

STRANDS AND STANDARDS

GREENHOUSE MANAGEMENT



Course Description

Students will develop knowledge and skills related to the greenhouse industry. Greenhouse operations and management will be the primary units of study. Students will be prepared to produce commercial plant species in a controlled environment and manage commercial and experimental greenhouse operations.

Intended Grade Level	9-12
Units of Credit	0.5
Core Code	30.01.00.00.154
Concurrent Enrollment Core Code	N/A
Prerequisite	N/A
Skill Certification Test Number	132
Test Weight	0.5
License Area of Concentration	CTE and/or Secondary Education 6-12
Required Endorsement(s)	
Endorsement 1	Agriculture (CTE/General)
Endorsement 2	Ornamental Horticulture
Endorsement 3	

STRAND 1

Student will participate in personal and leadership development activities through the FFA.

Standard 1

Student will use communication skills to effectively communicate with others.

- Understand when it is appropriate to listen and to speak.
- Understand and follow verbal and written instructions for classroom and laboratory activities.
- Will practice communication skills through public speaking using one or more of the following activities: memorized speech, prepared speech, extemporaneous speech, parliamentary practice, group presentation, or serving in a leadership capacity.

Standard 2

Student will effectively use teamwork to respectfully work with others.

- Identify and understand different roles in working with a team.
- Lead a group discussion or serve in a leadership capacity.

Standard 3

Student will use critical thinking and problem-solving skills.

- Analyze the cause of the problem.
- Develop a solution to address the problem.
- Implement the plan.
- Evaluate the effectiveness of the plan.

Standard 4

Student will be dependable, reliable, steady, trustworthy, and consistent in performance and behavior.

- Set and meet goals on attendance and punctuality.
- Prioritize, plan, and manage work to complete assignments and projects on time.

Standard 5

Student will be accountable for results.

- Use an achievement chart for activities and behaviors in class that encourages a personal evaluation of classroom performance.
- Use reflection to describe what was learned, what went well, what could have been improved, and what are the implications to the learning process.
- Track and communicate progress toward completion of assignments and projects.

Standard 6

Be familiar with the legal requirements and expectations of the course.

- Be familiar with the course disclosure statement and all requirements for successful completion of the course.
- Demonstrate workplace ethics, e.g., fair, honest, disciplined.

Performance Skills

- Student will practice communication skills through public speaking using one or more of the following activities: memorized speech, prepared speech, extemporaneous speech, parliamentary practice, group presentation, or serving in a leadership capacity.

STRAND 2

Student will participate in work-based learning activities through the Supervised Agricultural Experience (SAE) Program.

Standard 1

Student will demonstrate employability skills.

- Use a career search network to find career choices.
- Identify appropriate CTE Pathway for selected career choice.
- Prepare for entry into the work force by completing one of the following: list of required skills needed for a career choice, a resume including a list of demonstrated skills, a cover letter or letter of application, a job application, or participate in an actual or simulated job interview.

Standard 2

Student will participate in a work-based learning experience outside the classroom.

- Student will plan and implement a Supervised Agricultural Experience Program:
 - Foundational SAE: Career exploration and planning, employability skills for college and career readiness, personal financial management and planning, workplace safety, and agricultural literacy.
 - Immersion SAE: Ownership/entrepreneurship, placement/internship, research, school-based enterprise, and/or service-learning experiences.

Standard

Student will develop a job portfolio specific to their selected SAE/WBL experience.

- Student will keep a personal record/journal/log of their SAE/WBL experience; including pictures, financial records or log of their hours, skills learned, goals, reflection, etc.

Performance Skills

- Student will keep a personal record/journal/log of their SAE/WBL experience; including pictures, financial records or log of their hours, skills learned, goals, reflection, etc.

STRAND 3

Students will demonstrate greenhouse crop production techniques.

Standard 1

Describe greenhouse structures.

- Differentiate greenhouse designs.
- Review considerations for greenhouse frameworks.
- Identify and describe greenhouse glazing materials.
- Describe the functions of the headhouse.
- Describe greenhouse bench options.
- Identify and operate supplemental lighting systems.

Standard 2

Explain greenhouse climate control.

- Describe methods of heating greenhouse structures.
- Contrast major greenhouse cooling and ventilation systems.
- Discuss how energy curtains and a shade cloth are used to maintain greenhouse temperatures.
- Analyze greenhouse climate controls.

