



Agricultural Power, Structural, and Mechanical Systems

Criticality Survey 2026

CONTENT STANDARD 1.0: PROFESSIONAL ORGANIZATIONS AND LEADERSHIP

Performance Standard 1.1: Student Leadership in Career Technical Student Organizations (CTSO) and Professional Associations.

1.1.1	Explore the role of professional organizations and/or associations in the Agricultural Power, Structural, and Mechanical Systems Industry.	1.56
1.1.2	Define the value, role, and opportunities provided through career technical student organizations.	1.74
1.1.3	Engage in career exploration and leadership development.	2.03
Performance Standard 1.2: Supervised Agricultural Experience		
1.2.1	Maintain SAE record books.	1.94
1.2.2	Describe the proficiency award areas related to the SAE program area.	1.50
1.2.3	Describe necessary steps to receive higher degrees in FFA.	1.59

CONTENT STANDARD 2.0: LAB ORGANIZATION AND SAFETY

Performance Standard 2.1: General Safety Rules and Procedures

2.1.1	Describe general shop safety rules and procedures (i.e., pass a safety test).	2.53
2.1.2	Describe the Occupational Safety and Health Administration's (OSHA's) role in ensuring workplace safety.	2.29
2.1.3	Describe and comply with the required use of safety glasses, ear protection, gloves, and shoes (i.e., personal protection equipment [PPE]) during lab/shop activities.	2.71
2.1.4	Operate equipment according to manufacturer and general safety guidelines.	2.62
2.1.5	Operate lifting equipment to manufacturer specifications.	2.41
2.1.6	Describe work area ventilation requirements and best practices.	2.21
2.1.7	Identify safety markings and what they indicate.	2.32
2.1.8	Identify types of fire extinguishers and fire safety equipment.	2.09
2.1.9	Describe classes of fire extinguishers and procedures for using fire extinguishers and fire safety equipment.	1.88
2.1.10	Describe procedures for using eyewash stations.	2.15
2.1.11	Describe and wear appropriate clothing for shop activities.	2.44
2.1.12	Describe safe working procedures when working with high-voltage circuits.	2.41
2.1.13	Describe and follow lockout/tagout (LOTO) procedures.	2.29
2.1.14	Describe information contained on safety data sheets (SDS) and where they are kept.	2.06
2.1.15	Maintain a safe, clean, and organized work area.	2.41

2.1.16	Define a confined space.	1.88
2.1.17	Demonstrate the proper disposal of hazardous waste.	2.09
CONTENT STANDARD 3.0: TOOLS AND HARDWARE		
Performance Standard 3.1: Safe and Proper Use of Tools		
3.1.1	Select hand tools and power tools best suited for particular tasks.	2.35
3.1.2	Demonstrate use of measuring and marking tools.	2.38
3.1.3	Convert between metric and standard measuring systems.	1.85
3.1.4	Inspect tools for defects, repairing or replacing as needed.	2.21
Performance Standard 3.2: Hardware and Fasteners		
3.2.1	Identify common hardware and fasteners.	1.91
3.2.2	Demonstrate application of hardware and fasteners.	1.88
CONTENT STANDARD 4.0: METAL TECHNOLOGY		
Performance Standard 4.1: Welding		
4.1.1	Demonstrate safety practices required for welding and metalwork.	2.29
4.1.2	Describe properties of metal.	1.97
4.1.3	Identify types of metal and the applicable welding techniques.	2.03
4.1.4	Determine the intended use of metal workpieces.	1.94
4.1.5	Select the best welding process based on material composition and intended use of the workpiece.	2.06
4.1.6	Set up and use oxy-fuel equipment.	2.09
4.1.7	Set up and use shielded metal arc welding equipment.	2.26
4.1.8	Set up and use gas metal arc welding equipment.	2.15
4.1.9	Set up and use gas tungsten arc welding equipment.	1.82
4.1.10	Set up and use plasma cutting equipment.	2.18
4.1.11	Select welding consumables (e.g., wire, electrode type, gas, filler rod) based on welding processes.	2.12
Performance Standard 4.2: Cold Metal Work		
4.2.1	Select specific tools for cold metal work.	1.74
4.2.2	Interpret metalworking plans.	1.85
4.2.3	Cut threads with a tap and die.	2.00
4.2.4	Join metal with fasteners (e.g., rivets, bolts, screws).	2.03
4.2.5	Thread steel pipe.	1.82
4.2.6	Lay out and drill holes.	2.06
4.2.7	Shape sheet and strap metal.	1.85
CONTENT STANDARD 5.0: POWER SYSTEMS		
Performance Standard 5.1: Engines Technology		
5.1.1	Describe the operating principles of internal combustion engines.	1.56
5.1.2	Describe the function and operating principles of the fuel, lubrication, governor, and ignition systems.	1.68
5.1.3	Access owner's manual information, service schedules, and manufacturer's data to perform periodic maintenance.	1.97
5.1.4	Troubleshoot common failures relating to ignition, fuel, cooling, lubrication, electrical, and compression systems.	1.97

