

Florida Department of Education
Curriculum Framework

Program Title: Nursery Management
Program Type: Career Preparatory
Career Cluster: Agriculture, Food and Natural Resources

Career Certificate Program

Program Number	A010616		
CIP Number	0101060602		
Grade Level	30, 31		
Standard Length	900 hours		
Teacher Certification	Refer to <u>Program Structure</u> table.		
CTSO	N/A		
SOC Codes (all applicable)	45-2092 - Farmworkers and Laborers, Crop, Nursery, and Greenhouse 11-9013 - Farmers, Ranchers, and Other Agricultural Managers		
CTE Program Resources	http://www.fldoe.org/academics/career-adult-edu/career-tech-edu/program-resources.stml		
Basic Skills Level	Mathematics:	9	Communications (Reading and Language Arts): 9

Purpose

This program offers a sequence of courses that provides coherent and rigorous content aligned with challenging academic standards and relevant technical knowledge and skills needed to prepare for further education and careers in the Agriculture, Food and Natural Resources career cluster; provides technical skill proficiency, and includes competency-based applied learning that contributes to the academic knowledge, higher-order reasoning and problem-solving skills, work attitudes, general employability skills, technical skills, and occupation-specific skills, and knowledge of all aspects of the horticulture and landscape industries within the Agriculture, Food and Natural Resources career cluster.

The content includes but is not limited to planning, management, finance, technical and production skills, underlying principles of technology, labor issues, community issues, and health, safety and environmental issues.

Program Structure

This program is a planned sequence of instruction consisting of three occupational completion points. Planned and Supervised Agricultural Experiences (SAE) must be provided through one or more of the following: (1) directed laboratory experience, (2) student project, (3) placement for experience, or (4) cooperative education.

This program is comprised of courses which have been assigned course numbers in the SCNS (Statewide Course Numbering System) in accordance with Section 1007.24 (1), F.S. Career and Technical credit shall be awarded to the student on a transcript in accordance with Section 1001.44(3)(b), F.S.

To teach the courses listed below, instructors must hold at least one of the teacher certifications indicated for that course.

The following table illustrates the postsecondary program structure:

OCP	Course Number	Course Title	Teacher Certification	Length	SOC Code
A	ORH0862	Nursery Workers	AGRICULTUR 1 @2 HORTICULT #7	300 hours	45-2092
B	ORH0863	Nursery and Greenhouse Managers 1	AGRICULTUR 1 @2	450 hours	11-9013
C	ORH0864	Nursery and Greenhouse Managers 2	AGRI @2 HORTICULT #7	150 hours	11-9013

Common Career Technical Core – Career Ready Practices

Career Ready Practices describe the career-ready skills that educators should seek to develop in their students. These practices are not exclusive to a Career Pathway, program of study, discipline or level of education. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study.

1. Act as a responsible and contributing citizen and employee.
2. Apply appropriate academic and technical skills.
3. Attend to personal health and financial well-being.
4. Communicate clearly, effectively and with reason.
5. Consider the environmental, social and economic impacts of decisions.
6. Demonstrate creativity and innovation.
7. Employ valid and reliable research strategies.
8. Utilize critical thinking to make sense of problems and persevere in solving them.
9. Model integrity, ethical leadership and effective management.
10. Plan education and career path aligned to personal goals.
11. Use technology to enhance productivity.
12. Work productively in teams while using cultural/global competence.

