

Small Engines I

One semester (1/2 credit)

9th- 12th Grades

Text: Small Engines

1. Safety p. 13-21
 - a. classes of fires
 - b. fire extinguishers
 - c. safe and unsafe shop practices

2. Tools p. 21-29
 - a. basic hand tools
 - b. standard overhaul tools
 - c. types of torque wrenches

3. Fasteners p. 43- 61
 - a. types of fasteners
 - b. bolt head styles
 - c. measure bolts and threads
 - d. grading bolts
 - e. types of nuts
 - f. types of washers
 - g. snap rings
 - h. removal of bolts
 - i. restore threads

4. Measuring p. 29- 41
 - a. measuring instruments
 - b. reading measuring instruments

- c. major parts of an outside micrometer
- d. major parts of a vernier caliper
- e. major parts, set up and use of a dial caliper

5. Engine principles and design p. 63- 76

- a. types of energy
- b. types of motion
- c. parts of basic internal combustion engine
- d. types of engine design
- e. types of engine cooling systems

6. Principles of 2 and 4 stroke engines p. 77- 90

- a. components of a 4 cycle engine
- b. operation of a 4 cycle engine
- c. factors that determine the firing order of a multi-cylinder engine
- d. camshaft lobe
- e. valve timing and overlap
- f. types of valve arrangements
- g. components of a 2 cycle engine
- h. operation of a 2 cycle engine
- i. valves used in a 2 cycle engine
- j. factors which determine timing on 2 cycle engines

7. Electricity p. 147- 175

- a. sources of electricity
- b. parts of a circuit
- c. conductors and insulators
- d. direct and alternating current
- e. electrical schematic symbols
- f. ohm's law
- g. series and parallel circuits

8. Ignition systems p. 147- 175

- a. types of ignition systems
- b. components of primary and secondary battery ignition system
- c. components of a magneto system

9. Charging systems p. 147- 175

- a. kinds of charging systems
- b. system components and functions
- c. operating stages of a charging system

10. Starting systems p. 147- 175

- a. types of small gas engine starters
- b. components of a manual starting system
- c. components of a dc starting system

11. Lubrication system p. 175- 191

- a. types of lubrication systems
- b. crankcase breather
- c. SAE/ API
- d. 2 cycle oil

12. Cooling systems p. 191- 201

- a. function of the cooling system
- b. components of the cooling system
- c. causes of overheating

13. Fuel system p. 109- 147

- a. purpose of the fuel system
- b. types of small engine fuel supply system
- c. types of carburetors
- d. types fuel filters
- e. types of air cleaners
- f. parts of carburetors
- g. carburetor systems

14. Governor systems p. 123- 147

- a. purpose of the governor system
- b. types of governor systems
- c. components of the governor system

15. Exhaust system p/ 201- 217

- a. types of exhaust systems

16. Troubleshooting p. 201- 217

- a. basic troubleshooting
- b. requirements for an engine to run