

Agricultural Structures Design and Fabrication

Grade Level:

10th, 11th and 12th

Course Duration:

One Year

Teacher:

Lee Blanton

Room Number:

614 A

Contact Information:

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Office Hours:

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Course Overview

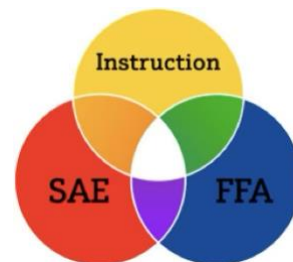
In Agricultural Structures Design and Fabrication, students will explore career opportunities, entry requirements, and industry expectations. To prepare for careers in mechanized agriculture and technical systems, students must attain knowledge and skills related to agricultural structures design and fabrication.

Supervised Agricultural Experiences (SAE)

All students will be required to maintain an SAE project and document their progress using the Agricultural Experience Tracker (AET).

Three-Part Agricultural Education Model

1. Classroom Instruction: Students will receive hands-on and theoretical instruction in agricultural mechanics and metal technologies.
2. FFA Participation: Students are encouraged to join and participate in the National FFA Organization and participate in leadership development events, career development events, and community service activities
3. Supervised Agricultural Experience (SAE): Each student will develop and maintain an SAE project, which will be documented using the AET platform. SAE projects can include entrepreneurship, placement, research, or exploratory experiences related to agricultural mechanics or other agricultural fields.



Course Content and Structure

Primary Learning Objectives:

- Develop knowledge and skills related to the design, construction, and maintenance of agricultural structures.
- Demonstrate safe and effective use of tools, machinery, and equipment found in agricultural construction.
- Apply mathematical, scientific, and technical knowledge to solve real-world problems in agriculture.
- Understand and implement best practices for sustainable and efficient agricultural structures.
- Enhance leadership, teamwork, and critical-thinking skills through hands-on projects and collaborative activities.

Skills and Knowledge Gained by the End of the Course:

- Proficiency in reading and interpreting blueprints, scale drawings, and technical plans.
- Ability to safely use hand tools, power tools, and machinery common in agricultural construction.
- Knowledge of construction materials, such as wood, metal, concrete, and their applications in agricultural settings.
- Competence in designing and fabricating structures like barns, fences, irrigation systems, storage facilities, and greenhouses.
- Understanding of electrical, plumbing, and welding systems used in agricultural structures.
- Awareness of safety protocols, environmental considerations, and regulatory requirements for agricultural construction projects.

Course Units and Weekly Breakdown:

- Weeks 1-2: FFA and SAE Integration
 - Introduction to the FFA organization and its role in agricultural education.
 - Leadership development and career exploration.
 - Overview of Supervised Agricultural Experience (SAE) projects.
 - Students will begin planning their individual SAE projects.
- Weeks 3-5: Career Exploration
 - Overview of careers in agricultural mechanics, construction, and engineering.
 - Guest speakers and research on career pathways.
 - Resume building and interview preparation.
- Weeks 6-8: Safety and Tools
 - Workshop safety protocols and procedures.
 - Identification, maintenance, and proper use of hand tools and power tools.
 - Safety tests and certifications.

- Weeks 9-11: Materials and Measurements
 - Properties and applications of construction materials (wood, metal, concrete, etc.).
 - Accurate measurement techniques and use of measuring tools.
 - Calculations for material quantities and project costs.
- Weeks 12-16: Welding and Metal Fabrication
 - Introduction to welding processes (MIG, TIG, stick welding).
 - Metal cutting, shaping, and fabrication techniques.
 - Hands-on projects: building gates, frames, and other metal structures.
- Weeks 17-20: Woodworking and Carpentry
 - Basics of woodworking tools and techniques.
 - Framing, cutting, and assembly of wooden structures.
 - Projects: building storage sheds, benches, or small barns.
- Weeks 21-24: Electrical Systems
 - Fundamentals of electrical wiring and safety protocols.
 - Installation and maintenance of electrical systems for agricultural structures.
 - Hands-on activities: wiring lights, outlets, and switches.
- Weeks 25-28: Plumbing and Irrigation Systems
 - Basics of plumbing systems and irrigation design.
 - Installation of pipes, valves, and irrigation components.
 - Practical exercises: building a simple irrigation system or plumbing setup.
- Weeks 29-30: Sustainable Construction Practices
 - Environmental considerations in agricultural construction.
 - Energy-efficient designs and renewable energy systems.
- Weeks 31-36: Capstone Project
 - Students design, plan, and construct an agricultural structure or system of their choice.
 - Projects must incorporate skills from multiple units (e.g., welding, woodworking, plumbing).
 - Final presentations and evaluations of the completed projects.

