



Approved Innovative Course

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Course: Viticulture

PEIMS Code: N1300265

Abbreviation: VITICUL

Grade Level(s): 10-12

Number of Credits: 1.0

Course description:

This course is designed to introduce students to the concepts and practices of grape production and the aspects of environmental science that relate to successful management of grapevines.

Essential knowledge and skills:

- (a) General requirements. This course is recommended for students in Grades 10-12. Recommended prerequisite: 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 education 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, fiber, wood products, natural resources, horticulture, and other plant and animal products/resources.
 - (3) Viticulture is a course designed to provide students with the academic and technical knowledge and skills that are required to pursue a career related to vineyard operations, grape cultivation, and related industries that contribute some \$2 billion annually to the Texas economy. Students in Viticulture develop an understanding of grape production techniques and practices, while emphasizing environmental science related to production decisions. To prepare for success, students need opportunities to learn, reinforce, experience, apply, and transfer their knowledge and skills in a variety of settings.



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(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 the word "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 the viticulture industry;
 - (B) apply competencies related to resources, information, interpersonal skills, and systems of operation in the viticulture industry;
 - (C) demonstrate knowledge of personal and occupational safety practices in the workplace; and
 - (D) 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 production cycle and basic physiology of grapevines. The student is expected to:
 - (A) apply asexual propagation techniques as used in the production of domesticated grapes;
 - (B) identify the major vegetative and reproductive structures of grapevines;
 - (C) describe the annual vegetative and reproductive growth cycle of grapevines;
 - (D) explain how environmental conditions influence grapevine vegetative and reproductive growth; and
 - (E) describe the use of training systems in vineyard production.



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- (4) The student analyzes vineyard design and development. The student is expected to:
- (A) identify the site characteristics required for successful vineyard production;
 - (B) evaluate the soil and climatic characteristics of a potential vineyard site to determine if it is suitable for vineyard production;
 - (C) identify and research successful vineyards in other parts of the world with soil and climate characteristics similar to local conditions; and
 - (D) develop a vineyard design and installation plan.
- (5) The student evaluates technology and practices utilized for vineyard frost protection. The student is expected to:
- (A) describe the environmental conditions that lead to plant cold injury;
 - (B) identify frost damage in grapevines and an effective course of action;
 - (C) differentiate between advection and radiation frost events;
 - (D) evaluate passive frost protection techniques employed in horticulture crop systems;
 - (E) evaluate active frost protection techniques employed in horticulture crop systems; and
 - (F) analyze the cost effectiveness of frost protection systems.
- (6) The student demonstrates vineyard management techniques. The student is expected to:
- (A) demonstrate safe usage of vineyard tools;
 - (B) demonstrate dormant pruning of grapevines with an emphasis on using pruning as an effective method for minimizing crop loss due to frost, and;
 - (C) apply grapevine-training techniques.
- (7) The student develops an integrated pest management plan for vineyards. The student is expected to:
- (A) identify the major insect pests and diseases of vineyards;
 - (B) identify animal pests of vineyards;
 - (C) evaluate the components of integrated pest management related to horticultural crops;
 - (D) explain how cultural practices may be used for vineyard pest control; and
 - (E) describe the safe usage of pesticides in vineyards.
- (8) The student examines soil properties and fertility as it relates to horticultural production systems. The student is expected to:
- (A) explain the concepts of soil type, texture, and basic soil chemistry;
 - (B) identify the essential nutrients required by horticultural crops;



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- (C) describe the relationship between soil properties and fertility;
 - (D) develop and present a vineyard fertility plan;
 - (E) identify the practices of organic vineyards; and
 - (F) calculate the fertilizer needs of horticultural crops.
- (9) The student evaluates water requirements vineyards and associated climatic factors. The student is expected to:
- (A) explain the water requirements of grapevines;
 - (B) examine grape varieties that thrive in local soil and weather conditions;
 - (C) analyze the influence of soil properties and climate on vineyard water relations;
 - (D) describe irrigation strategies used in horticultural crop systems;
 - (E) evaluate the water resources required for horticultural crop systems;
 - (F) describe methods of determining soil moisture; and
 - (G) calculate the irrigation needs of vineyards based on soil and climate.
- (10) The student identifies the equipment and tools used in vineyard production. The student is expected to:
- (A) describe the tools and equipment used in vineyard production;
 - (B) demonstrate the safe usage of vineyard tools; and
 - (C) explain the use of technology in modern vineyard production systems.

Description of specific student needs this course is designed to meet:

The course will give students access to instruction and resources that allow them to practice and apply 21st century workplace skills. The course provides:

- Opportunities to observe and solve real world problems
- Interdisciplinary curricula that guide students in application of skills and knowledge across multiple areas of study: mathematics, science, agriculture, construction, language arts and technology
- Project-based learning focused on relevant skills in agriculture
- Hands-on experience of standard practices in a commercial vineyard
- Activities that allow students to investigate careers related to the grape industry



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Major resources and materials:

The Texas Winegrape Network
winegrapes.tamu.edu

eXtension Grapes
www.extension.org/grapes

Kamas, Jim (2014). Growing Grapes in Texas: Texas: Texas A&M University

Recommended course activities:

Vineyard site evaluation, grapevine pruning, grapevine training, grapevine propagation, vineyard floor management, trellis construction, vineyard planting, and vineyard design.

Suggested methods for evaluating student outcomes:

Students will be evaluated for comprehension of concepts through written assignments and testing in addition to ongoing monitoring by the teacher and student self-assessment. Application of concepts will be evaluated through hands-on exercises.

Teacher qualifications:

An assignment for Viticulture is allowed with one of the following certificates:
Agriculture, Food and Natural Resources: Grades 6-12
Agriculture
Science and Technology: Grades 6-12
Any vocational agriculture certificate

Additional information: