# Scope & Sequence

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| Course Name: Agricultural Mechanics and Metal Technologies **TSDS PEIMS Code:** 13002200 | | | **Course Credit:** 1.0  **Course Requirements:** Recommended for Grades 10-12.  **Prerequisites:** None.  **Recommended Prerequisites:** Principles of Agriculture, Food, and Natural Resources. |
| **Course Description:** Agricultural Mechanics and Metal Technologies is designed to develop an understanding of agricultural mechanics as it relates to safety and skills in tool operation, electrical wiring, plumbing, carpentry, fencing, concrete, and metal working techniques. To prepare for careers in agricultural power, structural, and technical systems, students must attain academic skills and knowledge; acquire technical knowledge and skills related to power, structural, and technical agricultural systems and the industry; and develop knowledge and skills regarding career opportunities, entry requirements, industry certifications, and industry expectations. | | | |
| **NOTE:** This is a suggested scope and sequence for the course content. This content will work with any textbook or instructional materials. If locally adapted, make sure all TEKS are covered. | | | |
| **Total Number of Periods**  **Total Number of Minutes**  **Total Number of Hours** | 175 Periods  7,875 Minutes  131.25 Hours\* | \*Schedule calculations based on 175/180 calendar days. For 0.5 credit courses, schedule is calculated out of 88/90 days. Scope and sequence allows additional time for guest speakers, student presentations, field trips, remediation, extended learning activities, etc. | |
| **Unit Number, Title, and Brief Description** | **# of Class Periods\***  (assumes 45-minute periods)  Total minutes per unit | **TEKS Covered**  **130.26. (c) Knowledge and skills** | |
| **Unit 1: Professional Standards/Employability Skills**  Students will discuss the professional standards and employability skills, including identifying career development and entrepreneurship opportunities in the field of power, structural, and technical agricultural systems, apply competencies related to resources, information, interpersonal skills, problem solving, critical thinking, and systems of operation of power, structural, and technical agricultural systems, and examine licensing, certification, and credentialing requirements to maintain compliance with industry requirements. Students will further develop and demonstrate these skills and attributes throughout the course. In small groups and/or in other classroom activities, students will demonstrate knowledge of personal and occupational safety, health, and first-aid policy in the workplace, identify appropriate work habits, and characteristics of good citizenship skills. | 15 periods  675 minutes | (1) The student demonstrates professional standards/employability skills as required by business and industry. The student is expected to:  (A) identify career development and entrepreneurship opportunities in the field of power, structural, and technical agricultural systems;  (B) apply competencies related to resources, information, interpersonal skills, problem solving, critical thinking, and systems of operation of power, structural, and technical agricultural systems;  (C) examine licensing, certification, and credentialing requirements to maintain compliance with industry requirements;  (D) demonstrate knowledge of personal and occupational health, safety, and first-aid practices in the industry;  (E) identify employer expectations and appropriate work habits; and  (F) demonstrate characteristics of good citizenship, including advocacy, stewardship, and community leadership. | |
| **Unit 2: Tools and Equipment**  Students will discuss operating instructions for tools and equipment to perform a given task. In small groups and/or in other classroom activities, students will select, use, maintain, and store appropriate hand tools to perform a given task, select, use, maintain, and store appropriate power equipment such as tools powered by electric, pneumatic, and internal combustion engines, and select and use measuring and marking devices. | 10 periods  450 minutes | (3) The student follows operating instructions for tools and equipment to perform a given task. The student is expected to:  (A) select, use, maintain, and store appropriate hand tools to perform a given task;  (B) select, use, maintain, and store appropriate power equipment such as tools powered by electric, pneumatic, and internal combustion engines; and  (C) select and use measuring and marking devices. | |
| **Unit 3: Processes to Assemble Equipment**  Students will discuss the processes relating to assembly of equipment in agricultural systems operations. In small groups and/or in other classroom activities, students will select, use, and maintain appropriate tools, equipment, and facilities, and identify and determine properties, types, and uses of metal. | 10 periods  450 minutes | (10) The student applies processes relating to assembly of equipment in agricultural systems operations. The student is expected to:  (A) select, use, and maintain appropriate tools, equipment, and facilities; and  (B) identify and determine properties, types, and uses of metal. | |
