PRECISION EXAMS by youscience

Agricultural Systems and Technology II

EXAM INFORMATION

Exam Number

113

Items

40

Points

45

Prerequisites

AGRICULTURAL SYSTEMS AND TECHNOLOGY I

Recommended Course Length

ONE SEMESTER

National Career Cluster

AGRICULTURE, FOOD & NATURAL RESOURCES

Performance Standards

INCLUDED (OPTIONAL)

Certificate Available

YES

DESCRIPTION

Students will develop knowledge and skills in the application of principles and techniques of power, structural, and technical systems used in the agricultural industry. Emphasis will be on selecting, operating, maintaining, servicing, and using agricultural power units and equipment. The course also includes agricultural uses of concrete and electricity. Safety and the proper use of safe practices will be integrated throughout the instruction. The instructional methods will involve applications of concepts being taught through classroom and laboratory instruction and supervised agricultural experience. Note: This course builds on knowledge and skills developed in Agricultural Systems and Technology.

EXAM BLUEPRINT

STANDARD	PERCENTAGE OF EXAM
1- Leadership Development	7%
2- Work-Based Learning	0%
3- Safety Practices	9%
4- Combustion Engines	20%
5- Power Units and Implements	7%
6- Operate Basic Power Units	11%
7- Plan and Construct with Concrete	9%
8- Basic Electrical Wiring Systems	18%
9- Metal Fabricating	20%

STANDARD 1

Student will participate in personal and leadership development activities through the FFA

Objective 1 Student will use communication skills to effectively communicate with others.

1. Understand when it is appropriate to listen and to speak.
2. Understand and follow verbal and written instructions for classroom and laboratory activities.

Objective 2 Student will effectively use teamwork to respectfully work with others.

1. Identify and understand different roles in working with a team

Objective 3 Student will use critical thinking and problem-solving skills

1. Analyze the cause of the problem.
2. Develop a solution to address the problem.
3. Implement the plan.
4. Evaluate the effectiveness of the plan.
5. Use generally accepted industry standards to analyze, evaluate, troubleshoot and diagnose the challenges associated with a specific repair, maintenance, or fabrication project.

Objective 4 Student will be dependable, reliable, steady, trustworthy and consistent in performance and behavior.

1. Set and meet goals on attendance and punctuality.
2. Prioritize, plan and manage work to complete assignments and projects on time.

Objective 5 Student will be accountable for results.

1. Use an achievement chart for activities and behaviors in class that encourages a personal evaluation of classroom performance.
2. File a weekly/bi-weekly written report on progress toward completion of assignments and projects.

Objective 6 Be familiar with the legal requirements and expectations of the course.

1. Be familiar with the course disclosure statement and all requirements for successful completion of the course.
2. Demonstrate workplace ethics, e.g. fair, honest, disciplined.

STANDARD 2

Student will participate in work-based learning activities through the Supervised Agricultural Experience (SAE) Program

Objective 1 Student will demonstrate employability skills.

1. Use a career search network to find career choices.
2. Identify appropriate CTE Pathway for selected career choice.
3. Write a resume including a list of demonstrated skills.
4. Write a letter of application.
5. Complete a job application.
6. Participate in an actual or simulated job interview.

Objective 2 Student will participate in a work-based learning experience outside the classroom

1. Student will plan and implement a Supervised Agricultural Experience Program from at least one of the following areas; ownership/entrepreneurship, placement/internship, research, school-based enterprise, and/or service-learning experiences.

Objective 3 Student will develop a job portfolio specific to their selected work-based learning experience.

1. Student will keep a personal record/journal/log of their work-based learning experience; including pictures, financial records, skills learned, hours associated with project, goals, reflection, etc.

STANDARD 3

Student will demonstrate appropriate safety practices in agricultural power, structural, and technical systems in laboratory and work settings

Objective 1 Implement safety practices related to agricultural power, structural, and technical systems in learning and work situations.

1. Identify, select, and properly use appropriate personal protective equipment (PPE).
2. Verify that all equipment is in good operating condition and that appropriate safety devices are in place and working (e.g., guards in place, tool rests adjusted, etc.).

3. Maintain neat, well-organized, well-ventilated, and safe work areas.

Objective 2 Understand and demonstrate safety in agricultural power, structural, and technical systems.

1. Identify safety hazards and the actions needed to minimize risk with agricultural power units, machinery, and equipment.
2. Identify appropriate safety responses in accidents or emergencies, including the use of first aid and contact of emergency services.
3. Properly dispose of waste materials to assure minimum environmental impact.

STANDARD 4

Students will provide preventive maintenance in the care and operation of internal combustion engines

Objective 1 Assess the importance of proper preventive maintenance of internal combustion engines.

1. Demonstrate proper preventive maintenance to engine life and efficiency of operation.
2. Utilize operators' manuals to determine preventive maintenance schedules and practices for specific engines.
3. Identify, select, properly use, and maintain tools needed in preventive maintenance of internal combustion engines.

Objective 2 Identify and distinguish the components and systems of internal combustion engines.

1. Classify engines by fuel used, kind of ignition, and cycle of operation.
2. Explain the functions of engine systems, including air, fuel, exhaust, ignition, lubrication, and cooling.
3. Identify the major components or structure of an engine, including engine block, cylinders, pistons, connecting rods, and crankshaft.
4. Describe the strokes of a four-stroke-cycle engine, including the role of combustion and heat.

Objective 3 Perform preventive maintenance on engine systems.

1. Perform air intake system maintenance on engines, including those with dry element filters, oil foam filters, and oil bath cleaners.

