

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

Course Outline Cover Page

Fire Prevention and Control

Course Title

MSG 090

Department and Number

Course Description: To develop the knowledge and skills necessary to enable the learner to be able to apply fire prevention and control techniques on board merchant ships.

Prepared by: Brent Villiers

State: FSM-FMI

	Hours per Week	No. Of Weeks	Total Hours	Semester Credits
Lecture	1/2	2/1	8	0.5
Laboratory	3/6/12/24	16/8/4/2	48	1
Total Semester Credits:				1.5

Purpose of Course

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

Prerequisite Course(s): Nil

Signature, Chairman, Curriculum Committee

Date Approved by Committee

Signature, President, COM-FSM

Date Approved by the President

General Objective: To equip the seafarers in the maritime industry with practical skills and competence in shipboard operations consistent with their duties on merchant vessels and fishing vessels. To enable mariners to adapt with confidence to the demands and opportunities of a team approach to shipboard operations. This course provides candidates with the skills and knowledge required to:

- assist in maintaining shipboard fire prevention procedures;
- respond effectively as a key member of the on board fire fighting team; and
- assist in maintaining fire fighting and fire detection equipment carried on merchant ships.

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

1. Ensure the effectiveness of on board fire safety procedures;
2. Discuss the chemistry of fire and its relationship to materials carried on board ship;
3. Describe the underlying principles affecting spread of fire and extinguishment;
4. Demonstrate the safe operation of portable firefighting equipment;
5. Conduct interior search and rescue and firefighting operations as a member of a team;
6. Describe fixed fire detection and extinguishing systems; and

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. Fire prevention
 - fire causes in the marine environment
 - pro-active fire prevention techniques
2. Emergency procedures
 - ship board emergency response organization
 - role and responsibilities
 - fire party operations
3. Elements of combustion
 - fire triangle

- flashpoint
 - self-ignition temperature
 - flammability range
 - vapor density of fuels
4. Classification of fires
 - extinguishing principles
 - color coding of fire extinguishers
 5. Fire party operations
 - search and rescue operations in fire and smoke affected compartments.
 - use of SCBA
 - use of portable fire extinguishing equipment
 6. Fixed fire detection and extinguishing systems
 - fire detector types
 - detector applications
 - fixed fire suppression types
 - operation of fixed fire suppression systems
 7. Machinery space fires
 - associated hazards
 - boiler uptake fires
 - tactical firefighting in machinery spaces

Learning Outcomes:

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

Learning Outcome 1

Ensure the effectiveness of on board fire safety procedures.

Assessment criteria

- 1.1 Fire hazards and risks found on board ships are identified.
- 1.2 Methods of reducing the occurrence of fire are described.
- 1.3 The procedure upon discovering a fire is outlined.
- 1.4 The importance of familiarization with respect to escape routes and equipment location is discussed.
- 1.5 Duties and responsibilities as a member of the Emergency Response Organization are stated.
- 1.6 The importance of testing and evaluating emergency procedures is described.

Conditions and methods of assessment

As specified at the end of the outline and by a combination of:

- written assessment
- oral assessment
- group project

Learning Outcome 2**Discuss the chemistry of fire and its relationship to materials carried on board ships.****Assessment criteria**

- 2.1 The elements of fire and their relationship to the fire triangle are described.
- 2.2 The dangers associated with fuels having a low flashpoint are discussed.
- 2.3 The dangers associated with the heating of fuels to their self-ignition temperature are discussed.
- 2.4 Situations where spontaneous combustion may occur are described.
- 2.5 The importance of ensuring that fuels are outside their range of flammability is described
- 2.6 Safety precautions that should be adopted when using fuels with a high vapor density are described.
- 2.7 The risks associated with finely divided fuels are described.

Conditions and methods of assessment

As specified at the end of the outline and by a combination of:

- written assessment
- oral assessment

Learning Outcome 3**Describe the underlying principles affecting spread of fire and extinguishment.****Assessment criteria**

- 3.1 The classes of fire are listed.
- 3.2 Extinguishing principles appropriate to each class of fire are described.
- 3.3 The means by which a fire may spread are described.
- 3.4 The concept of ventilation in relation to firefighting is outlined.

- 3.5 The differences between A, B & C class divisions are described.
- 3.6 Fire rated divisions shown on a fire control plan are identified

Conditions and methods of assessment

As specified at the end of the outline and by a combination of:

- written assessment
- oral assessment

Learning Outcome 4

Demonstrate the safe operation of portable firefighting equipment.