Standards

After successfully completing this program, the student will be able to perform the following:

Occupational Completion Point: A

Nursery Workers – 300 Hours

- 01.0 Describe the horticulture industry.
- 02.0 Identify safety procedures in the workplace.
- 03.0 Identify and classify plants.
- 04.0 Demonstrate plant propagation techniques.
- 05.0 Identify growing media and apply fertilizers.
- 06.0 Apply irrigation skills for plants and turf.
- 07.0 Demonstrate integrated pest management approaches.
- 08.0 Describe the principles and requirements for plant growth.
- 09.0 Apply best management practices in horticulture industry.
- 10.0 Identify principles of landscape design.
- 11.0 Apply safety procedures in the workplace.
- 12.0 Classify plants based on scientific principles.
- 13.0 Demonstrate proper use of growing media and fertilizers.
- 14.0 Demonstrate Integrated Pest Management approaches.
- 15.0 Identify the principles and requirements of plant growth.
- 16.0 Apply best management practices in landscape design.
- 17.0 Apply principles of landscape design and maintenance.
- 18.0 Harvest, transport, and install plant materials.
- 19.0 Identify procedures to operate, repair, and maintain tools and equipment.
- 20.0 Identify emerging technologies in the horticulture industry.
- 21.0 Demonstrate leadership, employability, communications and human relations skills.
- 22.0 Identify business principles.
- 23.0 Manage inventory.

Occupational Completion Point: B

Nursery and Greenhouse Managers 1– 450 Hours

- 24.0 Apply knowledge to identify and classify plants.
- 25.0 Control pests.
- 26.0 Operate tools and equipment.
- 27.0 Prepare growing media.
- 28.0 Irrigate plants.
- 29.0 Demonstrate proper fertilizing techniques.
- 30.0 Demonstrate abilities to maintain and analyze records.
- 31.0 Maintain tools and equipment.

Occupational Completion Point: C

Nursery and Greenhouse Managers 2– 150 Hours

- 32.0 Demonstrate application of chemicals and calibrate spray equipment.
- 33.0 Develop irrigation and drainage plan.
- 34.0 Raise crop too point of sale.
- 35.0 Prune and shape nursery stock.
- 36.0 Harvest, process, and ship nursery stock.
- 37.0 Market nursery stock.
- 38.0 Operate, repair, and maintain nursery equipment and facilities.
- 39.0 Identify business principles.
- 40.0 Develop life cycle of equipment.

**Florida Department of Education
Student Performance Standards**

**Program Title: Nursery Management
Career Certificate Program Number: A010616**

Course Number: ORH0862 Occupational Completion Point: A Nursery Workers – 300 Hours – SOC Code 45-2092	
01.0	Describe the horticulture industry. The student will be able to:
01.01	Describe the importance of horticulture to the American and global economies.
01.02	Identify career opportunities in horticulture and educational requirements and continuing education opportunities for horticulture careers.
01.03	Describe the importance of horticulture to the environment, including sustainability practices
01.04	Identify professional organizations and certifications for the horticultural industry.
02.0	Identify safety procedures in the workplace. The student will be able to:
02.01	Identify the common causes of accidents in the horticulture industry.
02.02	Demonstrate proper safety precautions and use of personal protective equipment specific to the horticulture industry.
02.03	Explain, identify and utilize pertinent information from a container label and/or Safety Data Sheet (SDS) according to Environmental Protection Agency (EPA), Worker Protection Standard and Occupational Safety and Health Agency (OSHA) Regulations.
03.0	Identify and classify plants. The student will be able to:
03.01	Identify plants by scientific and common names.
03.02	Classify plants botanically.
03.03	Write scientific names for plants.
04.0	Demonstrate plant propagation techniques. The student will be able to:
04.01	Identify propagating and growing facilities and structures.
04.02	Prepare propagation media.
04.03	Select and collect propagation materials.

