Statewide Dual Credit Learning Objectives
Introduction to Plant Science

Subjects Covered
1. Plant Anatomy and Physiology
2. Plant Reproduction/Propagation
3. Plant Injuries and Their Control/Integrated Pest Management
4. Plant Nutrition and Culture
5. Plant Classifications (Forage/Food)
6. Cropping/Growing Systems
7. Greenhouse Growing Structures/Production Techniques
8. Beginning and Promoting an Ornamental Horticulture Business/Career
9. Human Relations/Personnel Management

Learning Objectives

1. Plant Anatomy and Physiology
   a. Summarize the role of each cell structure in plant development.
   b. Evaluate the importance of various plant tissues in plant development.
   c. Summarize the contribution of each organ within the plant body.
   d. Evaluate the stages of plant growth and development.
   e. Compare the various stages of plant reproduction.
   f. Recommend appropriate plant growth regulators for various plants.

2. Soil and Climate
   a. Assess the significance of Solar Radiation to plant growth.
   b. Illustrate the hydrological cycle and discuss its significance to plant growth and development.
   c. Analyze the contributions of temperature and air movement to the total atmospheric composition.
   d. Discuss the factors involved in soil formation.
   e. Examine the physical and chemical properties of the soil.
   f. Appraise the importance of organic substances to soil health.
   g. Identify factors that lead to soil degradation.
3. **Plant Reproduction/Propagation**
   a. Develop an understanding of plant genetic.
   b. Contrast mitosis and meiosis and explain the significance of each.
   c. Explain the importance of plant breeding.
   d. Hypothesize the future influence of biotechnology on the plant industry.
   e. Evaluate the significance of sexual propagation of plants.
   f. Assess the effectiveness of various types of asexual propagation of plants.
   g. Defend the need for Germplasm.

4. **Plant Injuries and Their Control/Integrated Pest Management**
   a. Discuss the effects of pesticides on the environment and human health.
   b. Evaluate the significance of Integrated Pest Management.
   c. Properly identify various weeds, insects, mites, and plant diseases.
   d. Compare the various methods of injury control.
   e. Suggest appropriate control measures for plant injuries.
   f. Align the stages of the disease cycle.
   g. Demonstrate proper use of Personal Protective Equipment (PPE).

5. **Plant Nutrition and Culture**
   a. Summarize the role of water in maintaining plant health.
   b. Identify the essential nutrients needed for plant growth.
   c. Distinguish the difference in major and minor plant nutrients.
   d. Discuss the influence of soil/media pH on nutrient availability.
   e. Choose an appropriate fertilizer and application method.

6. **Plant Classifications (Forage/Food)**
   a. Identify examples of field crops, forage crops, vegetable crops and fruit crops.
   b. Identify common uses of field crops, forage crops, vegetable crops and fruit crops.
   c. Describe common production practices for field crops, forage crops, vegetable crops and fruit crops.
   d. Evaluate the economic impact of field crops, forage crops, vegetable crops and fruit crops.
7. **Cropping/Growing Systems**
   a. Evaluate the factors that influence site selection of a nursery.
   b. Compare various growing methods for nursery production.
   c. Identify various environmental factors that influence landscape plant selection.
   d. Choose appropriate irrigation systems for a variety of plant production systems.

8. **Greenhouse Growing Structures/Production Techniques**
   a. Evaluate the factors that influence site selection of a greenhouse.
   b. Identify strengths and weaknesses of various greenhouse structures.
   c. Discuss the advantage of automated environmental controls in a greenhouse.
   d. Create a greenhouse growing schedule.
   e. Calculate the economic value of a variety of greenhouse crops.
   f. Design a layout for a greenhouse structure.
   g. Defend the benefits of hydroponic production in comparison to soil-based production.
   h. Formulate a list of materials needed for the construction of a hydroponic system.

9. **Beginning and Promoting an Ornamental Horticulture Business/Career**
   a. Evaluate the factors in choosing a horticultural production system.
   b. Maintain adequate records that support sound, business decisions.
   c. Develop a post-harvest handling plan for a horticultural crop.
   d. Present a marketing plan for a horticultural business.
   e. Design an effective transportation plan for a horticultural business.

10. **Human Relations/Personnel Management**
    a. Identify leadership skills necessary for effective management.
    b. Demonstrate adequate communication skills.
    c. Role-Play a sale that illustrates good salesmanship.