

## **Fall Greenhouse Management with Floriculture**

### **General Course Description:**

This course is designed to give students a background in the area of floriculture and its many applications along with greenhouse management skills. It addresses the biology and technology involved in the production, processing and marketing of plants and flowers. Topics covered include: reproduction and propagation of plants, plant growth, growth media, management practices for field and greenhouse production, production of plants of local interest and pest management. Students participate in a variety of activities including extensive laboratory work in the greenhouse. This course is articulated with Central Lakes College for college credit provided the student passes the summative final exam with a 70% or greater score.

### **Course Outline:**

- I. Plant Classification, Anatomy, and Physiology
  - A. Plant Taxonomy
  - B. Plant Identification
  - C. Floral Design
  
- II. Environmental Factors, Nutrients and Growth Media
  - A. Greenhouse Structures
  - B. Heat and Humidity Effects on Photosynthesis
  - C. Importance of Light Intensity and Duration and the Effects on Plant Growth
  - D. Open and Closed Environmental Systems
  - E. Desired Characteristics of Ideal Growing Medium
  - F. Watering Methods
  - G. Major Plant Nutrients
  - H. Soil Sampling
  - I. Plant Growth chemicals
  - J. Rodenticides, Fungicides and molluscicides
  
- III. Management Practices
  - A. Field production, Nursery production and greenhouse production
  - B. Interior Layouts of the greenhouse
  - C. Hydroponics
  - D. Aquaponics
  
- IV. Production and Maintenance Practices
  - A. Generate Schedules to water and care for plants
  - B. Address the maintenance of overwintering storage of plants

- C. Compare accepted and new practices in growing plants
  - D. Integrated Pest Management
- V. Plant Propagation
  - A. Sexual and asexual reproduction
  - B. Seed Dormancy
  - C. Rooting hormone
  - D. Grafting techniques
- VI. Careers
  - A. Communication
  - B. Resume
  - C. Interviewing skills

**Required Competencies for Articulation:**

- Identify plant kingdom hierarchies
- Identify plant stems, roots and inflorescence
- Classify plants as monoecious or dioecious
- Explain the parts of a plant
- Identify with 90% accuracy plants that are locally common
- Explain transpiration and photosynthesis
- Explain how heat, humidity and gases affect greenhouse crops and photosynthesis
- Explain the importance of light intensity and duration and the effects on plant growth
- Compare and contrast an open and closed environmental system
- Describe the desired characteristics of an ideal growing medium
- Evaluate different methods of watering plants and determine the appropriate method for individual plants.
- Explain the aspect of growth influenced by each of the essential elements
- Describe the factors relevant to proper plant selection
- Describe the basic principles that lead to good design
- Explain how these principles are applied to landscape designing
- Describe features of plant materials, hardscape materials and architecture that make them useful as design elements.
- Describe the uses and limitations of flowers in a landscape design
- Explain the differences between annual, perennial, and biennial flowers
- List the characteristics of hardy and tender bulbs
  - Describe how to maintain annual and perennial flower plantings.
- Describe the common causes of injuries to landscape plants
- Explain the ways that insects and diseases are spread
- Apply the principles of control to plant pests

Classify weeds in several different ways and explain how they injure landscape plants  
Describe integrated pest management  
Explain the different formulations of chemical pesticides

**Standards Addressed:**

- PS.01.01 Classify plants according to taxonomy systems
- PS.01.01.01.a Explain systems used to classify plants.
  - PS.01.01.01.b. Compare and contrast the hierarchical classification of agricultural plants.
  - PS.01.01.01.c. Classify plants according to the hierarchical classification system, life cycles, plant use and as monocotyledons or dicotyledons.
- PS.01.02 Apply knowledge of plant anatomy and the functions of plant structures to activities associated with plant systems.
- PS.01.02.01.a. Diagram a typical plant cell and identify plant cell organelles and their functions.
  - PS.01.02.01.b. Compare and contrast mitosis and meiosis.
  - PS.01.02.02.a. Identify the components, the types and the functions of plant roots.
  - PS.01.02.03.a. Identify the components, the types and the functions of plant stems.
  - PS.01.02.04.c. Explain the relationships between leaf structure and functions and plant management practices.
  - PS.01.02.05.a. Identify the components of a flower, the functions of a flower and the functions of flower components.
  - PS.01.02.05.b. Identify the different types of flowers and flower forms.
  - PS.01.02.05.c. Apply the knowledge of flower structures to plant breeding, production and use.
  - PS.01.02.06.a. Explain the functions and components of seeds and fruit.
  - PS.01.02.06.b. Identify the major types of fruits.
  - PS.01.02.06.c. Apply the knowledge of seed and fruit structures to plant culture and use.
- PS.02 Prepare and implement a plant management plan that addresses the influence of environmental factors, nutrients and soil on plant growth.
- PS.02.01 Determine the influence of environmental factors on plant growth.
  - PS.02.01.01.a. Describe the qualities of light that affect plant growth.
  - PS.02.01.01.b. Describe plant responses to light color, intensity and duration.
  - PS.02.01.01.c. Evaluate plant responses to varied light color, intensity and duration.
  - PS.02.01.02.a. Describe the effects air, temperature and water have on plant metabolism and growth.
  - PS.02.01.02.b. Describe the optimal air, temperature and water conditions for plant growth.

- PS.02.02.01.a. Identify the major components of growing media and describe how growing media support plant growth.
- PS.02.02.02.a. Identify the categories of soil water.
- PS.02.03.02.a. Discuss the influence of pH on the availability of nutrients.
- PS.02.03.02.c. Adjust the pH of growing media.
- PS.03.01 Demonstrate plant propagation techniques.
- PS.03.05.03.a. Identify storage methods for plants and plant products.
- PS.03.05.03.c. Monitor environmental conditions in storage facilities for plants and plant products.
- PS.04.01 Create designs using plants.
- PS.04.02.01.c. Select plants, hard goods, supplies and other materials for use in a design based on a range of criteria.
- PS.04.01.01.a. Define design and identify design elements.

## Syllabus:

### Week 1-3

- Course overview
- Weed ID
- Integrated Pest Management

### Week 4-6

- Putting fall flower beds to sleep
- Bulb care, planting spring bulbs
- Pruning in the fall
- Fall Lawn Care

### Week 7-8

- Greenhouse Structures
- Greenhouse Heating, Benches, Watering Systems

### Week 9-10

- Hydroponics and Aquaponics
- Setting up their own hydroponic system
- Give presentations to elementary students on hydroponics

### Week 11-15

- FLORICULTURE**
- Principles of Design
- Color Wheel
- Construct a bud vase.
- Construct a one-sided arrangement

Construct a centerpiece.  
Construct a corsage/boutonniere  
Construct an evergreen, straw or willow wreath

Week 16

Demonstrate a sales transaction  
Delivery techniques with good salesmanship  
Calculate the price of arrangements, including retail vs cost  
Prepare an advertisement flyer

Week 17

Careers in Horticulture  
Communication, resume and interviewing skills