# Agricultural Mechanics Course No. 18401 Credit: 1.0

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| --- | --- | --- | --- |
| **Student name:**  |  | **Graduation Date:** |  |

Pathways and CIP Codes:Power, Structural & Technical Systems (01.0201)

Course Description:

Directions:The following competencies are required for full approval of this course. Check the appropriate number to indicate the level of competency reached for learner evaluation.

**RATING SCALE:**

4. Exemplary Achievement: Student possesses outstanding knowledge, skills or professional attitude.

3. Proficient Achievement:Student demonstrates good knowledge, skills or professional attitude. Requires limited supervision.

2. Limited Achievement:Student demonstrates fragmented knowledge, skills or professional attitude. Requires close supervision.

1. Inadequate Achievement:Student lacks knowledge, skills or professional attitude.

0. No Instruction/Training:Student has not received instruction or training in this area.

## Benchmark 1: The Ag Mechanics Industry and Careers

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 1.1 | Explain the importance of welding, mechanics, technical skills and construction in the local economy  |  |
| 1.2 | Identify local businesses that require ag mechanics skill |  |
| 1.3 | List the causes of accidents in the Ag Mechanics workplace |  |

## Benchmark 2: Safety / Ag Mechanics Lab Orientation w/ Tool Use

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 2.1 | Identify and demonstrate proper methods of shop/lab clean-up |  |
| 2.2 | Identify various tool storage locations |  |
| 2.3 | Learn the components of the fire triangle |  |
| 2.4 | Explain the proper use of a fire extinguisher |  |
| 2.5 | Explain proper shop safety color coding |  |
| 2.6 | Complete a shop/lab safety test with 100% accuracy  |  |
| 2.7 | Explain the uses of agricultural mechanics hand tools.  |  |
| 2.8 | Demonstrate use of hand tools properly and safely  |  |
| 2.9 | Explain the uses of power tools to perform ag mechanics tasks |  |

## Benchmark 3: Arc Welding

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 3.1 | Explain the physical processes of arc welding  |  |
| 3.2 | List the proper arc welding safety guidelines  |  |
| 3.3 | Identify arc welding safety hazards |  |
| 3.4 | Identify pieces of arc welding equipment |  |
| 3.5 | Differentiate between AC and DC welding  |  |
| 3.6 | Apply knowledge through student welding demonstration ex: flat position welds using 6013 and 6011 |  |

## Benchmark 4: MIG Welding

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 4.1 | List the proper MIG welding safety guidelines  |  |
| 4.2 | Identify MIG welding safety hazards  |  |
| 4.3 | Identify pieces of MIG welding equipment |  |
| 4.4 | Explain the physical processes of MIG welding  |  |
| 4.5 | Explain the physical processes of MIG welding  |  |
| 4.6 | Apply knowledge through student welding demonstration ex: flat position welding and out of position welding |  |

## Benchmark 5: Oxy-Acetylene Cutting

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 5.1 | List the oxy-acetylene cutting safety guidelines  |  |
| 5.2 | Identify oxy-acetylene cutting and brazing equipment |  |
| 5.3 | Explain the physical processes of oxy-acetylene cutting, welding and brazing  |  |
| 5.4 | Demonstrate oxy-acetylene cutting techniques |  |

## Benchmark 6: Plasma Cutting

### Competencies

| **#** | **DESCRIPTION** | **RATING** |
| --- | --- | --- |
| 6.1 | List the plasma cutting safety guidelines  |  |
| 6.2 | Identify plasma cutting equipment |  |
| 6.3 | Explain the processes of plasma cutting and proper the techniques involved. |  |
| 6.4 | Demonstrate plasma cutting techniques  |  |
| 6.5 | Demonstrate proper setups and adjustments for different metal thicknesses |  |

