2012 - 2013

Florida Department of Education
Curriculum Framework

Program Title: **Landscape and Horticulture Technology**
Career Cluster: **Agriculture, Food and Natural Resources**

	AS	AAS
CIP Number	1101060500	0101060500
Program Type	College Credit	College Credit
Standard Length	64 credit hours	64 credit hours
CTSO	N/A	N/A
SOC Codes (all applicable)	37-1012	37-1012
Targeted Occupation List	http://www.labormarketinfo.com/wec/TargetOccupationList.htm	
Perkins Technical Skill Attainment Inventory	http://www.fldoe.org/workforce/perkins/perkins_resources.asp	
Statewide Articulation	http://www.fldoe.org/workforce/dwdframe/artic_frame.asp	

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 landscape and horticulture sector within the Agriculture, Food and Natural Resources career cluster.

The content includes but is not limited to instruction pertaining to an understanding of plant physiology and growth, plant nutrition and fertilization, plant classification and identification, propagation, pest control, pruning and shaping plants, maintenance of landscape plants, drainage and irrigation systems, equipment management, marketing, cultural and environmental management, business management, design, and employability and human relations skills. This program also prepares for certification and licensure as a horticulture professional, landscape technician, or landscape contractor & designer.

Program Structure

This program is a planned sequence of instruction consisting of 64 hours.

Laboratory Activities

Laboratory activities are an integral part of this program. These activities include instruction in the use of safety procedures, tools, equipment, materials, and processes related to these occupations. Equipment and supplies should be provided to enhance hands-on experiences for students.

Special Notes

Planned and supervised occupational activities must be provided through directed laboratory experience, practicum or cooperative/internship experience. Whenever the cooperative method is offered, the following is required for each student: a training plan, signed by the student, teacher and employer which includes instructional objectives and a list of on-the job and in-school learning experiences; a work station which reflects equipment, skills and tasks which are relevant to the occupation which the student has chosen as a career goal. The student may receive compensation for work performed.

Accommodations

Federal and state legislation requires the provision of accommodations for students with disabilities as identified on the secondary student's IEP or 504 plan or postsecondary student's accommodations' plan 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 postsecondary service provider. 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.

Articulation

To be transferable statewide between institutions, this program must have been reviewed, and a "transfer value" assigned the curriculum content by the appropriate Statewide Course Numbering System discipline committee. This does not preclude institutions from developing specific articulation agreements with each other.

The following industry certifications articulate credit into this degree program. These statewide articulation agreements have been approved by the Articulation Coordinating Committee.

Certified Horticulture Professional (FNGLA001) – 6 credit hours

For details on articulation agreements which correlate to programs and industry certifications refer to http://www.fldoe.org/workforce/dwdframe/artic_frame.asp.

Program Length

The AS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS, and it must be transferable according to Rule 6A-14.030 (2), F.A.C. The AAS degree requires the inclusion of a minimum of 15 credits of general education

coursework according to SACS. The standard length of this program is 64 credit hours according to Rule 6A-14.030, F.A.C.

Certificate Programs

A College Credit Certificate consists of a program of instruction of less than sixty (60) credits of college-level courses, which is part of an AS or AAS degree program and prepares students for entry into employment (Rule 6A-14.030, F.A.C.). This AS/AAS degree program includes the following College Credit Certificates:

Landscape and Horticulture Professional (0101060504) – 18 credit hours
Landscape and Horticulture Specialist (0101060503) – 12 credit hours
Landscape and Horticulture Technician (0101060505) – 30 credit hours

Standards for the above certificate programs are contained in separate curriculum frameworks.

Standards

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

01.0 Demonstrate an understanding of plant physiology and growth.
02.0 Classify plants.
03.0 Determine drainage system needs and design a drainage system.
04.0 Select, operate, and maintain tools and equipment.
05.0 Fertilize plants.
06.0 Manage a pest-control program.
07.0 Prune and shape plants.
08.0 Plan and install a drainage system.
09.0 Protect plants and equipment from adverse weather.
10.0 Maintain and analyze records.
11.0 Demonstrate employability skills.
12.0 Demonstrate managerial and supervisory skills.

A. Horticulture Specialization:

13.0 Prepare growing media and seedbeds.
14.0 Propagate plants.
15.0 Grow plants.
16.0 Protect plants and equipment from adverse weather.
17.0 Harvest, process, and ship plants.
18.0 Market plants.
19.0 Design horticulture facilities.
20.0 Design, install, and service nursery irrigation systems.