| **Unit 4: Electrical Wiring Skills**  Students will discuss electric wiring skills. In small groups and/or in other classroom activities, students will identify principles of electricity and wiring terminology, install electric wiring components and fixtures to comply with governmental regulations and applicable codes, and maintain electric motors. | 15 periods  675 minutes | (4) The student identifies and performs electric wiring skills. The student is expected to:  (A) identify principles of electricity and wiring terminology;  (B) install electric wiring components and fixtures to comply with governmental regulations and applicable codes; and  (C) maintain electric motors. | |
| **Unit 5: Plumbing Skills**  Students will discuss plumbing skills. In small groups and/or in other classroom activities, students will identify and use plumbing tools, and identify plumbing fixtures. | 10 periods  450 minutes. | 5) The student performs plumbing skills. The student is expected to:  (A) identify and use plumbing tools; and  (B) identify plumbing fixtures. | |
| **Unit 6: Concrete Construction Skills**  Students will discuss concrete construction skills. In small groups and/or in other classroom activities, students will project cost estimates for materials, and form and pour concrete slabs. | 15 periods  675 minutes | (6) The student performs concrete construction skills. The student is expected to:  (A) project cost estimates for materials; and  (B) form and pour concrete slabs. | |
| **Unit 7: Carpentry Skills**  Students will discuss carpentry skills. In small groups and/or in other classroom activities, students will identify materials used in agricultural construction, identify elements of a cost estimate and prepare a bid package for a planned project, demonstrate basic carpentry skills, and paint and protect a project with coatings. | 20 periods  900 minutes | (7) The student performs carpentry skills. The student is expected to:  (A) identify materials used in agricultural construction;  (B) identify elements of a cost estimate and prepare a bid package for a planned project;  (C) demonstrate basic carpentry skills; and  (D) paint and protect a project with coatings. | |
| **Unit 8: Fencing Methods**  Students will discuss fencing methods. In small groups and/or in other classroom activities, students will select fencing materials, and plan and install fences. | 15 periods  675 minutes | (8) The student identifies fencing methods. The student is expected to:  (A) select fencing materials; and  (B) plan and install fences. | |
| **Unit 9: Cold and Hot Metal Techniques**  Students will discuss appropriate cold and hot metal techniques. In small groups and/or in other classroom activities, students will identify types of metal, cut, file, shape, and drill metal, select and operate oxy-fuel welding and cutting equipment to meet standards, select and operate electric-arc welding equipment to meet standards, and perform specialty welding and cutting techniques to meet standards. | 20 periods  900 minutes | (9) The student performs appropriate cold and hot metal techniques. The student is expected to:  (A) identify types of metal;  (B) cut, file, shape, and drill metal;  (C) select and operate oxy-fuel welding and cutting equipment to meet standards;  (D) select and operate electric-arc welding equipment to meet standards; and  (E) perform specialty welding and cutting techniques to meet standards. | |
| **Unit 10: Cost-Effective Construction Techniques**  Students will discuss cost-effective construction techniques. In small groups and/or in other classroom activities, students will analyze site, equipment, and permit requirements, operate computer-aided drafting design software, develop, read, and interpret designs and sketches, estimate material needs and costs, measure, mark, and cut material, and perform specialized nonmetallic fabrication techniques. | 25 periods  1,125 minutes | (11) The student plans and performs cost-effective construction techniques. The student is expected to:  (A) analyze site, equipment, and permit requirements;  (B) operate computer-aided drafting design software;  (C) develop, read, and interpret designs and sketches;  (D) estimate material needs and costs;  (E) measure, mark, and cut material; and  (F) perform specialized nonmetallic fabrication techniques. | |
| **Unit 11: Supervised Agriculture Experience Program**  Students will discuss and develop all components of a supervised agriculture experience. Through a variety of classroom activities, students will utilize appropriate technology to plan, propose, conduct, document and evaluate their supervised agriculture experience program, apply appropriate record-keeping skills, and participate in leadership opportunities. As a culminating unit activity, students will produce and participate in a local program of activities using a strategic planning process. | 20 periods  900 minutes | 2) The student develops a supervised agriculture experience program. The student is expected to:  (A) plan, propose, conduct, document, and evaluate a supervised agriculture experience program as an experiential learning activity;  (B) apply proper record-keeping skills as they relate to the supervised agriculture experience;  (C) participate in youth leadership opportunities to create a well-rounded experience program; and  (D) produce and participate in a local program of activities using a strategic planning process. | |