Assessment criteria

- 4.1 The color coding of portable fire extinguishers is identified.
- 4.2 The extinguishing of A, B, or C Class fires using first aid appliances is demonstrated.
- 4.3 Extinguishing an F Class fire with a fire blanket is demonstrated.
- 4.4 The recharging of portable fire extinguishers is demonstrated.
- 4.5 The use of hose lines to extinguish fires is demonstrated.
- 4.6 The setting up of foam making equipment to extinguish B Class fires is demonstrated.

Conditions and methods of assessment

As specified at the end of the outline and by a combination of:

- Written assessment
- Oral assessment
- Role playing
- Practical assessment

Learning Outcome 5

Conduct interior search and rescue and firefighting operations as a member of a team.

Assessment criteria

- 5.1 The donning and start up procedures of SCBA are demonstrated.
- 5.2 Search and rescue operations in a smoke filled space are conducted.
- 5.3 Interior fire extinguishing operations are demonstrated.
- 5.4 The logging of SCBA operators on a BA Control Board is demonstrated.

- 5.5 After use maintenance of SCBA is demonstrated.
- 5.6 Lifeline signals are stated.
- 5.7 Without wearing SCBA a compartment filled with high expansion foam is entered.

Conditions and methods of assessment

As specified at the end of the outline and by a combination of:

- Written assessment
- Oral assessment
- Role playing
- Practical assessment
- Group work

Learning Outcome 6

Describe fixed fire detection and extinguishing systems.

Assessment criteria

- 6.1 The actions to be taken when a fire alarm is activated are discussed.
- 6.2 Principles by which detection systems may detect the presence of a fire are described.
- 6.3 The major components of a fire detection system are outlined.
- 6.4 Current fixed fire extinguishing systems are outlined.
- 6.5 The correct procedures for safe operation of fixed fire extinguishing systems are stated.

Conditions and methods of assessment

As specified at the end of the outline and by a combination of:

- Written assessment
- Oral assessment

Learning Outcome 7

Outline standard shipboard fire fighting organization.

Assessment criteria

- 7.1 The sources of information relating to shipboard emergency response organization are stated.
- 7.2 A typical shipboard fire party organization model is described.

- 7.3 The roles of each fire party within the shipboard emergency response organization are described.

Conditions and methods of assessment

As specified at the end of the outline and by a combination of:

- Written assessment
- Oral assessment

Delivery strategy

The module provides for delivery by off-the-job training and assessment utilizing facilities that simulate fire conditions found on board commercial vessels. Some areas of content may be common to more than one learning outcome, and therefore integration of training and assessment may be appropriate.

Methods of instruction include:

1. Classroom instruction
2. Instructor demonstrations
3. Role playing
4. Participation in practical exercises
5. Group work and
6. Simulations

Resource requirements

Delivery of the training will require:

- Classroom
- Fire training facility capable of simulating firefighting activities in a marine environment.
- Protective clothing in sufficient quantity for all participants. (At a minimum this must include fire coats, protective footwear, helmets and gloves)

Occupational health and safety Requirements

Teaching areas must comply with the current national workplace health and safety regulations.

During the conduct of practical firefighting exercises students must be under the observation of an instructor.

Resource requirements

Delivery of the training will require access to:

1. A fire training centre capable of simulating firefighting activities in a marine environment.
2. Firefighting equipment as currently carried on board merchant ships in accordance with SOLAS Chapter II-2.
3. Audio visual aids including:
Learn or Burn, video, AMC Search
Fire Aboard, video, AMC Search
4. Access to the following publication:
International Maritime Organization, 1997,
SOLAS - Consolidated Edition, London.
5. SPC 002 Fire Prevention & Control
Learners Guide

Assessment Method**Conditions of assessment**

A holistic assessment strategy is proposed that attempts to ensure that as much as possible, that the assessment replicates conditions that learners may encounter in their workplace. Knowledge based criteria will be satisfied through written and oral questioning relating to training sessions. Skill-based criteria will be satisfied through observing the ability of learners to correctly apply the techniques taught in the course. Assessment will be performed off the job, at an approved training centre. This course may be assessed on and off-the-job. Competence may be assessed in the following situations: classroom; fire training ground; and appropriate vessels.

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.