04.04	Demonstrate propagation by sexual and asexual methods.
04.05	Demonstrate environmental controls for propagation materials.
04.06	Identify and select proper rooting hormones based on plant characteristics.
05.0	Identify growing media and fertilizers. The student will be able to:
05.01	Identify soil and media materials.
05.02	Identify nutritional needs of plants.
05.03	Identify symptoms of nutritional deficiencies and toxicities of plants.
05.04	Identify types and kinds of fertilizers.
05.05	Identify methods of distributing fertilizers.
05.06	Interpret information on a label of fertilizer used in Florida.
06.0	Apply irrigation skills for plants and turf. The student will be able to:
06.01	Identify water needs of plants.
06.02	Irrigate plants at recommended rates.
06.03	Identify the symptoms of excessive water and water stress in plants.
06.04	Describe the basic irrigation systems and principles used in the landscape and nursery.
07.0	Demonstrate Integrated Pest Management approaches. The student will be able to:
07.01	Identify common pests of plants.
07.02	Describe life cycles of common pests of plants.
07.03	Recognize signs of damage from pests.
08.0	Describe the principles and requirements of plant growth. The student will be able to:
08.01	Explain how the energy of sunlight is converted to chemical energy through the process of photosynthesis.
08.02	Explain how photosynthesis in plants is directly affected by various environmental factors such as light and temperature.
08.03	Explain the process of respiration and the flow of energy in plants.

08.04	Describe the influence of light and temperature on plant growth including photo tropism.
09.0	Apply Best Management Practices in the horticulture industry. The student will be able to:
09.01	Identify and apply Best Management Practices to reduce pollution and conserve water.
09.02	Identify and apply Best Management Practices on fertilizer recommendations for Florida plants and turf.
09.03	Compare and contrast organic verses traditional practices.
10.0	Identify principles of landscape design. The student will be able to:
10.01	Compare and contrast the use of line, form, texture and color in designing landscapes.
10.02	Identify the principles of design (unity, repetition, balance, emphasis and scale) as they apply to landscapes.
10.03	Identify points of emphasis and major design areas in the residential landscape.
10.04	Identify plant selection for a residential landscape using Florida Friendly Landscape Principles.
10.05	Read and interpret a landscape plan.
10.06	Develop skills for drawing and identifying symbols.
10.07	Draw and design a landscape plan for a small garden.
10.08	Construct a landscape display.
10.09	Identify technology used for landscape design.
11.0	Apply safety procedures in the workplace. The student will be able to:
11.01	Describe emergency procedures in the horticulture workplace.
11.02	Create preventive measures to avoid hazardous situations.
11.03	Apply problem solving skills to correct a hazardous situation.
12.0	Classify plants based on scientific principles. The student will be able to:
12.01	Describe principles of plant biology and growth.
12.02	Explain the role of plants in the ecosystem.
12.03	Describe the major classifications of plants based on life cycle.

12.04	Demonstrate the use of scientific and common names of plants including genus and specific epithet and cultivar.
12.05	Demonstrate proper use of scientific names.
13.0	Demonstrate proper use of growing media and fertilizers. The student will be able to:
13.01	Apply information on a label of fertilizer used in Florida.
13.02	Apply fertilizer and soil amendments.
13.03	Identify materials that are needed to alter pH and calculate the amount to apply to change the pH.
13.04	Demonstrate the procedure for calibrating a fertilizer spreader or injector using appropriate mathematical concepts.
13.05	Identify essential elements and nutrients in plant growth including macronutrients and micronutrients.
13.06	Using references make fertilizer recommendations for ornamental plants, turf grass, and palms.
14.0	Demonstrate Integrated Pest Management approaches. The student will be able to:
14.01	Classify insects according to feeding habits.
14.02	Describe biological, chemical, and cultural methods of controlling plant pests.
14.03	Diagnose and outline a plan for controlling pests on a horticultural crop.
14.04	Describe methods of controlling nematode pests on ornamental plants.
14.05	Develop a pest control program for a horticultural crop using Integrated Pest Management.
14.06	Identify and apply Best Management Practices on the management and handling of pesticides.
15.0	Identify the principles and requirements of plant growth. The student will be able to:
15.01	Demonstrate methods of pruning plants.
15.02	Identify appropriate time to prune plants.
15.03	Identify and select pruning tools.
15.04	Demonstrate proper use of pruning tools and care.
15.05	Identify Plant Growth Regulators (PRG) and their use on horticulture and landscape plants.
15.06	Outline and use a record book for the use of a plant growth regulator on a horticultural or nursery crop.

