

# Greenhouse Management

**Levels:** Grades 9–12  
**Units of Credit:** 0.50  
**CIP Code:** 01.0633  
**Core Code:** 30-01-00-00-154  
**Prerequisite:** None  
**Skill Test:** # 132

## COURSE DESCRIPTION

Students will develop knowledge and skills related to the floriculture industry. Floral design and greenhouse operations and management will be the primary units of study. Students will be prepared to create floral arrangements, produce commercial plant species in a controlled environment, and manage commercial and experimental greenhouse operations.

## CORE STANDARDS, OBJECTIVES, AND INDICATORS

**Use the following Standard 1 and Standard 2 if this course is taught at the entry level.**

### STANDARD 1

**Students will explain the role of FFA in agricultural education.**

**Objective 1:** Discuss the history and organization of FFA as it relates to the complete program of agricultural education.

- a. Explain the interrelationship of classroom and laboratory instruction, supervised agricultural experience, and FFA.
- b. Describe how, when, and why FFA was organized.
- c. Identify key FFA historical events.
- d. Identify the mission and strategies, colors, motto, emblem and parts of the emblem, and organizational structure of FFA.
- e. Recite and explain the meaning of the FFA Creed.
- f. Discuss the meaning and purpose of a program of activities and its committee structure.
- g. List FFA chapter officers, and discuss the role of each.

**Objective 2:** Identify opportunities in FFA.

- a. Describe FFA opportunities that develop leadership skills, personal growth, and career success.
- b. Summarize major state and national activities available to FFA members.

**Objective 3:** Describe FFA degrees, awards, and career development events (CDEs).

- a. List and explain the FFA degree areas.
- b. Identify FFA proficiency awards.
- c. List and discuss various team and individual CDEs.

### STANDARD 2

**Students will explain the role of supervised agricultural experience (SAE) programs in agricultural education.**

**Objective 1:** Examine the responsibilities and benefits associated with an SAE.

- a. Explain the meaning and benefits of supervised agricultural experience.
- b. Explain the characteristics of an effective SAE program and the responsibilities of those involved.

**Objective 2:** Determine the types of SAE programs.

- a. Compare entrepreneurship SAEs and placement SAEs.
- b. Describe research/experimentation SAEs.
- c. Describe exploratory SAEs.

**Objective 3:** Plan an SAE program.

- a. Identify the steps in planning an SAE program.
- b. Describe the function of a business/training plan and/or agreement in an SAE program.
- c. Develop a short-range plan and a long-range plan for an SAE program.
- d. Relate classroom and laboratory instruction to an SAE program.

**Objective 4:** Maintain and use SAE records.

- a. Explain the importance of keeping records on an SAE program.
- b. Explain how SAE records are organized.
- c. Follow approved procedures to make entries in SAE records.

**Use the following Standard 1 and Standard 2 if this course is taught at the advanced level.**

#### **STANDARD 1**

**Students will develop personal, leadership, and career skills through FFA participation.**

**Objective 1:** Assess the role of FFA participation in developing personal and leadership skills.

- a. Identify important personal skills and the strategies used in developing the skills.
- b. Identify important leadership skills and the role of FFA participation in developing the skills.

**Objective 2:** Assess the role of FFA participation in developing career skills.

- a. List and describe proficiency awards appropriate for horticulture
- b. List and describe career development events appropriate for horticulture.
- c. Relate the importance of supervised agricultural experience to FFA achievement.
- d. Utilize FFA and supervised agricultural experience participation to gain advanced degrees of FFA membership.

#### **STANDARD 2**

**Students will explain the maintenance and expansion of supervised agricultural experience (SAE) programs.**

**Objective 1:** Maintain and use SAE records.

- a. Explain how SAE records are maintained from year to year.
- b. Explain how to summarize and analyze SAE records.

**Objective 2:** Devise long-range plans for expanding SAE programs.

- a. Evaluate the overall quality of a current SAE, and determine how to make it more productive or profitable.
- b. Explain factors that should be considered in expanding an SAE program.
- c. Explain how placement SAE and ownership SAE programs may be expanded.

#### **STANDARD 3**

**Students will demonstrate greenhouse crop production techniques.**

**Objective 1:** Describe greenhouse structures.

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

**Objective 2:** Explain greenhouse climate control.

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

**Objective 3:** Describe automated greenhouse systems.

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

**Objective 4:** Examine the components and properties of growing media.

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

**Objective 5:** Investigate chemical characteristics of growing media.

- a. Demonstrate proper techniques for sampling growing media.
- b. Test and determine pH level of various growing media.
- c. Interpret pH test results of a growing media sample.

**Objective 6:** Supply nutrients to greenhouse crops.

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

**Objective 7:** Explain the effects of light, temperature, and water on plant growth.

- a. Examine the effect of light on greenhouse crops.
- b. Describe the influence of temperature on greenhouse crops.
- c. Explain how watering practices influence greenhouse crop production.

**Objective 8:** Identify and explain the functions of plant growth regulators.

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

**Objective 9:** Propagate greenhouse crops.

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

**Objective 10:** Grow greenhouse crops.

- a. Plan a growing schedule to maximize the production of the greenhouse facility.
- b. Explain the importance of proper spacing of greenhouse crops and recommended spacing practices.
- c. Select the appropriate container and medium for a greenhouse crop.
- d. Explain the purposes for pinching greenhouse crops and the techniques used.

- e. Describe disbudding procedures.
- f. Demonstrate proper watering techniques.
- g. Demonstrate production of potted flowering crops.
- h. Demonstrate production of bulb crops.
- i. Demonstrate production of bedding plants.
- j. Demonstrate production of foliage plants.

**Objective 11:** Discuss pest management techniques.

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

**STANDARD 4**

**Students will explain greenhouse business concepts.**

**Objective 1:** Prepare greenhouse crops for sale.

- a. Clean plants and containers.
- b. Decorate plants and containers.
- c. Calculate mark-up.
- d. Attach price tags and care instructions.

**Objective 2:** Explain the basics of marketing in the greenhouse industry.

- a. Recognize ways of maintaining and increasing the effectiveness of horticultural business displays.
- b. Recognize how advertising is used.
- c. Complete sales tickets.
- d. Use proper telephone techniques.

**Objective 3:** Describe greenhouse business management.

- a. Differentiate the types of greenhouse businesses.
- b. Recognize costs related to production.
- c. Describe career opportunities associated with greenhouse management.