

Outline

Outboard Fuel & Carburetion Systems

Course Title

SE123

Dept. & Course No.

I. COURSE DESCRIPTION:

This course covers functions, maintenance, service of fuel tanks, pumps, carburetors, intake manifolds, flame arresters, and filters, and fuel injection systems used in marine engines.

II. SEMESTER CREDITS: 3

III. CONTACT HOURS PER WEEK: 2 3 5
Lec Lab Total

IV. PREREQUISITES: SE112 & SE113

V. STUDENT LEARNING OUTCOMES:

Upon completion of the course, the student will be able, with 65% accuracy, to:

VI. COURSE CONTENTS:

1. Explain functions of a fuel system on 50hp engine or above:
 - A. Fuel System
 1. Fuel tank
 2. Fuel pump
 3. Fuel lines
 4. Carburetor
 5. Reed valves
 6. Fuel injectors
2. Name and explain the functions of each part of the the fuel system
3. Locate and service/repair each part of the fuel system.
4. Explain and demonstrate removal, installation, service and repair of carburetors and fuel injectors.
 - B. Carburetors and injectors
 1. Float Assy.
 2. Float valve seal
 3. Carburetor body
 4. Fuel assy. chamber
 5. Throttle & choke butterfly
 6. Fuel injectors
5. Explain the purpose of the intake manifold.
 - C. Intake manifold
 1. Leaf stop
 2. Leaf-segment
 3. Leaf Plate
6. Remove, install, service and repair intake manifold.
7. Explain and demonstrate proper removal, installation, and replacement of fuel filters.
 - D. Fuel Filter
 1. Diaphragm
 2. Screen
 3. Gasket

VII. MATERIALS AND EQUIPMENT

- A. 50hp outboard motors of any kinds
- B. Special tools
- C. Pegasol (Solvent)
- D. Carburetor repair kit
- E. Sealant (form a gasket)
- F. Routine classroom materials

VIII. TEXTS

Text(s):

Roth, Alfred C. Small Gas Engines. South Holland, Illinois. Goodheart-Wilcox, 2012.

IX. METHODS OF INSTRUCTION

- A. Lecture
- B. Guest Speakers
- C. Laboratory work
- D. Audio/Visual aids
- E. Demonstration/Discussion
- F. Individualized instruction
- G. Reinforcement/Enrichment activities

X. METHOD OF EVALUATION

- A. The component with corresponding weight in percent included in the computation of the total grade.

Final Exam	15%
Mid-Term	15%
Test & Homework	20%
Project	50%
Total	100%

- B. Transmutation of percent to letter grade is as follows:

90 - 100 = A
80 - 89 = B
70 - 79 = C
65 - 69 = D
0 - 64 = F

TASKS

SEI23 Outboard Fuel & Carburetion Systems Credits: 2 1 48
Course No. & Title Lec Lab Ttl. Lab.Hrs.

Student Learning Outcome #1-7 12 hrs.

1. Remove and install carburetors, fuel pumps and filters
2. Disassemble and assemble carburetors, fuel pumps and filters
3. Service, repair, replace worn parts and maintenance carburetors, fuel tanks and fuel lines
4. Remove and service the reed valves and install
5. Remove and inspect and test fuel injectors.

Student Learning Outcome #4 12 hrs.

1. Remove & install air silencer and base
2. Remove, inspect throttle linkage and install
3. Explain, & demonstrate carburetor parts and its functions
4. Repair, service and install
5. Remove and install carburetors

Student Learning Outcome #5-6 12 hrs.

1. Explain the functions of intake manifold
2. Explain the use/purpose of leaf/reed plate
3. Remove and demonstrate leaf stop, leaf segments, leaf plate and install

Student Learning Outcome #7 12 hrs.

1. Remove and install diaphragm
2. Remove, check and install screen
3. Remove and replace gasket

**Palau Community College
SE123 Outboard Fuel and Carburetion Systems
Course Learning Outcomes**

During the course experience, the **course learning outcomes** (CLOs) will be assessed through the use of signature assignments. A rating scale will be used to determine the students' proficiency level of each CLO using specifically aligned assignments. The numerical ratings of 4, 3, 2 and 1 are not intended to represent the traditional school grading system of A, B, C, D and F. The descriptions associated with each of the numbers focus on the level of student performance for each of the course learning outcomes listed below.

Rating Scale: 4 Outstanding	2 Developing
3 Proficient	1 Emerging

Course Learning Outcome 1: Students will be able to identify and explain the operation of the components of an outboard fuel system.

Outstanding 4	Fully understands and can explain the operation of all components of an outboard fuel system, from the tank through to the combustion chamber. Has excellent knowledge of carburetors and knowledge of gas fuel injectors.
Proficient 3	Understands and can explain the operation of most components of an outboard fuel system, from the tank through to the combustion chamber. Has a good knowledge of carburetors and gas fuel injectors.
Developing 2	Has a reasonable understanding of most components of an outboard fuel system. Can explain the system on a very basic level. Has a good idea of how carburetors and fuel injectors work.
Emerging 1	Can recognize most of the components of an outboard fuel system. Can explain the system with help and prompting from the instructor. Understands the basic function of carburetors and injectors.

Course Learning Outcome 2: Students will be able to remove, service and reinstall all components in an outboard fuel system.

Outstanding 4	Can quickly remove, service and install all components from an outboard fuel system. Can strip and service carburetors without supervision or assistance. Can refit carburetors to engines and effectively re-tune them so that the engine runs smoothly.
Proficient 3	Can remove, service and install most components from an outboard fuel system. Can strip and service carburetors without supervision or assistance. Can refit carburetors to engines and effectively re-tune them with limited assistance from the instructor so that the engine runs smoothly.
Developing 2	Can remove and install most components from an outboard fuel system with assistance from an instructor. Can strip and reassemble carburetors if closely supervised. Can refit carburetors to engines and effectively re-tune them with assistance from the instructor so that the engine runs smoothly.
Emerging 1	Can assist an instructor to remove and install some components from an outboard fuel system. Can strip and reassemble carburetors if closely supervised. Can assist an instructor to refit carburetors to engines and effectively re-tune them.

Course Learning Outcome 3: Students will be able to trouble-shoot and repair all aspects of an outboard fuel system.

Outstanding 4	Can quickly identify and competently trouble-shoot faults in the fuel system and repair them without help from the instructor. Has an excellent understanding of the most common faults.
Proficient 3	Can identify and trouble-shoot faults in the fuel system and repair them without help from the instructor. Has a fair understanding of the most common faults.
Developing 2	Can identify and trouble-shoot only the major faults in the fuel system and repair them with help from the instructor. Has an understanding of some common faults.
Emerging 1	Can assist an instructor to identify and trouble-shoot the major faults in the fuel system and repair them with help from the instructor. Knows of some common faults.