15.07	Identify specific cultural, mechanical, chemical, and biological methods of weed management.
16.0	Apply best management practices in landscape design. The student will be able to:
16.01	Identify and apply Best Management Practices for the design and installation of landscapes.
17.0	Apply principles of landscape design and maintenance. The student will be able to:
17.01	Demonstrate the use of line, form, texture and color in designing landscapes.
17.02	Demonstrate the principles of design (unity, repetition, balance, emphasis and scale) as they apply to landscapes.
17.03	Apply points of emphasis and major design areas in the commercial landscape.
17.04	Identify plant selection for a commercial landscape using Florida Friendly Landscape principles.
17.05	Create a landscape plan for a residential or commercial property.
17.06	Calculate materials needed according to the identified landscape plan (e.g. cost analysis).
17.07	Identify factors in selecting turf for landscape installation.
18.0	Harvest, transport, and install plant materials. The student will be able to:
18.01	Determine requirements for preserving plant viability.
18.02	Demonstrate proper landscape plant establishment techniques.
18.03	Select and prepare plants for transporting and transplanting.
18.04	Select horticultural products according to Florida grades and standards.
19.0	Identify procedures to operate, repair, and maintain tools and equipment. The student will be able to:
19.01	Perform equipment pre-operational check.
19.02	Identify, maintain, and operate hand tools and power tools.
20.0	Identify emerging technologies in the horticulture industry. The student will be able to:
20.01	Investigate DNA and genetics applications in horticulture including the theory of probability.
20.02	Evaluate advances in biotechnology that impact horticulture. (e.g. transgenic crops, biological controls, micro propagation drones, mechanical technology, etc.).
21.0	Demonstrate leadership, employability, communications and human relations skills. The student will be able to:

21.01	Identify acceptable work habits and personal characteristics.
21.02	Identify acceptable employee hygiene habits.
21.03	Identify or demonstrate appropriate responses to criticism from employer,
21.04	Describe the importance of industry certifications.
21.05	Create a resume and portfolio.
22.0	Identify business principles. The student will be able to:
22.01	Calculate markup, gross margin, and gross profit.
22.02	Evaluate a Profit and Loss (P&L) statement.
22.03	Prepare a pro forma for business.
22.04	Write a business plan.
23.0	Manage inventory. The student will be able to:
23.01	Take an inventory.
23.02	Recognize usage of barcodes.
23.03	Identify and manage Stock Keeping Units (SKUs).

Course Number: ORH0863
Occupational Completion Point: B
Nursery and Greenhouse Managers 1– 450 Hours – SOC Code 11-9013

24.0	Apply knowledge to identify and classify plants. The student will be able to:
24.01	Classify plants as monocots or dicots.
24.02	Classify plants as annuals, biennials, and perennials.
24.03	Identify plants appropriate to a region.
24.04	Classify plants according to growth habit.

24.05	Prepare propagation materials (seeds, cuttings, etc.) for planting.
24.06	Apply growth stimulants to propagation materials.
24.07	Demonstrate greenhouse sanitation and safety practices when propagating.
24.08	Prepare flats and seedbeds and plant seeds.
25.0	Control pests. The student will be able to:
25.01	Report insect and disease damage.
25.02	Identify chemical spray damage.
25.03	Select proper IPM practices (biological, chemical, organic, and physical) for control of insects, diseases, vertebrates and weeds.
25.04	Evaluate the efficacy and phytotoxicity of a chemical prior to inclusion in a growing program.
26.0	Operate tools and equipment. The student will be able to:
26.01	Identify, operate, and maintain tractor and power equipment.
26.02	Load, secure, and transport equipment.
27.0	Prepare growing media. The student will be able to:
27.01	Sterilize rooting, potting, and growing media.
27.02	Adjust pH and nutritional levels of media.
27.03	Fill and level benches and pots with media.
27.04	Demonstrate sanitation practices when handling and storing plant media materials.
27.05	Identify procedures for tissue culture.
28.0	Irrigate plants. The student will be able to:
28.01	Set up an irrigation system for a propagation area.
28.02	Set up an irrigation system for a growing structure.
28.03	Set up an irrigation system for a retail display.
28.04	Maintain and repair an irrigation system.

