

**Course Name: Ag Project Construction**

**Teacher: Mr. J. Curran**

**Credit: 1 Credit (For completion of full year)**

**Clock Hours: 182**

**Grade Level: 10-12**

**Prerequisites: Ag Tech Exploration and Animal Science**

**Teaching Resources: Textbook-Delmar-Agricultural Mechanics Fundamentals and Applications, 3rd Edition; Elmer L. Cooper, Ed. D.; Copyright--1997. Equipment instruction manuals are also used in educating the student.**

**Course Description: This class is designed for the more advanced use of the shop equipment by students in the construction of a wide variety of projects. Students will spend the first part of the year in the classroom reviewing machine and tool operation and safety procedures. Students will also be exposed to blueprint reading, project drawing, figuring bills of materials and filling out of project expense sheets. Skills to be performed before building of any project includes: Arc Welding, Mig Welding, Plasma Cutting, OxyAcetylene Cutting, Drill Bit Sharpening, and Painting. All projects to be built in shop will be approved by the instructor before construction begins and a set of plans must be submitted to the instructor.**

**Students will have approved protective clothing, eye protection, tape measure, pliers and gloves (optional).**

# Ag Project Construction Curriculum Outline

Areas of Instruction/Topic Headings	Week
<b>I. FFA/SAE</b>	<b>1.5 - 1st Quarter</b>
A. Explanation of Welding CDE	
B. Announcements of upcoming FFA Events	
C. Review of SAE projects to be built	
D. Student activity: 1)Students will participate in one or more FFA activities provided 2)Students will build projects for their SAE programs if needed	
<b>II. Arc Welding</b>	<b>2 - 1st Quarter</b>
A. Terminology used in arc welding	
B. Equipment used	
C. Welder polarities and settings	
D. Electrodes used	
E. Machine adjustments	
F. Safety procedures and practices	
G. Student activity: Welding of projects using different electrodes and polarities	
<b>III. OxyAcetylene Cutting</b>	<b>2 - 1st Quarter</b>
A. Terminology	
B. Fuel properties	
C. Turn on/off procedures	
D. Backfires and Flashbacks	
E. Procedures for using	
F. Safety when using the cutting unit	
G. Uses of other fuels for cutting	
H. Student activity: Demonstration of correct usage of unit while completing cutting skills	
<b>IV. Mig Welding</b>	<b>1.5 - 1st Quarter</b>
A. Terminology	
B. Shielding gases and their uses	
C. Characteristics of good welds	
D. Welding problems or mistakes	
E. Selection of filler wire	
F. Following Safety procedures	
G. Student activity: Complete various skills using the Mig welder	
<b>V. Plasma Arc Cutting</b>	<b>1 - 1st Quarter</b>
A. Operation of the plasma machine	
B. Common cutting faults	
C. Duty cycle	
D. Current setting	
E. Eye Protection	
F. Following Safety rules	
G. Student activity: Cutting ferrous/nonferrous metals	

- VI. Bill of Materials** **1.5-1st Quarter**
- A. Figuring linear feet, board feet, square feet**
  - B. Pricing metal by the pound and converting to price per foot**
  - C. Filling out a project cost sheet**
  - D. Student activity: Calculate the total cost of a project when given a blueprint and material price sheet**
- VII. Twist Drill Sharpening** **.5- 2nd Quarter**
- A. Correct Angles**
  - B. Procedure for sharpening**
  - C. Student activity: Successfully sharpen a twist drill bit**
- VIII. Metal Bending** **.5- 2nd Quarter**
- A. Using the correct die**
  - B. Limitations of bender**
  - C. Student activity: Bend metal for various projects**
- IX. Cold Cutting Saw** **.5- 2nd Quarter**
- A. Advantages over abrasive saw**
  - B. Correct setting of saw for cutting angles or straight cuts**
  - C. Safety around the saw**
  - D. Student activity: Saw will be utilized to cut out skill materials and project material**
- X. Painting** **1- 2nd Quarter**
- A. Selecting paints**
  - B. Mixing for correct application**
  - C. Turning on and operating the paint room**
  - D. Using the spray gun**
  - E. Cleaning the spray gun**
  - F. Safety rules when painting**
  - G. Student activity: Projects will be painted before leaving the Ag Shop**
- XI. Lab/Shop Work** **24- 2nd,3rd,  
and 4th Quarter**
- A. Performing skills**
  - B. Building projects**
  - C. Following safety rules**
  - D. Cleaning up**
  - E. Student activity: skills and projects will be completed to satisfaction of the instructor within a reasonable amount of time, using safety precautions and doing quality work**

