

HORTICULTURE FOR THE WORKPLACE I

ACTIVITY/COURSE CODES: 5652

COURSE DESCRIPTION:

Horticulture for the Workplace I includes organized subject matter and practical experiences related to the culture of plants used principally for ornamental or aesthetic purposes. Instruction emphasizes knowledge and understanding of the importance of establishing, maintaining, and managing ornamental horticulture enterprises.

Typical instructional activities include hands-on experiences with propagating, growing, establishing, and maintaining nursery plants and greenhouse crops; tissue culture techniques; designing landscapes; preparing designs; sales analysis and management; participating in personal and community leadership development activities; planning and implementing a relevant school-to-work transition experience; and participating in FFA activities.

This is a list of core competencies to be completed in two years by all students enrolled in these courses. The teacher may select additional competencies based on a local needs assessment.

OBJECTIVE:

Given the necessary equipment, supplies, and facilities, the student, upon completion of the prescribed number of instructional hours, will be able to successfully complete the following core competencies.

Credit: 2 units

RECOMMENDED TEXTBOOK:

Introduction to Horticulture – *Prentice Hall / Interstate*

ADDITIONAL RESOURCES:

Horticulture Lesson Plan Library – *CAERT, Inc.*
Greenhouse Production - *Prentice Hall / Interstate*
Advisor's Guide to the FFA Student Handbook

UNIT A. EXPLORING THE HORTICULTURE INDUSTRY

Lesson 1—Understanding Horticulture

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. Define horticulture and describe its relationship to science and technology.
2. Identify the three major segments of the horticulture industry.
3. Identify and define activities included in the ornamental horticulture industry.

Lesson 2—Exploring Career Opportunities in Horticulture

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. List skills you should have to ensure success in a horticulture career.
2. Explain how to prepare for a horticulture career.
3. List examples of horticulture jobs and careers.
4. Prepare a professional job resume for a horticulture job.
5. Demonstrate the ability to successfully complete a job interview.
6. Identify proper interpersonal skills that should be demonstrated while working on a job in the horticulture industry.

Unit B: EMPLOYABILITY IN THE AGRICULTURE INDUSTRY

Lesson 1—Developing Goals

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

1. Explain the process of goal setting.
2. Describe the terms and types of goals.
3. Explain seven aspects of effective goals.

Lesson 2—Obtaining Education for a Job

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

1. Explain the benefits of education.
2. Describe the different levels of formal education.
3. Explain continuing education and its importance.
4. Identify sources of education for a job.

Lesson 3—Finding a Job

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

1. Describe information sources for job opportunities.
2. Develop a system to evaluate job openings.

Lesson 4—Applying For a Job

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

1. Explain how to research a job opportunity.
2. Describe two methods of applying for a job.
3. Identify the common types of information requested on a job application form.

Lesson 5—Writing a Resume and Letter of Application

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

1. Explain the purpose of a résumé.
2. List the main items that should be included in a résumé.
3. Describe the purpose of a letter of application and its primary elements.

Lesson 6—Succeeding in a Job Interview

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

1. Define a job interview and explain its purpose.
2. Explain some tips for making a good impression in a job interview.
3. Describe what an applicant can learn from being denied a job opening.

Unit C: THE FFA AND SAEP

Lesson 1—Exploring the History and Organization of FFA

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

1. Explain how, when, and why the FFA was organized.
2. Explain the mission and strategies, colors, motto, parts of the emblem, and the organizational structure of the FFA.
3. Recite and explain the meaning of the FFA Creed.
4. Explain the purpose of a Program of Activities and its committee structure.

Lesson 2—Discovering Opportunities in FFA

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

1. Describe how the FFA develops leadership skills, personal growth, and career success.
2. Identify major state and national activities available to FFA members.

Lesson 3—Understanding FFA Officer Duties and Responsibilities

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

1. Describe the duties and responsibilities of chapter FFA officers.
2. Explain the proper dress and characteristics of a good FFA leader.

Lesson 4—Planning and Organizing an FFA Meeting

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

1. Explain how to plan a meeting and develop the order of business.
2. Describe how to set up the meeting room.
3. Explain the parliamentary procedure used in an FFA meeting.

