

# Faculty of Engineering, the Built Environment & IT

*Technology for tomorrow*

**Study Guide 2018 Semester 2**

Department of Marine Engineering

North Campus

## **MEK 1**

**EMAR 102**

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**PREREQUISITE SUBJECTS/MODULES**

None

#### A OBJECTIVES

 The objective of the course is to develop an understanding of the fundamental underpinning principals of general marine engineering and safety.

 To meet the minimum requirements for knowledge, understanding and proficiency

 for Marine Engineering Officers according to the SAMSA code.

The intended applications of the skills acquired are for:

* preparation for further/advanced study.
* practical applications.

**B ESSENTIAL CONTENT**

 The following are essential aspects of this course:

* Marine Materials
* Fuel & lubricant
* Pumps and pumping systems
* Ship Safety
* Watchkeeping within marine engineering
* Maintenance

 These aspects will be evaluated against the objectives/outcomes provided in the table detailing the syllabus in section C.

**C SYLLABUS**

 The following syllabus describes the scope of the work to be covered in this course.

| Content | **Related Topics Considered** | **Learning outcomes.****After completing this unit, learners will be able to:** | **Reference/s** | **Assessment** | **SAMSA references** | **Expected duration** |
| --- | --- | --- | --- | --- | --- | --- |
|  **Marine Materials** **A** | * Production and properties of iron & steel
* Material testing
* Manufacturing processes
* Material treatment
* Alloying & effects
* Non-ferrous Material
* Non-metallic materials
* Material Failure
* Corrosion prevention
* Cathodic protection
 |  * Describe the production and uses of general materials used in ship construction
* Have and understanding of commonly used design materials and typical applications.
* Have and understanding of commonly failure.
* Have and understanding corrosion prevention and protection
 | F1: Chapter 1 | Integrated and assessed in later sections. | Document No. GOP-532.05 | 4 weeks |
| **Fuel & Lubricant****B** | Fuel* Production & properties
* Fuel oil management
* Viscosity control
* Clarification & purification
* Filtration
* Lubrication
* Lubricant additives and testing
* Fuel oil analysis and testing
 | * Identify and differentiate fuels and lubricants and the application thereof
* Describe the operation of a purifier
* Describe Viscosity & how to control it.
* Describe lubrication.
* Describe analysis and testing
 | F1: Chapter 2  | 1st test Content A-B | Document No. GOP-532.05 | 5 weeks |
| **Pumps & pumping system****C** | * Pumps classification
* Pumps efficiency
* Bilge systems
* Ballast systems
* Fresh water systems
* Sewage systems
* Heating and cooling systems
* Incinerators and pulpers
* Systems regulation
 | * Describe pumps and pumping systems with respect to the marine environment.
* Describe the auxiliary ship systems.
* Identify problem and possible solution
 | F1: Chapters 6  | Integrated and assessed in later sections. | Document No. GOP-532.05 | 5 weeks |
| **Ship safety****D** | * Fire (prevention –detection – alarms)
* Fire detectors (heat – flame – smoke)
* Fire extinguisher
* Gas detectors
* Enclosed spaces
* Explosive properties of Gas & vapour
* Emergency generators
* Firefighting systems
* Regulation survey and trainings
 | * Describe ship safety requirements and explain the effective application of relevant safety equipment.
* Describe fixed and portable firefighting systems.
* Describe the surveys, organisation and training.
 | F1: Chapter 7  | 2ND Test Contents Sections C-D | Document No. GOP-532.05 | 5 weeks |
| **Watchkeeping****E** | * Taking over a watch & Handing over a watch
* Unmanned machinery spaces
* Compilation of log book
* Vessel departure & arrival
* Engine room resource management 1
* Unusual condition (fire & black out)
* Time tracking and duty
 | * • Explain the underlying theoretical principles of watch keeping practice.
* Describe manned and unmanned routine inspection.
* Describe the action and check list to follow during unusual condition in respect of the ERM procedure.
* Manage time schedule and duty
 | F1 chapter 9 | Final Test Contents A-B-C-D-E | Document No. GOP-532.05Pag 2 | 5 weeks |

**D EVALUATION**

**1. FORMATIVE ASSESSMENT**

 The tutorial assessments are designed to assess comprehension, application and analysis. Students write the tutorials or part thereof individually. They are then placed in ad hoc teams of up to four students to discuss their answers and to produce a combined answer sheet. The combined answer sheet will be assessed by the lecturer or assistant for feedback purposes.