# Girard High School

Name \_\_\_\_\_ SSN \_\_\_\_-\_\_\_\_-\_\_\_\_\_

Instructor \_\_\_\_\_

**RATING SCALE:**  
 3: Skilled, works independently  
 2: Competent, may need assistance  
 1: Received instruction, skill undeveloped  
 0: No exposure, instruction or training

**INTEGRATION:**  
 (M) Math (S) Science  
 (E) Language Arts (C) Career Development Skill  
 (L) Lab Activity

# Ag Project Construction

Enrollment Date	Completion Date	Hours completed
____/____/____	____/____/____	_____

I certify that the student received the training in the area indicated.

Student Signature \_\_\_\_\_ Date \_\_\_\_\_

Instructor Signature \_\_\_\_\_ Date \_\_\_\_\_

Administrator Signature \_\_\_\_\_ Date \_\_\_\_\_

- I. FFA/SAE
- 3 2 1 0 1. Relates FFA CDE to classroom instruction
  - 3 2 1 0 2. Develops goals and future SAE plans
  - 3 2 1 0 3. Identifies potential projects for SAE
  - 3 2 1 0 4. Designs cash flow budget
  - 3 2 1 0 5. Generates inventory of business and personal/assets
  - 3 2 1 0 6. Serves on POA committee
  - 3 2 1 0 7. Participates in FFA sales programs
  - 3 2 1 0 8. Prepares a written report on a career in agricultural construction (E)
  - 3 2 1 0 9. Explores educational requirements needed for entering a career in construction
  - 3 2 1 0 10. Prepares plans for building of community projects (picnic tables, swings)
  - 3 2 1 0 11. Prepares written application for proficiency award in some area (E)

- II. Arc Welding
- 3 2 1 0 1. Identifies equipment needed
  - 3 2 1 0 2. Differentiates between polarities on combination welders
  - 3 2 1 0 3. Analyzes and prepares a written report on differences in electrodes (E)
  - 3 2 1 0 4. Completes correct machine adjustments before operating

- 3 2 1 0 5. Prepares a written list of safety precautions to follow when arc welding (E)
- 3 2 1 0 6. Follows all safety precautions when working around the arc welding equipment (L)

- III. OxyAcetylene Cutting
- 3 2 1 0 1. Prepares written report explaining how acetylene is manufactured (S)(E)
  - 3 2 1 0 2. Differentiates between cutting and welding with the unit
  - 3 2 1 0 3. Prepares a written procedure for correctly and safely tuning the unit on (E)
  - 3 2 1 0 4. Demonstrates the correct procedure for turning the unit on and off (L)
  - 3 2 1 0 5. Explains the difference between a backfire and a flashback
  - 3 2 1 0 6. Identifies other fuels that can be used for cutting (S)
  - 3 2 1 0 7. Relates to all safety precautions while using the cutting torch (L)

- IV. Mig Welding
- 3 2 1 0 1. Explains the difference between Mig and stick welding
  - 3 2 1 0 2. Identifies characteristics of good welds (S)
  - 3 2 1 0 3. Interprets welding problems and mistakes (L)

- 3 2 1 0 4. Selects techniques to correct problems
- 3 2 1 0 5. Analyzes and orally reports on different gases used and what they are used for (S)(E)
- 3 2 1 0 6. Supports all safety precautions necessary

- V. Plasma Cutting
- 3 2 1 0 1. Understands operating functions of machine
  - 3 2 1 0 2. Calculates duty cycle of plasma cutter (M)
  - 3 2 1 0 3. Demonstrates current setting (L)
  - 3 2 1 0 4. Explains correct eye protection needed
  - 3 2 1 0 5. Summarizes in a written report the differences in ferrous and non-ferrous metals (S) (E)
  - 3 2 1 0 6. Practices proper safety when working with the plasma cutter (L)

