

Syllabus AG 221 - Agricultural Engineering & Fabrication II

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Google Classroom codes: 1st Hr: **mq7h464** 2nd Hr: **ofnqxn**

Course Description:

Students in this course will learn advanced skills in welding. Major topics are the use of plasma cutter, arc welding, MIG welding, TIG welding and gas cutting equipment. Other topics include metal work, project construction, agricultural structures and project plan design. FFA activities in agricultural mechanics are emphasized. An approved Supervised Agricultural Experience is required.

Competencies/Topics:

STANDARD 13.0 APPLY PRACTICES AND PROCEDURES FOR PLANNING, BUILDING, AND MAINTAINING STRUCTURES

- 13.1 Identify legal land descriptions
- 13.2 Investigate techniques used to survey land
- 13.3 Create sketches and plans for structures
- 13.4 Determine structural requirements, specifications, and estimate costs for structures (i.e., bill of materials)
- 13.5 Follow architectural and mechanical plans to construct, maintain, and/or repair agricultural structures (i.e., material selection, site preparation and/or layout, plumbing, concrete/masonry, electrical wiring, wood fabrication)
- 13.6 Design animal, plant, and mechanical facilities including equipment
- 13.7 Manage basic facility maintenance, installation, or repair

STANDARD 14.0 DEMONSTRATE OPERATION OF TOOLS, EQUIPMENT, AND INSTRUMENTS

- 14.1 Demonstrate safe operating instructions and procedures as recommended by the manufacturer
- 14.2 Utilize service manuals to perform preventative maintenance and determine scheduled service on tools, equipment, and instruments, including small engines
- 14.3 Maintain hand tools and power equipment (i.e., hand saws, power saws, welders, leaf blowers, etc.)
- 14.4 Demonstrate a variety of metal fabrication, welding, soldering, cutting, and finishing processes (i.e., SMAW, GMAW, GTAW, fuel-oxygen, plasma arc torch, etc.)
- 14.5 Demonstrate a variety of wood fabrication and finishing processes
- 14.6 Service electrical systems and components of mechanical equipment and power systems using a variety of troubleshooting and/or diagnostic methods
- 14.7 Utilize manufacturers' guidelines to diagnose, troubleshoot, and repair machinery, equipment, and power source systems (i.e., hydraulic, pneumatic, transmission, steering, suspension, etc.)

STANDARD 16.0 EXAMINE TECHNOLOGY TOOLS AND SYSTEMS USED TO ACCESS, MANAGE, INTEGRATE, AND CREATE INFORMATION AND SOLVE PROBLEMS

- 16.3 Analyze the benefits and limitations of emerging technology such as geospatial, online mapping systems, drones, and robotics
- 16.4 Explain the benefits of computer-based and mobile application equipment
- 16.5 Apply computer and other technologies to solve problems and increase efficiency [i.e., LabQuest, programmable logic controller (PLC), Geospatial Information System (GIS), Computer numeric control (CNC), Unmanned aircraft system (UAS), etc.]

AZ CTE Professional Skills

1.0 COMPLEX COMMUNICATION: Employs complex communication * skills in a manner that adds to organizational productivity. *Complex Communication refers to the need to combine traditional communication skills with technical workplace content transmitted via rapidly evolving technologies to increasingly diverse audiences.

- 2.0 COLLABORATION:** Collaborates, in person and virtually, to complete tasks aimed at organizational goals.
- 3.0 THINKING AND INNOVATION:** Integrates expertise in technical knowledge and skills with thinking and reasoning strategies to create, innovate, and devise solutions.
- 4.0 PROFESSIONALISM:** Conducts self in an appropriate manner reflective of the organizational expectations.
- 5.0 INITIATIVE AND SELF-DIRECTION:** Exercises initiative and self-direction in the workplace.
- 6.0 INTERGENERATIONAL AND CROSS-CULTURAL COMPETENCE:** Interacts effectively with different cultures, generations, and individuals with disabilities to achieve organizational mission, goals, and objectives.
- 7.0 ORGANIZATIONAL CULTURE:** Functions effectively within an organizational culture.
- 8.0 LEGAL AND ETHICAL PRACTICES:** Observes laws, rules, and ethical practices in the workplace.
- 9.0 FINANCIAL PRACTICES:** Applies knowledge of finances for the profitability and viability of the organization.

Grading:

Students will earn points by written assignments, quizzes, tests, and hands-on activities in the laboratory. Approximate point values are as follows:

Assignment Weight	1st Semester	2nd Semester
Weighted 60%	Written assignments, quizzes, tests, Daily wk points Leadership points Supv Experience Project Interactive Notebook Employability Skills	Written assignments, quizzes, tests, Daily wk points Leadership points Supv Experience Project Interactive Notebook Employability Skills
Weighted 30%	Laboratory projects	Laboratory projects
Weighted 10%	Final Exam	Final Exam

A large portion of the grade is based on laboratory activities. Employability Skills will be graded that could include proper preparation, punctuality, participation, attitude, cooperation, willingness to share will be graded. School rules will apply to absences, tardiness, and make up work. It is the student’s responsibility to make up all excused work missed in a timely fashion.

Students cannot make-up non-work days, days lost due to safety/agreement violations and/or non-dress days.

Late work: A conference with the teacher is necessary to discuss the ability to complete assignments late. Assignment point value will be reduced 5% a day it is not turned in to the teacher to a max of 60%. All Late work must be turned in before the end of the 9 week grading period.

Course Procedures

Performance objectives for this course can only be completed by student participation in planned activities. Student grades will be based upon the completion of assignments given both in class and in the laboratory. Students are expected to dress appropriately for activities planned and work conducted. Safety procedures will be emphasized at all times.

Major Projects

Some of the major projects that students will be expected to complete include keeping an Interactive Notebook, personal job related records, welding skill development, project construction, class projects (school improvement construction projects). Please refer to the curriculum outline for approximate times projects will be due.

This course may be taken for Dual Enrollment at MCC as Welding 101.