B. Landscape Specialization:

13.0 Analyze and design the project (landscape and interiorscape).
14.0 Prepare, estimate, and establish contracts.
15.0 Analyze and organize the project.
16.0 Lay out and install landscape.
17.0 Plan and install a drainage system.

18.0 Maintain customer relations and observe follow-up procedures.
19.0 Maintain landscape plants.
20.0 Select, operate, and maintain landscape tools and equipment.
21.0 Plan, install, and service landscape irrigation systems.

2012 - 2013

Florida Department of Education
Student Performance Standards

Program Title: **Landscape and Horticulture Technology**
CIP Numbers: **1101060500 A.S.**
0101060500 A.A.S.
Program Length: **64 credit hours**
SOC Code(s): **37-1012**

The AS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS, and it must be transferable according to Rule 6A-14.030 (2), F.A.C. The AAS degree requires the inclusion of a minimum of 15 credits of general education coursework according to SACS. At the completion of this program, the student will be able to:

01.0 Demonstrate an understanding of plant physiology and growth--The student will be able to:

01.01 Describe the process of photosynthesis.
01.02 Identify and describe the functions of all parts of the plant.
01.03 Describe an asexual reproduction process.
01.04 Explain the differences between angiosperms and gymnosperms.
01.05 Identify the differences between woody and herbaceous plants.

02.0 Classify plants--The student will be able to:

02.01 Identify and group shade and flowering trees.
02.02 Identify and group fruit trees and plants.
02.03 Identify and group annuals, vegetables, and herbs.
02.04 Identify and group woody ornamentals, vines, and ground covers.
02.05 Identify and group tropical foliage plants.
02.06 Identify and group turf and ornamental grasses.

03.0 Determine drainage system needs and design a drainage system--The student will be able to:

03.01 Determine the natural slope/grade of an area.
03.02 Determine the texture and percolation characteristics of the soil.
03.03 Identify techniques for constructing ditches and culverts.
03.04 Direct the movement of water away from structures and installations.
03.05 Design and underground drainage system.

04.0 Select, operate, and maintain tools and equipment–The student will be able to:

04.01 Determine equipment needs for the company.
04.02 Select and operate equipment for the job.
04.03 Supervise the service and maintenance of power equipment.
04.04 Supervise the repair and maintenance of facilities.
04.05 Instruct and supervise employees in the safe use of tools and equipment.
04.06 Maintain an inventory of parts and supplies.

05.0 Fertilize plants--The student will be able to:

- 05.01 Evaluate influences of nutrients on plant growth.
- 05.02 Collect soil and leaf tissue samples for analysis.
- 05.03 Interpret and evaluate the results of soil and leaf tissue analysis.
- 05.04 Apply fertilizers, using appropriate methods (dry, liquid, slow-release, injection, etc.).
- 05.05 Demonstrate proper handling and storage of fertilizers, observing safety precautions.

06.0 Manage a pest-control program--The student will be able to:

- 06.01 Develop an integrated pest management program or schedule.
- 06.02 Train employees in the safe use of pesticides.
- 06.03 Obtain a restricted-use pesticide license.

07.0 Prune and shape plants--The student will be able to:

- 07.01 Train employees in pruning techniques.
- 07.02 Develop a pruning program and time schedule.
- 07.03 Identify and use tools for pruning.
- 07.04 Prune plants to achieve desired growth.
- 07.05 Prune plans with unique cultural requirements (roses, fruit trees, etc.).
- 07.06 Prune specialty items (topiary, espalier, bonsai, etc.).
- 07.07 Select and use chemical growth regulators.
- 07.08 Root-prune plants and trees.
- 07.09 Demonstrate sanitation and safety practices when pruning.

08.0 Plan and install a drainage system–The student will be able to:

- 08.01 Determine the natural slope/grade of an area.
- 08.02 Determine the texture and percolation characteristics of the soil.
- 08.03 Identify techniques for constructing ditches and culverts.
- 08.04 Direct the movement of water away from installations.

09.0 Protect plants and equipment from adverse weather–The student will be able to:

- 09.01 Monitor and interpret weather forecasts.
- 09.02 Supervise procedures for protecting plants and equipment from adverse weather.
- 09.03 Compare cost and efficiency of various methods of protecting plants and equipment from adverse weather.

10.0 Maintain and analyze records–The student will be able to:

- 10.01 Maintain fertilizer and pesticide application records.
- 10.02 Keep equipment maintenance and service records.
- 10.03 Maintain sales and production records.
- 10.04 Record labor and personnel information.
- 10.05 Keep inventory records.
- 10.06 Analyze cost and effectiveness of management practices.
- 10.07 Determine plant production cost.

