

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

Course Outline Cover Page

Instrumentation and Navigational Aids
Course Title

MM 213
Department and Number

Course Description: This course provides the student with the knowledge and skills required to make proper use of wheelhouse equipment for the safe navigation and operation of vessels of up to 500 gross tons.

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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): MM177 Navigation & Position Determination, MM176 Nautical Knowledge II

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 to make proper use of wheelhouse equipment for the safe navigation and operation of vessels of up to 500 gross tons.

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

1. Use the following wheelhouse equipment to assist with the safe navigation of a vessel:
 - Echo sounder
 - Speed Log
 - Autopilot
 - Wheelhouse alarms;
2. Use GPS and electronic charts for navigation and position determination;
3. Use Magnetic and Gyro Compasses to determine direction and course
4. Comply with the requirements for provision of equipment on a vessel as required by the International Regulations for the Prevention of Collisions at Sea 1972

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. Wheelhouse Equipment
 - Operation and use of echo sounders, speed logs, autopilots and alarms.
 - Capabilities, limitations and accuracy of items of wheelhouse equipment
 - Performance checks and tests
 - Interpretation of information provided by items of wheelhouse equipment.
2. GPS and Electronic charts
 - Operating principle, capabilities, limitations and accuracy of GPS and DGPS
 - Use of GPS and DGPS
 - Types of electronic chart systems

- Use of GPS interfaced electronic charts, plotters, radars, and autopilot.
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 - Types of electronic chart systems
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3. Compasses
- Causes of magnetic compass deviation
 - Components of a magnetic compass system
 - Procedure for a compass swing
 - Gyro compass starting procedure
 - Gyro compass errors
 - Care and maintenance of magnetic and gyro compasses.
4. Lights, Shapes & Sound Signaling Equipment
- Provision of equipment in accordance with international regulations
 - Installation & maintenance requirements.

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

Learning Outcome 1 Use the following wheelhouse equipment to assist with the safe navigation of a vessel.

- **Echo sounder**
- **Speed Log**
- **Autopilot**
- **Wheelhouse alarms**

Assessment criteria

1.1 Purpose of items of wheelhouse equipment and alarms is explained.

1.2 Items of wheelhouse equipment are operated and adjusted for optimum performance.

1.3 Capabilities, limitations and accuracy of each item of equipment are explained.

1.4 Performance checks and tests are carried out in accordance with manufacturer's instructions, good navigational practice and legislative requirements.

Conditions and Method of assessment	<p>1.5 Information provided by wheelhouse equipment is correctly interpreted and applied to aid in the safe navigation and operation of the vessel.</p> <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"> • Written test involving the use of sketching, diagram interpretation, short answer questions, multiple choice questions • Oral questioning • Observation during practical exercises.
Learning Outcome 2	Use GPS and electronic charts for navigation and position determination.
Assessment criteria	<p>2.1 The operating principle of GPS, including DGPS is explained.</p> <p>2.2 Capabilities, limitations and accuracy of GPS & DGPS are explained.</p> <p>2.3 Use of GPS and DGPS to determine the vessel's position to the designed accuracy is demonstrated.</p> <p>2.4 Types of electronic charts and operating systems are described.</p> <p>2.5 Correct setup and use of GPS when interfaced with other navigational aids such as electronic charts, chart plotters, radars, and autopilot is demonstrated.</p> <p>2.6 Precautions to be taken when using GPS interfaced with navigational aids such as electronic charts, plotters, radars, and autopilots 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"> • Written test involving the use of sketching, diagram interpretation, short answer questions, multiple choice questions • Oral questioning • Observation during practical exercises.

Learning Outcome 3**Use Magnetic and Gyro Compasses to determine direction and course.**

Assessment criteria

- 3.1 Causes of compass deviation are described.
- 3.2 Main components of a magnetic compass system are identified and their uses explained.
- 3.3 Factors that can lead to a change in a vessel's deviation are described.
- 3.4 Maintenance procedures for a magnetic compass are described.
- 3.5 Procedure for conducting a compass swing to obtain a deviation card is described.
- 3.6 Basic principle of operation of a gyrocompass is outlined.
- 3.7 Start-up procedure of a gyrocompass is described and performed.
- 3.8 Care and maintenance requirements of gyrocompasses are explained.
- 3.9 Errors of gyrocompasses and their correction or compensation procedures are described.
- 3.10 Use of gyro repeaters is explained and alignment of repeaters is carried out.

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 4**Comply with the requirements for provision of equipment on a vessel as required by the International Regulations for the Prevention of Collisions at sea 1972.**

Assessment criteria

- 4.1 Positions of navigation lights for a specified vessel are described.
- 4.2 Installation and maintenance requirements for navigation lights are explained.
- 4.3 Nature and positioning requirements of navigational shapes are described.
- 4.4 Requirements for sound signaling equipment for a specified vessel 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: <ul style="list-style-type: none"> • Written test involving the use of sketching, diagram interpretation, short answer questions, multiple choice questions • Oral questioning.
<u>Delivery strategy</u>	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.
<u>Resource requirements</u>	Delivery of the training will require: <ul style="list-style-type: none"> • A suitable theory teaching space • Simulation and/or laboratory equipment • Vessel in survey • Suitable GPS and electronic navigation equipment

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.