south dakota DEPARTMENT OF EDUCATION
Learning. Leadership. Service.

Ag Metal Fabrication Technology

Career Cluster	Agriculture, Food and Natural Resources
Course Code	18404
Prerequisite(s)	Fundamental Ag Mechanical Technologies, Recommended: Introduction to AFNR
Credit	0.5 credit
Program of Study and Sequence	Fundamental Ag Mechanical Technologies – Ag Metal Fabrication – Capstone Course
Student Organization	National FFA Organization
Coordinating Work-Based Learning	Job shadowing, mentoring, internships, entrepreneurships, service learning, workplace tours, apprenticeship, school-based enterprises, Supervised Agricultural Experience (SAE)
Industry Certifications	OSHA 10 Hour Safety Certification (Construction Industry, or General Industry), National Career Readiness Certificate (NCRC), Certified Welder (AWS)
Dual Credit or Dual Enrollment	https://sdmylife.com/images/Approved-CTE-Dual-Credit.pdf
Teacher Certification	Agriculture Food and Natural Resources Cluster Endorsement; Power Structural & Technical Systems Pathway Endorsement; *Agriculture Education
Resources	

Course Description
The Ag Metal Fabrication Technology course provides students with advanced metal fabrication skills, which include Shielded Metal Arc Welding (SMAW), Metal Inert Gas (MIG) welding/Gas Metal Arc Welding (GMAW), oxy acetylene fuel welding, brazing and cutting, Gas Tungsten Arc Welding (GTAW)/Tungsten Inert Welding (TIG), and plasma cutting. This course will also incorporate soft skills necessary for careers in the Power, Structural, and Technical Systems career pathway. Classroom and laboratory content will be enhanced by utilizing appropriate equipment and technology. Geometry, physical science, physics, English, and human relations skills will be reinforced throughout this course. Work-based learning strategies appropriate for this course are school-based enterprises, industry speakers, job shadowing and field trips. Opportunities for application of clinical and leadership skills are provided by participation in FFA activities, conferences, and Career Development Events. Each student will be expected to maintain a Supervised Agricultural Experience (SAE).

Program of Study Application
Ag Metal Fabrication is a second pathway course in the Agriculture, Food and Natural Resources Program of Study, Power Systems pathway. Ag Metal Fabrication is preceded by Fundamental Ag Mechanical Technologies and would be followed by a capstone experience.

Course Standards

AMF 1: Apply safety practices in metal fabrication.

Webb Level	*Sub-indicator*
Three Strategic Thinking	AMF 1.1 – Demonstrate safe operation and knowledge of metal fabrication tools and equipment.
Three Strategic Thinking	AMF 1.2 - Demonstrate workplace/worksite safety procedures and protocols.

AMF 2: Demonstrate the basics of metal fabrication.

Webb Level	*Sub-indicator*
Two Skill/Concept	AMF 2.1 Demonstrate knowledge of metal fabrication techniques and related technologies.
Two Skill/Concept	AMF 2.2 Prepare various metals for welding.
Three Strategic Thinking	AMF 2.3 Create plans for a metal project.
Four Extended Thinking	AMF 2.4 Create a metal fabrication project.

AMF 3: Demonstrate the principles of Shielded Metal Arc Welding (SMAW) and the correct operation of SMAW equipment.

Webb Level	*Sub-indicator*
Two Skill/Concept	AMF 3.1 Perform Shielded Metal Arc Welding (SMAW) techniques.

AMF 4: Demonstrate the principles of Metal Inert Gas (MIG) welding, also known as Gas Metal Arc Welding (GMAW), and the correct operation of MIG equipment.

Webb Level	*Sub-indicator*
Two Skill/Concept	AMF 4.1 Perform metal inert gas (MIG) welding techniques.

AMF 5: Understand the correct operation of oxyacetylene equipment.

Webb Level	*Sub-indicator*
Two Skill/Concept	AMF 5.1 Explore oxyacetylene welding, cutting, and brazing.

AMF 6: Explore advanced welding processes.

Webb Level	*Sub-indicator*
Two Skill/Concept	AMF 6.1 Investigate and explain principles of advanced welding processes (e.g. Tungsten Inert Gas (TIG) welding, plasma cutting (hand or table))

AMF 7: Develop employability skills related to the Power, Structural, and Technical Systems Pathway.

Webb Level	*Sub-indicator*
Two Skill/Concept	AMF 7.1– Develop soft skills to enhance employability.
Two Skill/Concept	AMF 7.2 - Investigate careers related to metal fabrication.

AMF 8: Implement an individual project for career development through a Supervised Agriculture Experience/Work based Experience.

Webb Level	*Sub-indicator*
Two Skill/Concept	AMF 8.1 Develop an individual project plan with goals and timeline.
Two Skill/Concept	AMF 8.2 Explore opportunities within AFNR industries.
Three Strategic Thinking	AMF 8.3 Apply concepts of financial management appropriate to agricultural projects and personal finances.
Three Strategic Thinking	AMF 8.4 Develop and document knowledge and skills to ensure workplace safety regarding personal health and environmental management.
Four Extended Thinking	AMF 8.5 Research and analyze how public policy, laws, and advocacy impact agricultural systems and agricultural literacy.