10.08 Determine insurance needs.
10.09 Prepare an annual budget.
10.10 Prepare a five-year projection plan.
10.11 Maintain accounts-receivable and accounts-payable records.
10.12 Use computers in the landscape and horticulture operations.

11.0 Demonstrate employability skills--The student will be able to:

11.01 Conduct a job search.
11.02 Secure information about a job.
11.03 Identify documents that may be required when applying for a job.
11.04 Complete a job application form.
11.05 Demonstrate competency in job interview techniques.
11.06 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other person.
11.07 Identify acceptable work habits.
11.08 Demonstrate knowledge of how to make job changes.
11.09 Demonstrate acceptable employee health habits.

12.0 Demonstrate managerial and supervisory skills–The student will be able to:

12.01 Instruct employees in their tasks.
12.02 Prepare daily work plans.
12.03 Enforce safety regulations.
12.04 Develop an outline for a policy manual.
12.05 Organize and conduct employee training.
12.06 Conduct employee grievance procedures.
12.07 Evaluate performance of employees.
12.08 Prepare job descriptions.
12.09 Conduct job interviews.
12.10 Demonstrate effective communication skills.
12.11 Demonstrate computer literacy as related to landscape and horticulture operations.

A. Horticulture Specialization:

13.0 Prepare growing media and seedbeds–The student will be able to:

13.01 Identify media materials.
13.02 Mix rooting and growing media according to plant requirements.
13.03 Sterilize rooting, potting, and growing media.
13.04 Collect and test a soil sample from field and potting media.
13.05 Adjust pH and nutritional levels of media.
13.06 Prepare planting beds and sites.
13.07 Fill and level benches and pots with media.
13.08 Demonstrate sanitation practices when handling and storing plant media materials.

14.0 Propagate plants–The student will be able to:

14.01 Collect propagation materials at proper time (seeds, cuttings, scions, bulbs, etc.).

14.02 Demonstrate propagation by grafting, budding, layering, separating, dividing, cutting, and tissue culturing.
14.03 Prepare flats and a seedbed and plant seeds.
14.04 Prepare a rooting bed.
14.05 Prepare propagation materials (seeds, cuttings, scions, etc.)
14.06 Apply growth stimulants to propagation materials.
14.07 Control propagation facility environment (moisture, temperature, light).
14.08 Transplant rooted propagation materials including tissue culture transplants.
14.09 Describe advanced propagation techniques (tissue, culture, pre-germination, see irradiation, tree cuttings).
14.10 Demonstrate sanitation and safety practices when propagating.

15.0 Grow plants–The student will be able to:

15.01 Prepare media for containers.
15.02 Prepare field site for transplants.
15.03 Select plant containers.
15.04 Determine plant spacing in the field and on container beds.
15.05 Transplant propagated materials to various containers and to the field.
15.06 Determine and provide light requirements of various plant types.
15.07 Determine water requirements and apply water at proper rates.
15.08 Identify weeds and apply herbicides.
15.09 Determine fertilization requirements.
15.10 Identify insect and insect-like disease problems and apply pesticides.
15.11 Demonstrate safety practices when applying pesticides.

16.0 Protect plants and equipment from adverse weather–The student will be able to:

16.01 Monitor and interpret weather forecasts.
16.02 Supervise procedures for protecting plants and equipment from adverse weather.
16.03 Compare cost and efficiency of various methods of protecting plants and equipment from adverse weather.
16.04 List plants according to environmental tolerances (light, temperature, moisture, wind, salt, etc.).

17.0 Harvest, process, and ship plants–The student will be able to:

17.01 Grade and harvest field-grown plants (ball, burlap, bare-root, “grow-bags”).
17.02 Identify mechanical techniques for harvesting field-grown plants (tree spade and mechanical digger).
17.03 Select, grade, and assemble container-grown plants.
17.04 Prepare for shipment, loading, and transporting harvested plant materials.
17.05 Use proper methods for preserving plant viability.
17.06 Comply with regulation regarding the inspection and movement of plant materials.
17.07 Demonstrate safety practices when harvesting, processing, and shipping nursery stock.

18.0 Market plants–The student will be able to:

18.01 Identify, inventory, and label marketable plants.

18.02 Identify market segments (commercial, residential, wholesale, retail, etc.)
18.03 Identify methods of marketing (advertising, public relations, sales personnel, trade shows, etc.).
18.04 Develop a marketing program (budget, displays, sales aids, price lists, etc.).
18.05 Develop sales training program (product knowledge, customer relations, sales techniques, resource materials, etc.)
18.06 Develop an annual sales calendar (seasonal sales, special promotion, etc.).

