identified

Article V. Curriculum

Section 11. Curriculum description.

11.1 Curriculum Description for BSMT program

.1 The BSMT program has a total of 180 credit units. The program is comprised of the general education component, professional courses and the shipboard training (On-the-job Training).

.2 The general education courses are in accordance with the requirements of the CHED Memorandum Order No. 59 s. 1996 – The New General Education Curriculum (GEC) and the CHED Memorandum No. 04, s. 1997 – Guidelines for the Implementation of CMO No. 59, s. 1996.

.3 There must be at least 21 professional courses with a total of 70 credit units. The total contact time of said courses is 54 hours a week for lecture and 48 hours a week for laboratory.

.4 The supervised One Year Shipboard Training is part of the requirements of the STCW in which the students/cadets will be engaged in the actual operation of the ship and the performance of their tasks which shall be documented in the CHED approved Training Record Book. A total of 40 credit units shall be awarded to those students who satisfactorily fulfilled the requirements of the shipboard training.

.5 The sequencing of the courses according to pre-requisites and co-requisites must be observed.

11.2 Curriculum Description for BSMarE program

.1 The BSMarE program has a total of 187 credit units. The program is comprised of the general education component, professional courses and the shipboard training (On-the-job Training).

.2 The general education courses must be in accordance with the requirements of the CHED Memorandum Order No. 59 s. 1996 – The New General Education Curriculum (GEC) and the CHED Memorandum No. 04, s. 1997 – Guidelines for the Implementation of CMO No. 59, s. 1996.

.3 There must be at least 24 allied and professional courses with a total of 74 credit units. The total contact time of said courses is 57 hours a week for lecture and 51 hours a week for laboratory.

.4 A three (3) credit-unit course is allocated for the technical elective which can be selected from the following courses: Information Technology, Introduction to Ship Business Management and Introduction to Marine Surveying.

.5 The supervised One Year Shipboard Training is part of the requirements of the STCW in which the students/cadets will be engaged in the actual operation of the ship and the performance of their tasks which shall be documented in the

CHED approved Training Record Book. A total of 40 credit units shall be awarded to those students who satisfactorily fulfilled the requirements of the shipboard training.

.6 The sequencing of the courses according to pre-requisites and co-requisites must be observed.

Section 12. Curriculum outline:

12.1. BS Marine Transportation (BSMT)

.1 General Education

Course Name	Lec Hrs	Lab Hrs	Credit Unit
a. Language and Literature			
a.1. English			
.1 English 1 - Communication Skills	3	0	3
.2 English 2 - Communication Skills	3	0	3
.3 English 3 - Marine Vocabulary and Terms (Maritime English)	3	0	3
.4 English - Technical Writing with Oral Communication	3	0	3
ENGLISH	12	0	12
a.2. Filipino			
.1 Filipino 1 - Sining ng Pakikipagtalastasan	3	0	3
.2 Filipino 2 - Pagbasa/Pagsulat sa Iba't-ibang Disiplina	3	0	3
FILIPINO	6	0	6
a.3. Literature			
.1 World Geography	3	0	3
LITERATURE	3	0	3
TOTAL LANGUAGE AND LITERATURE	**21**		**21**
b. Mathematics and Natural Sciences			
b.1. Mathematics			
.1 College Algebra	3	0	3
.2 Plane and Spherical Trigonometry	5	0	5
.3 Solid Mensuration	3	0	3
MATHEMATICS	11	0	11
b.2. Natural Sciences			
.1 Physics 1	3	3	4
.2 Physics 2	3	3	4
.3 General Chemistry	3	3	4
NATURAL SCIENCES	9	9	12
TOTAL MATHEMATICS AND NATURAL SCIENCES	**20**	**9**	**23**
c. Social Sciences			
c.1. General Psychology with Alcohol and Drug Prevention, STD, HIV & AIDS Prevention	3	0	3
TOTAL SOCIAL SCIENCES	**3**	**0**	**3**
d. Mandated Courses			
d.1. Philippine History and Constitution	3	0	3
d.2. Life and Works of Rizal	3	0	3
TOTAL MANDATED COURSES	**6**	**0**	**6**
e. Computer			
e.1. Basic Computer Operation	2	3	3
TOTAL COMPUTER	**2**	**3**	**3**
GRAND TOTAL GE COURSES	**52**	**12**	**56**

.2 Core courses; BSMT Professional Courses

Courses			Function	Lec Hrs	Lab Hrs	Credit Unit
	Module	Course Name				
1	*Seam 1	Ships, Ship Routines & Construction	F-2/F-3	2	3	3
2	Seam 2	Cargo Handling & Stowage 1-Carriage of Non-Dangerous Goods	F-2	2	0	2
3	Seam 3	Cargo Handling & Stowage 2 - Carriage of Dangerous Goods	F-2	3	0	3
4	Seam 4	Stability and Trim	F-2/F-3	3	3	4
5	Seam 5	Ship Handling and Maneuvering	F-1	1	3	2
6	Nav 1	Terrestrial Navigation 1	F-1	3	3	4
7	Nav 2	Terrestrial Navigation 2	F-1	3	3	4
8	Nav 3	Celestial Navigation 1	F-1	3	3	4
9	Nav 4	Celestial Navigation 2	F-1	3	3	4
10	D-Watch 1	Deck Watchkeeping, Chapt. VIII	F-1	2	0	2
11	D-Watch 2	Collision Regulations	F-1	3	3	4
12	*Safety 1	Basic Safety 1	F-3	2	3	3
13	Mersar	Merchant Ships Search and Rescue	F-1	2	3	3
14	E Nav 1	Electronic Navigation, RADAR	F-1	2	6	4
15	E Nav 2	Electronic Navigation, ARPA	F-1	3	6	5
16	Mar Com	Radio Communication, INMARSAT/GMDSS	F-7	3	6	5
17	Mar Power	Basic Marine Engineering	F-1	3	0	3
18	*Pers Man	Shipboard Personnel Management	F-3	3	0	3
19	*Marlaw	Maritime Law	F-3	3	0	3
20	*Marpol	Marine Pollution and Prevention	F-3	3	0	3
21	Met Ocean	Meteorology & Oceanography	F-1	2	0	2
TOTAL PROFESSIONAL COURSES				**54**	**48**	**70**

Note: * - Common courses with BSMarE

.3 Shipboard Training

ONE YEAR SEAGOING SERVICE documented in a CHED-approved training record book is awarded with **40 Credit Units.** Seagoing service shall be supervised and include at least six months bridge watchkeeping duties under supervision of the Master or a qualified Officer.

Course Name	Function	Lec Hrs	Lab Hrs	Credit Unit
TOTAL SHIPBOARD TRAINING		**One (1) Year**		**40**

.4 Non-academic Courses

Course Name	Lec Hrs	Lab Hrs	Credit Unit
a. PE and NSTP			
a.1. Physical Education (PE)			
.1 PE 1 - Basic Swimming	0	2	2
.2 PE 2 - Physical Education 2	0	2	2
.3 PE 3 - Physical Education 3	0	2	2
.4 PE 4 - Physical Education 4	0	2	2
PHYSICAL EDUCATION	**0**	**8**	**(8)**
a.2. National Service Training Program (NSTP)			
.1 NSTP 1 - National Service Training Program			3
.2 NSTP 2 - National Service Training Program			3
NATIONAL SERVICE TRAINING PROGRAM			**(6)**
TOTAL NON-ACADEMIC COURSES	**0**	**8**	**(14)**

Summary of Total Number of Units of the BSMT curriculum

Courses	Lec Hrs	Lab Hrs	Credit Unit
1. GE COURSES	**52**	**12**	**56**
2. CORE/PROFESSIONAL COURSES	**54**	**48**	**70**
3. NON-ACADEMIC COURSES	**0**	**8**	**(14)**
SUB-TOTAL	**106**	**68**	**140**
4. SHIPBOARD TRAINING	**One (1) Year**		**40**
TOTAL CREDIT UNITS FOR BSMT			**180**

12.2. BS Marine Engineering (BSMarE)

.1 General Education

Course Name	Lec Hrs	Lab Hrs	Credit Unit
a. Language and Literature			
a.1. English			
.1 English 1 - Communication Skills	3	0	3
.2 English 2 - Communication Skills	3	0	3
.3 English 3- Marine Vocabulary and Terms (Maritime English)	3	0	3
.4 English 4-Technical Writing with Oral Communication	3	0	3
ENGLISH	12	0	12
a.2. Filipino			
.1 Filipino 1 - Sining ng Pakikipagtalastasan	3	0	3
.2 Filipino 2 - Pagbasa/Pagsulat sa ibat-ibang disiplina	3	0	3
FILIPINO	6	0	6
a.3. Literature			
.1 World Geography	3	0	3
LITERATURE	3	0	3
TOTAL LANGUAGE AND LITERATURE	**21**		**21**

b. Mathematics and Natural Sciences			
b.1. Mathematics			
.1 College Algebra	3	0	3
.2 Plane Trigonometry and Solid Mensuration	5	0	5
.3 Calculus and Analytic Geometry	3	0	3
MATHEMATICS	11	0	11
b.2. Natural Sciences			
.1 Physics 1	3	3	4
.2 Physics 2	3	3	4
.3 General Chemistry	3	3	4
NATURAL SCIENCES	9	9	12
TOTAL MATHEMATICS AND NATURAL SCIENCES	**20**	**9**	**23**

c. Social Sciences			
c.1. General Psychology with Alcohol and Drug Prevention, STD, HIV & AIDS Prevention	3	0	3
TOTAL SOCIAL SCIENCES	**3**	**0**	**3**

d. Mandated Courses			
d.1. Philippine History and Constitution	3	0	3
d.2. Life and Works of Rizal	3	0	3
TOTAL MANDATED COURSES	**6**	**0**	**6**

e. Computer			
e.1. Basic Computer Operation	2	3	3
TOTAL COMPUTER	**2**	**3**	**3**
GRAND TOTAL GE COURSES	**52**	**12**	**56**

