

## COURSE OUTLINES

### General Laboratory

Course Title

SE 221

Dept. & Course No.

#### I. COURSE DESCRIPTION:

Advance maintenance and repair skills are developed in all aspects of a real-life shop situation by applying skills from previously studied courses. It includes dealing with customer problems, shop practices and procedures, tune-up and troubleshooting techniques, and installing motors and accessories. Emphasis is placed on actual work situations.

#### II. SEMESTER CREDITS: 4

#### III. CONTACT HOURS PER WEEK: 1      9      10 Lec      Lab      Total

#### IV. PREREQUISITES: SE 212 & 213

#### V. PERFORMANCE OBJECTIVES:

#### VI. COURSE CONTENT:

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

1. Explain and demonstrate proper procedures for handling shop inventory and the customers.

##### A. Inventory/Customer

1. Shop tools
2. Used & old stocks
3. Interview customer
4. Fill work orders

2. Explain and perform general tune-up procedures.

##### B. Tune-up procedures

1. Receiving motor
2. Compression check
3. Ignition
4. Carburetor
5. Tank test
6. General

3. Explain and demonstrate troubleshooting procedures.

##### C. Troubleshooting

1. General
2. Lubrications
3. Fuel Supply
4. Ignition
5. Adjustment

4. Demonstrate procedures for installing motors and accessories.

D. Motor & Accessories  
Installation.

1. Engine mounting
2. Speedo-meter
3. Tech-O-meter
4. Steering system
5. Bilge pump
6. Running light
7. Cut out transom
8. Apply measurement methods, single and double installation methods
9. Select propellers

## VII. MATERIALS AND EQUIPMENTS

- A. Inventory cards
- B. Two/four cycles engines
- C. Pre gasoline
- D. Arbor press
- E. Outboard Engine (any horse power)
- F. Timing light
- G. Parts (new & old)

## VIII. TEXTS AND REFERENCES

A. Text(s)

Small Gas Engine

Roth, Alfred C: Small Engine South Holland, Illinois:  
The Goodheart-Wilcox Inc., 2007

B. References

Outboard Service Manuals Waukegan, Illinois:  
Outboard Marine Corporation

## IX. METHOD OF INSTRUCTION

- A. Lecture
- B. Laboratory work
- C. Demonstration/discussion
- D. Reinforcement/enrichment activities

The components with corresponding weight in percent included in the computation of the total grade:

Final Exam .....	15%
Mid-term .....	15%
Tests and homework .....	20%
Projects .....	<u>50%</u>
Total .....	100%

Transmutation of percent to letter grade is as follows:

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

## TASKS

### SE 221 – General Laboratory

Course No. & Title

Credits:	<u>1</u>	<u>3</u>	<u>144</u>
	Lec	Lab	Total Lab Hrs.

SLO #1

36 hrs

1. Demonstrate and explain how to deal with shop inventories  
(include shop tools, running equipments new stock on hands and etc.).
2. Interview customers and fill out work order forms.

SLO #2

36 hrs

1. Explain and demonstrate tune-up procedures
2. Check compressions between each cylinders
3. Check and set the timing
4. Service, repair and maintain carburetor
5. Service, repair electrical & ignition system

SLO #3

36 hrs

1. Apply trouble shooting procedures
2. Check and test ignition coils, power pack, stator and sensor  
Coils for out-put check
3. Demonstrate and apply initial adjustment applied for all basic carburetors

SLO #4

36 hrs

1. Demonstrate the use of template to mount new engine on the transom
2. Service and install steering system
3. Install and wire Tech-meter, Speedo-meter, running light and bilge pump
4. Cut out transom
5. Apply measurement methods, single and double installation methods
6. Select propeller

**Course Level Achievement**  
**Form A**  
(Used for shop courses as well as other program courses)  
**SE 221 GENERAL LABORATORY**

Student's Name (Print): \_\_\_\_\_

Semester/Year: \_\_\_\_\_

Instructor's Name (Print): \_\_\_\_\_

**Directions:** Evaluate the student using the rating scale below and check the appropriate numbers to indicate the degree of competency. The numerical ratings of 5,4,3,2, 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 competencies listed below.

- Rating Scale:
- 5. Excellent
  - 4. Above Average
  - 3. Average
  - 2. Below Average
  - 1. Unacceptable

**SE 221 – General Laboratory**

COMPETENCY	RATING				
1. Perform and demonstrate proper procedures for handling inventories and the customers.	5	4	3	2	1
2. Perform general tune-up	5	4	3	2	1
3. Perform trouble shooting	5	4	3	2	1
4. Perform installing motors and accessories	5	4	3	2	1

I certify that the student has completed all the competencies in this course and has achieved an average rating as shown on the right.

\_\_\_\_\_  
Instructor's Signature

\_\_\_\_\_  
Date



## **1. Perform and demonstrate proper procedures for handling inventories and customers.**

- 5 Perform all tasks below with 90-100% accuracy.
  - Perform shop tools inventory (new and used tools on hand).
  - Perform used, old and new stocks inventory
  - Perform customers interview, this includes dealing with customer problems
  - Perform filling work orders and help customers
- 4 Perform all the tasks above with 80-89% accuracy.
- 3 Perform all the tasks above with 70-79% accuracy.
- 2 Perform all the tasks above with 65-69% accuracy.
- 1 Perform all the tasks above with below 65% accuracy.

## **2. Perform general tune-up**

- 5 Perform all tasks below with 90-100% accuracy.
  - Perform each cylinder compression check
  - Perform removal of ignition components, test and install
  - Perform removal of carburetor, disassemble, clean, inspect, repair and reassemble
  - Perform and demonstrate tune-up procedures
- 4 Perform all the tasks above with 80-89% accuracy.
- 3 Perform all the tasks above with 70-79% accuracy.
- 2 Perform all the tasks above with 65-69% accuracy.
- 1 Perform all the tasks above with below 65% accuracy.

## **3. Perform troubleshooting**

- 5 Perform all tasks below with 90-100% accuracy.
  - Demonstrate and apply all basic carburetor initial adjustment
  - Perform and test ignition coil, power pack, stator and sensor coil for out put check
  - Perform and demonstrate oil changing
  - Perform ignition timing setting
- 4 Perform all the tasks above with 80-89% accuracy.
- 3 Perform all the tasks above with 70-79% accuracy.
- 2 Perform all the tasks above with 65-69% accuracy.
- 1 Perform all the tasks above with below 65% accuracy.

## **4. Perform installing motors and accessories.**

- 5 Perform all four (4) procedures of installing motors and accessories
  - Perform and demonstrate use of template to mount new motor on the transom
  - Perform and demonstrate measurement methods for single and double engine installation.

- Perform and install tech-o-meter, speed-o-meter, running light, and bilge pump
  - Perform and install steering system (power steering system and manual steering).
- 4 Perform all the tasks above with 80-89% accuracy.
  - 3 Perform all the tasks above with 70-79% accuracy.
  - 2 Perform all the tasks above with 65-69% accuracy.
  - 1 Perform all the tasks above with below 65% accuracy.