

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

**Course Outline Cover Page**

**Nautical Knowledge I**  
 Course Title

**MME 160**  
 Department and Number

**Course Description:** To provide the student with the knowledge and skills required managing and operating a vessel of less than 20 gross tons within inshore waters.

**Prepared by:** Brent Villiers

**State:** FSM-FMI

	Hours per Week	No. Of Weeks	Total Hours	Semester Credits
Lecture	2/4/8/16	8/4/2/1	16	1
Laboratory	12/24	12/6	144	3

Total Semester Credits: 4

**Purpose of Course**

Degree Requirement \_\_\_\_\_  
 Degree Elective \_\_\_\_\_  
 Advanced Certificate \_\_\_\_\_  
 Certificate \_\_\_\_\_ XX \_\_\_\_\_  
 Remedial \_\_\_\_\_  
 Other (Workshop) \_\_\_\_\_

**Prerequisite Course(s):** Safety Certificate

\_\_\_\_\_  
**Signature, Chairman, Curriculum Committee**

\_\_\_\_\_  
**Date Approved by Committee**

\_\_\_\_\_  
**Signature, President, COM-FSM**

\_\_\_\_\_  
**Date Approved by the President**

**General Objective:** In addition to meeting COM-FSM's Certificate of Achievement criteria, this course is targeted at students and mariners who wish to obtain a Certificate of Competency as Master Grade 6 in accordance with the South Pacific Maritime Code. This course covers part of the syllabus requirements as described in the code and on successful completion of this course the student or mariner will be able to manage and operate a vessel of less than 20 gross tons within inshore waters.

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

1. Maneuver, berth and anchor a small power driven vessel.
2. Take appropriate action in response to emergencies and manage the safety related requirements of a small power driven vessel.
3. Comply with legislative requirements concerning safety of life and prevention of pollution at sea.
4. Apply available meteorological data to the safe operation of a small vessel.
5. Keep a safe navigational watch in accordance with international and local regulations.
6. Manage the structural related requirements of a small vessel.
7. Use ropes and wires in the operation of a small vessel.
8. Apply navigation techniques to ensure the safe operation of a small vessel in inshore waters.

***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 Maneuvering & Handling
  - Maneuvering characteristics
  - Effects of external environment
  - Anchoring
  - Berthing and unberthing
  - Mooring to a buoy
  - Towing.

2. Emergency Procedures
  - Collisions, groundings and marine casualties
  - Handling of a disabled vessel
  - Person-overboard procedures
  - Assisting vessels in distress
  - Basic principles of stability and trim
  - Master's obligations to passengers and crew
  - Legislative requirements for safety equipment
  - Compliance with pollution prevention regulations
  - Survey items.
3. Weather Watch-keeping
  - Weather reports and warnings
  - Interpretation of a synoptic chart
  - Recognition of environmental indicators
  - Tropical revolving storms.
4. Watch-keeping.
  - International regulations for preventing collisions at sea.
  - Local regulations
  - IALA buoyage system 'A'
  - Navigating in the vicinity of large vessels.
5. Vessel Construction
  - Design features of small vessels
  - Structural components
  - Materials used in vessel construction.
6. Rope work
  - Use and application of common knots, bends and hitches
  - Care and maintenance of synthetic, natural fiber, and wire ropes
  - Safety precautions
  - Soft eye-splice in a fiber rope.
7. Navigation
  - Information available from charts
  - Plotting of bearings and courses
  - Measurement of distance
  - Time/speed/distance calculations
  - Simple techniques for obtaining position lines

- Use of local tide-tables
- Use of compass for steering and taking bearings.

