Texas CTE

Greenhouse Operation and Production

General requirements. This course is recommended for students in Grades 10-12. Students shall be awarded one credit for successful completion of this course GOP.A

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Introduction GOP.B

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. GOP.B.1

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. GOP.B.2

3 Greenhouse Operation and Production is designed to develop an understanding of greenhouse production techniques and practices. To prepare for careers in horticultural systems, students must attain academic skills and knowledge, acquire technical knowledge and skills related to horticultural systems and the workplace, and develop knowledge and skills regarding career opportunities, entry requirements, and industry expectations. To prepare for success, students need opportunities to learn, reinforce, apply, and transfer their knowledge and skills and technologies in a variety of settings. GOP.B.3

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

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. GOP.B.5

Knowledge and skills. GOP.C

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

- a identify career development and entrepreneurship opportunities in the field of greenhouse operations and production; GOP.C.1.A
- b apply competencies related to resources, information, interpersonal skills, problem solving, and critical thinking in greenhouse operations and production; GOP.C.1.B
- c examine licensing, certification, and legal requirements to maintain compliance with industry requirements; GOP.C.1.C
- d demonstrate knowledge of personal and occupational health and safety practices in the industry; GOP.C.1.D
- e identify employers' expectations and appropriate work habits; GOP.C.1.E
- f demonstrate characteristics of good citizenship such as advocacy, stewardship, and community leadership. GOP.C.1.F

2 **The student develops a supervised agriculture experience program. The student is expected to:** GOP.C.2

- a plan, propose, conduct, document, and evaluate a supervised agriculture experience program as an experiential learning activity; GOP.C.2.A
- b apply proper record-keeping skills as they relate to the supervised agriculture experience; GOP.C.2.B
- c participate in youth leadership opportunities to create a well-rounded experience program; GOP.C.2.C
- d produce and participate in a local program of activities using a strategic planning process. GOP.C.2.D

3 **The student identifies and classifies plants used in greenhouse production. The student is expected to:** GOP.C.3

- a classify greenhouse plants according to taxonomy systems; GOP.C.3.A
- b develop knowledge of plant anatomical structures and functions for plant identification; GOP.C.3.B
- c develop plant classifications based on cropping schedules and market demand for greenhouse crops. GOP.C.3.C

4 **The student identifies and investigates different greenhouse structures and construction factors. The student is expected to:** GOP.C.4

- a select greenhouse coverings; GOP.C.4.A
- b compare greenhouse styles and construction materials; GOP.C.4.B
- c analyze the costs associated with greenhouse construction; GOP.C.4.
- d evaluate greenhouse site orientation and construction concerns; GOP.C.4.D
- e integrate other growing structures such as cold frames, hotbeds, lath houses, and potting sheds; GOP.C.4.E
- f investigate local, state, and national regulations affecting greenhouse operations. GOP.C.4.F

5 **The student identifies and assesses environmental conditions within the greenhouse. The student is expected to:** GOP.C.5

- a investigate environmental factors controlled in the greenhouse; GOP.C.5.A
- b determine and calculate factors used in heating and cooling a greenhouse; GOP.C.5.B
- c investigate the effects of greenhouse climate conditions such as ventilation, carbon dioxide generation, and humidity on plant growth in the greenhouse; GOP.C.5.C
- d explore the importance of light quality, quantity, and duration on the production of greenhouse crops; GOP.C.5.D
- e compare open and closed environmental systems in the greenhouse such as misting beds or hydroponics. GOP.C.5.E

6 **The student identifies, operates, and maintains greenhouse environmental and mechanical controls. The student is expected to:** GOP.C.6

- a explain how to operate and maintain heating, cooling, and ventilation systems in a greenhouse; GOP.C.6.A
- b explain how to operate and maintain electrical systems in a greenhouse; GOP.C.6.B
- c explain how to operate and maintain various water systems in a greenhouse. GOP.C.6.C

7 **The student propagates greenhouse crops. The student is expected to:** GOP.C.7

- a analyze different methods of propagating greenhouse crops using sexual and asexual propagation methods; GOP.C.7.A
- b propagate greenhouse crops using various methods such as using seeds, seedlings, plugs, cuttings, and tissue culture; GOP.C.7.B
- c investigate physiological conditions that affect plant propagation such as seed dormancy and root initiation. GOP.C.7.C

8 **The student identifies and investigates greenhouse crop production factors. The student is expected to:** GOP.C.8

- a explain and demonstrate the chemical and physical differences in greenhouse media components; GOP.C.8.A
- b compare greenhouse growing mixes for factors such as drainage and nutrient-holding capacity; GOP.C.8.B
- c compare and contrast different containers, benches, and other production equipment used in greenhouse crop production; GOP.C.8.C
- d evaluate different methods of watering greenhouse crops; GOP.C.8.D
- e analyze the effect of nutrients on greenhouse plant growth; GOP.C.8.E
- f diagnose common nutrient deficiency symptoms found in greenhouse crops; GOP.C.8.F
- g develop fertilization plans that address greenhouse crop needs and environmental impacts. GOP.C.8.G

9 **The student investigates pest identification and control methods in the greenhouse environment. The student is expected to:** GOP.C.9

- a assess insect, pathogen, and weed infestations in a greenhouse; GOP.C.9.A
- b implement Integrated Pest Management in controlling an insect, pathogen, or weed problem; GOP.C.9.B
- c use appropriate greenhouse pesticide application techniques and equipment; GOP.C.9.C
- d research chemicals used to regulate plant growth in the greenhouse; GOP.C.9.D
- e examine pesticide labeling and safety data sheets. GOP.C.9.E

10 **The student performs greenhouse management business procedures. The student is expected to:** GOP.C.10

- a market greenhouse crops; GOP.C.10.A
- b transport greenhouse crops; GOP.C.10.B
- c analyze materials, labor, and administrative costs related to greenhouse production; GOP.C.10.C
- d analyze methods used to maintain crop quality during marketing and transport; GOP.C.10.D
- e prepare a production schedule for a greenhouse crop. GOP.C.10.E