 Formative assessment is open-book. The learner may use his/her own reference books and other resources.

**2. SUMMATIVE ASSESSMENT**

2.1. LABORATORY / PRACTICAL ASSIGNMENTS

The purpose of this assessment is to reconcile practice with theory. The attainment of the specific outcomes will be assessed by observation of the practical demonstrations performed in the laboratory and the analysis undertaken followed by a report (which will serve as the only record). This assessment is open-book, therefore a learner may use his/her own reference books and other resources. The work is conducted in groups with the team leader being rotated for each lab session.

 Note: It is the learner’s responsibility to ensure that he/she reaches a high level of competency before being assessed. The learner should therefore consult the laboratory technician/assistant for additional access to the laboratory if required.

* 1. THEORETICAL ASSESSMENTS

The purpose of this assessment is to ascertain whether or not the specific outcomes have been achieved by an individual. Students write a minimum of three theoretical assessments individually. The attainment of the specific outcomes will be assessed by the application of the assessment criteria supplied with each unit of learning and detailed for each assessment task. This assessment is closed-book and therefore the application of the various engineering concepts are written from memory.

2.3 CONTINUOUOS EXAMINATION TESTS

This IS done in the form of 3 test, the purpose of this assessment is to ascertain whether or not the key theoretical and practical concepts pertaining to the specific outcomes have been synthesized and integrated for this module by the individual. Learners do the final assessment individually at the end of the module. This assessment is a written test and therefore the theoretical and practical application of the engineering concepts are tested.

 Evaluation shall be based on:

* Year mark = 7 x Exams x 0.7
* Assignment x 0.3
* Exam mark = 1st Test 0.3

 2nd Test 0.3

 Final Test 0.4

* Final mark = (Ym x0.7) +(Em x 0.3)
* Final Mark = 3 x Class Test (50% of Final Mark)
* = 3 x Assignment (50% of Final Mark)
* = 50% sub-minimum for final mark
* The student must acquire a sub-minimum of 50% in both Assignment work and class tests to pass the Module.
* **~~The student will not be allowed final test entry if he/she has failed to achieve a sub-minimum of 10% 1~~~~st~~ ~~and 2~~~~nd~~ ~~test together (this applies to achieve a minimum of 50% passing final test with full marks).~~**
* To pass the subject the student must achieve a sub-minimum of 50% for the ~~exams~~ class tests and 50% Assignment work.
* The subject is **closed** book during evaluation (including exam tests). A formula sheet will be made available. Student can expect to be pressured on time.

**E PRACTICAL WORK**

 An assignment, as determined by the lecturer, will be done by the student. This shall include:

 Self-study (research)

**F REFERENCES (Prescribed)**

F1 Marine Engineering Theory – Volume 1: General 1st edition Derek G. Lambert

F2 Lecturer notes

**G OTHER REFERENCES**

**H ICT COMPONENT (software)**

H1 MSWord, Excel and Internet surveys.

H2 Autodesk Inventor

**I SCHEDULE OF WORK**

 TESTS

 Test 1: Date: (to be confirmed) \_\_\_\_\_

 Test 2: Date: (to be confirmed) \_\_\_\_\_

 Test 3: Date: (Lecturers discretion) \_\_\_\_\_\_

 Notes:

 1. The order in which the syllabus is covered may change and is at the discretion of the lecturer.