



EXAM INFORMATION

Items

44

Points

73

Prerequisites

NONE

Grade Level

9-12

Course Length

ONE YEAR

Career Cluster

AGRICULTURE, FOOD AND NATURAL
RESOURCES

SCIENCE, TECHNOLOGY,
ENGINEERING, AND MATHEMATICS

Performance Standards

INCLUDED

Certificate Available

YES

DESCRIPTION

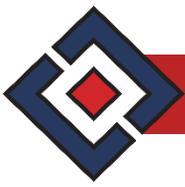
Agricultural Systems Technology I (110) is the first assessment in a series. Students must demonstrate knowledge and skills in the application of principles and techniques of power, structural, and technical systems used in the agricultural industry, particularly agricultural production and service. Students will demonstrate basic skills in the areas of hot and cold metalwork, tool reconditioning, plumbing, painting, bill of materials preparation, small gas engines, and welding. The basic practices associated with soil and water management are included. Safety and proper use of tools and equipment will be emphasized.

EXAM BLUEPRINT

STANDARD

PERCENTAGE OF EXAM

1- The Role of Student Organizations in Agricultural Education	5%
2- Role of Agricultural Experience In Agricultural Education	3%
3- Agricultural Education and Technology	1%
4- Safety Practices in Technical Systems	25%
5- Maintain Agricultural Structures	12%
6- Basic Plumbing and Skills	8%
7- Small Internal Combustion Engines	12%
8- Fabricate with Metal	34%



STANDARD 1

STUDENTS WILL EXPLAIN THE ROLE OF STUDENT ORGANIZATIONS IN AGRICULTURAL EDUCATION

- Objective 1** Discuss the history and organization of student organization as it relates to the complete program of agricultural education.
1. Explain the interrelationship of classroom and laboratory instruction, supervised agricultural experience, and student organization.
 2. Describe how, when, and why student organizations are organized.
 3. Identify key student organization historical events.
 4. Identify the mission, strategies, colors, motto, emblem, parts of the emblem, and organizational structure of student organizations.
 5. Recite and explain the meaning of a student organization creed.
 6. Discuss the meaning and purpose of a program of activities and its committee structure.
 7. List student organization chapter officers and discuss the role of each.
- Objective 2** Identify opportunities in student organizations.
1. Describe student organization opportunities that develop leadership skills, personal growth, and career success.
 2. Summarize major state and national activities available to student organization members.
- Objective 3** Describe student organization degrees, awards, and career development events (CDEs).
1. List and explain the student organization degree areas.
 2. Identify student organization proficiency awards.
 3. List and discuss various team and individual CDEs.

Standard 1 Performance Evaluation included below (Optional)

STANDARD 2

STUDENTS WILL EXPLAIN THE ROLE OF SUPERVISED AGRICULTURAL EXPERIENCE PROGRAMS IN AGRICULTURAL EDUCATION

- Objective 1** Examine the responsibilities and benefits associated with an agricultural experience.
1. Explain the meaning and benefits of supervised agricultural experience.
 2. Explain the characteristics of an effective agricultural experience program and the responsibilities of those involved.
- Objective 2** Determine the types of agricultural experience programs.
1. Compare entrepreneurship agricultural experiences and placement agricultural experiences.
 2. Describe research/experimentation agricultural experiences.
 3. Describe exploratory agricultural experiences.
- Objective 3** Plan an agricultural experience program.
1. Identify the steps in planning an agricultural experiences program.
 2. Describe the function of a business/training plan and/or agreement in an agricultural experience program.



3. Develop a short-range plan and a long-range plan for an agricultural experience program.
4. Relate classroom and laboratory instruction to an agricultural experience program.

Objective 4 Maintain and use agricultural experience records.

1. Explain the importance of keeping records on an agricultural experience program.
2. Explain how agricultural experience records are organized.
3. Follow approved procedures to make entries in agricultural experience records.

Standard 2 Performance Evaluation included below (Optional)

STANDARD 3

STUDENTS WILL DESCRIBE THE ROLE OF AGRICULTURAL EDUCATION IN AGRICULTURAL SYSTEMS AND TECHNOLOGY

Objective 1 Investigate agricultural power, structural, and technical systems.

1. Explain the meaning and importance of agricultural power, structural, and technical systems.
2. Identify and describe career opportunities in agricultural power, structural, and technical systems.

STANDARD 4

STUDENTS WILL DEMONSTRATE APPROPRIATE SAFETY PRACTICES IN AGRICULTURAL POWER, STRUCTURAL, AND TECHNICAL SYSTEMS IN LABORATORY AND WORK SETTINGS

Objective 1 Explain the meaning and importance of safety in agricultural power, structural, and technical systems.

1. Define safety and describe why it is important.
2. Identify safety hazards and demonstrate the actions needed to minimize or eliminate risk associated with agricultural power, structural, and technical systems in learning and/or work facilities.

Objective 2 Implement safety practices related to agricultural power, structural, and technical systems in learning and work facilities.

