

Florida Department of Education
Curriculum Framework

Program Title: Landscape & Turf Management
Program Type: Career Preparatory
Career Cluster: Agriculture, Food and Natural Resources

Career Certificate Program

Program Number	A200100		
CIP Number	0101060703		
Grade Level	30, 31		
Standard Length	900 hours		
Teacher Certification	Refer to the <u>Program Structure</u> section.		
CTSO	N/A		
SOC Codes (all applicable)	45-2092- Farmworkers and Laborers, Crop, Nursery, and Greenhouse 37-3011 - Landscaping and Groundskeeping Workers 37-1012 - First-Line Supervisors of Landscaping, Lawn Service, and Groundskeeping Workers		
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	ORH0802	Landscaping and Grounds keeping		450 hours	37-3011
C	ORH0803	Landscaping And Grounds keeping Supervisors		150 hours	37-1012

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

Landscaping and Groundskeeping – 450 Hours

- 24.0 Maintain tools and equipment
- 25.0 Demonstrate application of chemicals and calibrate spray equipment
- 26.0 Classify plants and turfgrass
- 27.0 Demonstrate fertilization skills
- 28.0 Irrigate plants and turf
- 29.0 Layout and install landscape and/or interiorscape
- 30.0 Maintain landscape
- 31.0 Maintain customer relations and observe follow-up procedures

Occupational Completion Point: C

Landscape and Grounds keeping Supervisors– 150 Hours

- 32.0 Analyze and design landscape
- 33.0 Prepare estimates, contracts, and presentation
- 34.0 Lay out and install landscape and turf
- 35.0 Conduct final walk-through of landscape installation
- 36.0 Identify components of athletic fields
- 37.0 Maintain athletic fields
- 38.0 Develop recreational areas
- 39.0 Maintain sports turf
- 40.0 Establish turfgrass
- 41.0 Tending and rejuvenating turf
- 42.0 Determine drainage system needs and design a drainage system.
- 43.0 Develop life cycle of equipment.

**Florida Department of Education
Student Performance Standards**

**Program Title: Landscape & Turf Management
Career Certificate Program Number: A200100**

**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 (PGR) 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: ORH0802	
Occupational Completion Point: B	
Landscaping and Groundskeeping – 450 Hours – SOC Code 37-1011	
24.0	Maintain tools and equipment. The student will be able to:
24.01	Maintain oil level in engines of power equipment.
24.02	Check and maintain tire air pressure on equipment.
24.03	Maintain fuel levels using proper fuel or fuel mixtures (alternative fuels).
24.04	Operate transmissions (hydrostatic, manual, automatic).
24.05	Identify, operate, and maintain tractor and power equipment.

24.06	Service and maintain battery and electrical systems.
24.07	Perform minor tune-up on engines.
24.08	Load, secure, and transport equipment.
24.09	Demonstrate safety precautions while working with tools and equipment.
25.0	Demonstrate application of chemicals and calibrate spray equipment. The student will be able to:
25.01	Select, mix, apply, and record a non-restricted chemical according to the label and local, state, federal, and EPA regulations.
25.02	Calibrate spray and spreader equipment.
25.03	Discuss appropriate responses to chemical or fertilizer spills.
25.04	Identify and report insect and disease damage on plants and turf.
25.05	Diagnose a plant or disease problem on turf.
25.06	Identify and report insect and disease damage.
25.07	Determine chemical compatibility.
25.08	Determine appropriate time frequency and method of chemical application.
25.09	Identify current certification and licensure.
26.0	Classify plants and turfgrass. The student will be able to:
26.01	Classify plants and turfgrass as annuals, biennials, and perennials.
26.02	Identify plants and turfgrass that are specific to a region.
26.03	Identify common weeds in Florida turf grasses.
27.0	Demonstrate fertilization skills. The students will be able to:
27.01	Develop a fertilization schedule.
27.02	Interpret fertilizer charts and develop recommendations according to turf species.
27.03	Calibrate fertilizer equipment.
28.0	Irrigate plants and turf. The student will be able to:

28.01	Identify various types of irrigation systems.
28.02	Install and maintain piping and water distribution components.
28.03	Install valves, timers, rain shut-offs, moisture sensors, and back flow prevention devices.
28.04	Design a microirrigation system.
28.05	List problems associated with improper design, installation and maintenance.
28.06	Identify water for irrigation.
28.07	Interpret water source test results.
28.08	Identify remediation practice and tools available to address water quality issues.
29.0	Layout and install landscape and/or interiorscape. The student will be able to:
29.01	Prepare landscape and/or interiorscape.
29.02	Prepare final grade.
29.03	Calculate labor and material costs associated with installation.
29.04	Layout plants based on a landscape plan.
29.05	Plant site using sound cultural practices.
29.06	Install mulch and perform final cleanup.
30.0	Maintain landscape. The student will be able to:
30.01	Perform maintenance inspection of the project.
30.02	Determine water requirements and apply at proper rates.
30.03	Identify weeds and apply herbicides safely.
30.04	Determine fertilization requirements and apply at proper rates.
30.05	Identify plant pest and disease problems and apply corrective measures.
30.06	Trim and prune landscape plants.
30.07	Maintain turf viability; mow at proper height and frequency, blade edge, line trim, and remove trash.

