ATTACHMENT I
Text of Proposed New 19 TAC

Chapter 127. Texas Essential Knowledge and Skills for Career Development and Career and Technical Education

Subchapter C. Agriculture, Food, and Natural Resources

§127.59. Geographic Information Systems for Agriculture (One Credit), Adopted 2025.

(a) General requirements. This course is recommended for students in 10-12 grade. Recommended prerequisites: Principles of Agriculture, Food, and Natural Resources. Students shall be awarded 1 credit for successful completion of this course.

(b) Introduction.

(1) Career and technical education instruction provide content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions

(2) The Agriculture, Food, and Natural Resources Career Cluster focuses on the production, processing, marketing, distribution, financing, and development of agricultural commodities and resources, including food, fiber, wood products, natural resources, horticulture, and other plant and animal products/resources.

(3) The Geographic Information System for Agriculture is a course designed to provide students with the academic and technical knowledge and skills that are required to pursue a career as a Precision Agriculture Specialist, Crop Specialist, Independent Crop Consultant, Nutrient Management Specialist, Physical Scientist, Precision Agronomist, Precision Farming Coordinator, Research Agricultural Engineering and Soil Fertility Specialist. Students will learn to use computers to develop or analyze maps of remote sensing to compare physical topography with data on soils, fertilizer, pests, or weather.

(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.

(c) Knowledge and skills.

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

(A) apply competencies related to resources, information, interpersonal skills, and systems associated with geographic information systems; and

(B) identify employers' expectations, including appropriate work habits.

(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.

(3) The student explains the current applications of GIS in agriculture food and natural resources and identifies the future need for GIS in precision agriculture. The student is expected to:

(A) identify career development and entrepreneurship opportunities in the field of geographic information systems (GIS) for agriculture;

(B) research current and emerging careers related to GIS in agriculture and natural resource fields;

(C) identify and analyze applications of GIS technologies in agriculture, food, and natural resources;

(D) interprets GIS data as it pertains to agriculture; and

(E) research h licensing, certification, and credentialing requirements.

(4) The student analyzes geographic information and spatial data types in Agriculture, Food and Natural Resources. The student is expected to:

(A) demonstrate a knowledge of the history of GIS and basic terminology used in agriculture;

(B) identify GIS models and representations in precision agriculture;

(C) apply GIS representations of geographic phenomena in soil types, topography, and farming management;

(D) organize and manage spatial data in yield monitoring for crop planning; and

(E) analyze GIS data sources and ethics in agriculture.

(5) The student utilizes GIS tools used in Agriculture, Food and Natural Resources. The student is expected to:

(A) identify hardware and software for agriculture data management and processing;

(B) exhibit competencies related to spatial data capture and preparation, spatial data storage and maintenance, spatial query, and analysis, and spatial data presentation for agriculture; and

(C) demonstrate understanding of remote sensing tools and technologies used in precision farming including Unmanned Aerial Support (UAS), Unmanned Aerial Vehicles (UAV), and Global Positioning Satellite (GPS).

(6) The student integrates spatial referencing and global positioning techniques in Agriculture, Food and Natural Resources. The student is expected to:

(A) demonstrate knowledge of spatial referencing systems and projections for capturing and displaying agricultural data; and

(B) demonstrate knowledge of using satellite-based positioning for agriculture uses.

(7) The student evaluates the applications for spatial data entry and preparation for agricultural analysis. The student is expected to:

(A) input agricultural spatial data for GIS analysis; and

(B) apply concepts related to agriculture data accuracy and precision.

(8) The student performs agricultural spatial data analysis. The student is expected to:

(A) classify analytical GIS capabilities for maximum crop yields;

(B) compare vector and raster-based data for agricultural analysis; and

(C) explore concepts related to GIS analysis function and natural resource management.

(9) The student creates spatial data visualizations and cartographic models. The student is expected to:

(A) identify types of GIS maps used in agriculture;

(B) develop GIS maps for various types of agricultural data;

(C) demonstrate proficiency of Cartographic symbol used in precision farming; and

(D) creates visual data for use in agricultural decision making.

§127.61. Beekeeping and Honey Processing (1 Credit), Adopted 2025.

(a) General requirements. This course is recommended for students in grades 10-12. Recommended prerequisites: Principles of Agriculture, Food and Natural Resources. Students shall be awarded one credit for successful completion of this course.

(b) Introduction.

(1) Career and technical instruction provides content aligned with challenging academic standards and relevant technical knowledge and skills for students to further their education and succeed in current or emerging professions.

(2) The Agriculture, Food, and Natural Resources Career Cluster focuses on the production, processing, marketing, distribution, financing, and development of agricultural commodities and resources, including food, wood products, natural resources, horticulture, and other plant and animal products/resources.