.2 Core courses

a. Allied Courses

Courses	Function	Lec Hrs	Lab Hrs	Credit Unit
1. Marine Engineering Drawing & Design	F-1	1	3	2
2. Thermodynamics	F-1	4	0	4
3. Mechanics & Hydromechanics	F-1	4	0	4
4. Engineering Materials	F-1/F-3	3	0	3
Total		12	3	13

b. BSMarE Professional Courses

Courses	Function	Lec Hrs	Lab Hrs	Credit Unit
5. Machine shop 1	F-1	1	6	3
6. Machine shop 2	F-1	1	6	3
7. Machine shop 3	F-1	1	6	3
8. Electro Technology 1	F-2	2	3	3
9. Electro Technology 2	F-2	3	3	4
10. Electro Technology 3	F-2	3	3	4
11. Industrial Chemistry	F-1	2	0	2
12. Marine Automation	F-1	3	3	4
13. Instrumentation and Control	F-2	3	0	3
14. Shipboard Personnel Management	F-4	3	0	3
15. Ships and Ship Routines and Construction	F-4	2	3	3
16. Basic Safety	F-4	1	3	2
17. Introduction to Naval Architecture	F-4	2	0	2

18. Engine Room Watchkeeping	F-1	1	0	1
19. Marine Power Plant (Diesel)	F-1/F-3	3	3	4
20. Marine Power Plant (Steam)	F-1/F-3	3	3	4
21. Auxiliary Machinery 1	F-1/F-3	3	3	4
22. Auxiliary Machinery 2	F-1/F-3	2	3	3
23. Marine Pollution and Prevention	F-4	3	0	3
24. Maritime Law	F-4	3	0	3
Total		45	48	61

.4 Technical Elective courses (Any of the following courses):

Courses	Function	Lec Hrs	Lab Hrs	Credit Unit
1. Information Technology		3	0	3
2. Introduction to Ship Business Management				
3. Introduction to Marine Surveying				
Total		3		3

.3 Shipboard Training

ONE YEAR SEAGOING SERVICE documented in a CHED-approved training record book is awarded with **40 Credit Units**. Seagoing service shall be supervised and include at least six months duties in the engine department under supervision of the Chief Engineer or a qualified Officer.

Courses	Lec Hrs	Lab Hrs	Credit Unit
TOTAL SHIPBOARD TRAINING	**One (1) Year**		**40**

.4 Non-academic Courses

Courses	Lec Hrs	Lab Hrs	Credit Unit
a. PE and NSTP			
a.1. Physical Education (PE)			
.1 PE 1 – Basic Swimming	0	2	2
.2 PE 2 - Physical Education 2	0	2	2
.3 PE 3 - Physical Education 3	0	2	2
.4 PE 4 - Physical Education 4	0	2	2
PHYSICAL EDUCATION	**0**	**8**	**(8)**
a.2. National Service Training Program (NSTP)			
.1 NSTP 1 - National Service Training Program			3
.2 NSTP 2 - National Service Training Program			3
NATIONAL SERVICE TRAINING PROGRAM			**(6)**
TOTAL NON-ACADEMIC COURSES	**0**	**8**	**(14)**

Summary of Total Number of Units of the BSMarE curriculum

Courses	Lec Hrs	Lab Hrs	Credit Unit
1. GE COURSES	52	12	56
2. CORE/PROFESSIONAL/ELECTIVE COURSES	60	51	77
3. NON-ACADEMIC COURSES	0	8	(14)
SUB-TOTAL	112	71	147

4. SHIPBOARD TRAINING	One (1) Year		40
TOTAL CREDIT UNITS FOR BSMarE			**187**

Section 13. Sample/Model program of study

13.1. BS Marine Transportation (BSMT)

The institution may enrich the sample/model program of study depending on the needs of the industry, provided that all prescribed courses/competencies required in the curriculum outline are offered and pre-requisites and co-requisites are observed.

FIRST YEAR

First Semester					
Ref. No.	Module	Descriptive Title	Lec.	Lab.	Units
D16	*Math 1	College Algebra	3	0	3
D13	*Physics 1	Physics 1	3	3	4
D14	*English 1	English 1 - Communication Skills	3	0	3
D15	*Comp 1	Basic Computer Operation	2	3	3
D11	*Seam 1	Ships, Ship Routines & Construction	2	3	3
D12	Nav 1	Terrestrial Navigation 1	3	3	4
	*P.E. 1	Basic Swimming	0	2	(2)
	*NSTP	National Service Training Program			(3)
	Sub-total		16	14	25

Second Semester					
Ref. No.	Module	Descriptive Title	Lec.	Lab.	Units
D25	*Math 2	Plane and Spherical Trigonometry	5	0	5
D26	*Physics 2	Physics 2	3	3	4
D27	*English 2	English 2 - Communication Skills	3	0	3
D22	D-Watch 1	Deck Watchkeeping, Chapt. VIII	2	0	2
D23	Seam 2	Cargo Handling & Stowage 1-Carriage of Non-Dangerous Goods	2	0	2
D24	Nav 2	Terrestrial Navigation 2	3	3	4
D21	*Safety 1	Basic Safety 1	2	3	3
	*P.E. 2		0	2	(2)
	*NSTP	National Service Training Program			(3)
	Sub-total		20	11	28

SECOND YEAR

First Semester					
Ref. No.	Module	Descriptive Title	Lec.	Lab.	Units
D31	Nav 3	Celestial Navigation 1	3	3	4
D35	*Math 3	Solid Mensuration	3	0	3
D32	D-Watch 2	Collision Regulations	3	3	4
D34	*English 3	Marine Vocabulary and Terms (Maritime English)	3	0	3
D33	Seam 3	Cargo Handling & Stowage 2 - Carriage of Dangerous Goods	3	0	3
D36	*Chem 1	General Chemistry	3	3	4
	*P.E. 3		0	2	(2)
	Sub-total		18	11	23