1. Identify, select, and properly use appropriate personal protective equipment (PPE).
2. Explain the standard OSHA color codes for marking physical hazards.
3. Verify that all equipment is in good operating condition according to OSHA standards, that appropriate safety devices are in place, and working (e.g., guards in place, tool rests adjusted, etc.).
4. Maintain a neat, well-organized laboratory or shop working area.

Objective 3 Identify fire hazard conditions and actions to take in case of fire.

1. Explain combustion and identify three conditions necessary for it to occur.
2. Describe fire prevention in agricultural power, structural, and technical systems.
3. Explain classes of fires and appropriate extinguishers.

Objective 4 Take appropriate actions in an accident or emergency.

1. Demonstrate the use of simple first aid in an accident with an injury.



2. Locate first-aid kits and investigate their contents and use in power, structural, and technical systems settings.
3. Discuss appropriate safety responses in an accident or emergency.

Standard 4 Performance Evaluation included below (Optional)

STANDARD 5

STUDENTS WILL PLAN, CONSTRUCT, AND APPROPRIATELY MAINTAIN AGRICULTURAL STRUCTURES

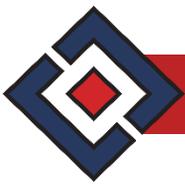
- Objective 1** Create and/or use sketches, plans, and specifications for agricultural structures.
1. Identify symbols and drawing techniques used in creating sketches and plans.
 2. Use scale measurement and dimensions with sketches and plans.
 3. Identify and interpret different views of a construction drawing.
 4. Develop sketches or plans for an agricultural structure.
- Objective 2** Determine materials for agricultural structures.
1. Identify types and grades of materials used in constructing agricultural structures, including lumber, plywood, manufactured materials (e.g., particleboard and wafer board), roofing, insulation, doors, and windows.
 2. Identify fasteners and other devices used in constructing agricultural structures.
 3. Identify dimensions and sizes of materials and fasteners used in agricultural structures.
- Objective 3** Construct a small agricultural structure or project.
1. Identify and demonstrate safe and proper use of common tools used in agricultural construction.
 2. Select materials for a construction project.
 3. Prepare a bill of materials for a small structure or project, including a cost estimate.
 4. Measure, mark, and cut materials according to plans for an agricultural structure.
 5. Assemble an agricultural structure by properly fitting materials and using fasteners.
 6. Evaluate a completed structure in terms of plans and quality of work.
- Objective 4** Select and use appropriate protective coatings, such as paints and preservatives.
1. Discuss the importance of properly selecting and using paints and preservatives.
 2. Identify and use appropriate application methods for coating materials, including surface preparation and safety.
 3. Maintain painting tools and equipment by proper cleaning, storage, and on-job use.

Standard 5 Performance Evaluation included below (Optional)

STANDARD 6

STUDENTS WILL DEMONSTRATE BASIC PLUMBING KNOWLEDGE AND SKILLS

- Objective 1** Distinguish plumbing materials and products.



1. Describe the meaning and importance of plumbing systems for air, water, wastes, and other fluid-based materials.
2. Identify components of plumbing supply systems and waste systems, including pipe, tubing, valves, faucets, fittings, and fixtures.
3. Identify materials used in manufacturing plumbing materials, such as plastics (PVC and CPVC), copper, iron, and steel.
4. Describe how plumbing system components are sized and appropriately match sizes to jobs.
5. Prepare a bill of materials for a plumbing job.

Objective 2 Perform simple plumbing jobs.

1. Identify and select appropriate tools for a plumbing job.
2. Measure, cut, fit, and install PVC and/or CPVC materials as used in water supply systems, including use of cleaner and cement.
3. Measure, cut, thread, and install iron or steel pipe materials as used in water supply systems.
4. Demonstrate the use of soldering in plumbing applications.
5. Repair and maintain plumbing systems.

Standard 6 Performance Evaluation included below (Optional)

STANDARD 7

STUDENTS WILL SELECT, OPERATE, MAINTAIN, AND REPAIR SMALL INTERNAL COMBUSTION ENGINES

Objective 1 Select and operate internal combustion engines.

1. Identify components and systems of internal combustion engines.
2. Describe the operation of internal combustion engines by cycle and fuel used.
3. Use the operator's manual to operate and maintain an engine properly.
4. List and explain criteria to use in selecting an engine.
5. Obtain and/or prepare the proper fuel for an internal combustion engine.
6. Start, operate, and shut down an internal combustion engine.

Objective 2 Analyze and troubleshoot internal combustion engines.

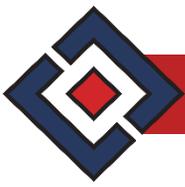
1. Identify the major components of internal combustion engines and the functions of each.
2. Explain the meaning of troubleshooting and list the common engine problems identified/solved by troubleshooting.

Objective 3 Maintain internal combustion engines.

1. Perform routine maintenance, such as cleaning an engine, changing the oil, and cleaning or replacing the air filter.
2. Replace and adjust spark plugs as needed.
3. Winterize or otherwise prepare an engine for extended storage.
4. Practice environmental responsibility through the proper disposal of engine wastes, such as oil and filters.

Objective 4 Operate small equipment powered by internal combustion engines.