(3) Beekeeping and Honey Processing is a course designed to provide students with the academic and technical knowledge and skills that are required to pursue a career related to beekeeping, apiary operations, honey harvesting, and related industries. Beekeeping and Honey Processing is a vital part of our U.S. agricultural economy. To prepare for success, students need opportunities to learn, reinforce, experience, apply, and transfer their knowledge and skills in a variety of settings.

(4) Students are encouraged to participate in extended learning experiences such as career and technical student organizations and other leadership or extracurricular organizations.

(5) Statements that contain "including" reference content that must be mastered, while those containing the phrase "such as" are intended as possible illustrative examples.

(c) Knowledge and skills.

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

(A) describe career development and entrepreneurship opportunities in beekeeping, apiary operations, honey harvesting, and related industries;

(B) apply competencies related to resources, information, interpersonal skills, and systems of operation in the viticulture industry;

(C) demonstrate knowledge of personal, occupational safety practices, and environmental regulations and first-aid procedures associated with apiary operations;

(D) identify training, education, and certification requirements for occupational choice; and

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

(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 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.

(3) The student explains the biology and bee behavior. The student is expected to:

(A) identify different types of bees and their life spans;

(B) explain the different roles played by the different types of honey bees; and

(C) demonstrate knowledge of honey bee development, castes, bee behavior, division of labor, and the life cycle.

(4) The student analyzes beehive design and development. The student is expected to:

(A) identify the site characteristics required for successful beehive production;

(B) evaluate the factors such as climatic characteristics and food sources for a potential beehive to determine if it is suitable for honey harvesting and pollination;

(C) research and compare successful beehives in other parts of the world with similar local conditions; and

(D) develop a beehive design and installation plan including shelter concerns, solar, topographical, human and animal habitation, and good neighbor policy.

(5) The student evaluates technology and practices for weatherizing the hive. The student is expected to:

(A) demonstrate knowledge of the environmental conditions that lead to bee colonies adapting to extremes in climate conditions- summer, autumn, and winter management; and

(B) identify and practice winterizing hives and an effective course of action.

(6) The student demonstrates beehive management techniques. The student is expected to:

(A) identify the tools of an apiarist and demonstrate safe usage of tools;

(B) demonstrate inspection of a beehive with an emphasis on using protective; equipment, how to light a smoker, comb replacement or inspection; and

(C) apply beehive-training techniques including diagnosing the brood pattern, adding brood comb to the nest, switching colonies, feeding bees, providing water, removing old combs, extracting honey, and caging queens;

(D) identify safety precautions in the field and handling of live bees, caring for the colonies in the hives, extracting of honey and honeycomb;

(E) explain the proper methods of bee handling to prevent harm to themselves and others; and

(F) describe personal protective equipment used to reduce the risk of accidents.

(7) The student develops an integrated pest management plan for beehives. The student is expected to:

(A) identify the major insect pests and diseases of honeybees;

(B) evaluate the components of integrated pest management related to honeybees; and

(C) describe the safe usage of pesticides in honeybee hives.

(8) The student produces honey using the proper equipment and tools. The student is expected to:

(A) describe the tools and equipment used in honey production, including but not limited to, bee brush, fume board, honey drip tray, nectar detector, escape board, and extractor;

(B) demonstrate the safe usage of honey harvesting tools;

(C) explain the use of technology in modern honey production systems; and

(D) apply training and extract honey using appropriate procedures.

(9) The student identifies procedures and regulations for sanitation and safety in the food industry. The student is expected to:

(A) identify food industry inspection standards, including hazard analysis and critical control points;

(B) identify the appropriate chemicals used in food industry; specifically in honey processing;

(C) identify safety and governmental regulations involved in the processing and labeling of foods;

(D) demonstrate knowledge of procedures relating to the safe manufacture of foods through hygienic food handling and processing;

(E) develop and maintain sanitation schedules; and

(F) research food safety laws.

(10) The student demonstrates an in-depth understanding of entrepreneurship and how to grow a business. The student is expected to:

(A) develop concepts based on terms entrepreneurship and entrepreneur;

(B) define small, medium, and large-sized businesses;

(C) visualize and communicate a business model; and

(D) collaborate with a team on the development of a project.

(11) The student completes the process for development, implementation, and evaluation of a marketing plan and a financial forecast. The student is expected to:

(A) identify and explain the target market for honey related products;

(B) create and conduct a customer survey;

(C) analyze the survey results;

(D) structure modification recommendations based on survey results; complete a detailed market analysis;

(E) analyze and explain different types of market strategies;

(F) direct a social media marketing campaign for honey processed products; and

(G) develop and explain a projected income statement, cash budget, projected, balance sheet, projected sources and uses of funds statement.

(12) The student explains the scope and nature of distribution of the honey-related products. The student is expected to:

(A) define effective channels of distribution strategies, including activities associated with transportation, storage, product handling, and inventory control;

(B) explain how distribution can add value to goods, services, and intellectual property; and

(C) determine costs associated with distribution.