Lesson 5—Determining the Benefits of an SAE

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

1. Explain the importance of goals and career ladders.
2. Define supervised agricultural experience.
3. Explain the benefits of supervised agricultural experience programs.

Lesson 6—Determining the Kinds of SAE

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

1. Explain the difference between entrepreneurship and placement SAE's.
2. Describe research and experimentation SAE's and exploratory SAE's.
3. Explain the characteristics of a good SAE program and student responsibilities.

Lesson 7—Researching Possible SAE Programs

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

1. Identify career interest areas in agriculture.
2. Identify skills needed for career success.
3. Explain opportunities for SAE programs.

Lesson 8—Planning Your SAE Programs

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

1. Identify the steps in planning an SAE Program.
2. Identify the parts of an annual SAE program plan.
3. Discuss the function of a training plan and/or agreement in an SAE program

Lesson 9—Implementing SAE Programs

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

1. Discuss the importance of keeping records on an SAE program.
2. Explain the types of financial records needed to support a chosen SAE program.
3. Identify standards to follow in keeping records on an SAE program.

Lesson 10—Keeping and Using SAE Records

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

1. Explain how SAE records are organized.
2. Identify the procedures to making entries in the SAE records.
3. Explain how to summarize and analyze the SAE records.

Lesson 11—Making Long Range Plans for Expanding SAE Programs

Student Learning Objectives: Instruction in this lesson should result in students achieving the following objectives:

1. Identify the factors that should be considered in expanding an SAE program.
2. Explain how placement and ownership SAE programs may be expanded.

UNIT D.**HORTICULTURAL MECHANICS, MACHINERY OPERATION AND MAINTENANCE****Lesson 1 – Identify and properly use tools and equipment utilized in the horticulture industry**

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. Identify hand and power tools used in the greenhouse, turf management and landscaping.
2. Identify equipment and its uses of tools used in the greenhouse, turf management and landscaping.
3. Demonstrate proper safety procedure for utilizing tools used in the greenhouse, turf management and landscaping.
4. Demonstrate proper maintenance and storage procedures for tools used in the greenhouse, turf management and landscaping.

UNIT E.**PLANT ANATOMY AND PHSIOLOGY****Lesson 1 – Classify ornamental plants**

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. Describe the system used for naming and classifying plants.
2. Identify the major groups of plants.
3. Describe the differences between annuals, biennials, and perennials.

Lesson 2 – Understanding leaf anatomy and morphology

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. Describe the main parts of a leaf.
2. Describe some major types of leaves.
3. Discuss common vein patterns found in leaves.
4. Explain how a leaf is organized.

Lesson 3 – Understanding stem anatomy

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. Describe the functions of a stem.
2. Identify the external structures of a stem.
3. Identify the internal structures of a stem.
4. Distinguish between the different types of specialized stems.

Lesson 4 – Understanding root anatomy

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. List the functions of roots in plants.
2. Identify the parts of a root.
3. Identify the two major types of root systems.
4. Recognize a healthy root system.

Lesson 5 – Understanding flower anatomy

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. Describe the parts of a flower.
2. Explain the purpose of a flower.
3. List some different types of flowers.
4. Describe the difference between monocot and dicot flowers.

Lesson 6 – Understanding plant physiology

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. Describe the process of photosynthesis.
2. Describe the process of cellular respiration.
3. Explain why photosynthesis and respiration are important to us as human beings.

Lesson 7 – Understanding light, temperature, air and water effects on plant growth

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. Describe the effect of light on plants.
2. Describe a plant's temperature needs.
3. Explain how the quality of air affects plants.
4. Describe a plant's water needs.

Lesson 8 – Understanding plant growth regulators

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. Describe the work of plant growth regulators.
2. Explain the functions of several plant hormones.
3. List several commercial uses for plant growth regulators.

UNIT F

PLANT PROPAGATION

Lesson 1 – Understanding sexual reproduction

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. Discuss the importance of plant propagation.
2. Explain the difference between sexual and asexual propagation.
3. Identify the major parts of a seed.
4. List the function of each major part of a seed.