- VI. Bill of Materials
- 3 2 1 0 1. Calculates problems dealing with linear square and board feet (M)
  - 3 2 1 0 2. Converts the price of metal to price per foot when given the price per pound (M)
  - 3 2 1 0 3. Estimates the cost of a project before starting (M)
  - 3 2 1 0 4. Calculates the final cost of a project by preparing a bill of materials

VII. Twist Drill Sharpening

- 3 2 1 0 1. Describes the correct angles to sharpen
- 3 2 1 0 2. Identifies the correct angle measurement (M)
- 3 2 1 0 3. Gives an oral presentation on the correct procedure for sharpening a bit (E)
- 3 2 1 0 4. Demonstrates the correct technique of sharpening a bit (L)
- 3 2 1 0 5. Performs all safety procedures needed while sharpening a bit (L)

#### VIII. Metal Bending

- 3 2 1 0 1. Understands the need for changing dies for round or square stock
- 3 2 1 0 2. Realizes the limitations of the bender
- 3 2 1 0 3. Orally describes the procedure to follow when changing dies (E)
- 3 2 1 0 4. Calculates measurements for various angles of bends (M)
- 3 2 1 0 5. Follows safety rules of bender (L)

#### IX. Cold Cutting Saw

- 3 2 1 0 1. Calculates amount of cutting fluid to mix with water. (M)
- 3 2 1 0 2. Prepares written report discussing the advantages/disadvantages (E)
- 3 2 1 0 3. Demonstrates correct way of setting saw to cut straight or at angles (L)
- 3 2 1 0 4. Selects correct safety rules to follow (L)

#### X., Painting

- 3 2 1 0 1. Presents oral report on selection of paints for different projects (E)
- 3 2 1 0 2. Calculates the amount of thinner to use (S)(M)
- 3 2 1 0 3. Selects correct settings on spray gun for application (L)
- 3 2 1 0 4. Breaks down procedure for cleaning the spray gun (L)
- 3 2 1 0 5. Follows all safety rules in the paint lab (L)

#### XI. Lab/Shop Work

- 3 2 1 0 1. Follows blueprints when constructing project (L)
- 3 2 1 0 2. Locates tools in shop (L)
- 3 2 1 0 3. Modifies blueprints as needed (L)
- 3 2 1 0 4. Prepares for shop in advance
- 3 2 1 0 5. Relates well with other students in class

- 3 2 1 0 6. Demonstrates pride in quality of project (L)
- 3 2 1 0 7. Asks for assistance when needed (L)
- 3 2 1 0 8. Organizes shop equipment and projects as needed (L)
- 3 2 1 0 9. Adheres to all safety precautions needed in a shop setting (L)
- 3 2 1 0 10. Calculates a final bill of materials on a finished project (M)(L)

#### XII. Career Development Skills

- 3 2 1 0 1. Draws conclusions or makes generalizations from another's oral communication
- 3 2 1 0 2. Demonstrates concise, impromptu speaking skills
- 3 2 1 0 3. Applies measurement concepts of distance, direction, rate, time and acceleration
- 3 2 1 0 4. Compiles and maintains records, logs, lab notebooks and other documents
- 3 2 1 0 5. Accesses, navigates and uses on-line services
- 3 2 1 0 6. Performs a self-assessment of strengths and weaknesses
- 3 2 1 0 7. Applies the steps in the decision making process
- 3 2 1 0 8. Proposes alternative plans for action
- 3 2 1 0 9. Determines cost, time and resources needed to complete a task within an industry or occupation
- 3 2 1 0 10. Identifies and controls personal "time wasters"
- 3 2 1 0 11. Applies employee rules for cost effectiveness
- 3 2 1 0 12. Participates in career exploration activities

#### XIII. Life Knowledge Skills

- 3 2 1 0 1. Practices honesty HS 12
- 3 2 1 0 2. Communicates with customers HS 50
- 3 2 1 0 3. Learns responsibility and accountability HS 13
- 3 2 1 0 4. Understands the consequences of ethics HS 34