

AE.EPT. Engine and Power Technology

Essential Discipline Goals

- Develop and apply the technical and related academic skills necessary to gain successful employment in the Power Mechanic Industry.
- Demonstrate the ability to communicate, solve problems, work independently and in teams, and apply technical knowledge effectively.
- Develop work habits and leadership skills, which will foster productivity and career advancement.
- Utilize laboratory projects and/or activities to apply related knowledge and skills.
- Acquire an awareness of the latest changes in technology, which will affect the methods of application now and in the future.

Standards

Indicators

- AE.EPT.02** Identify a wide variety of career opportunities available in the small engine industry 1.7.5
- AE.EPT.02.01** Prepare a list of several career opportunities within the Power Mechanics Industry 1.7.5
- AE.EPT.02.01** Identify local career opportunities which utilize power mechanic skills 1.7.5
- AE.EPT.04** Identify the many applications of small engines in use today 1.7.1
- AE.EPT.04.01** Develop a list of equipment and vehicles, which utilize small engines as a power source. (lawn and garden industrial, commercial and recreational use) EG1.2.5
- AE.EPT.04.02** Demonstrate the use of small engine in one of the pieces of equipment from one or more of the categories above 1.3.1
- AE.EPT.04.03** Evaluate the many contributions of the small gasoline engine in the world today EG1.2.5
- AE.EPT.06** Develop an awareness of the modifications and design changes that have occurred in the history of the small engine
- AE.EPT.06.01** Create a time line or poster which describes some of the major changes or improvements in small engines EG1.2.5
- AE.EPT.06.02** Identify and compare the differences between a new and old engine of the same horsepower 1.5.9
- AE.EPT.08** Develop communication skills essential for success in the field of Power Mechanics 1.5.9
- AE.EPT.08.01** Develop a personal resume EG2.3.3
- AE.EPT.08.02** Fill out a sample job application EG2.3.3
- AE.EPT.08.03** Conduct a mock employer interview EG3.1.3
- AE.EPT.08.04** Prepare and present a sales presentation on a piece of power equipment 2.8A.3
- AE.EPT.08.05** Complete a mock telephone service call EG3.1.3
- AE.EPT.08.06** Review and interpret equipment maintenance and warranty information 1.3.4
- AE.EPT.08.07** Demonstrate proper safety and operation of a piece of power equipment 1.3.1
- AE.EPT.10** Develop safe working habits in the Power Mechanics shop/lab 1.3.2
- AE.EPT.10.01** Demonstrate safe use of tools and equipment 1.3.1
- AE.EPT.10.02** Demonstrate general shop/lab site safety habits 1.3.1
- AE.EPT.10.03** Review emergency safety procedures 1.3.2
- AE.EPT.10.04** Appropriate safety exams should be completed and kept on file
- AE.EPT.10.05** Complete reading assignments on shop/lab safety 1.5.6
- AE.EPT.12** Develop a working knowledge of the tools and measuring instruments used in Power Mechanics 4.1A.1
- AE.EPT.12.01** Locate service data on different types of small engines 1.5.6
- AE.EPT.12.02** Practice locating and applying information from data tables related to the unit of study (ex. Wire size, drill size, torque-specs, model numbers) 1.5.6
- AE.EPT.12.03** Collect and interpret small engine service data 1.5.6
- AE.EPT.12.04** Determine appropriate repair/replacement procedures to follow based on an analysis of available service data 1.4.2
- AE.EPT.14** Develop an understanding of basic four stroke engine components and operation 5.3B.1