Lesson 2 – Propagating plants sexually

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. Discuss the importance of sexual propagation of plants.
2. Describe the process of seed germination.
3. Describe the factors involved in planting seeds for transplanting.
4. Explain how to successfully direct seed outdoors.

Lesson 3 – Propagating plants by cuttings

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. Explain why plants are propagated asexually.
2. Describe leaf and leaf-bud cuttings and how they are used to propagate plants.
3. Describe the three types of stem cuttings.
4. Explain how root cuttings are prepared for propagation.
5. Identify some of the environmental factors that determine the success of rooting of cuttings.

Lesson 4 – Propagating plants by division, separation and layering

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. Explain the difference between separation and division in plant propagation.
2. Describe layering and identify four common forms of layering.

Lesson 5 – Propagating plants by grafting and budding

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. Describe how grafting is used to propagate plants.
2. Identify and explain the difference between three common methods of grafting.
3. Explain how budding is used for plant propagation.

Lesson 6 – Propagating plants by tissue culture

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. Discuss the importance of tissue culture.
2. Discuss a tissue culture method of propagation used in the greenhouse industry.

UNIT G.

GROWING MEDIA, NUTRIENTS AND FERTILIZERS

Lesson 1 – Properties of growing media

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. Identify the types of growing media.
2. Describe the functions of growing media.
3. Explain the relationship between growing media and plant growth

Lesson 2 – Growing media components

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. Describe the components of soil.
2. List the components of a soilless mix.
3. Compare and contrast the use of soil versus a soilless mix.

Lesson 3 – Providing nutrients for a horticulture crop

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. Name the nutrients needed for plant growth.
2. Describe pH and how it is modified.
3. Describe the components of a fertilizer.
4. Explain the methods of applying fertilizers to horticulture crops.

Lesson 4—Determining the Nature of Soil

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. Explain how the resources soil provides help in supporting life.
2. Explain the contents of soil.
3. Describe the biological nature of soil.
4. Describe the four ways plants use soil.
5. Describe some horticultural uses of soil.
6. Describe some non-horticultural uses of soil.

Lesson 5 - Understanding Soil Texture and Structure

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. Describe the concept of soil texture and its importance.
2. Determine the texture of a soil sample.
3. Describe soil structure, its formation, and importance.
4. Identify various soil structures.

Lesson 6 - Explaining a Soil Profile

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. Explain the soil profile.
2. Explain how soils within the profile change over time.
3. Distinguish between the major horizons of a soil profile.

Lesson 7 - Understanding Moisture Holding Capacity

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. Explain moisture holding capacity.
2. Explain what determines a soil's moisture holding capacity.
3. Determine the moisture holding capacity of a given soil profile.

Lesson 8 - Understanding Soil Degradation

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. Describe soil degradation.
2. Explain how construction can result in soil degradation.
3. Identify sources of contamination and explain how they result in soil degradation.
4. Explain soil erosion and how it results in soil degradation.
5. Identify other sources of soil degradation.

Lesson 9 - Understanding Soil Erosion and Management Practices

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. Explain soil erosion.
2. Identify the causes of soil erosion and steps in the erosion process.
3. Explain the ways in which different types of wind erosion occur and the associated problems.
4. Distinguish between the different types of water erosion.
5. Identify urban management practices that reduce soil erosion.
6. Identify horticultural management practices that will minimize soil erosion.

UNIT H

INTEGRATED PEST MANAGEMENT

Lesson 1 - Understanding Integrated Pest Management

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. Explain integrated pest management.
2. Explain best management practices.
3. Identify the basic elements of an integrated pest management program.

Lesson 2 - Determining the Kinds of Pesticides

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. Explain plant pests and how they cause losses.
2. Identify the major classifications of pesticides and their use.
3. Identify the major classifications of herbicides and their use.
4. Identify the major classifications of insecticides and their use.

Lesson 3 - Using Pesticides Safely

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. Explain the way pesticides are classified according to toxicity.
2. Identify the types of pesticide exposure.
3. Explain how toxicity is measured.
4. Identify the safety practices that should be followed when applying pesticides.

