



Course Overview

Unit Title	Unit Summary
<u>Course Introduction and FFA</u>	Students will be introduced to the comprehensive scope of agricultural structures design and fabrication while exploring FFA organization opportunities and leadership development. This unit establishes the foundation for understanding career pathways in mechanized agriculture and technical systems, emphasizing the importance of student organization participation in professional development and skill building.
<u>Shop Safety</u>	Students will master comprehensive safety protocols essential for agricultural structures work environments, including general safety principles and equipment-specific safety procedures. They will understand and implement safety contracts, demonstrate proper safety practices, and develop a safety-first mindset critical for success in construction and fabrication industries. This unit emphasizes the paramount importance of maintaining safe work environments in all agricultural structures applications.
<u>Professional Standards and Employability Skills</u>	Students will identify career and entrepreneurship opportunities in agricultural structures while developing professional standards required by industry. They will research licensing and certification requirements for industry-based careers, understand employer expectations, and develop the professional competencies necessary for success in mechanized agriculture and technical systems fields.
<u>Supervised Agricultural Experience (SAE) Development</u>	Students will develop comprehensive understanding of Supervised Agricultural Experience programs and their role in experiential learning. They will learn SAE program types, develop record-keeping skills, and create personalized SAE plans that align with their career goals in agricultural structures. This unit emphasizes the practical application of classroom learning through hands-on agricultural experiences.
<u>Facilities Design and Fabrication</u>	Students will master the principles of agricultural facilities design and fabrication, including building plan development, site selection, and material cost estimation. They will learn to create comprehensive building plans, develop bills of materials, and utilize CAD software for professional design applications. This unit provides the foundation for understanding agricultural construction project planning and execution.
<u>Power Systems in Agricultural Structures</u>	Students will develop comprehensive understanding of electrical systems in agricultural structures, including electrical principles, terminology, and

	code compliance. They will learn to estimate electrical needs, read electrical meters, identify wiring materials, and understand circuit design. Students will explore alternative power systems and develop skills in electrical system repair and maintenance for agricultural applications.
<u>Agricultural Structures Construction</u>	Students will master diverse construction techniques essential for agricultural structures, including surveying, GPS/GIS systems, concrete work, and water management systems. They will learn non-traditional building techniques, masonry and drywall installation, and proper installation of doors, windows, and roofing materials. Students will develop plumbing installation skills that comply with codes and regulations for agricultural applications.
<u>Metal Construction and Fabrication</u>	Students will develop advanced metal construction and fabrication skills essential for agricultural structures, including oxy-fuel cutting techniques and various welding processes. They will master SMAW (7018 electrode) and GMAW welding applications through hands-on project completion. This unit emphasizes precision fabrication skills and metal joining techniques commonly used in agricultural construction and equipment fabrication.
<u>Capstone SAE Fabrication Project</u>	Students will apply all acquired knowledge and skills through student-choice SAE shop projects that demonstrate mastery of agricultural structures design and fabrication concepts. They will plan, design, and execute comprehensive projects that integrate design principles, construction techniques, and fabrication skills. This capstone experience allows students to showcase their technical competencies and prepare for industry employment or advanced education.

Standards for Course Introduction and FFA

Texas Essential Knowledge and Skills (TEKS)

(2) The student develops leadership skills through participation in an agricultural youth organization.

The student is expected to:

- participate in youth agricultural leadership opportunities **[2(A)]**
- review and participate in a local program of activities **[2(B)]**
- create or update documentation of relevant agricultural experience such as community service, professional, or classroom experiences **[2(C)]**

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Standards for Shop Safety

Texas Essential Knowledge and Skills (TEKS)

(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:

- describe and demonstrate appropriate personal and occupational safety and health practices for the workplace **[1(D)]**

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Standards for Professional Standards and Employability Skills

Texas Essential Knowledge and Skills (TEKS)

(1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:

- identify career development, education, and entrepreneurship opportunities in agricultural structures **[1(A)]**
- identify and demonstrate interpersonal, problem-solving, and critical-thinking skills used in agricultural structures **[1(B)]**

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Standards for Supervised Agricultural Experience (SAE) Development

Texas Essential Knowledge and Skills (TEKS)

(2) The student develops a supervised agricultural experience program. The student is expected to:

- plan, propose, conduct, document, and evaluate a supervised agricultural experience program as an experiential learning activity **[2(A)]**
- use appropriate record-keeping skills in a supervised agricultural experience program **[2(B)]**

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Standards for Facilities Design and Fabrication

Texas Essential Knowledge and Skills (TEKS)

(3) The student applies knowledge and skills related to agricultural facilities design and fabrication.

The student is expected to:

- develop building plans including scope and sequence **[3(A)]**
- analyze site selection and building placement **[3(B)]**
- estimate material costs and develop bills of materials **[3(C)]**
- utilize CAD software to create building plans **[3(E)]**

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Standards for Power Systems in Agricultural Structures

Texas Essential Knowledge and Skills (TEKS)

(4) The student demonstrates knowledge and skills related to power systems in agricultural structures.

The student is expected to:

- understand principles of electricity and electrical terminology **[4(A)]**
- estimate electrical needs and loads **[4(B)]**
- apply electrical codes including local and national codes **[4(C)]**
- read and use various electrical meters **[4(D)]**
- identify electrical circuit wiring and materials **[4(E)]**
- perform electrical system repair **[4(F)]**
- research alternative power systems including solar and wind **[4(G)]**

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Standards for Agricultural Structures Construction

Texas Essential Knowledge and Skills (TEKS)

(5) The student demonstrates knowledge and skills related to agricultural structures construction. The student is expected to:

- understand surveying purposes, procedures, and equipment **[5(A)]**
- utilize GIS and GPS systems in agricultural applications **[5(B)]**
- reinforce, place, finish, and cure concrete **[5(C)]**
- design, establish, and maintain water management systems including irrigation and drainage **[5(D)]**
- apply non-traditional building techniques including modular, aluminum panel, and metal stud construction **[5(E)]**
- install masonry and drywall systems **[5(F)]**
- install doors, windows, and roofing materials **[5(G)]**
- install plumbing equipment and fixtures that comply with codes and regulations **[5(H)]**

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Standards for Metal Construction and Fabrication

Texas Essential Knowledge and Skills (TEKS)

(6) The student demonstrates knowledge and skills related to metal construction and fabrication. The student is expected to:

- perform oxy-fuel cutting operations **[6(A)]**
- demonstrate welding processes including SMAW and GMAW **[6(B)]**

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Standards for Capstone SAE Shop Projects

Texas Essential Knowledge and Skills (TEKS)

(2) The student develops a supervised agricultural experience program. The student is expected to:

- plan, propose, conduct, document, and evaluate a supervised agricultural experience program as an experiential learning activity **[2(A)]**
- use appropriate record-keeping skills in a supervised agricultural experience program **[2(B)]**
- create or update documentation of relevant agricultural experience such as community service, professional, or classroom experiences **[2(C)]**

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