- AE.EPT.14.01 Identify the basic components of a small engine and describe the function of each part 1.5.7
- AE.EPT.14.02 Describe four-stroke engine operation and explain the purpose of each stroke EG2.2.2
- AE.EPT.14.03 Complete reading assignment on four-stroke theory of operation 1.5.6
- AE.EPT.16 Develop an understanding of basic two-stroke engine components and operation
 - AE.EPT.16.01 Identify the basic components of a Two-stroke small engine and describe the function of each part 1.5.7
 - AE.EPT.16.02 Describe two-stroke engine operation and explain the purpose of each stroke EG2.3.3
 - AE.EPT.16.03 Compare the advantages and disadvantages of a two-stroke engine EG2.3.3
- AE.EPT.40.04 Complete reading assignment on two-stroke theory of operation 1.5.6
- AE.EPT.18 Develop an understanding of small engine compression system parts and operation
 - AE.EPT.18.01 Identify the parts of the two-stroke and four-stroke compression systems 1.5.7
 - AE.EPT.18.02 Explain the function of each part in the compression system EG2.3.3
 - AE.EPT.18.03 Demonstrate the ability to remove and replace each part of a compression system 1.3.4
 - AE.EPT.18.04 Identify common compression system failures and list possible causes 1.4.2
 - AE.EPT.18.05 Complete reading assignment on small engine compression systems 1.5.6
- AE.EPT.20 Identify the different methods of lubrication, and the function of motor oil, if four-stroke and two-stroke engines
 - AE.EPT.20.01 Identify the different parts of a small engine's lubrication system 1.5.7
 - AE.EPT.20.02 List the function of motor oil EG2.3.3
 - AE.EPT.20.03 Explain the classification and service rating of oils recommended for small engines EG2.3.3
 - AE.EPT.20.04 Demonstrate the proper mixing of oil and gasoline for use in a two-stroke engine
- AE.EPT.22 Develop an understanding of the parts and operation of a small engine carburetion system 1.5.2
 - AE.EPT.22.01 Explain the primary function of a carburetor 1.5.2
 - AE.EPT.22.02 Identify the three basic types of carburetors (ex. Diaphragm, float type, and slide-barrel.) 1.5.7
 - AE.EPT.22.03 Identify the basic parts of a carburetor 1.5.7
 - AE.EPT.22.04 Explain the operation of the three basic types of carburetors 1.5.2
 - AE.EPT.22.05 Demonstrate the ability to disassemble and rebuild carburetors 1.3.4
 - AE.EPT.22.06 Complete reading assignments on small engine carburetion 1.5.6
- AE.EPT.24 Develop an understanding of a small engine governor system
 - AE.EPT.24.01 Explain the function of an ignition system EG2.3.3
 - AE.EPT.24.02 Identify the parts of a mechanical breaker point ignition system 1.5.7
 - AE.EPT.24.03 Identify the parts of a solid-state ignition system 1.5.7
 - AE.EPT.24.04 Install and adjust common parts of a small engine ignition system 1.3.4
 - AE.EPT.24.05 Perform a spark test using a recommended spark tester 1.4.2
 - AE.EPT.24.06 Complete reading assignment on small engine ignition system 1.5.6
- AE.EPT.26 Demonstrate the ability to successfully disassemble and reassemble a small gasoline engine
 - AE.EPT.26.01 Utilize proper methods and tools to disassemble a small gasoline engine 1.2.5
 - AE.EPT.26.02 Use available measuring tools to take measurements commonly used to determine engine failure 4.1A.1
 - AE.EPT.26.03 Clean and inspect parts for wear and damage 1.3.4
 - AE.EPT.26.04 Utilize proper procedures and tools to reassemble a small gasoline engine according to manufacturer's specifications 1.3.4
- AE.EPT.28 Develop an understanding of the operating theory of multi-cylinder engines
 - AE.EPT.28.01 Identify the parts of a multi-cylinder engine 1.5.7
 - AE.EPT.28.02 Describe the function of each part in a multi-cylinder engine EG2.3.3
 - AE.EPT.28.03 Compare the compression, ignition, and fuel systems of a multi-cylinder engine to those of a single cylinder engine 1.5.8
 - AE.EPT.28.04 Disassemble and reassemble a multi-cylinder engine if available 1.3.4
 - AE.EPT.28.05 Perform recommended maintenance procedures on multi-cylinder engines 1.3.4

