# Agricultural Fabrication Course No. 18409 Credit: 1.0

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

Pathways and CIP Codes: Agricultural Technology and Mechanical Systems (01.0201); Diversified Agricultural Science (01.0000)

Course Description: Course provides students with the skills & knowledge that are specifically applicable to the construction, maintenance, and repair of structures integral to the agricultural industry, including but not limited to animal enclosures, irrigation systems, & storage facilities. In these courses, students typically study design, planning, & construction knowledge & skills (such as survey, carpentry, plumbing, concrete, & electrical systems), in addition to the safe operation of tools and machines

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.

**Prerequisite: either 18001 – Introduction to Agricultural or 18002 - Agriscience**

## 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 skills. |  |
| 1.3 | List the causes of accidents in the Ag Mechanics workplace. |  |

Benchmark 2: Click or tap here to enter text.

Competencies

| # | DESCRIPTION | RATING |
| --- | --- | --- |
| 2.1 | Complete a shop/lab safety test with 100% accuracy. |  |
| 2.2 | Identify types of proper PPE and there uses in an ag fabrication shop. |  |
| 2.3 | Identify various tool storage locations. |  |
| 2.4 | Explain the uses of ag fabrication hand tools. |  |
| 2.5 | Demonstrate use of hand tools properly and safely. |  |
| 2.6 | Explain the uses of power tools to perform ag fabrication tasks. |  |
| 2.7 | Demonstrate the safe use of cutting and ag fabrication equipment. |  |
| 2.8 | Identify and demonstrate proper methods of shop/ lab clean up. |  |
| 2.9 | Identify the components of the fire triangle. |  |
| 2.10 | Explain the proper use of the fire extinguisher. |  |

Benchmark 3: METALLURGY

Competencies

| # | DESCRIPTION | RATING |
| --- | --- | --- |
| 3.1 | Understand chemical and physical properties of metal. |  |
| 3.2 | Explain steel classification and identification. |  |
| 3.3 | Differentiate between carbon and alloy steels. |  |
| 3.4 | Identify standard steel shapes and configurations. |  |
| 3.5 | Identify metals using the spark test. |  |
| 3.6 | Analyze the impact of heat treatments on metals. |  |
| 3.7 | Identify the heat effected zone fusion zone in the base material. |  |

Benchmark 4: JOINT DESIGN & WELD SYMBOLS

Competencies

| # | DESCRIPTION | RATING |
| --- | --- | --- |
| 4.1 | Identify types of weld joints. |  |
| 4.2 | Analyze joint designs for strength and application. |  |
| 4.3 | Explain the components of welding symbols. |  |
| 4.4 | Apply welding symbols to blueprints. |  |
| 4.5 | Identify symbols for specific welds. |  |

Benchmark 5: Click or tap here to enter text.

Competencies

| # | DESCRIPTION | RATING |
| --- | --- | --- |
| 5.1 | Demonstrate the ability to measure materials within a 1/16”. |  |
| 5.2 | Convert common decimal fractions to equivalent of a 1/16”. |  |
| 5.3 | Select potential project for construction utilizing the Kansas State Fair Ag Mechanics Exhibitors Guide. |  |
| 5.4 | Evaluate existing designs. |  |
| 5.5 | Develop a working drawing of a project to include measurements, material selection, and multiple views. |  |
| 5.6 | Identify types of metal. |  |
| 5.7 | Analyze material shape for strength and application. |  |
| 5.8 | Estimate materials needed for a project. |  |
| 5.9 | Calculate material cost and waste percentage. |  |
| 5.10 | Prepare a bill of materials. |  |
| 5.11 | Calculate project costs. |  |
| 5.12 | Explain the importance of efficient material layout. |  |
| 5.13 | Read blueprints and follow detail plans for project construction. |  |
| 5.14 | Demonstrate the ability to efficiently layout material for a project. |  |
| 5.15 | Design a project using a Computer Aided Drawing (CAD). |  |

Benchmark 6: PRODUCTION PROCESSES AND CONSTRUCTION

Competencies

| # | DESCRIPTION | RATING |
| --- | --- | --- |
| 6.1 | Plan and complete a project using the competencies below. |  |
| 6.2 | Select proper welding process for project application. |  |
| 6.3 | Identify time saving techniques for production work. |  |
| 6.4 | Demonstrate the use of jigs and fixtures. |  |
| 6.5 | Anticipate and control welding distortion. |  |
| 6.6 | Demonstrate proper setups and adjustments for different metal thicknesses. |  |
| 6.7 | Apply proper procedures to construct a metal project. |  |
| 6.8 | Document the production process with record bookkeeping and photographs. |  |

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

Instructor Signature:

For more information, contact:

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