28.05	Identify and use various types of irrigation systems (low volume, ebb and flow, drip, mat, recirculating, etc.).
28.06	Explain and apply Best Management Practices as they apply to irrigation.
29.0	Demonstrate proper fertilizing techniques. The student will be able to:
29.01	Collect soil and leaf tissue samples for analysis.
29.02	Interpret and evaluate the results of soil and leaf tissue analysis and determine corrective actions.
29.03	Demonstrate proper handling and storage of fertilizers, observing safety precautions.
29.04	Evaluate, operate, and maintain fertilizer distribution equipment.
29.05	Develop a fertilization schedule for various plant species.
29.06	Determine rate of fertilizer application.
30.0	Demonstrate abilities to maintain and analyze records. The student will be able to:
30.01	Create a plant and inventory supply list.
30.02	Maintain current plant and supply inventory.
30.03	Maintain job records, daily log sheets, and inventory.
30.04	Calculate labor and material costs involved with product pricing.
30.05	Analyze and maintain production and sales records.
30.06	Determine plant production costs.
30.07	Prepare a budget.
31.0	Maintain tools and equipment. The student will be able to:
31.01	Maintain oil level in engines of power equipment.
31.02	Check and maintain tire air pressure on equipment.
31.03	Maintain fuel levels using proper fuel or fuel mixtures.
31.04	Demonstrate proper equipment operations.
31.05	Identify, operate, and maintain tractor and power equipment.

Course Number: ORH0864
Occupational Completion Point: C
Nursery and Greenhouse Managers 2– 150 Hours – SOC Code 11-9013

32.0	Demonstrate application of chemicals and calibrate spray equipment. The student will be able to:
32.01	Select, mix, apply, and record a non-restricted chemical according to the label and local, state, federal, and EPA regulations.
32.02	Discuss appropriate responses to chemical or fertilizer spills and proper disposal practices.
32.03	Identify and report insect and disease damage on plants and turf.
32.04	Diagnose a plant or disease problem on turf.
33.0	Develop irrigation and drainage plan. The student will be able to:
33.01	Identify drainage components for different types of drainage systems.
33.02	Install irrigation systems with control valves and clocks.
33.03	Set up an irrigation system for a growing area.
33.04	Comply with local, state and federal conservation guidelines.
34.0	Raise crop to point of sale. The student will be able to:
34.01	Choose plant, container, media, and growing structure.
34.02	Apply sound cultural practices.
34.03	Use Integrated Pest Management to raise crop (i.e. fertilizer, growth retardants, pesticides).
34.04	Schedule crop for sale.
34.05	Maintain production records
35.0	Prune and shape nursery stock. The student will be able to:
35.01	Prune plants to achieve desired growth and shape.
35.02	Explore the use of chemical growth regulators.
35.03	Identify techniques for pruning specialty items (topiary, bonsai).