Supervised Agricultural Experience (SAE)

Each student is required to develop and maintain an SAE project throughout the course. SAE projects allow students to apply the skills they learn in class to real-world agricultural experiences. Students will document their SAE progress using the Agricultural Experience Tracker (AET), every Friday.

Examples of SAE projects include:

- Welding and fabricating custom equipment or structures.
- Repairing and maintaining agricultural machinery.
- Assisting with electrical or plumbing projects on a farm or ranch.
- Researching and developing innovative solutions for agricultural mechanics challenges.

SAE Expectations:

1. Students must log hours, activities, and reflections in AET weekly Friday.
2. SAE projects will be evaluated based on effort, documentation, and alignment with course objectives.
3. Students will present their SAE projects at the end of the year as part of their final grade.

Types of Assignments

1. Hands-On Projects:
 - a. Building and fabricating metal structures.
 - b. Repairing agricultural equipment and systems.
 - c. Designing and constructing custom projects based on blueprints.
2. Written Assignments:
 - a. Research essays on agricultural mechanics topics.
 - b. Technical reports on completed projects.
 - c. Reflections and evaluations of individual and group work.
3. Quizzes and Tests:
 - a. Weekly quizzes on safety protocols, tool identification, and technical concepts.
 - b. Unit tests covering welding techniques, mechanical systems, and project planning.
4. SAE Documentation:
 - a. Weekly AET entries documenting SAE progress.
 - b. Mid-year and end-of-year SAE evaluations.
5. Capstone Project:
 - a. Students will design and complete a capstone project that integrates skills learned throughout the course.
 - b. Projects will be presented to the class and evaluated based on craftsmanship, creativity, and alignment with course objectives.

Assessment Methods

1. Major Grades (40 %)
 - Exams and Quizzes
 - Projects and Fabrication Work
 - SAE Presentation
2. Minor Grades
 - SAE Documentation
 - Graded based on completeness, organization, and quality of AET entries.
 - Class Participation and Professionalism
 - Active engagement in class discussions and activities.
 - Adherence to safety protocols and proper use of equipment.
 - Teamwork, leadership, and communication during group tasks.

Additional Information:

FFA Participation

- Students are encouraged to join the National FFA Organization to enhance their leadership, teamwork, and communication skills. FFA activities include leadership development events (LDEs), career development events (CDEs), and community service projects.

Important Dates

- SAE Project Proposal Due: September 1st
- Semester Exam SAE Evaluation: December 1st
- Final Exam SAE Presentation: May 1st
- Capstone Project Completion: May 1st

This syllabus reflects the integration of the Three-Part Agricultural Education Model and emphasizes the importance of hands-on learning, FFA participation, and SAE projects. Let me know if you need additional changes!

Personal Protective Equipment (PPE)

- **Failure to dress out for Shop days will result in loss of Participation points**
- **PPE Includes: (please let me know ASAP if you are unable to provide**
 - Safety Glasses (1 pair provided by school)
 - Welding hood (Welding hoods available to use if you do not want to purchase your own)
 - Closed Toe Leather Shoes
 - Welding Gloves
 - Hearing Protection
 - Long pants (Cotton)
 - Long Sleeve Shirt (Does not have to be FR, but must be Cotton)
 - Examples: Wrangler work shirts, Dickies, Ariat, Cowboy Gear