Lesson 4 - Interpreting Pesticide Labels

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. Explain the purpose of the pesticide label.
2. Identify the information that should be included on the pesticide label.
3. Explain when the pesticide label should be read.

Lesson 5 - Applying Pesticides

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. Identify the categories of pesticides according to time of application.
2. Explain the different areas of application in applying pesticides.
3. Explain how to properly calibrate equipment used in applying pesticides.

Lesson 6 - Managing Environmental Impact of Pesticides

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. Identify the environmental concerns involved with pesticide use.
2. Explain pesticide persistence and its impact on the environment.
3. Explain proper disposal of surplus pesticides and empty containers.

Lesson 7 - Identifying and Managing Plant Pests in the Greenhouse

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. Identify the major categories of pests found in the greenhouse.
2. Discuss pest control techniques used in a greenhouse.
3. Describe the different practices of integrated pest management used in the greenhouse.

Lesson 8 - Identifying and Managing Plant Pests in the Landscape

Student Learning Objective: Instruction in this lesson should result in students achieving the following objectives:

1. List the major destructive plant insects in the landscape.
2. Describe plant disease control techniques used in the landscape.
3. Name weed control techniques used in landscape beds.

Unit I. Greenhouse Structures

Lesson 1—Exploring Greenhouse Structures

Student Objectives, Instruction in this lesson should result in students achieving the following objectives:

1. Identify greenhouse designs.
2. Review considerations for greenhouse frameworks.
3. Identify and describe greenhouse glazing materials.
4. Describe the functions of the headhouse.
5. Discuss the advantages of retractable-roof greenhouses.
6. Describe greenhouse bench options.

Lesson 2—Controlling the Greenhouse Climate

Student Objectives, Instruction in this lesson should result in students achieving the following objectives:

1. Describe methods of heating greenhouse structures.
2. Explain major greenhouse cooling and ventilation systems.
3. Identify greenhouse climate control systems.

Lesson 3—Using Automated Systems in the Greenhouse

Student Objectives, Instruction in this lesson should result in students achieving the following objectives:

1. Discuss the advantages of automated systems.
2. Identify automated systems involved in planting.
3. Identify automated systems involved in moving plants in the greenhouse.
4. Identify automated systems involved in watering plants.

Unit J.

Producing a Greenhouse Crop

Lesson 1— PREPARATION OF SOILS AND PLANTING MEDIA

Student Objectives, Instruction in this lesson should result in students achieving the following objectives:

1. Gather a soil sample using recommended procedures.

Lesson 2— PROPAGATION AND PLANTING OF PLANTS

Student Objectives, Instruction in this lesson should result in students achieving the following objectives:

1. Identify the varieties of flowering plants that are most profitably grown in the local community.
2. Select and prepare a recommended media for a seed flat to germinate bedding plants.
3. Demonstrate the ability to seed a flat or individual container using recommended procedures.
4. Demonstrate the ability to plant bulbs using recommended procedures.
5. Transplant seedlings or cuttings into selected sterile containers using recommended procedures.
6. Plan and maintain a mist preparation system using time clocks and irrigation equipment.
7. Select, prepare, take, and place cuttings using recommended procedures.
8. Plant a selected crop of rooted cuttings using recommended procedures.
9. Package and label plants for shipment.

Lesson 3— CULTURAL AND ENVIRONMENTAL CONTROL PRACTICES

Student Objectives, Instruction in this lesson should result in students achieving the following objectives:

1. Demonstrate the ability to control and manage the growth of flowering plants by pinching, disbudding, or pruning according to recommended procedures.
2. Apply growth regulating chemicals to plants using recommended procedures.
3. Install a shade cloth to a shadehouse area using recommended procedures.
4. Manipulate the temperature of a given greenhouse using air-conditioning, heaters, vents, or fans.
5. Cultivate soils with a Rototiller using recommended practices.
6. Aerate compacted soils using recommended procedures.
7. Stake and tie flowering plants that require support using recommended procedures.
8. Demonstrate the ability to repair broken pipes, sprinkler heads, mist heads, and/or valves using recommended procedures.
9. Apply granular and liquid fertilizer to flower beds and floral crops at a preselected rate using recommended procedures.

Lesson 4— IRRIGATION PRACTICES

Student Objectives, Instruction in this lesson should result in students achieving the following objectives:

1. Plan and implement a watering schedule using an automatic irrigation system.
2. Demonstrate the ability to hand irrigate given plants using recommended procedures

Lesson 5— PLANT PEST AND DISEASE CONTROL

Student Objectives, Instruction in this lesson should result in students achieving the following objectives:

1. Demonstrate the ability to examine plants and recognize and report damage resulting from disease and insects.
2. Measure, mix, and apply a recommended chemical for control of a specific pest on floral crops.
3. Identify and remove diseased plants grown in beds, pots, or frames in the greenhouse or shadehouse.
4. Identify and manually remove weeds growing in potted plants or beds using recommended procedures.
5. Demonstrate the ability to clean spray equipment after use according to approved practices.
6. Repair and/or replace nonfunctional hoses, pipes, lines, or nozzles on spray equipment.

Lesson 6— PACKAGING, STORAGE, AND SHIPMENT OF POTTED FLOWERS AND FOLIAGE PLANTS

Student Objectives, Instruction in this lesson should result in students achieving the following objectives:

1. Identify and remove dead or diseased plant parts from potted plants or other floriculture specimens grown for market.

Lesson 7— MISCELLANEOUS EQUIPMENT MAINTENANCE AND REPAIR

Student Objectives, Instruction in this lesson should result in students achieving the following objectives:

1. Oil electric motors according to specifications listed in the operator's manual.
2. Replace or repair plastic or polyethylene covers for a greenhouse using recommended procedures.
3. Repair or replace valves on irrigation systems using galvanized or PVC plastic pipe according to recommended procedures.

Lesson 8—Growing Potted Perennials

Student Objectives, Instruction in this lesson should result in students achieving the following objectives:

1. Describe the importance and scope of perennials.
2. Discuss the factors involved in propagating perennials.
3. Explain production practices used in forcing perennial plants to flower.

Unit K. Greenhouse Business Management

Lesson 1—Managing the Greenhouse Business

Student Objectives, Instruction in this lesson should result in students achieving the following objectives:

1. Identify types of greenhouse businesses.
2. Recognize costs related to production.
3. Develop and implement a marketing strategy.
4. Describe career opportunities associated with greenhouse management.

Unit L. Nursery Production

Lesson 1—Understanding Nursery Production Facilities

Student Objectives, Instruction in this lesson should result in students achieving the following objectives:

1. Explain the scope and history of the Nursery Industry.
2. Describe the different types of nurseries.
3. Explain the economic factors involved in selecting a nursery site.
4. Explain the environmental factors involved in selecting a nursery site.
5. Describe the different types of nursery facilities.
6. Explain how a plant hardiness map is used.

Lesson 2—Producing Nursery Crops

Student Objectives, Instruction in this lesson should result in students achieving the following objectives:

1. Describe the process of lining out nursery stock.
2. List and describe the proper nursery field practices.
3. Describe sample field practice schedules for different types of plants.
4. Describe the common pests and problems of field nursery stock.
5. Describe the process of properly staking a tree in the field.
6. Describe the tools and equipment used in production.

Lesson 3—Packaging Nursery Crops

Student Objectives, Instruction in this lesson should result in students achieving the following objectives:

1. Describe the three types of packaging of nursery crops.
2. Describe how to ball and burlap (B&B) stock properly.
3. Explain the advantages and disadvantages of B&B, container, and bare root.
4. Describe the types of storage used for nursery stock.
5. Describe the techniques of defoliation of plants before storage.
6. List and describe the problems that might occur to plants in storage.
7. Describe the process of grading with calipers.

Unit M. Nursery Business Management

Lesson 1—Managing the Nursery Business

Student Objectives, Instruction in this lesson should result in students achieving the following objectives:

1. Describe the desirable work traits of a nursery worker.
2. Describe common tasks performed by a nursery worker.
3. Describe a common business organizational chart.
4. Describe the types of business records kept by a nursery.
5. Describe the ways nurseries advertise their stock.