5.1.5	Perform basic repairs for common failures relating to ignition, fuel, cooling, lubrication, electrical, and compression systems.	2.00
Performance Standard 5.2: Electric Motors		
5.2.1	Identify types of electric motors (e.g., AC/DC, single-phase, three-phase).	1.88
5.2.2	Identify basic components of an electric motor.	1.74
5.2.3	Select motors based on type of application.	1.68
5.2.4	Troubleshoot common failures relating to electric motors.	1.74
5.2.5	Perform basic maintenance on electric motors.	1.82
Performance Standard 5.3: Agricultural Machinery		
5.3.1	Identify common machinery used in local agricultural, food, and natural resource applications.	1.68
5.3.2	Describe basic equipment maintenance needs for types of agricultural machinery.	1.88
5.3.3	Identify common systems used by agricultural machinery (e.g., GPS, GIS, onboard measuring equipment, auto-steer).	1.65
Performance Standard 5.4: Common Power Systems and Components		
5.4.1	Identify common power systems used in agricultural, food, and natural resource applications (e.g., hydraulics, pneumatics, belts, drivetrains).	1.88
5.4.2	Identify common power systems components used in agricultural, food, and natural resource applications	1.82
5.4.3	Identify the applications of common power systems in agriculture.	1.76
5.4.4	Troubleshoot common power system issues in agricultural, food, and natural resource applications.	1.91
CONTENT STANDARD 6.0: ELECTRICITY		
Performance Standard 6.1: Basic Electrical Principles		
6.1.1	Identify common tools used in electrical applications (e.g., multimeter, wire cutters, tubing bender, crimping tool).	2.03
6.1.2	Identify common consumables in electrical applications (e.g., conduit, wire, wire connectors).	1.91
6.1.3	Demonstrate safety practices and precautions when working with electricity.	2.26
6.1.4	Define basic electrical terminology.	1.82
6.1.5	Identify and explain the basic principles of electricity (e.g., single-phase, three-phase, low-voltage, medium-voltage, high-voltage).	1.88
6.1.6	Access electrical code requirements for wiring tasks.	1.62
6.1.7	Select and install an electrical circuit suitable for required electrical supply.	1.74
6.1.8	Measure electrical circuits for voltage, current flow, resistance, and wattage.	1.91
6.1.9	Troubleshoot problems in electrical circuits.	1.76
6.1.10	Describe the relationship of volts, amps, and ohms to Ohm's law.	1.68
CONTENT STANDARDS 7.0: AGRICULTURAL CONSTRUCTION		
Performance Standard 7.1: Drafting in Agricultural Projects		
7.1.1	Differentiate between plans used in projects (e.g., blueprints, shop plans, wiring schematics).	1.62

7.1.2	Select a building design, based on building needs (i.e., use, environment, budget).	1.53
7.1.3	Develop a bill of materials from a selected set of plans.	1.65
7.1.4	Draw basic plans, using drafting techniques.	1.47
Performance Standard 7.2: Construction of Agricultural Projects		
7.2.1	Identify common hand and power tools used in agricultural construction.	1.88
7.2.2	Describe the steps to prepare a site (e.g., measuring, layout, surveying, leveling).	1.56
7.2.3	Construct an agricultural project based on specified plans.	1.56
CONTENT STANDARDS 8.0: WATER AND WASTEWATER MANAGEMENT		
Performance Standard 8.1: Agricultural and Industrial Water Management		
8.1.1	Describe the role of water use, management, and conservation in the agricultural industry.	1.74
8.1.2	Describe the fundamentals of agricultural water systems and irrigation.	1.85
8.1.3	Select and use safety equipment appropriate to working conditions.	2.26
Performance Standard 8.2: Pipe Fitting Skills		
8.2.1	Describe how to select and identify fittings and pipe.	1.82
8.2.2	Describe how to measure, mark, cut, and join pipe.	1.88
CONTENT STANDARDS 9.0: PRECISION AGRICULTURAL APPLICATIONS		
Performance Standard 9.1: Calculations in Agricultural Power, Structural, and Mechanical Systems		
9.1.1	Perform calculations for agricultural applications (e.g., volume, area, rate, ratio, percentages).	1.97
9.1.2	Identify common units of measure for agricultural applications.	1.94
9.1.3	Convert common units of measure found in agricultural applications.	1.91
9.1.4	Compare the terms <i>accuracy</i> and <i>precision</i> .	1.76
Performance Standard 9.2: Precision Agricultural Technologies		
9.2.1	Compare predictive, preventative, and corrective maintenance.	1.91
9.2.2	Describe uses of notification and workflow systems in agricultural applications.	1.50
9.2.3	Describe uses of precision and emerging technology in agriculture (e.g., GPS/GIS).	1.59
9.2.4	Describe opportunities for new technology in agriculture.	1.44