

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

Course Outline Cover Page

Small Vessel Stability II
Course Title

MM 211
Department and Number

Course Description: This course provides the student with the knowledge and skills required to manage the stability related requirements of a vessel of less than 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): MM 175 Small Vessel Stability

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 manage the stability related requirements of a vessel of less than 500 gross tons.

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

1. Use loadlines in order to prevent overloading a vessel;
2. Manage the distribution of weights on a vessel;
3. Manage the stability of a vessel in a seaway;
4. Take appropriate actions in the event of partial loss of intact buoyancy of a vessel;
5. Perform static stability calculations using simplified stability data.

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. Loadlines
 - Conditions of assignment
 - Assigned marks
 - Draft and displacement calculations.
2. Static Stability
 - KG, GM and GZ
 - Final KG calculations
 - Moment of static stability
 - GZ curve
 - Free surface correction.
3. Dynamical Stability & Motion
 - Stiff and tender vessels
 - Changes in stability during the voyage
 - Synchronized rolling and roll period
 - Effect of sudden or constant loads
 - Dynamical stability and capsizing.
4. Damaged Stability
 - Bilging
 - Permeability
 - Action to take if bilged.

5. Simplified Stability Data

- Weights of liquids in tanks
- Determination of vertical and longitudinal moments of weights loaded
- Determination of final displacement, LCG and KG of the vessel
- Compliance with the IMO stability criteria.

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

Learning Outcome 1 Use loadlines in order to prevent overloading a vessel.

Assessment criteria

- 1.1 General conditions of assignment of loadlines are explained.
- 1.2 Assigned loadline marks and their use is described.
- 1.3 Given the forward and aft drafts of a vessel, the mean draft, freeboard, and trim are calculated.
- 1.4 Dock Water Allowance when a vessel is not floating in salt water is calculated.
- 1.5 Amount of change in draft when weights are added or removed from a vessel is calculated.

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.

Learning Outcome 2 Manage the distribution of weights on a vessel.

Assessment criteria

- 2.1 Final KG is calculated and the vessel's stability is assessed with that KG.
- 2.2 Relationship between KG and GM is explained.
- 2.3 Relationship between GZ and angle of heel is explained.
- 2.4 Information available from a GZ curve is described.

- 2.5 Use of Free Surface Correction is explained.

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

Manage the stability of a vessel in seaway.

Assessment criteria

- 3.1 The effect of raising or lowering a vessel's centre of gravity on its sea keeping qualities is explained.
- 3.2 Operational practices that cause a vessel to become stiff or tender are described.
- 3.3 Causes of changes to a vessel's stability during a voyage are described.
- 3.4 Factors that affect a vessel's roll period are identified.
- 3.5 Approximate GM is calculated using a vessel's roll period.
- 3.6 Actions to correct synchronized rolling situation are described.
- 3.7 Effects of sudden or constant loads on a vessel's stability are described.
- 3.8 Situations that can cause a vessel to capsize are identified and actions to minimize the risk 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, calculations
- Oral questioning
- Observation during practical exercises.

Learning Outcome 4

Take appropriate actions in the event of partial loss of intact buoyancy of a vessel.

Assessment criteria

- 4.1 The effect of bilging a compartment on the stability of a vessel is described.
- 4.2 The effect of permeability of the bilged compartment is described.

Conditions and Method of assessment	<p>4.3 Appropriate actions to take if a vessel is bilged are described.</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 5	Perform statical stability calculations using simplified stability data.
Assessment criteria	<p>5.1 Given the sounding tables in a vessel's stability data, the weights of liquids in the vessel's tanks are obtained.</p> <p>5.2 Vertical and longitudinal moments of any weight loaded on the vessel are determined.</p> <p>5.3 The final displacement, LCG and KG of the vessel for any given condition of loading are calculated.</p> <p>5.4 Limiting curves are used to determine if the vessel meets the minimum stability criteria.</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 diagram interpretation, short answer questions, multiple choice questions, calculations • Oral questioning.
<u>Delivery strategy</u>	<p>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. Students will need to be provided with access to a vessel that has stability data available or access to an equipment laboratory with simulation equipment that will allow practical exercises in stability to simulate actual circumstances onboard a vessel.</p>
<u>Resource requirements</u>	<p>Delivery of the training will require:</p> <ul style="list-style-type: none"> • A suitable theory teaching space • Simulation and/or laboratory equipment • Vessel in survey • Simplified stability data

- Calculator
- Student Workbook

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.