1. Identify safety hazards and practices to follow to assure safe operation with small equipment, including mowers, tillers, blowers, and edgers.



2. Explain the meaning and importance of pre-operation inspections, including those of fuel and oil levels, the air system, and the condition of engine components.
3. Start and safely operate engine-powered equipment.
4. Stop, properly cool down, and store engine-powered equipment.

Standard 7 Performance Evaluation included below (Optional)

STANDARD 8

STUDENTS WILL FABRICATE WITH METAL

Objective 1 Explain types of metals and their uses.

1. Identify kinds of metals by appearance and testing, such as spark testing.
2. Classify metals according to characteristics and uses.
3. Identify, maintain, recondition, and use tools in hot and cold metalwork.

Objective 2 Fabricate with hot and cold metal.

1. Select and use appropriate safety practices in metal fabrication.
2. Apply cold metal processes in fabrication, including measuring, marking, cutting, bending, tapping, threading, filing, drilling, and riveting.
3. Discuss the use of hot metal processes, including annealing, tempering, bending, cutting, and hole punching.

Objective 3 Use shielded metal arc welding (SMAW) processes.

1. Set up for SMAW operations on carbon steel.
2. Start and restart an arc and backfill at the edge while running a bead on carbon steel.
3. Build a weld pad on carbon steel in the flat position.
4. Make 1F (flat position-fillet weld) welds on carbon steel.
5. Make 2F (horizontal position-fillet weld) welds on carbon steel.
6. Make 1G (flat position-groove weld) welds on carbon steel.
7. Make 2G (horizontal position-groove weld) welds on carbon steel.

Objective 4 Use manual oxy-fuel gas cutting processes.

1. Perform safety inspections of equipment and accessories.
2. Set up for manual oxy-fuel gas cutting operations on carbon steel.
3. Perform straight cutting operations on carbon steel.
4. Perform shape-cutting operations on carbon steel.
5. Perform bevel-cutting operations on carbon steel.
6. Pierce a hole through a carbon steel plate.

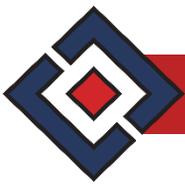
Objective 5 Use gas metal arc welding (GMAW) processes.

1. Set up for GMAW operations on carbon steel.
2. Start and restart an arc and backfill at the edge while running a bead on carbon steel.
3. Use Short Circuit Transfer welding process to make 1F (flat position-fillet weld) welds on carbon steel.
4. Use Short Circuit Transfer welding process to make 2F (horizontal position-fillet weld) welds on carbon steel.



5. Use Short Circuit Transfer welding process to make 1F (flat position-fillet weld) multi-pass weld on carbon steel.
6. Use Short Circuit Transfer welding process to make 1G (flat position-groove weld) welds on carbon steel.
7. Use Short Circuit Transfer welding process to make 2G (horizontal position-groove weld) welds on carbon steel.

Standard 8 Performance Evaluation included below (Optional)



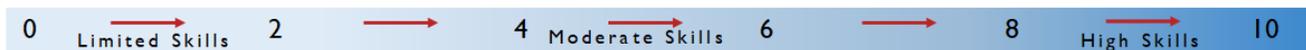
Agricultural Systems Technology I Performance Standards (Optional)

Performance assessments may be completed and evaluated at any time during the course. The following performance skills are to be used in connection with the associated standards and exam. To pass the performance standard the student must attain a performance standard average of **8 or higher** on the rating scale. Students may be encouraged to repeat the objectives until they average **8 or higher**.

Students Name _____

Class _____

PERFORMANCE RATING SCALE



STANDARD 1 The Role of Student Organization in Agricultural Education

Score:

- Recite and explain the meaning of a student organization (optional)
- Attend a student organization meeting/participate in a student organization activity (optional)

STANDARD 2 The Benefits of Agricultural Experience

Score:

- Prepare a plan for a long-term agricultural experience (optional)
- Record all transactions and activities on an agricultural experience in an approved record book (optional)

STANDARD 4 Safety Practices in Technical Systems

Score:

- Demonstrate safe practices when working in laboratories

STANDARD 5 Maintain Agricultural Structures

Score:

- Measure land with tape and/or instruments

STANDARD 6 Basic Plumbing Knowledge

Score:

- Install and/or repair plastic pipe and fittings
- Install and/or repair galvanized steel pipe and fittings

STANDARD 7 Small Internal Combustion Engines

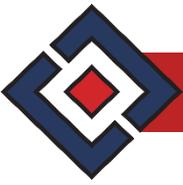
Score:

- Use, classify, and service small gas engines
- Start, operate, and shut down a small gas engine

STANDARD 8 Fabricate with Metal

Score:

- Set up, test, and adjust oxyacetylene welding/cutting equipment
- Cut various thickness of mild steel with an oxyacetylene cutting torch
- Start up, adjust, and shut down electric welding equipment for welding various metals, joints, and material thicknesses



- Prepare metal for welding
- Fabricate shop projects using metal
- Demonstrate proper use of safety practices when fabricating and/or installing metal materials

PERFORMANCE STANDARD AVERAGE SCORE: