College of Micronesia – FSM
P.O. Box 159
Kolonia, Pohnpei

Course Outline Cover Page

Vessel Construction and Machinery I — Course Title
MM 210 — Department and Number

Course Description: This course provides the student with the knowledge and skills required by the master of a vessel of less than 500 gross tons to manage structural related requirements to maintain the seaworthiness of a vessel and a propulsion unit using the appropriate engineering systems and support services.

Prepared by: Brent Villiers **State:** FSM-FMI

	Hours per Week	No. Of Weeks	Total Hours	Semester Credits
Lecture	3/6/12/24	16/8/4/2	48	3
Laboratory	3/6/12/24	16/8/4/2	48	1
		Total Semester Credits:		4

Purpose of Course

Degree Requirement	_____XX_____
Degree Elective	_____
Advanced Certificate	_____
Certificate	_____
Remedial	_____
Other (Workshop)	_____

Prerequisite Course(s): MM 178 Ship Construction and Machinery

_____ _____
Signature, Chairman, Curriculum Committee **Date Approved by Committee**

_____ _____
Signature, President, COM-FSM **Date Approved by the President**

General Objective: By successfully completing this course, students will have been provided with the skills required by the master of a vessel of less than 500 gross tons to manage structural related requirements to maintain the seaworthiness of a vessel and a propulsion unit using the appropriate engineering systems and support services.

Learning Outcomes: On successful completion of this course the student will be able to:

1. Manage the structural related requirements of a vessel of up to 500 gross tons.
2. Manage the watertight integrity and structural fire protection of a vessel of up to 500 gross tons.
3. Plan the periodic maintenance and survey requirements of a vessel of up to 500 gross tons.
4. Manage the operational requirements of the propulsion machinery and auxiliary equipment of a small vessel in accordance with manufacturer's instructions.
5. Operate the propulsion unit and auxiliary equipment of a small vessel.

STUDENTS SHOULD BE MADE AWARE OF OCCUPATIONAL HEALTH AND SAFETY ISSUES IN ALL SITUATIONS AND BE EXPECTED TO DEMONSTRATE SAFE WORKING PRACTICES AT ALL TIMES.

Outline of Content: This course contains:

1. Vessel Structure
   - Major structural components
   - Deck and point loading
   - Watertight subdivision
   - Watertight and weather tight integrity
   - Structural fire protection.
2. Maintenance & Survey
   - Authorities requisites
   - Surveys
   - Planned maintenance.
3. Engineering Systems
   - Propulsion plant components and functions
   - Operation and limitations of propulsion plants
   - Cooling water and lubrication systems
   - Pumps
   - Electrical systems

- Waste management and pollution control equipment
- Safety devices and arrangements associated with propulsion machinery and ancillary equipment
- Remote controls, alarms and indicators
- Operation of machinery
- Fuel consumption calculations.

Learning Outcomes: On completion of this course the learner will be able to:

Learning Outcome 1 **Manage the structural related requirements of a vessel of up to 500 gross tons.**

Assessment criteria

1.1 Causes of stresses on a vessel's structure are explained.
1.2 Major structural components are identified.
1.3 Functions of the structural components are described.

Conditions and Method of assessment

As specified in the Assessment Strategy listed at the end of this outline and by a combination of:

- Written test involving the use of sketching, diagram interpretation, short answer questions, multiple choice questions
- Oral questioning.

Learning Outcome 2 **Manage the watertight integrity and structural fire protection of a vessel of up to 500 gross tons.**

Assessment criteria

2.1 Arrangements to restrict the spread of fire are explained.
2.2 Arrangements to control flooding are explained.
2.3 Survey requirements to maintain watertight and weather tight integrity are described.
2.4 Method of tank and bulkhead testing for watertightness to survey requirements is described.

Conditions and Method of assessment

As specified in the Assessment Strategy listed at the end of this outline and by a combination of:

- Written test involving the use of sketching, diagram interpretation, short answer questions, multiple choice questions

- Oral questioning.

Learning Outcome 3 **Plan the periodic maintenance and survey requirements of a vessel of up to 500 gross tons.**

Assessment criteria

3.1 Survey requirements in accordance with the South Pacific Maritime Code are outlined.
3.2 Survey items are identified.
3.3 Occasions when a vessel has to be removed from water for survey purposes are listed.
3.4 Loadline survey requirements are outlined.
3.5 Procedures for preparing a vessel for survey are described.
3.6 Advantages of Planned Maintenance are described.
3.7 A maintenance program, including all survey requirements for a typical vessel is prepared.

Conditions and Method of assessment

As specified in the Assessment Strategy listed at the end of this outline and by a combination of:

- Written test involving the use of sketching, diagram interpretation, short answer questions, multiple choice questions
- Written assignments
- Oral questioning.

Learning Outcome 4 **Manage the operational requirements of the propulsion machinery and auxiliary equipment of a small vessel in accordance with manufacturer's recommendations.**

Assessment criteria

4.1 The components of typical propulsion plants are identified and their functions are described.
4.2 The operation and limitations of propulsion plants are identified.
4.3 Cooling water system, lubrication system, and starting of diesel engines are described.
4.4 The types of pumps used on board are identified and their application in different systems is described.
4.5 The basic electrical system of a vessel and its components are described.
4.6 Safety devices and arrangements associated with propulsion machinery and auxiliary equipment are described.

4.7 The equipment used for waste management and pollution control as required by MARPOL 73/78 are described.

Conditions and Method of assessment

As specified in the Assessment Strategy listed at the end of this outline and by a combination of:

- Written test involving the use of sketching, diagram interpretation, short answer questions, multiple choice questions
- Oral questioning
- Observation during practical exercises.

Learning Outcome 5 **Operate the propulsion unit and auxiliary equipment of a small vessel.**

Assessment criteria

5.1 Remote controls, alarms and indicators for the control of main propulsion machinery and auxiliary equipment are identified.

5.2 Machinery is operated in accordance with technical, company and safety parameters.

5.3 The fuel consumption for a transit is calculated.

5.4 Relationship between fuel consumption and change of vessel's speed is identified.

Conditions and Method of assessment

As specified in the Assessment Strategy listed at the end of this outline and by a combination of:

- Written test involving the use of sketching, diagram interpretation, short answer questions, multiple choice questions, and calculations.
- Oral questioning
- Observation during practical exercises.

Delivery strategy

This course provides for off-the-job delivery in a classroom, supported by simulation and/or laboratory equipment and access to a vessel in survey. The learning outcomes dealing with engineering systems may be effectively delivered using an integrated Bridge/Engine simulator.

Resource requirements

Delivery of the training will require:

- A suitable theory teaching space
- Simulation and/or laboratory equipment
- Vessel in survey

- Samples of vessel component parts
- Access to a ship repair/dry dock facility
- Ship's plans and drawings
- SPMC and National Regulations dealing with Surveys.

Assessment Strategy

Assessment Method	Knowledge, skills and attitudes may be measured by using a combination of practical exercises, oral assessment, and written tests.
Condition of Assessment	This course may be assessed on-the-job and off the job. Competence may be assessed in the following situations: a vessel under survey; approved training vessel/facility; approved equipment laboratory; approved simulator facility.

Evaluation:

Final Grade for this course will be based on meeting the course requirements at the following percentage rates:

96% - 100%	A – Superior
90% - 95%	B – Above Average
80% - 89%	C – Average
69% - 79%	D – Below Average
0 % - 69%	F – Failure

Attendance:

The COM-FSM attendance policy will apply.