Second Semester					
Ref. No.	Module	Descriptive Title	Lec.	Lab.	Units
D41	Nav 4	Celestial Navigation 2	3	3	4
D45	*Soc. Sci. 1	Philippine History and Constitution	3	0	3
D42	Mersar	Merchant Ships Search and Rescue	2	3	3
D46	*English 4	Technical Writing with Oral Communication	3	0	3
D43	E Nav 1	Electronic Navigation, RADAR	2	6	4
D44	Mar Com	Radio Communication, INMARSAT/GMDSS	3	6	5
	*P.E. 4		0	2	2
	Sub-total		16	20	24

THIRD YEAR

First Semester					
Ref. No.	Module	Descriptive Title	Lec.	Lab.	Units
D53	*Filipino 1	Sining ng Pakikipagtalastasan	3	0	3
D51	E Nav 2	Electronic Navigation, ARPA	3	6	5
D52	Mar Power	Basic Marine Engineering	3	0	3
D54	*Soc. Sci. 2	General Psychology with Alcohol and Drug Prevention, STD, HIV & AIDS Prev.	3	0	3
D55	Seam 4	Stability and Trim	3	3	4
D56	*Hum 1	World Geography	3	0	3
	Sub-total		18	9	21

Second Semester					
Ref. No.	Module	Descriptive Title	Lec.	Lab.	Units
D66	*Filipino 2	Pagbasa at Pagsulat sa Iba't Ibang Disiplina	3	0	3
D65	*Pers Man	Shipboard Personnel Management	3	0	3
D67	*Soc. Sci. 3	Life and Works of Rizal	3	0	3
D61	*Marlaw	Maritime Law	3	0	3
D62	*Marpol	Maritime Pollution and Prevention	3	0	3
D63	Seam 5	Ship Handling and Maneuvering	1	3	2
D64	Met Ocean	Meteorology & Oceanography	2	0	2
		Sub-total	18	3	19

These courses are identical for BSMT and BSMarE programs. 140

SHIPBOARD TRAINING

ONE YEAR SEAGOING SERVICE documented in a CHED-approved training record book is awarded with **40 Credit Units.** Seagoing service shall be supervised and include at least six months bridge watchkeeping duties under supervision of the Master or a qualified Officer.

GE, Core/Professional, Non-academic	**140**
Shipboard Training	**40**
Grand Total	**180**

13.2 BS Marine Engineering (BSMarE)

The institution may enrich the sample/model program of study depending on the needs of the students and industry, provided that all prescribed courses/competencies required in the curriculum outline are offered and pre-requisites and co-requisites are observed.

FIRST YEAR

First Semester					
Ref. No.	Module	Descriptive Title	Lec.	Lab.	Units
E13	*Math 1	College Algebra	3	0	3
E14	*English 1	English 1 - Communication Skills	3	0	3
E15	*Comp 1	Computer Operation	2	3	3
E11	*Seam 1	Ships & Ship Routines & Construction	2	3	3
E16	*Chem 1	General Chemistry	3	3	4
E12	E Materials 1	Engineering Materials 1	3	0	3
E17	*Fil. 1	Sining ng Pakikipagtalastasan	3	0	3
	*P.E. 1	Basic Swimming	0	2	(2)
	*NSTP	National Service Training Program	-	-	(3)
		Sub-total	19	11	27

Second Semester					
Ref. No.	Module	Descriptive Title	Lec.	Lab.	Units
E21 & E31	*Math 2	Plane Trigonometry and Solid Mensuration	5	0	5
E24	*Eng. 2	English 2 - Communication Skills	3	0	3
E12	*Safety 1	Basic Safety 1	1	3	2
E13	*Physics 1	Physics 1	3	3	4
E17	MaShop 1	Machine Shop 1	1	6	3
E18	Draw 1	Marine Engineering Drawing 1	1	3	2
E43	*Fil. 2	Pagbasa at Pagsulat sa Iba't-ibang Disiplina	3	0	3
	*P.E. 2	Physical Education 2	0	2	(2)
	*NSTP	National Service Training Program	-	-	(3)
		Sub-total	19	14	27

SECOND YEAR

First Semester					
Ref. No.	Module	Descriptive Title	Lec.	Lab.	Units
E32 & E41	*Math 3	Calculus and Analytic Geometry	3	0	3
E34	*Engl 3	Marine Vocabulary and Terms (Maritime English)	3	0	3
E35	Chem 2	Industrial Chemistry	2	0	2
E37	Electro 1	Electro Technology 1	2	3	3
E23	*Physics 2	Physics 2	3	3	4
E25	WKC	Watchkeeping for Eng. Officers	1	0	1
E27	MaShop 2	Machine Shop 2	1	6	3
E45	*Soc Sci 1	Philippine History, Constitution, Taxation and Land Reform	3	0	3
	Draw 2	Introduction to Naval Architecture	2	0	2
	*P.E. 3	Physical Education 3	0	2	(2)
		Sub-total	20	14	26

Second Semester					
Ref. No.	Module	Descriptive Title	Lec.	Lab.	Units
E44	*Engl 4	Technical Writing with Oral Communication	3	0	3
E46	Aux 1	Auxiliary Machinery 1	3	3	4
E 47	Electro 2	Electro Technology 2	3	3	4
E36	Power 1	Marine Power Plant (Diesel)	3	3	4
E38	MaShop 3	Machine Shop 3	1	6	3
E 51 & E61	Thermo	Thermodynamics	4	0	4
	*P.E. 4	Physical Education 4	0	2	(2)
Sub-total			17	17	24