19.0 Design horticulture facilities–The student will be able to:

19.01 Design a facility for propagating plants.
19.02 Design a bedding-plants growing facility.
19.03 Design a container growing facility.
19.04 Design a field growing facility.
19.05 Design a tropical foliage growing facility.
19.06 Design a retail facility.

20.0 Design, install, and service nursery irrigation systems–The student will be able to:

20.01 Determine irrigation requirements.
20.02 Assess quality of irrigation water.
20.03 Design and set up an irrigation system for propagation area, greenhouse or enclosed structure, shade house, retail display area, and field-growing area.
20.04 Maintain electric and engine-driven pumps.
20.05 Operate and service various types of irrigation systems.
20.06 Calculate cost efficiency of irrigation system.

B. Landscape Specialization:

13.0 Analyze and design the project (landscape and interiorscape)–The student will be able to:

13.01 Determine the purpose, problems, or desired effect of the project.
13.02 Analyze the environmental conditions of the landscape or interiorscape.
13.03 Determine site analysis problems.
13.04 Demonstrate working knowledge of Computer-Assisted Drafting (CAD) system.
13.05 Design hardscape plan.
13.06 Design and select appropriate plant materials for desired effect and function.
13.07 Determine the method and form of presentation of the project.

14.0 Prepare, estimate, and establish contracts–The student will be able to:

14.01 Develop a list of materials required for the project.
14.02 Determine equipment needs.
14.03 Estimate time and man hours.
14.04 Determine cost of materials, equipment, and labor.
14.05 Prepare a price for customer, based on specifications.
14.06 Establish terms of a contract.

15.0 Analyze and organize the project–The student will be able to:

15.01 Interpret plans and specifications.
15.02 Identify safety requirements.
15.03 Organize site preparation.
15.04 Locate project materials.
15.05 Determine personnel needs.
15.06 Determine equipment needs.
15.07 Establish project schedule.

16.0 Lay out and install landscape–The student will be able to:

16.01 Locate existing utilities.
16.02 Rough grade site.
16.03 Install large materials.
16.04 Install irrigation system.
16.05 Construct hardscape (walls, walks, patio, drives, etc.)
16.06 Lay out and install plants.
16.07 Prepare interiorscape.
16.08 Prepare final grade.
16.09 Install lawns.
16.10 Install mulch.
16.11 Perform final clean up.

17.0 Plan and install a drainage system–The student will be able to:

17.01 Plan the construction of an underground drainage system.
17.02 Estimate and order appropriate fill materials.
17.03 Establish proper elevations and grade a landscape site.
17.04 Read soil and contour maps.

18.0 Maintain customer relations and observe follow-up procedures–The student will be able to:

18.01 Conduct walk-through of project with client to ensure satisfaction.
18.02 Identify current and future maintenance requirements.
18.03 Analyze project records for profitability and employee performance.

19.0 Maintain landscape plants–The student will be able to:

19.01 Determine water requirements and apply at proper rates.
19.02 Identify weeds and apply herbicides safely.
19.03 Determine fertilization requirements and apply at proper rates.
19.04 Regulate growth of landscape plants through chemical or mechanical needs.
19.05 Maintain turf viability (mow at proper height and frequency, aerate, edge, clip, and remove trash).
19.06 Identify plant pest problems and apply corrective measures.
19.07 Cultivate and mulch plants.
19.08 Brace and repair trees.

20.0 Select, operate, and maintain landscape tools and equipment–The student will be able to:

20.01 Determine equipment needs for the company.
20.02 Select and operate equipment for the job.
20.03 Supervise the service and maintenance of service equipment.
20.04 Supervise the repair and maintenance of facilities.
20.05 Instruct and supervise employees in the safe use of tools and equipment.
20.06 Maintain an inventory of parts and supplies.

21.0 Plan, install, and service landscape irrigation systems–The student will be able to:

21.01 Determine irrigation requirements.
21.02 Assess quality of irrigation water.
21.03 Plan an irrigation system.
21.04 Supervise the installation of irrigation equipment.
21.05 Service and maintain electric engine-driven pumps.
21.06 Operate and service low-volume irrigation system.
21.07 Operate and service overhead irrigation system.
21.08 Operate and maintain automatic system.
21.09 Calculate cost efficiency of an irrigation system.