## Benchmark 7: Small Engine Maintenance/Repair

### Competencies

| **#** | **Description** | **RATING** |
| --- | --- | --- |
| 7.1 | Integrate safety practices specific to Small Engine Repair and Maintenance |  |
| 7.2 | Operate and perform necessary equipment for assembly and disassembly. |  |
| 7.3 | Review and examine maintenance schedules and procedures. |  |
| 7.4 | Identify and reference components, parts, models, and serial numbers. |  |
| 7.5 | Check fuel, lubricant and fluid levels. |  |
| 7.6 | Identify stress points and wear indicators. |  |
| 7.7 | Observe and operate computer and electronic diagnostic equipment. |  |
| 7.8 | Select, use and calibrate measuring and testing devices like calipers and gauges |  |
| 7.9 | Calculate measurements with both standard and metric instruments.  |  |
| 7.10 | Properly use, read, and calibrate micrometers. |  |
| 7.11 | Assess equipment and systems using diagnostics  |  |
| 7.12 | Demonstrate trouble-shooting procedures.  |  |
| 7.13 | Diagnose wear and condition of parts |  |
| 7.14 | Evaluate tolerances and perform needed repairs. |  |

## Benchmark 8: Electricity in Agriculture

### Competencies

| **#** | **Description** | **RATING** |
| --- | --- | --- |
| 8.1 | Identify common used tools and equipment in electricity |  |
| 8.2 | Properly demonstrate the use of electrical tools  |  |
| 8.3 | Distinguish between AC and DC currents |  |
| 8.4 | Identify common terms used in electricity |  |
| 8.5 | Calculate the number of watts used by a device or a motor. |  |
| 8.6 | Calculate an electrical bill for a given set of devices  |  |
| 8.7 | Draw various wiring diagrams for different circuits |  |
| 8.8 | Demonstrate correct procedure for installing switches, receptacles, and light fixtures |  |

## Benchmark 9: Click or tap here to enter text.

### Competencies

| **#** | **Description** | **Rating** |
| --- | --- | --- |
| 9.1 | Identify the main parts of a wall frame |  |
| 9.2 | Explain methods of forming the outside corners and partition intersections of wall frames |  |
| 9.3 | Estimate materials required for wall frames, ceiling frames, and sheathing  |  |
| 9.4 | List covering materials commonly used for sloping roofs |  |
| 9.5 | Define terms associated with roofing |  |
| 9.6 | Prepare exterior and interior surfaces for painting |  |
| 9.7 | Prep and Paint Surfaces  |  |
| 9.8 | Identify ingredients of concrete |  |
| 9.9 | Identify how to proportionally mix concrete |  |
| 9.10 | Calculate cubic yards of concrete needed in various situations  |  |
| 9.11 | Calculate concrete costs  |  |
| 9.12 | Identify concrete tools |  |
| 9.13 | Demonstrate how to prepare a site for concrete.  |  |
| 9.14 | Demonstrate proper use of concrete tools. |  |

## Benchmark 10: Differential Leveling and Surveying

### Competencies

| **#** | **Description** | **rating** |
| --- | --- | --- |
| 10.1 | Demonstrate the use of basic measuring tools. |  |
| 10.2 | Perform field differential surveys using a field level/laser level. |  |
| 10.3 | Record field data in a notebook and perform field calculations. |  |
| 10.4 | Demonstrate accuracy and precision in note taking. |  |
| 10.5 | Calculate material volumes from survey data, calculate elevations from survey data, determining elevations by the use of instruments. |  |
| 10.6 | Stake out a residential floor plan using standard field survey techniques. |  |

## Benchmark 11: Layout and Setup of Projects

### Competencies

| **#** | **Description** | **Rating** |
| --- | --- | --- |
| 11.1 | Read blueprints and follow detail plans for project construction |  |
| 11.2 | Make and read a working drawing  |  |
| 11.3 | Estimate materials needed for a project |  |
| 11.4 | Calculate project costs  |  |
| 11.5 | Prepare a bill of materials |  |
| 1.6 | Identify types of metal  |  |
| 11.7 | Construct group projects |  |
| 11.8 | Construct individual projects |  |
| 11.9 | Make a project drawing on the computer  |  |

## Benchmark 12: Project Construction

### Competencies

| **#** | **Description** | **Rating** |
| --- | --- | --- |
| 12.1 | Explain procedures to design a metal or wood project |  |
| 12.2 | Use correct procedures to design a metal or wood project  |  |
| 12.3 | Apply proper procedures to construct a metal or wood project  |  |
| 12.4 | Project: |  |

I certify that the student has received training in the areas indicated.

Instructor Signature:

For more information, contact:

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