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

**Learning Outcome 1** **Maneuver, berth and anchor a small power driven vessel.**

Assessment criteria	<p>1.1 Maneuvering characteristics of a small power driven vessel are explained and described with regards to:</p> <ul style="list-style-type: none"> <li>• Displacement and planing hulls</li> <li>• Outboard and inboard engines</li> <li>• Stopping distance</li> <li>• Response to rudder movements at varying speeds</li> <li>• Transverse thrust of propeller</li> <li>• Single propeller and twin propeller propulsion.</li> </ul> <p>1.2 Precautions to be observed when maneuvering a vessel under the influence of the following external conditions are described:</p> <ul style="list-style-type: none"> <li>• Tidal streams and currents</li> <li>• Confined waters</li> <li>• Poor visibility</li> <li>• Heavy weather conditions</li> <li>• Maneuvering in close proximity to large vessels</li> <li>• Crossing a river entrance bar.</li> </ul> <p>1.3 Ability to maneuver the vessel as required to anchor and weigh anchor is demonstrated.</p> <p>1.4 Ability to maneuver a vessel to berth and unberth from a wharf under the prevailing conditions of wind and tide is demonstrated.</p> <p>1.5 Ability to maneuver a vessel to secure to a mooring buoy and cast off from a buoy under the prevailing conditions of wind and tide is demonstrated.</p> <p>1.6 Precautions to be observed when engaged in towing operations are described.</p>
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Conditions and Method of assessment	<p>As specified in the Assessment Strategy listed at the end of this outline and by a combination of:</p> <ul style="list-style-type: none"> <li>• Written test involving the use of sketching, diagram interpretation, short answer questions, and multiple-choice questions.</li> <li>• Oral questioning</li> <li>• Observations during practical exercises.</li> </ul>
<b>Learning Outcome 2</b>	<b>Take appropriate action in response to emergencies and manage the safety related requirements of a small power driven vessel.</b>
Assessment criteria	<p>2.1 Correct action to be taken in the event of a collision, grounding or other marine casualty is described.</p> <p>2.2 Methods of handling a partially disabled vessel with damage to the rudder or propeller are described.</p> <p>2.3 Actions to be taken in the event of a person falling overboard are described</p> <p>2.4 Obligation to render assistance to other vessels in distress is described.</p> <p>2.5 Principles of stability and trim applicable to a small vessel and the disposition of passengers and cargo required to maintain stability and trim within safe limits are described.</p>
Conditions and Method of assessment	<p>As specified in the Assessment Strategy listed at the end of this outline and by a combination of:</p> <ul style="list-style-type: none"> <li>• Written test involving the use of sketching, diagram interpretation, short answer questions, multiple choice questions</li> <li>• Oral questioning</li> <li>• Observation during practical exercises</li> </ul>
<b>Learning Outcome 3</b>	<b>Comply with legislative requirements concerning safety of life and prevention of pollution at sea.</b>
Assessment criteria	<p>3.1 Certificates required to be carried by a vessel of less than 20 gross tons or 15</p>

	<p>meters in length are listed and their requirements outlined.</p> <p>3.2 Type and quantity of safety equipment required to be carried on a commercial vessel of less than 20 gross tons or 15 meters in length is listed.</p> <p>3.3 Requirements for the correct stowage and maintenance of safety equipment are described.</p> <p>3.4 Requirements to ensure compliance with pollution prevention regulations are described.</p>
Conditions and Method of assessment	<p>As specified in the Assessment Strategy listed at the end of this outline and by a combination of:</p> <ul style="list-style-type: none"> <li>• Written test involving the use of diagram interpretation, short answer questions, multiple choice questions;</li> <li>• Oral questioning.</li> </ul>
<b>Learning Outcome 4</b>	<b>Apply available meteorological data to the safe operation of a small vessel.</b>
Assessment criteria	<p>4.1 Sources of weather reports and warnings (including storm warnings) are listed.</p> <p>4.2 Information contained in weather reports and warnings is described.</p> <p>4.3 Information provided by a synoptic chart is interpreted correctly.</p> <p>4.4 Wind strength and direction, swell height and direction, sea state, visibility, cloud cover, and atmospheric pressure are noted and recorded using visual observations and meteorological instruments.</p> <p>4.5 Warning signs of an approaching Tropical Revolving Storm are described.</p> <p>4.6 Correct action to be taken in the event of deteriorating weather conditions is described.</p>
Conditions and Method of assessment	<p>As specified in the Assessment Strategy listed at the end of this outline and by a combination of:</p> <ul style="list-style-type: none"> <li>• Written test involving the use of diagram interpretation, short answer questions, multiple choice questions, calculations</li> </ul>

- Oral questioning
- Observation during practical exercises.