THIRD YEAR

First Semester					
Ref. No.	Module	Descriptive Title	Lec.	Lab.	Units
E53	Electro 3	Electro Technology 3	3	3	4
E55	*Soc Sci 2	General Psychology with PADAMS, AIDS Prevention, and Family Planning	3	0	3
E57	Mechanics	Mechanics & Hydromechanics	4	0	4
E66	*MARPOL	Marine Pollution & Prevention	3	0	3
E67	Aux 2	Auxiliary Machinery 2	2	3	3
	Tech Elective	Technical Elective (Information Technology, Introduction to Ship Business Management or Introduction to Marine Surveying)	3	0	3
E56	*Hum 1	World Geography	3	0	3
Sub-total			21	6	23

Second Semester					
Ref. No.	Module	Descriptive Title	Lec.	Lab.	Units
E62	*Persman	Shipboard Personnel Management	3	0	3
E65	*MARLAW	Maritime Law	3	0	3
E52	Auto	Marine Automation	3	3	4
E54	Power 2	Marine Power Plant (Steam)	3	3	4
E64	*Soc Sci 3	Life and Works of Rizal	3	0	3
	Instru. & Cont.	Instrumentation & Control	3	-	3
Sub-total			18	6	20

These courses are identical for BSMT and BSMarE programs. 147

SHIPBOARD TRAINING

ONE YEAR SEAGOING SERVICE documented in a CHED-approved training record book is awarded with 40 Credit Units. Seagoing service shall be supervised and include at least six months duties in the engine department under supervision of the Chief Engineer or a qualified Officer.

GE, Core/Professional, Non-academic	**147**
Shipboard Training	**40**
Grand Total	**187**

Section 14. The Basic Safety Courses (BSC) as required in Section A-VI/1; paragraph 2 of the STCW Code shall form part of the curricula both for the Bachelor of Science in Marine Transportation (BSMT) and Bachelor of Science in Marine Engineering (BSMarE) programs, as follows:

14.1. BSC shall appear in the Transcript of Records (TOR) as follows:

- Personal Survival Techniques;
- Fire Prevention and Fire Fighting;
- Elementary First Aid; and
- Personal Safety and Social Responsibility

14.2. The following IMO Model Courses shall be used as guide in the BSC Course Requirements:

- Personal Survival Techniques - IMO Model Course 1.19
- Fire Prevention & Fire Fighting - IMO Model Course 1.20
- Elementary First Aid - IMO Model Course 1.3
- Personal Safety & Social Responsibility - IMO Model Course 1.21

14.3. Complete physical and equipment requirements shall be set-up within the school campus. In cases were the school cannot set-up said requirements within the school campus, the following conditions may be allowed subject to the approval of the Commission:

.1 Maritime institutions located in the National Capital Region (NCR) shall be allowed to set-up their fire fighting facilities outside NCR provided that the site shall be made within the neighboring provinces, e.g. Rizal, Batangas, Cavite, Laguna, or Bulacan. Provided, further, that the site shall be owned by the institution concerned.

.2 Maritime institutions already owned accredited training centers outside the school campus shall be allowed only within the city or province, subject to environmental compliance.

.3 Maritime institutions setting up their Basic Safety Course facilities outside the school campus shall be allowed only within the city or province subject to environmental compliance

14.4. Issuance of Certificate of Completion. The maritime institutions upon verifying compliance against the course requirements for the Basic Safety Courses may issue "Certificate of Completion" to the qualified students **using the attached prescribed form – MEUF-CC-1.**

14.5. Section 16, Article V of CMO 38, s. 1998 and its referenced, Annex III shall be terminated starting 2nd Semester of School Year 2005-2006. Hence, all maritime institutions including HEIs applying for new maritime program offerings must establish their own facilities needed for the conduct of both theoretical and practical instructions of the said Basic Safety Courses.

14.6. Monitoring and evaluation to determine compliance with the abovementioned requirements shall be conducted starting November 2005.

Section 15. Courses involving the Use of Simulators. The courses involving the use of simulators such as Global Maritime Distress and Safety System (GMDSS), Radio Detection and Ranging (RADAR), and Automatic Radar Plotting Aids (ARPA) shall be an integral part of the curriculum based on the training requirements under the relevant provisions of the STCW 78, as amended. These shall be reflected in the Transcript of Records (TOR).

Section 16. Shipboard Training. The shipboard training, a One-Year Seagoing Service shall be in accordance with the following:

16.1 The said shipboard training may be taken as appropriate after the 1st, 2nd or 3rd curriculum year.

16.2. The required shipboard training of deck and engine cadets must be documented in a CHED approved training record book of which at least six (6) months is associated with relevant watchkeeping duties under the supervision of a qualified officer.

16.3. The shipboard training shall be undertaken only after the completion of Basic Safety Courses.

Section 17. Unstructured Sea-Going Experience. Students have the option to undergo three years of unstructured sea-going experience, provided however, that such six (6) months is associated with relevant watchkeeping duties.

Article VI. Course Specifications

Section 18. The course specifications for the BSMT and BSMarE programs are contained in **Annexes I and II,** respectively of this Memorandum.

