# Agricultural Fabrication Course No. 18409 Credit: 1.0

|  |  |  |  |
| --- | --- | --- | --- |
| **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

Special Note: The AFNR College and Career Ready Skills are to be taught throughout the course utilizing FFA and SAE programming found at the Kansas Ag Ed website. Specific activities may be found in the SAE for All Teachers Guide and at National FFA.org. The AFNR College and Career Ready Skills competencies can be found at Kansas Ag Ed.

Opportunities in Agriculture Education & FFA:Classroom and laboratory instruction integrates and/or is supplemented by experiential, project, and leadership and personal development through FFA .Students should be introduced to FFA through leadership activities and College and Career Ready Skills. Specific FFA information and activities may be found in the “National FFA Student Handbook, 16thedition”. Student activities, scoring rubrics, grading examples, and teacher lessons are all found in the “FFA Student Handbook Teachers Guide”. Additional information can be found at [www.ffa.org](http://www.ffa.org/).

Workplace Skills, Supervised Agricultural Experience and Record Keeping: Classroom and laboratory instruction integratesand/or is supplemented by experiential, project, and work based learning through SAE. Specific SAE activities that support the College and Career Ready Skills may be found in the “SAE for All Guide”. Students should be introduced to Foundational SAE’s and the AET student portfolio system. Student activities, scoring rubrics, grading examples, and teacher lessons are all found in the “SAE for All Teachers Guide”. Additional information is found in the SAE Individual Learning Guides and Teacher Editions and in the AFNR College and Career Ready Competency Profile found at *Kansas Ag* *Ed.*

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:

CTE Pathways Help Desk

(785) 296-4908

[pathwayshelpdesk@ksde.org](mailto:pathwayshelpdesk@ksde.org)



900 S.W. Jackson Street, Suite 102

Topeka, Kansas 66612-1212

[https://www.ksde.org](https://www.ksde.org/)

The Kansas State Department of Education does not discriminate on the basis of race, color, national origin, sex, disability or age in its programs and activities and provides equal access to any group officially affiliated with the Boy Scouts of America and other designated youth groups. The following person has been designated to handle inquiries regarding the nondiscrimination policies: KSDE General Counsel, Office of General Counsel, KSDE, Landon State Office Building, 900 S.W. Jackson, Suite 102, Topeka, KS 66612, (785) 296-3201.