**Learning Outcome 5****Keep a safe navigational watch in accordance with international and local regulations.**

## Assessment criteria

- 5.1 International Regulations for Preventing Collisions at Sea are understood and applied with particular emphasis on their applicability to small vessels.
- 5.2 IALA buoyage system 'A' is understood and applied to the safe navigation of the vessel.
- 5.3 Factors to be considered and precautions taken when navigating in the vicinity of large vessels are described.
- 5.4 Local regulations affecting the operation of small vessels are interpreted and applied.

## 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 diagram interpretation, short answer questions, multiple choice questions, calculations
- Oral questioning
- Observation during practical exercises.

**Learning Outcome 6****Manage the structural related requirements of a small vessel.**

## Assessment criteria

- 6.1 Design features of small vessels are identified.
- 6.2 Materials used in vessel construction and their relative advantages and disadvantages are listed.
- 6.3 Arrangements to maintain watertight integrity of small vessels are explained.
- 6.4 Methods of removing a small vessel from water for maintenance or survey purposes are described.

Conditions and Method of assessment	<p>As specified in the Assessment Strategy listed at the end of this outline and by a combination of:</p> <ul style="list-style-type: none"> <li>• Written test involving the use of sketching, diagram interpretation, short answer questions, multiple choice questions</li> <li>• Oral questioning.</li> </ul>
<b>Learning Outcome 7</b>	<b>Use ropes and wires in the operation of a small vessel.</b>
Assessment criteria	<p>7.1 Types of ropes in common use onboard a small vessel are identified.</p> <p>7.2 Care and maintenance of natural, synthetic and wire ropes is described.</p> <p>7.3 Safety precautions to be taken when working with ropes are described.</p> <p>7.4 Deterioration in the condition of fiber and wire rope is recognized and explained.</p> <p>7.5 Knots, bends, and hitches in common use are applied and their uses on board demonstrated.</p> <p>7.6 Ability to splice a soft eye in a synthetic or natural fiber rope in accordance with established practice is demonstrated.</p>
Conditions and Method of assessment	<p>As specified in the Assessment Strategy listed at the end of this outline and by a combination of:</p> <ul style="list-style-type: none"> <li>• Multiple choice and short answer written examination.</li> <li>• Oral examination.</li> </ul>
<b>Learning Outcome 8</b>	<b>Apply navigation techniques to ensure the safe operation of a small vessel in inshore waters.</b>
Assessment criteria	<p>8.1 Information available from a large-scale navigational chart of the local area is interpreted correctly to identify:</p> <ul style="list-style-type: none"> <li>• Title, number, scale and other information provided in the title block and margins</li> <li>• Prominent features</li> </ul>



- Dangers and navigational hazards
  - Tidal data
  - Tidal streams and currents
  - Aids to navigation
  - Depth contours and nature of bottom.
- 8.2 Information contained in other types of charts that may be available of the local area is interpreted correctly.
- 8.3 A large-scale chart is used to lay off a bearing, plot a safe course, and measure distance.
- 8.4 Simple speed/time/distance problems are solved.
- 8.5 Transits, beam marks and leading lights are used to establish position lines.
- 8.6 Techniques to estimate distances off landmarks and known points of interest are used.
- 8.7 Times and heights of high water and low water are extracted from local tide tables.
- 8.8 Use of vessel's compass to steer a course and take bearings is demonstrated.

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, 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.

Resource requirements

Delivery of this course will require:

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

- National legislation applicable to a vessel of less than 20 gross tons.

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.

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.