1. Course Name
2. Course Description
3. Number of units for lecture and laboratory
4. Number of contact hours per week
5. Prerequisites
6. Course Objectives
7. Course Outline/Learning Objectives
8. Equipment
9. References

Article VII. General Requirements

Section 19. Program Administration. There must be a separate college in the administration of maritime education programs. A full-time Dean assisted by a Department Head/s shall administer the maritime programs with the following qualifications:

19.1. Qualifications of a Dean

.1 The Dean must possess relevant academic degrees, certificate, experiences and credentials as follows:

.1.1. Completed Academic Requirements (CAR) in any field of master's studies with BSMT or BSMarE degree, however, within two (2) years, the Dean must be a holder of master's degree.

.12. Holder of a management level certificate (PRC Certificate of Registration) with at least 24 months sea-going experience as chief mate or second engineer officer;

.13. With at least two (2) years teaching experience; and

.1.4. Completed the following training courses: IMO Model Course 6.09 and IMO Model Course 3.12 or their equivalents.

The Dean shall be allowed to handle a maximum teaching load of not more than 12 hours a week.

19.2. Qualifications of Unit/Department Head

.1 The Department head must possess relevant academic degree, certificate, experiences and credentials as follows:

.1.1 BSMT degree for the deck department or BSMarE degree for the engine department;

.1.2 Holder of a management level certificate (at least a chief mate for the deck department or second engineer officer for the engine department) with at least 12 months sea-going experience as C/M or 2/E;

.1.3 With at least two (2) years teaching experience; and

.1.4 Completed the following training courses: IMO Model Course 6.09 and IMO Model Course 3.12 or their equivalents.

The Department Head shall be allowed a maximum teaching load of 18 hours a week.

Section 20. Qualifications of Faculty

20.1. The faculty members for **General Education (GE)** shall have at least Completed Academic Requirements (CAR) in the master's studies in their own fields of specialization. However, new graduates shall be given 3 years to complete academic requirements in master's studies including comprehensive examination with completed IMO Model Course 6.09 or its equivalent.

20.2. The General Education (GE) faculty should teach only subjects in their fields of specialization.

20.3. Faculty members teaching **professional subjects for BSMT program** must possess relevant academic degree, certificate, experiences and credentials as follows:

.1 BSMT degree and other professional licenses in their field of specialization;

.2 Operational level certificate of registration and valid ID from PRC with at least 18 months sea-going experience as an officer on vessel over 1500 GT;
(For the newly hired faculty, he/she must be a holder of Certificate of Competency (COC) in the operational level.

.3 IMO Model Course 6.09 certificate or its equivalent.

The faculty may be allowed a maximum teaching load of 40 hours per week.

20.4. Faculty members teaching other **professional subjects for BSMT program requiring faculty with management level certificate** must possess relevant academic degree, certificate, experiences and credentials as follows:

.1 BSMT degree;

.2 Management level certificate of registration and valid ID from PRC with at least 12 months sea-going experience on management level on vessel over 3000 GT;

.3 IMO Model Course 6.09 certificate or its equivalent.

The faculty may be allowed a maximum teaching load of 40 hours per week.

20.5. **Faculty members conducting courses involving the use of simulators**, in addition to the requirements in paragraph 23.3 and 23.4 shall have the following:

.1 received appropriate guidance in instructional techniques involving the use of simulators and

.2 gained practical operational experiences on the particular type of simulators being used.

20.6. Faculty members teaching **allied courses for BSMarE program** must possess relevant academic degree, certificate, experiences and credentials as follows:

.1 BS Engineering degree in allied BSMarE program;

.2 Valid license for the profession or certificate of completed academic requirements for master's studies in their own field; and

.3 IMO Model Course 6.09 certificate or its equivalent.

The faculty may be allowed a maximum teaching load of 40 hours per week.

20.7. Faculty members teaching **technical/professional subjects for BSMarE program** must possess relevant academic degree, certificate, experiences and credentials as follows:

.1 BSMarE degree and other professional licenses in their field of specialization;

.2 Operational level certificate of registration and valid ID from PRC with at least 18 months sea-going experience as an officer on vessel over 750 kW propulsion power; and

.3 IMO Model Course 6.09 certificate or its equivalent.

The faculty may be allowed a maximum teaching load of 40 hours per week.

20.8. Faculty members teaching other **professional subjects for BSMarE program requiring faculty with management level certificate** must possess relevant academic degree, certificate, experiences and credentials as follows:

.1 BSMarE degree and other professional licenses in their field of specialization;

.2 Management level certificate of registration and valid ID from PRC with at least 12 months sea-going experience on management level on vessel over 750 kW propulsion power; and

.3 IMO Model Course 6.09 certificate or its equivalent.

The faculty may be allowed a maximum teaching load of 40 hours per week.

20.9. Maritime school shall designate **assessors** who have completed IMO Model Course 3.12 (Examination and Certification of Seafarers) or its equivalent.

Designated assessors shall not assess their own class.

20.10. Maritime institution must develop and implement a system of faculty development for professional advancement of the faculty members for the allied/professional subjects.

20.11. A faculty member with a very satisfactory teaching performance may be allowed to handle additional six (6) hours per week.

