Agricultural Mechanics and Maintenance

Course Description: Agricultural Mechanics includes standards to prepare students for operational procedures for a shop or a home environment. Students learn basic skills in areas, including welding, electricity, land measurement, and plumbing. As students enter the 21st century, they need to have skills that can be used in a rural or an urban environment.

Recommended Prerequisites: Agriscience (HQ), Principles of Agricultural Sciences or Principles of Horticultural Sciences

Recommended Credit: 1

Recommended Grade Levels: 10th, 11th

Course Codes: **(2009-2010)** A10 – **5101** or A12 – **5151**
(2010-2015) A12 – **5151**

Agricultural Mechanics and Maintenance

Standard 1.0

Examine the basic shop procedures for a safe agricultural mechanics and maintenance laboratory or shop.

Standard 2.0

Design a layout and provide measurements for an agricultural project.

Standard 3.0

Construct or repair a metal agricultural project or agricultural machinery.

Standard 4.0

Construct and repair agricultural structures.

Standard 5.0

Examine the operation of a small engine and its application.

Standard 6.0

Apply the integration of academic competencies in Agricultural Mechanics and Maintenance.

Standard 7.0

Demonstrate premier leadership and personal growth needed for success and advancement in the career area of agricultural mechanics.

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Standard 1.0

Examine the basic shop procedures for a safe agricultural mechanics and maintenance laboratory or shop.

Learning Expectations and Performance Indicators:

1.1 Assess the value of teamwork in a laboratory environment.
1.2 Evaluate the need for a code of ethics for working in the laboratory.
1.3 Specify and explain safety procedures to use when working on farm machinery or power equipment.
1.4 Examine proper sharpening techniques for tools.
1.5 Complete safety test with 100 percent accuracy.

Standard 2.0

Design a layout and provide measurements for an agricultural project.

Learning Expectations and Performance Indicators:

2.1 Illustrate the principles of design layout.
2.2 Manipulate construction measurements used in agriculture.
2.3 Demonstrate the correct and safe use of precision instruments in constructing agricultural projects.

Standard 3.0

Construct or repair a metal agricultural project or agricultural machinery.

Learning Expectations and Performance Indicators:

3.1 Evaluate the proper use of cold metal working tools.
3.2 Operate arc-welding equipment.
3.3 Operate shielded gas-welding equipment.
3.4 Operate oxyacetylene equipment.

Standard 4.0

Construct and repair agricultural structures.

Learning Expectations and Performance Indicators:

4.1 Recommend building materials for a specific project with a written report.
4.2 Calculate basic conversion units.
4.3 Estimate a bill of materials and calculate its cost in a written report.
4.4 Design building walls using framing materials.
4.5 Assess the equipment to install an electrical circuit.
4.6 Assess appropriate materials to mix concrete and mortar.
4.7 Calculate the number of concrete blocks required for an agricultural structure.
4.8 Measure, cut, and join plumbing material.
4.9 Assess materials to construct rafters and trusses.
4.10 Operate surveying equipment to profile and differential leveling of building sites and structures.
4.11 Compose a written evaluation report using profile and differential leveling forms.

Standard 5.0

Examine the operation of a small engine and its application.

Learning Expectations and Performance Indicators:

5.1 Diagram and explain the function of each parts of a small engine.
5.2 Assess the procedures to clean and service small engines.
5.3 Compare the basic operations of a two- cycle and a four-cycle engine.
5.4 Differentiate the parts and functions between the varieties of fuels used to operate small engines.

Standard 6.0

Apply the integration of academic competencies in Agricultural Mechanics and Maintenance.

Learning Expectations and Performance Indicators:

Language Arts:

6.1 Complete appropriate shop and technical forms and written reports.

Mathematics:

6.2 Convert English/metric ratios.
6.3 Read instruments in metric or English.
6.4 Calculate ratios and percentages in basic shop skills.

Science:

6.5 Explain the physical properties involved in combustion.
6.6 Explain basic hydraulic principles using Pascal's laws.
6.7 Explain basic laws of electricity.

Standard 7.0

Demonstrate premier leadership and personal growth needed for success and advancement in the career area of agricultural mechanics.

Learning Expectations and Performance Indicators:

7.1 Research and prepare a written report on careers in agricultural mechanics.
7.2 Examine the FFA program of activities to develop leadership skills.
7.3 Develop a supervised agricultural experience program based on agricultural mechanics career area.
7.4 Demonstrate mechanical proficiency through FFA career development events.
7.5 Prepare exhibits for display.
7.6 Demonstrate abilities in parliamentary procedure.
7.7 Develop a group presentation on agricultural mechanics.