36.0	Harvest, process, and ship nursery stock. The student will be able to:
36.01	Determine customer needs per landscape plan.
36.02	Grade and harvest field-grown plants (ball, burlap, bare-root, "grow bags").
36.03	Identify mechanical techniques for harvesting field-grown plants (tree spade and mechanical digger).
36.04	Select and assemble container-grown plants using industry-accepted grades and standards.
36.05	Prepare for shipment, loading, and transporting harvested plant materials.
36.06	Comply with regulations regarding the inspection and movement of plant materials.
36.07	Demonstrate safety practices when harvesting, processing, and shipping nursery stock.
36.08	Determine proper shipping environment.
37.0	Market nursery stock. The student will be able to:
37.01	Label and merchandise plants including plant care tags, bar codes, and shipping instructions.
37.02	Maintain clean and attractive merchandising and display areas safely.
37.03	Use various advertising methods to promote sales.
37.04	Demonstrate procedures for taking a sale order.
37.05	Use sales catalog.
37.06	Demonstrate proper customer etiquette.
37.07	Describe care and use of plants and related products to customers.
37.08	Handle customer complaints and problems.
38.0	Operate, repair, and maintain nursery equipment and facilities. The student will be able to:
38.01	Determine equipment needs for the job.
38.02	Order parts and supplies.
38.03	Perform simple electrical repairs.
38.04	Build or repair frames, benches, and other greenhouse or nursery facilities.

38.05	Demonstrate safety practices when working with equipment and facilities.
39.0	Identify business principles. The student will be able to:
39.01	Describe principles of business management.
39.02	Describe business organizational structures.
39.03	Cite financial management methods.
39.04	Interpret laws, regulations, and codes pertinent to the nursery industry.
40.0	Develop life cycle of equipment. The student will be able to:
40.01	Analyze the cost of replacing equipment verses repairing equipment.
40.02	Evaluate lease verses purchase of equipment.

Additional Information

Laboratory Activities

Laboratory investigations that include scientific inquiry, research, measurement, problem solving, emerging technologies, tools and equipment, as well as, experimental, quality, and safety procedures are an integral part of this career and technical program/course. Laboratory investigations benefit all students by developing an understanding of the complexity and ambiguity of empirical work, as well as the skills required to manage, operate, calibrate and troubleshoot equipment/tools used to make observations. Students understand measurement error; and have the skills to aggregate, interpret, and present the resulting data. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

MyCareerShines is an interactive resource to assist students in identifying their ideal career and to enhance preparation for employment. Teachers are encouraged to integrate this resource into the program curriculum to meet the employability goals for each student. Access MyCareerShines by visiting: www.mycareershines.org.

Extended Student Supervision

Because of the production and marketing cycle of the agricultural industries, this program requires individual instruction and supervision of students for the entire period beyond the 180-day school year.

Cooperative Training – OJT

On-the-job training is appropriate but not required for this program. Whenever offered, the rules, guidelines, and requirements specified in the OJT framework apply.

Basic Skills (if applicable)

In a Career Certificate Program offered for 450 hours or more, in accordance with Rule 6A-10.040, F.A.C., the minimum basic skills grade levels required for postsecondary adult career and technical students to complete this program are: Computation (Mathematics) and Communications (Reading Language Arts). These grade level numbers correspond to a grade equivalent score obtained on a state designated basic skills examination.

Adult students with disabilities, as defined in Section 1004.02, Florida Statutes, may be exempted from meeting the Basic Skills requirements (Rule 6A-10.040). Students served in exceptional student education (except gifted) as defined in s. 1003.01, F.S., may also be exempted from meeting the Basic Skills requirement. Each school district and Florida College System Institution must adopt a policy addressing procedures for exempting eligible students with disabilities from the Basic Skills requirement as permitted in Section 1004.91.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Postsecondary students with disabilities must self-identify, present documentation, request accommodations if needed, and develop a plan with their counselor and/or instructors. Accommodations received in postsecondary education may differ from those received in secondary education. Accommodations change the way the student is instructed. Students with disabilities may need accommodations in such areas as instructional methods and materials, assignments and assessments, time demands and schedules, learning environment, assistive technology and special communication systems. Documentation of the accommodations requested and provided should be maintained in a confidential file.

Note: postsecondary curriculum and regulated secondary programs cannot be modified.

Additional Resources

For additional information regarding articulation agreements, Bright Futures Scholarships, Fine Arts/Practical Arts Credit and Equivalent Mathematics and Equally Rigorous Science Courses please refer to:

<http://www.fldoe.org/academics/career-adult-edu/career-tech-edu/program-resources.stml>