

Clifton-Clyde High School  
Agricultural Mechanics

**Course Length:** 152.5 Hours, 1 Credit

**Grade Level:** 10-12

**Prerequisites:** Intro to Ag

**Teaching Resources:** *Agricultural Mechanics: Fundamentals & Applications*, 2<sup>nd</sup> Edition

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*Fundamentals of Welding*, 2<sup>nd</sup> Edition, MAVCC

*Oxyacetylene Welding and Oxyfuel Cutting*, 3<sup>rd</sup> Edition, MAVCC

*Gas Metal Arc Welding and Flux-Cored Arc Welding*, 3<sup>rd</sup> Edition,  
MAVCC

Lincoln Electric CD-ROM Set

**Course Description:** Ag Mechanics will provide the student with the general knowledge and safety information needed to enter a mechanical career or further their mechanical training. Students will be introduced to the principles of mechanical physics and applications, mechanical careers and industries, technologies, and personal attitudes. Through the classroom and lab training, students will acquire knowledge and skills in all areas of welding, oxyacetylene equipment, machinery/tool operations, electricity, plumbing, and many other mechanical related operations. Emphasis will be on actual “hands-on” type learning. Students will continue development of their leadership and mental skills by designing, constructing, and testing a useful project.

**Course Outline:**

- I. Mechanics in the World of Agriculture
  - A. Agriculture and agricultural mechanics
  - B. Occupation and occupational clusters
  - C. Role of mechanization and mechanical applications in society
  - D. Contributions made by mechanical application to the development of agriculture
  - E. Inventions
  
- II. Career Options in Agricultural Mechanics
  - A. Major divisions in the career clusters
  - B. Agriculture occupations that require mechanical skill
  - C. Student Activities:
    1. Research and prepare a speech for an occupation in ag mechanics
  
- III. Electrical Principles and Wiring Materials
  - A. Basic principles of electricity and magnetism
  - B. Electrical safety
  - C. Wiring materials
  - D. Designing wiring plans
  - E. Student Activities:
    1. Figure electrical equations
    2. Create an electromagnet

### 3. Draw electrical plan

- IV. Installing Branch Circuits
  - A. Identifying electrical boxes, outlets, and switches
  - B. Installing electrical equipment
  - C. Altering branch circuits
  - D. Testing electrical circuits
  - E. Student Activities:
    - 1. Create a wiring board
  
- V. Plumbing
  - A. Plumbing tools
  - B. Types of pipe
  - C. Pipe fittings
  - D. Connecting pipe
  - E. Student Activities:
    - 1. Cut and connect pieces of pipe
  
- VI. Sketching and Drawing Projects
  - A. Drawing equipment
  - B. Drawing symbols
  - C. Pictorial and three-view drawings
  - D. Using a drawing
  - E. Student Activities:
    - 1. Make a practice drawing
    - 2. Create a drawing for welding project
  
- VII. Figuring a Bill of Materials
  - A. Parts of a bill
  - B. Recording amount of materials and cost
  - C. Figuring total bill
  - D. Student activities:
    - 1. Create an estimate of project before construction begins
    - 2. Create a final bill of project
  
- VIII. Shop Safety
  - A. Safety Equipment
  - B. General Safety
  - C. Fires
  - D. Accidents
  - E. Safety Colors
  - F. Machine Safety
    - 1. Oxy-Acetylene Torch
    - 2. Plasma Cutter
    - 3. Chop Saw
    - 4. Grinders

5. Drills
6. Arc Welder
7. MIG Welder
8. Metal Saw

G. Student Activities:

1. Demonstrate safe operation of above tools
2. Pass safety exam with 100%

IX. Shop Skills

A. Student Activities

1. Bead, butt, lap and tee weld with E6011
2. Bead, butt, lap and tee weld with E6013
3. Bead, butt, lap and tee weld with MIG welder
4. Cut 2" x 2" square with oxy-acetylene torch

X. Project Construction

A. Student Activities:

1. Project design
2. Project estimate
3. Project construction
4. Finish project
5. Bill of Materials

XI. FFA/SAE

A. Ag Mechanics CDE

B. Improving SAEs

C. Proficiency Awards

D. Goal Setting

E. Recordbooks

F. Student Activities:

1. Compete in Ag Mechanics CDE
2. SAE examination
3. Update record book