20.12. There shall be a faculty manual containing information and policies on:

.1 Hiring, retention, promotion and separation
.2 Functions and responsibilities
.3 Ranking system
.4 Evaluation
.5 Salary rates
.6 Faculty benefits
.7 Code of conduct/ethics

20.13. Faculty-Student Ratio - For effective teaching-learning process the following faculty-student ratio per class or per laboratory shall not be more than:

.1 Class - 1:50
.2 Laboratory - 1:25

Section 21. Technical Support Personnel. Technical Support Personnel particularly those in the laboratory must have the appropriate training or certification on laboratory supervision and safety.

21.1. Laboratory safety is the responsibility of the institution. The institution shall be responsible for keeping its laboratories properly used and maintained and free from dangers and hazards which may cause accidents or disease.

.1 All laboratory activities shall be properly and adequately supervised by a faculty member; students shall not be allowed to work inside the laboratories unsupervised;

.2 Each department with laboratory/ies shall have full-time laboratory technician/s to maintain laboratory facilities;

.3 Each department with laboratory/ies shall assign at least one personnel as the laboratory safety officer available at all times to respond to emergencies such as fire, chemical accidents, first aid needs, earthquakes, and other exigencies;

.4 The safety officer shall be properly trained, instructed and equipped to oversee the various safety measures. The institution shall ensure that safety officers undergo regular retraining and upgrading; and

.5 Laboratory safety officers shall be familiar with the emergency features of the laboratory and shall know the emergency procedures in cases of fires, accidents, earthquakes and chemical spills. They shall be familiar with basic first aid procedures.

Section 22. Library

22.1. Library Personnel

.1 Qualifications of Head Librarian:
- a. Appropriate or relevant professional training;
- b. Registered librarian;
- c. Master's degree (compliance within next three years)

.2 Number of Staff
- a. One full time professional librarian for every 1,000 students
- b. A ratio of 1 librarian to 2 staff/clerks

22.2. Library Holdings

.1 Basic Collection
- a. 3,000 volumes for start-up schools (50% of the holdings should be distinct titles)
- b. 5,000 volumes after two-years of operation (50% of the holdings should be distinct titles)

.2 Inclusion of Basic Collection
- a. General References
- b. Cultural
- c. Filipiniana
- d. Humanities
- e. Social Science
- f. Science and Technology
- g. General Education courses should have at least five (5) titles per course.

22.3. Professional Book Holdings

.1 Five (5) titles per professional course. Teacher Manuals are not counted as titles

.2 Published within the last 5 years

.3 The number of volumes is calculated at a ratio of 1 volume per 15 students enrolled in the course

.4 Maritime international laws, conventions, protocols and relevant publications as per listings in the attached Implementing Guidelines.

22.4. Periodical Collection
- .1 Newspapers
- .2 On-line subscriptions to Journals may be credited (1 international and 2 local)
- .3 Magazines
- .4 Bulletins
- .5 Reviews

22.5. Library Space. The library space should accommodate at least five percent (5%) of the total enrollment at any one time.

22.6. Networking. Libraries shall participate in inter-institutional activities and cooperative programs whereby resource sharing is encouraged.

Section 23. Facilities and Equipment

23.1. Maritime schools shall own its site and buildings to conform with CHED standards, building code and city/provincial ordinances.

23.2. The school site and building shall be equipped with adequate equipment, safety measures and procedures in the following:
- .1 Fire escape
- .2 Fire alarm systems
- .3 Campus security force

23.3. Site/Building/Room Requirements should include the following:

- .1 School site/lot
- .2 Athletic field and/or gymnasium
- .3 Administrative Offices (General or Executive Office, Registrar, Accounting, National Service Training Program (NSTP), Guidance/Placement office)
- .4 Medical and dental clinic
- .5 Toilets
- .6 Canteen/cafeteria
- .7 Faculty room
- .8 Student lounge
- .9 Library room
- .10 Tool room
- .11 Shipboard Training Office
- .12 Assessment Room

23.4. Classroom. The standard classroom shall be a minimum of 30 square meters for a class of 25 students and 56 square meters for a class of 50 students. Classrooms must be well-lighted and well-ventilated. They should contain the necessary equipment and furniture such as chairs, instructor's podium, and black/white boards.

23.5. Laboratory. The laboratory rooms should allow a space of 2 square meters per student for a laboratory size of 25 students or an appropriate space considering the size of equipment as per the attached Implementing Guidelines. They should be well-ventilated and well-lighted, contain the specific laboratory equipment and must be provided with adequate water supply. The following laboratory rooms shall be made available as follows:

- .1 Physics laboratory room
- .2 Chemistry laboratory room
- .3 Computer laboratory room
- .4 Basic safety courses laboratory room
- .5 Chart work area
- .6 Navigation and simulated-bridge room
- .7 Seamanship room
- .8 Simulator Rooms
  - .8.1 GMDSS
  - .8.2 RADAR
  - .8.3 ARPA
- .9 Machine shop
- .10 Steam plant
- .11 Refrigeration & Air-conditioning
- .12 Electrical laboratory room
- .13 Welding area

23.6. Laboratory Equipment. There shall be sufficient number of equipment, machinery, apparatus, supplies, tools and other materials, accessories and consumables for laboratory experiments and practical exercises as contained in **Annex III** which are made an integral part of these policies, standards and guidelines. The laboratory training equipment as contained in **Annex III** shall be adapted in the following:

- .1 Physical Sciences
- .2 Basic Safety Courses
- .3 Professional Subjects Laboratory Requirement

23.7. Sufficient and appropriate means that the number of such teaching aids and equipment shall be proportionate and adequate to the number of students enrolled in the particular subject **as contained in the attached Implementing Guidelines.**

23.8. Standards governing the use of simulators shall be contained in **Annex IV.**

23.9. The institution should provide the necessary audiovisual room and facilities with appropriate equipment in support of the teaching-learning process such as video/overhead/slide projector, sound system, LCD projectors, screens, and others.