30.08	Explain cause and effect of soil compaction and thatch buildups, and determine appropriate methods of correction.
30.09	Cultivate and mulch plants.
30.10	Prune trees based on ANSI (American National Standard Institute) standards.
30.11	Provide protection for plants from adverse weather conditions.
30.12	Comply with local, state, and federal regulations regarding landscape maintenance and pesticide applications.
30.13	Demonstrate sanitation and safety practices when maintaining landscape.
31.0	Maintain customer relations and observe follow-up procedures. The student will be able to:
31.01	Conduct walk-through of project with client to assure satisfaction.
31.02	Identify current and future maintenance requirements.
31.03	Analyze project records for profitability and employee performance.
31.04	Create a data base for Client Relation Management (CRM).

Course Number: ORH0803	
Occupational Completion Point: C	
Landscape and Grounds keeping Supervisors– 150 Hours – SOC Code 37-1012	
32.0	Analyze and design landscape. The student will be able to:
32.01	Analyze and interpret plans, specifications, and environmental conditions of the project.
32.02	Design the project.
32.03	Identify and locate project materials.
32.04	Determine personnel and equipment needs and safety requirements for the project.
32.05	Establish project schedule.
33.0	Prepare estimates, contracts, and presentation. The student will be able to:
33.01	Determine costs of materials, equipment, and labor.

33.02	Prepare a price for the project and terms of contract.
33.03	Prepare written contract, using standard rules of English, including punctuation, spelling, sentence structure and references.
33.04	Prepare and give oral presentation of the project design using standard rules of English, including punctuation and sentence structure.
33.05	Maintain job records, daily log sheets, and inventory.
34.0	Lay out and install landscape and turf. The student will be able to:
34.01	Locate existing utilities and secure a permit.
34.02	Prepare and rough grade the site.
34.03	Determine procedures for installation of large materials.
34.04	Install and test irrigation system.
34.05	Identify procedures for constructing hardscape (walls, walks, patios, drives, etc.).
34.06	Identify and consult with hardscape organizations.
35.0	Conduct final walk-through of landscape installation. The student will be able to:
35.01	Conduct walk-through of installation project with client to assure customer satisfaction.
35.02	Analyze project records for profitability and employee performance.
36.0	Identify components of athletic fields. The student will be able to:
36.01	Identify turf selection for various athletic fields.
36.02	Identify appropriate dimensions for different athletic fields and specific requirements.
36.03	Design an underground drainage system.
37.0	Maintain athletic fields. The student will be able to:
37.01	Apply proper line marks for athletic fields.
37.02	Painting fields (school logos or names)
37.03	Apply proper techniques for clay maintenance.
37.04	Mow grass to appropriate height for field use.

38.0	Develop recreational areas. The student will be able to:
38.01	Establish plant beds with annuals, biennials, and perennials.
38.02	Plant accent trees and shrubs in a recreational area.
38.03	Establish sports turf.
39.0	Maintain sports turf. The student will be able to:
39.01	Mow sport turf with reel mowers.
39.02	Irrigate turf.
39.03	Verticut turf.
39.04	Aerate turf and remove debris.
40.0	Establish turfgrass. The student will be able to:
40.01	Level seedbed.
40.02	Plant turf by sprigs, plugs or sod.
40.03	Remove sod with sod cutter.
40.04	Identify irrigation methods for establishing turfgrass.
41.0	Tending and rejuvenating turf. The student will be able to:
41.01	Apply top dressing.
41.02	Overseed turf.
41.03	Irrigate turf.
41.04	Aerate turf.
41.05	Apply fertilizer.
42.0	Determine drainage system needs and design a drainage system. The student will be able to:
42.01	Determine the natural slope/grade of an area.
42.02	Determine the texture and percolation characteristics of the soil.

42.03	Identify techniques for constructing ditches and culverts.
42.04	Design and underground drainage system.
43.0	Develop life cycle of equipment. The student will be able to:
43.01	Analyze the cost of replacing equipment verses repairing equipment.
43.02	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.

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.shtml>