Standard 3

Describe automated greenhouse systems.

- Assess automated planting systems.
- Identify automated systems for moving plants in the greenhouse.
- Compare automated watering-systems.

Standard 4

Examine the components and properties of growing media.

- Describe the components of growing media.
- Describe the functions of growing media.
- Determine desirable properties of growing media
- Evaluate the advantages and disadvantages of soilless media.

Standard 5

Investigate chemical characteristics of growing media.

- Demonstrate proper techniques for sampling growing media.
- Test and interpret the pH level of various growing media.

Standard 6

Supply nutrients to greenhouse crops.

- Explain plant nutrition.
- Describe pH and how it is modified.
- Describe the components of a fertilizer.
- Explain the methods of applying fertilizers to horticulture crops.

Standard 7

Explain the effects of light, temperature, air, and water on plant growth.

- Examine the effect of light on greenhouse crops.
- Describe the influence of temperature on greenhouse crops.
- Explain how watering practices influence greenhouse crop production.
- Explain the effect of oxygen and carbon dioxide on photosynthesis and plant growth.

Standard 8

Identify and explain the functions of plant growth regulators.

- Compare the functions of plant hormones.
- Examine commercial uses for plant growth regulators.

Standard 9

Propagate floriculture and greenhouse crops.

- Compare and contrast sexual and asexual reproduction.
- Explain pollination, cross-pollination, and self-pollination of flowering plants.
- Diagram the process of plant fertilization.
- Describe the process of seed germination.
- Explain the conditions required for seed germination.
- Explain the importance of seed viability and vigor.
- Demonstrate techniques for sowing seed.
- Describe optimal conditions for asexual propagation.
- Demonstrate techniques used to propagate plants by cuttings, division, separation, and layering.
- Transplant greenhouse plant materials.

- Compare and contrast annual, biennial, and perennial plants.
- Compare and contrast plants that are either monocots or dicots.

Standard 10

Grow greenhouse crops.

- Plan a growing schedule to maximize the production of the greenhouse facility.
- Explain the importance of proper spacing of greenhouse crops and recommended spacing practices.
- Select the appropriate container and medium for a greenhouse crop.
- Explain the purposes for pinching greenhouse crops and the techniques used.
- Describe disbudding procedures.
- Demonstrate proper watering techniques.
- Demonstrate production of potted flowering crops.
- Demonstrate production of bulb crops.
- Demonstrate production of bedding plants.
- Demonstrate production of foliage plants.

Standard 11

Discuss pest management techniques.

- Identify categories of pests (e.g., weeds, insects, fungi, etc.).
- Explain best management practices while maintaining environmental integrity.
- Discuss alternative pest control techniques.
- Demonstrate safe practices in selecting, applying, storing, and disposing of chemicals.
- Explain integrated pest management (IPM).

Performance Skills

- Propagate plants using both seed and cuttings.
- Perform typical plant maintenance including, transplanting, watering, pinching, and disbudding.
- Develop a growing schedule to maximize the production of a greenhouse facility.
- Student will prepare greenhouse plants for sale.

STRAND 4

Students will explain greenhouse business concepts.

Standard 1

Price greenhouse crops.

- Calculate the costs for greenhouse crops.
- Assess typical pricing strategies.
- Calculate mark-up.

Standard 2

Prepare greenhouse crops for sale.

- Clean plants and containers.
- Decorate plants and containers.
- Attach price tags and care instructions.

Standard 3

Explain the basics of marketing in the greenhouse industry.

- Display greenhouse crops for sale.
- Recognize ways of maintaining and increasing the effectiveness of horticultural business displays.

- Recognize how advertising is used.
- Complete sales tickets.
- Use proper telephone techniques.
- Describe effective packaging and delivery.

Standard 4

Describe greenhouse business management.

- Differentiate the types of greenhouse businesses.
- Recognize costs related to production.
- Analyze the importance of marketing, promotion, and sales.

Performance Skills

- Student will calculate the cost of greenhouse crops.
- Student will calculate mark-up.
- Student will prepare greenhouse crops for sale.

Skill Certification Test Points by Strand

Test Name	Test #	Number of Test Points by Strand										Total Points	Total Questions
		1	2	3	4	5	6	7	8	9	10		