**130.22. Agricultural Mechanics and Metal Technologies (One-Half to One Credit).**

(a)  General requirements. This course is recommended for students in Grades 10-12. Students may take this course in Grade 9 if they have met the recommended prerequisite of Principles of Agriculture, Food, and Natural Resources.

(b)  Introduction. To be prepared for careers in agricultural power, structural, and technical systems, students need to 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. To prepare for success, students need opportunities to learn, reinforce, apply, and transfer knowledge and skills and technologies in a variety of settings. This course 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.

(c)  Knowledge and skills.

(1)  The student learns the employability skills of a successful employee to meet current industry standards and society. The student is expected to:

(A)  identify career development and entrepreneurship opportunities in the field of power, structural, and technical agricultural systems, including how to search and obtain employment, what qualifications are required for varying career fields, and how to advance in a position;

(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; and

(E)  identify employers' expectations, including appropriate work habits, ethical conduct, legal responsibilities, and good citizenship skills.

(2)  The student develops an improved supervised agriculture experience program as it relates to agriculture, food, and natural resources. The student is expected to:

(A)  plan, propose, conduct, and evaluate entrepreneurship; placement; exploratory; research, either experimental or analytical; improvement; supplementary; laboratory-based; or other identified, supervised agricultural experience as an experiential learning activity;

(B)  apply proper record-keeping skills as they relate to a supervised experience;

(C)  design and use a customized record-keeping system for the individual supervised experience;

(D)  participate in youth leadership opportunities to create a well-rounded experience program in agriculture; and

(E)  produce a challenging approach for a local program of activities in agriculture.

(3)  The student follows operating instructions for tools and equipment to perform a given task. The student is expected to:

(A)  select and use the appropriate hand and power tools to perform a given task, maintain tools, and store tools; and

(B)  select and use measuring and marking devices.

(4)  The student identifies and performs electric wiring skills. The student is expected to:

(A)  identify principles of electric wiring and wiring terminology;

(B)  perform and install electric wiring components and fixtures to comply with government regulations and applicable codes; and

(C)  maintain electric motors.

(5)  The student performs plumbing skills. The student is expected to:

(A)  identify and select plumbing tools and fixtures;

(B)  install plumbing equipment and fixtures to comply with government regulations and applicable codes; and

(C)  maintain water systems.

(6)  The student performs concrete construction skills. The student is expected to:

(A)  project cost estimates for materials and construct forms; and

(B)  reinforce, place, finish, and cure concrete.

(7)  The student performs carpentry skills. The student is expected to:

(A)  identify materials used in agricultural construction;

(B)  identify elements of projected cost estimate and prepare a bid package for a planned project;

(C)  demonstrate basic carpentry skills; and

(D)  paint and protect with coatings.

(8)  The student identifies fencing methods. The student is expected to:

(A)  select fencing materials; and

(B)  plan and install fences.

(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.

(10)  The student knows metal merging technology and processes relating to assembly of equipment in agricultural systems operations. The student is expected to:

(A)  select and maintain appropriate tools, equipment, and facilities; and

(B)  identify and determine properties, types, and uses of metal.

(11)  The student plans and performs cost-effective construction techniques. The student is expected to:

(A)  analyze site, equipment, and permit requirements;

(B)  observe or 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.