COURSE OUTLINE

Two and Four-Cycle Engines
Course Title

SE113
Dept. & Course No.

I. COURSE DESCRIPTION:

This course covers overhaul and repair of lawn, garden and recreational engine under ship conditions according to manufactures recommendation. It is also include rebuilding procedures on large, multi cylinder and four-cycle engines. Complete engine diagnosis and reconditioning practices are covered.

II. SEMESTER CREDITS: 3

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

IV. PREREQUISITES: None

V. STUDENT LEARNING OUTCOMES:

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

1. Explain and demonstrate differences between two and four-cycle engines.
2. Explain concept of valve timing.
3. Remove, install and adjust intake and exhaust valves

VI. COURSE CONTENTS:

A. Two & Four-Cycle
   1. Types of engines
   2. Number of crank shaft revolutions.
   3. What happens in each stroke
   4. Compare size
   5. Number of moving parts
   6. Engine number power
   7. Means of lubrication
   8. Engine blocks
   9. Pistons
   10. Crankshafts
   11. Camshafts
   12. Cross scavenging
   13. Loop scavenging
   14. Parts identification
   15. Fuel Pumps
   16. Air cleaners
   17. Carburetion
   18. Governors
   19. Cooling system

B. Intake & Exhaust Valve
   1. Compare size
   2. Valve face
   3. Timing Marks
   4. Valve Stem
   5. Valve Margin

4. Explain and demonstrate engine tune-up and troubleshooting.

C. Tune-up and troubleshooting
   1. Troubleshoot 2-cycle engine
   2. Ignition Coil
   3. Fuel System
   4. Spark-plugs
   5. Magnets (flywheel)
   6. Compression
   7. Major Tune-up

VII. MATERIALS AND EQUIPMENTS:

A. Outboard Engine of any kind
B. 2 hp – 275 hp
C. Impeller housing
D. Impeller (synthetic rubber)
E. Sealant (Form a gasket type)
F. Impeller key

VIII. TEXT

A. Text(s):
Roth, Alfred C. Small Gas Engines. South Holland, Illinois. Goodheart-Wilcox, 2012.

IX. METHOD OF INSTRUCTION

A. Lecture
B. Guest speaker
C. Laboratory work
D. Audio/Visual
E. Demonstration/discussion
F. Individualized instruction
G. Reinforcement/enrichment activities

X. METHOD OF EVALUATION

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	50%
Total	100%

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

SE113 – Two and Four-Cycle Engine Credits: 2 Lec 1 Lab 48 Total Lab hrs.
Course Title

SLO #1 16 hrs

1. Disassemble & Reassemble different type of engines
2. Replace worn parts
3. Follow installation procedures
4. Apply measurement method
5. Service & maintain cooling system
6. Disassemble & reassemble ignition system

SLO #2-3 16 hrs

1. Grind & check valve face angle
2. Check value stem, margin spring, guide and keeper for wear and replace
3. Check and adjust valve clearance
4. Remove & install both intake and exhaust valve

SLO#4 16 hrs

1. Adjust and set timing
2. Check and adjust or change malfunctioning parts
3. Troubleshoot, repair and test run the system
4. Remove all the ignition components and test all the system with volt meter.
5. Check compression ratio

Palau Community College
SE113 Two and Four – Stroke Engines
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
3 Proficient
2 Developing
1 Emerging

Course Learning Outcome 1: Students will be able to recognize and name all major parts from both two and four-stroke engines.

Outstanding 4	Recognizes and names all engine parts from both two and four-stroke engines.
Proficient 3	Recognizes and names most engine parts from both two and four-stroke engines.
Developing 2	Recognizes some engine parts from both two and four-stroke engines.
Emerging 1	Needs instructor assistance in naming major parts in both two and four stroke engines.

Course Learning Outcome 2: Students will be able to recognize and explain differences between two and four-stroke engines.

Outstanding 4	Fully understands all the differences between two and four-stroke engines and can clearly explain and demonstrate these differences.
Proficient 3	Understands the basic differences between two and four-stroke engines and can explain and demonstrate these differences with minor errors.
Developing 2	Understands some of the basic differences between two and four-stroke engines and can explain and demonstrate these differences with some assistance.
Emerging 1	Understands that there are basic differences between two and four-stroke engines and can follow an explanation and demonstration made by the instructor.

Course Learning Outcome 3: Students will be able to explain tune-up and trouble-shooting techniques for two and four-stroke engines.

Outstanding 4	Trouble-shoots problems with any two or four-stroke engine and competently tunes and maintains the engines if necessary.
Proficient 3	Trouble-shoots problems with some two or four-stroke engines and tunes and maintains the engines if necessary.
Developing 2	Trouble-shoots problems with some two or four-stroke engines with assistance and can tune and maintain some of the engines if given guidance.
Emerging 1	Can hear that an engine is not running correctly and recognize the problem if it is clearly explained by the instructor. Can assist the instructor to tune or maintain an engine.