2. Perform fuel system maintenance on an engine, including filter replacement.
3. Perform lubrication system maintenance on an engine, including selecting and changing oil and replacing the filter.
4. Perform ignition system maintenance on an engine, including battery cleaning and hydrometer testing.
5. Perform exhaust system maintenance on an engine, including checking for leaks and replacing worn or damaged components.
6. Perform cooling system maintenance on liquid- and air-cooled engines.
7. Perform electrical system maintenance on engines.

STANDARD 5

Students will provide preventive maintenance and repair in the care and operation of power units and implements

Objective 1 Perform preventive maintenance on power units and implements.

1. Clean all components, removing trash, mud, dust, and other dirt by using pressure washing, hand wiping, or other appropriate methods.
2. Assess the drive train for maintenance or repair.
3. Properly inflate tires.
4. Lubricate the steering system, as appropriate.
5. Adjust belts and chains for proper operation.
6. Inspect, analyze, and provide appropriate service for the clutch and brakes.
7. Perform appropriate service on a hydraulic system, including checking fluid levels and replenishing fluids as needed, checking for leaks, and replacing or tightening faulty fluid conveyance components.
8. Adjust covers, shields, and other safety devices.
9. Evaluate and service vehicle traction and ballasting as needed.

Objective 2 Perform basic repair on power units and implements.

1. Explain the meaning and importance of troubleshooting malfunctions.
2. Select and use appropriate computer and onboard diagnostic equipment.
3. Use technical manuals in diagnosing problems, taking corrective actions, and testing power units and implements following repair.
4. Use metal fabrication skills in making selected repairs to power units and implements.

STANDARD 6

Students will safely operate basic power units and equipment

Objective 1 Identify power unit controls and instruments and their functions.

1. Locate controls on a power unit, including starter button or key, throttle, clutch, brakes, lights, and others (depending on the unit), and explain and demonstrate their functions.
2. Locate instruments on a power unit, including oil pressure gauge, temperature gauge, tachometer, fuel gauge, and others (depending on the unit), and discuss their functions.
3. Perform a pre-operation inspection according to the manufacturer's recommendations in the owner's manual.

Objective 2 Identify equipment controls for various agricultural power units and describe their functions.

1. Compare and contrast various agricultural power units and equipment.
2. Mount or attach equipment to a power unit or tractor following manufacturer's recommendations.
3. Operate equipment following safe and approved practices.

STANDARD 7

Students will plan and construct with concrete

Objective 1 Explain the composition and characteristics of concrete.

1. Define concrete, and list advantages and disadvantages of its use.
2. Identify important agricultural uses of concrete.
3. Explain proportions and qualities of ingredients.
4. Describe the qualities of properly placed and cured concrete.

Objective 2 Place concrete.

1. Identify tools and equipment used in placing concrete.
2. Explain the construction and use of forms.
3. Calculate the amount of concrete needed for a job.

4. Explain the use of reinforcing steel.
5. Demonstrate the placing of concrete, including striking off, finishing the surface, and curing.

STANDARD 8

Students will plan and install basic electrical wiring systems

Objective 1 Explain the characteristics and measurement of electricity.

1. Describe safety practices with electricity.
2. Define electricity and identify the kinds of current (DC and AC) used in agriculture.
3. Describe how electricity is measured, including ampere, watt, and volt.
4. Discuss voltage drop and its impact on electrical devices.
5. Describe the meaning and use of circuits.

Objective 2 Install basic electrical circuits.

1. Distinguish between the functions and materials of insulators and conductors.
2. Identify and use materials and tools in circuit installation.
3. Energize a simple circuit to test its workability.
4. Use instruments to test and validate circuits.
5. Explain and demonstrate the installation of electrical boxes, splices, and connections.

STANDARD 8

Students will fabricate with metal

Objective 1 Use shielded metal arc welding (SMAW) processes.

1. Make 3F (vertical position-butt weld) welds on carbon steel.
2. Make 3G (vertical position-groove weld) welds on carbon steel.

Objective 2 Use plasma cutting and air carbon arc gouging processes.

1. Perform safety inspections of equipment and accessories.

2. Set up for and make manual plasma cutting operations on carbon steel.
3. Set up for and make manual air carbon arc gouging on carbon steel.

Objective 3 Use gas metal arc welding (GMAW) processes.

1. Use Short Circuit Transfer welding process to make 3F (vertical position-fillet weld) welds on carbon steel.
2. Use Short Circuit Transfer welding process to make 3G (vertical position-groove weld) welds on carbon steel.

Objective 4 Student will fabricate a project using metal.

1. Develop sketches or plans for the project.
2. Select materials for the project.
3. Prepare a bill of materials for the project including a cost estimate.
4. Measure, mark, and cut materials according to the plans.
5. Complete project.
6. Evaluate a completed structure in terms of plans and quality of work.

Agricultural Systems and Technology II

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.

Student's Name: _____

Class: _____

PERFORMANCE STANDARDS RATING SCALE

- ☐ File a weekly/bi-weekly written report on progress toward completion of assignments and projects.
- ☐ Student will keep a personal record/journal/log of their work-based learning experience; including pictures, financial records, skills learned, hours associated with project, goals, reflection, etc.
- ☐ Maintain neat, well-organized, well-ventilated, and safe work areas.
- ☐ Perform preventive maintenance on engine systems.
- ☐ Use technical manuals in diagnosing problems, taking corrective actions, and testing power units and implements following repair.

PERFORMANCE STANDARD AVERAGE SCORE:

Evaluator Name: _____

Evaluator Title: _____

Evaluator Signature: _____

Date: _____