Horticulture Science 012000… 6045

Course Description

This course includes the study of structure and functions of plants, including requirements for growth, methods of propagation, and the management of pests and diseases. Identification and selection of plants along with their use and function and physiological processes are also stressed.

Course Code:

Program(s) of Study to which This Course Applies

- Plant Systems

Course Framework	Reference Standards	Academic Crosswalk
Standard 1. Students will understand plant anatomy and physiology concepts.	OS (7.4) TX(Hort130.20-3A)	[TBD by NDE]
Benchmark 1.1 Describe the functions of photosynthesis, respiration, and transpiration and explain how they are related. Sample performance indicators: • Recite the chemical equations for photosynthesis and respiration. • Perform an experiment to measure respiration in leaves.		
Benchmark 1.2 Compare and contrast tissue types in the four parts of the plant. Sample performance indicators: • Identify tissue types in cross sections of tissues in plants. • Explain the functions of the various cells in leaves.		

Benchmark 1.3 Explain the process and stages of germination in monocots and dicots. Sample performance indicators: • Germinate monocot and dicot seeds. • Identify and label parts of the seeds in monocots and dicots. • Identify the various stages of germination.		[TBD by NDE]
Benchmark 1.4 Identify the parts of a flower and explain their roles in reproduction. Sample performance indicators: • Dissect and label a complete flower. • Differentiate pollination of complete and incomplete flowers. • Describe the role of pollinators in reproduction.		
Standard 2. Students will evaluate growth factors and conditions.	OS (7.4) NS (PS.02.03)	[TBD by NDE]
Benchmark 2.1 Evaluate media for specific uses. Sample performance indicators: • Select plant media for plant cuttings. • Identify major soil amendments in media.		
Benchmark 2.2 Manipulate abiotic and biotic factors to alter plant germination, growth, and development. Sample performance indicators: • Perform an experiment with growth regulators. • Perform an experiment using one abiotic variable.		
Benchmark 2.3 Develop a growth and maintenance schedule for a horticulture crop. Sample performance indicators: • Monitor and record weekly growth of a horticulture crop. • Create a growth schedule for poinsettias.		
Benchmark 2.4 Determine the importance and functions of macro and micronutrients. Sample performance indicators:		[TBD by NDE]

• List the macro and micronutrients. • Evaluate a fertilizer label and calculate an application rate.		
Standard 3. Students will demonstrate and evaluate proper propagation methods.	OS (7.2)	[TBD by NDE]
Benchmark 3.1 Demonstrate proper plant reproduction methods. Sample performance indicators: • Properly propagate plants using the methods of propagation: Seeding, Grafting, Separation, Division, Hardwood Cuttings, Budding, Layering, and tissue culture. • Determine factors that increase the success of propagation in a greenhouse.		
Benchmark 3.2 Evaluate the best method of propagation based on individual plant species. Sample performance indicators: • Given a species, determine the best method of propagation to use.		
Benchmark 3.3 Compare and contrast the advantages and disadvantages of sexual and asexual reproduction. Sample performance indicators: • Define and explain hybrid vigor. • Explain the significance of asexual reproduction in the horticulture industry.		
Benchmark 3.4 Explain the importance of scientific selection in creating hybrids. Sample performance indicators: • Complete a Punnett square and identify phenotype and genotype possibilities.		[TBD by NDE]
Standard 4. Students will solve pest and disease disorders, using integrated pest management.	OS (7.3) NS (PS.03.03)	[TBD by NDE]
Benchmark 4.1 Identify characteristics of common pests, weeds, and diseases. Sample performance indicators: • Create a display of common pests and their life cycles. • Monitor pest populations through sticky trapping.		

Benchmark 4.2 Diagnose and suggest the proper treatment based on identifiable symptoms. Sample performance indicators: • Identify by sight common greenhouse pests and diseases. • Evaluate various treatment options for pest and disease control.		
Benchmark 4.3 Develop and implement an Integrated Pest Management plan for a given situation. Sample performance indicators: • Recite proper and safe methods of chemical handling and disposal. • Read and interpret a pesticide label.		[TBD by NDE]
Standard 5. Students will identify and classify common horticultural plants.	NS (PS.01.01) MCC II	[TBD by NDE]
Benchmark 5.1 Identify common horticulture plants by common and scientific name. Sample performance indicators: • Identify by sight, common horticulture plants. • Develop a plant collection of 10 common plant leaves.		
Benchmark 5.2 Classify plants according to the plant kingdom hierarchy. Sample performance indicators: • Label plants as either monocot or dicot. • Differentiate between angiosperm and gymnosperms.		
Benchmark 5.3 Select plants based on their usage and growth characteristics. Sample performance indicators: • Choose plants for correct usage in landscapes. • Select plants based on USDA Hardiness Zone map. • Differentiate between food plants and ornamentals.		[TBD by NDE]

Reference Standards Sources

- *OS=Agriculture and Environmental Systems-Career Field Technical Content Standards- Ohio Board of Regents*
- *NS=National Standards*
- *MCC= Metro Community College- Horticulture 1100 Course Outline*
- *TX= Texas Education Agency-Agriculture and Natural Resources*

Other Information

Suggestions for innovative teaching and learning strategies:	• Guest speakers from the plant industry • Greenhouse/ Nursery tours • Intelliprep • Tissue culture laboratory • School gardens/ greenhouse • On site landscaping
Related assessments:	• Pesticide Applicators Training • Successful plant stewardship • OSHA certification
Extended learning opportunities:	• Contests (Career Development Events) • Job Shadowing • Supervised Agricultural Experiences (SAE) • Professional seminars and workshops