Section 24. Admission, Retention and Residency

24.1. Maritime institutions shall adhere to the following admission and retention criteria:

.1 Student general admission requirements:

.1.1 High School graduate

.1.2 Annual medical examination following the prescribed Department of Health (DOH) medical requirements such as: Urine, Stool, CBC, X-Ray, Psycho, Eyesight (Ishihara for BSMT and Lantern or any other color perception test for BSMarE) and hearing examination.

.2 Retention of Students. The school shall adopt the following requirements:

.2.1 Assessment of students after the first year level to ensure achievement of the program objectives; and

.2.2 Annual medical examination following the prescribed Department of Health (DOH) medical requirements such as: Urine, Stool, CBC, X-Ray, Psycho, Eyesight (Ishihara for BSMT and Lantern or any other color perception test for BSMarE) and hearing examination.

Section 25. Research and Extension

25.1. Research. Every maritime school shall encourage its faculty members and students to undertake research for the enhancement of maritime education programs and training.

25.2. Extension. Every maritime school shall have extension services relevant to the maritime industry.

Section 26. Shipboard Training Office.

26.1. The Shipboard Training Office shall be responsible for administration and coordination of activities and requirements of students who shall undergo shipboard training. This Office shall:

.1 Arrange for and facilitate embarkation of cadets

.2 Assist students for shipboard training (in accordance with the provisions under Section 16 & 17)

.3 Coordinate with the shipowner/operator

.4 Conduct briefing for embarkation

.5 Conduct debriefing and assessment of cadets after shipboard training, and

.6 Keep updated records of approved companies, records of the results of assessment and record of graduates

In order to strengthen the Shipboard Training Office, there must be a guidelines to credit teaching load for faculty member designated as Shipboard Training Officer (STO).

26.2. Qualifications of Shipboard Training Officer (STO).

.1 There shall be a full time Shipboard Training Officer (STO) to head the Shipboard Training Office.

.2 The STO must be a Certificated Marine Officer with at least 12 months shipboard experience as an officer.

.3 The STO shall have received appropriate guidance in assessment methods and practice and have gained practical assessment experience.

.4 If STO will be given teaching load, he/she shall comply with the requirements as provided for under Section 20. STO shall be allowed a maximum teaching load of 24 hours a week.

Section 27. Quality Standards System (QSS)

27.1. Every maritime school shall have a certified quality standards system in accordance with the provisions of the Rules for a Quality Standards System in Maritime Academies as contained in **Annex V** of this CMO.

27.2. New school applying for the operation of maritime program/s must have its QSS documentation for certification prior to issuance of government authority (first year permit). Subsequently, QSS certification must be secured before applying for the 2nd year level.

27.3. The QSS of maritime institutions shall be evaluated by CHED authorized agencies at least once a year.

27.4. Considering that CHED has already delegated to the maritime institutions the authority to approve in its behalf the shipboard training of shipping companies where their cadets will be placed, the procedures for such approval shall be included in the QSS of the institution.

27.5. The qualifications of internal auditor of the maritime institutions shall be specified in its QSS, and shall comply with regulation under Section A I/8 of the STCW '95.

Section 28. Monitoring and Assessment of Maritime Program Offerings

28.1. Monitoring and assessment instrument shall be developed, and approved based on this PSG. Likewise, said instrument shall be reviewed and approved in case of any changes in this PSG. The approved and updated monitoring and assessment instrument shall be used in the conduct of monitoring and assessment of all recognized maritime education programs.

28.2. Monitoring and assessment of maritime programs shall be conducted annually to determine and verify compliance on this PSG including the requirements of STCW '95.

28.3. Classroom/laboratory observation and demonstration shall form part of the monitoring and assessment of maritime education programs.

28.4. Board Performance shall be considered in the conduct of monitoring and evaluation.

28.5. Result of monitoring and assessment shall be the basis for the issuance/continuance/revocation/closure of government authority.

28.6. Unannounced monitoring and assessment can be conducted only in any of the following conditions:
a. report or complaint of anomalies; and
b. violation/s of this CMO.

Article VIII. Implementing Guidelines

Section 29. Promulgation of the Implementing Guidelines. The implementing guidelines shall be promulgated to carry out the provisions of this CMO.

Article IX. Repealing Clause

Section 30. All issuances, including but not limited to the CMO 51, series of 1997, CMO 38, series of 1998 and CMO 10, series of 1999 and/or any part thereof inconsistent herewith, are deemed repealed or modified accordingly.

Article IX. Effectivity Clause

Section 31. This CMO shall take effect starting SY 2006-2007 including the existing maritime programs with permit status.

Section 32. An educational institution applying to offer new maritime program/s shall likewise comply with all the provisions of this CMO. (see Article II – Authority to Operate of this Memorandum)

Pasig City, Philippines, May 12, 2005.

For the Commission:

DR. CARLITO S. PUNO
Acting Chairman