- AE.EPT.30** Practice recommended preventive maintenance procedures on two-stroke and four-stroke engines
- AE.EPT.30.01** Locate important maintenance information in appropriate service manuals 1.5.6
 - AE.EPT.30.02** Demonstrate tune-up procedures on two-stroke and four-stroke engines 1.3.4
 - AE.EPT.30.03** Demonstrate the ability to clean a foam-type and paper-type air filter 1.3.4
 - AE.EPT.30.04** Demonstrate the ability to properly change the oil in a four-stroke engine 1.3.4
- AE.EPT.32** Demonstrate the ability to work safely with metalworking tools and equipment
- AE.EPT.32.01** Identify the common hand tools and equipment used in metal work 1.5.7
 - AE.EPT.32.02** Demonstrate the safe use of metal-working tools and equipment 1.3.4
 - AE.EPT.32.03** Complete a safety exam with 100% accuracy before using power tools and welding equipment
 - AE.EPT.32.04** Identify accident reporting procedures EG2.3.3
 - AE.EPT.32.05** Complete reading assignment on metal-working safety 1.5.6
- AE.EPT.34** Demonstrate the ability to identify the characteristics and usefulness of commonly used metals 4.1.3
- AE.EPT.34.01** Determine the difference between ferrous and non-ferrous metals 4.1.3
 - AE.EPT.34.02** Demonstrate common methods used to identify metals 1.3.4
 - AE.EPT.34.03** Identify common metal alloys 4.1.3
- AE.EPT.36** Develop a variety of metal working skills and practices used in the welding industry 1.3.4
- AE.EPT.36.01** Demonstrate the ability to lay out, mark and cut and bend commonly used metals 1.3.4
 - AE.EPT.36.02** Demonstrate the ability to drill, thread and fasten commonly used metals 1.3.4
 - AE.EPT.36.03** Demonstrate the ability to grind metal and sharpen cutting tools 1.3.4
- AE.EPT.38** Develop the ability to identify and operate gas welding and cutting equipment 1.3.1
- AE.EPT.38.01** Identify the parts of an oxyacetylene outfit 1.5.7
 - AE.EPT.38.02** Demonstrate the ability to set-up, light, adjust and shut down an oxyacetylene torch 1.3.4
 - AE.EPT.38.03** Demonstrate the ability to complete a puddle bead, fusion weld and braze bead on light gauge steel 1.3.4
 - AE.EPT.38.04** Demonstrate the ability to properly cut through steel with the oxyacetylene cutting torch 1.3.4
 - AE.EPT.38.05** Complete reading assignment on use of the oxyacetylene torch 1.5.6
- AE.EPT.40** Select electric arc welders, equipment and install simple electrical wiring systems
- AE.EPT.40.01** Identify the parts of an electric arc welder 1.5.7
 - AE.EPT.40.02** Distinguish between the different types of electric welding machines 1.5.8
 - AE.EPT.40.03** Describe the shielded metal arc welding process 5.1.2
 - AE.EPT.40.04** Select suitable supplies and equipment for shielded metal arc welding 1.3.4
- AE.EPT.42** Develop the ability to operate an electric arc welder and perform basic welding skills
- AE.EPT.42.01** Use safety equipment and protective clothing for arc welding 1.3.4
 - AE.EPT.42.02** Strike an arc and run flat-position beads 1.3.4
 - AE.EPT.42.03** Make butt and fillet welds 1.3.4
 - AE.EPT.42.04** Practice running beads with MIG welder, if available 1.3.4
- AE.EPT.44** Demonstrate the ability to plan and install simple electrical wiring systems 5.2B
- AE.EPT.44.01** Describe some basic principles of electricity 5.2.A1
 - AE.EPT.44.02** Describe the relationship among volts, watts, amperes 5.2.A1
 - AE.EPT.44.03** Select electrical boxes, outlets, and switches 5.2B
 - AE.EPT.44.04** Install and replace switches, outlets and fixtures 5.2B
 - AE.EPT.44.05** Design simple wiring systems 5.2B
- AE.EPT.46** Explore and prepare for career opportunities in the field of power mechanics
- AE.EPT.46.01** Practice job-hunting skills EG2.2.1
 - AE.EPT.46.02** Prepare a personal resume EG2.2.2
 - AE.EPT.46.03** Fill out a sample job application EG2.3.2
 - AE.EPT.46.04** Practice job interviewing skills EG2.2.2