

Agriculture Mechanics and Power Systems (2017)

OCCUPATIONAL SAFETY AND HEALTH IN AG MECHANICS 1.0

1 Safety Practices 1.1

- 1 Explain the importance of safety of agricultural mechanics. 1.1.1
- 2 Identify and differentiate between safe and unsafe work practices. 1.1.2
- 3 Describe the methods utilized to implement safe work practices. 1.1.3
- 4 Identify and explain the purpose of signals and symbols in agricultural safety. 1.1.4
- 5 Explain the importance and function of safety training. 1.1.5
- 6 Evaluate the importance of occupational safety and health in agriculture mechanics. 1.1.6
- 7 Identify and explain the role that various agencies play in regulating safety. 1.1.7
- 8 Identify and demonstrate the proper use of personal protection equipment (PPE). 1.1.8
- 9 Locate and demonstrate the proper uses of the first aid and emergency equipment. 1.1.9
- 10 Maintain a general safe working environment. 1.1.10
- 11 Demonstrate the proper disposal of hazardous waste. 1.1.11
- 12 Read and understand safety data sheets (SDS). 1.1.12

TOOLS AND HARDWARE 2.0

1 Safe and Proper Use of Tools 2.1

- 1 Determine which hand tool, power tool and measuring and marking devices are most appropriate for a job. 2.1.1
- 2 Identify and safely use hand and power tools utilized in agricultural mechanics. 2.1.2
- 3 Identify and properly use measuring and marking tools. 2.1.3
- 4 Measure and apply metric to standard measurement conversions. 2.1.4
- 5 Inspect and maintain tools. 2.1.5

2 Hardware and Fasteners 2.2

- 1 Identify and select proper common hardware and fasteners. 2.2.1
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METAL TECHNOLOGY 3.0

1 Welding 3.1

- 1 Demonstrate proper safety practices working with metal technology. 3.1.1
 - 2 Determine uses of metal. 3.1.2
 - 3 Identify types of metal and the proper welding technique. 3.1.3
 - 4 Recognize properties of metal. 3.1.4
 - 5 Properly select and use oxy-fuel equipment. 3.1.5
 - 6 Properly select and use shielded metal arc welding equipment. 3.1.6
 - 7 Properly select and use gas metal arc welding equipment. 3.1.7
 - 8 Properly select and use gas tungsten arc welding equipment. 3.1.8
 - 9 Properly select and use plasma cutting equipment. 3.1.9
 - 10 Properly select welding consumables (i.e., wire, electrode, gas and filler rod). 3.1.10
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2 Cold Metal Work 3.2

- 1 Read metal working plans. 3.2.1
 - 2 Properly cut threads with a tap and die. 3.2.2
 - 3 Join metal by riveting. 3.2.3
 - 4 Properly thread steel pipe. 3.2.4
 - 5 Lay out holes and drill holes using a twist drill. 3.2.5
 - 6 Bend sheet and strap metal to angles and/or shapes. 3.2.6
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POWER SYSTEMS 4.0

1 Engines Technology 4.1

- 1 Identify the operating principles of internal combustion engines. 4.1.1
 - 2 Explain the function and operating principles of the fuel, lubrication, governor, and ignition systems. 4.1.2
 - 3 Locate technical information in electronic and print form. 4.1.3
 - 4 Troubleshoot and maintain engines. 4.1.4
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2 Electric Motors 4.2

- 1 Select motors based on type of application. 4.2.1
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3 Agricultural Machinery 4.3

- 1 Identify and perform basic equipment maintenance on agricultural machinery. 4.3.1
- 2 Use mathematics to solve equipment calibration problems. 4.3.2
- 3 Demonstrate converting common units of measure found in agriculture. 4.3.3

4 Hydraulics 4.4

- 1 Identify the parts and functions of the hydraulic systems. 4.4.1
 - 2 Identify the applications of hydraulics in agriculture. 4.4.2
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ELECTRICITY 5.0

1 Basic Electrical Principles 5.1

- 1 Demonstrate proper safety practices when working with electricity. 5.1.1
 - 2 Define basic electrical terminology; identify and explain the basic principles of electricity. 5.1.2
 - 3 Recognize electrical code requirements for wiring. 5.1.3
 - 4 Plan and install an electrical circuit. 5.1.4
 - 5 Measure electrical circuits for voltage, current flow, resistance, and wattage. 5.1.5
 - 6 Trouble-shoot electrical circuits. 5.1.6
 - 7 Describe the relationship of volts, amps, and ohms in terms of Ohm's Law. 5.1.7
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MATHEMATICAL APPLICATIONS 6.0

1 Mathematical Applications in Agriculture Mechanics & Power Systems 6.1

- 1 Perform mathematical operations for whole numbers, fractions, decimals, ratios, percentages, and rounding (significant figures). 6.1.1
 - 2 Demonstrate converting common units of measure found in agriculture. 6.1.2
 - 3 Explain the meaning of accuracy verses precision. 6.1.3
 - 4 Use mathematics to solve equipment calibration problems. 6.1.4
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INSULATION 7.0

1 Insulation 7.1

- 1 Explain the importance of insulation. 7.1.1
 - 2 Explain the theory behind insulation. 7.1.2
 - 3 Identify and select insulation materials. 7.1.3
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EMERGING TECHNOLOGIES 8.0

1 Emerging Technologies in Ag Systems 8.1

- 1 Identify uses of precision and emerging technology in agriculture. 8.1.1
 - 2 Understand the potential applications of new technology in agriculture. 8.1.2
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CAREERS 9.0

1 Careers in Ag Mechanics 9.1

- 1 Research potential careers in ag mechanics. 9.1.1
 - 2 Demonstrate employability skills for a career in ag mechanics industry. 9.1.2
 - 3 Research additional industry certifications available. 9.1.3
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**LEADERSHIP TRAINING
THROUGH
AGRICULTURAL
EDUCATION 10.0**

1 Effective Leadership and Leadership Training 10.1

- 1 Expand leadership experience by participating in a chapter activity. 10.1.1
 - 2 Participate in a career development event at the local level or above. 10.1.2
 - 3 Exhibit leadership skills by demonstrating proper parliamentary procedure. 10.1.3
 - 4 Participate in a speech or presentation activity. 10.1.4
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2 School and Community Awareness 10.2

- 1 Participate in a school improvement or community development project. 10.2.1
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**SUPERVISED
AGRICULTURAL
EXPERIENCE 11.0**

1 Maintain a Supervised Agricultural Experience 11.1

- 1 Accurately maintain SAE record books. 11.1.1
- 2 Investigate the proficiency award areas related to SAE program area. 11.1.2
- 3 Actively pursue necessary steps to receive higher degrees in FFA. 11.1.3