

**Florida Department of Education
CLUSTER CURRICULUM FRAMEWORK**

Cluster Title: Environmental Horticulture Science and Services
Secondary

Cluster Type: Job Preparatory

Occupational Area: Agriscience and Natural Resources

Components: Core, Three Programs, Four Completion Points

Grade Level: Secondary
9-12, 30, 31

Facility Code: 203

CTSO: FFA

Coop Method: Yes

Apprenticeship: Yes

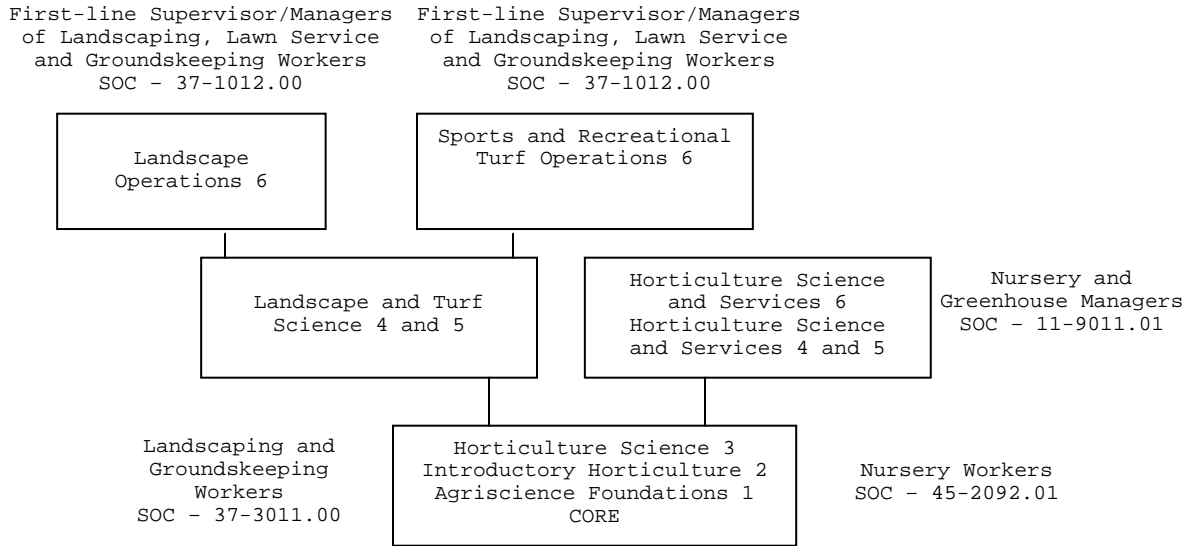
- I. **PURPOSE:** The Environmental Horticulture Science and Services cluster is designed to prepare students for employment or advanced training in the horticulture and landscape industries. This cluster focuses on broad, transferable skills and stresses understanding and demonstration of the following elements of the horticulture industry; planning, management, finance, technical and production skills, underlying principles of technology, labor issues, community issues, and health, safety and environmental issues.
- II. **CLUSTER STRUCTURE:** This cluster is a planned sequence of instruction consisting of a core, three programs and four completion points. When the recommended sequence is followed, the structure will allow students to complete at specified points for employment or remain for advanced training. A student who completes the applicable competencies at any occupational completion point may either continue with the training program or exit as an occupational completer.

The core of this cluster includes the competencies of the Certified Horticultural Professional examination. Students completing the core should be prepared to sit for the certification exam.

Students must complete the core, or demonstrate mastery of skill standards contained in the core, before advancing in either of the programs.

The following diagram illustrates the **CLUSTER STRUCTURE:**

Environmental Horticulture Science and Services Cluster



The programs in this cluster consist of the following courses, which include the core:

LANDSCAPE OPERATIONS

OCCUPATIONAL COMPLETION POINT - DATA CODE A

Landscaping and Groundskeeping Workers - SOC Code - 37-3011.00

CORE

- 8106810 - Agriscience Foundations 1 - 1 secondary credit
- 8121510 - Introductory Horticulture 2 - 1 secondary credit
- 8121520 - Horticultural Science 3 - 1 secondary credit

OCCUPATIONAL COMPLETION POINT - DATA CODE B

First-Line Supervisors/Managers of Landscaping, Lawn Service and Groundskeeping Workers - SOC Code 37-1012.00

- 8121310 - Landscape and Turf Science 4 - 1 secondary credit
- 8121320 - Landscape and Turf Science 5 - 1 secondary credit
- 8121330 - Landscape Operations 6 - 1 secondary credit

HORTICULTURE SCIENCE AND SERVICES

OCCUPATIONAL COMPLETION POINT - DATA CODE A

Nursery Workers - SOC Code - 45-2092.01

CORE

- 8106810 - Agriscience Foundations 1 - 1 secondary credit
- 8121510 - Introductory Horticulture 2 - 1 secondary credit
- 8121520 - Horticultural Science 3 - 1 secondary credit

OCCUPATIONAL COMPLETION POINT - DATA CODE B

Nursery and Greenhouse Managers - SOC Code 11.9011-01

- 8121610 - Horticulture Science and Services 4 - 1 secondary credit

- 8121620 - Horticulture Science and Services 5 - 1 secondary credit
- 8121630 - Horticulture Science and Services 6 - 1 secondary Credit

SPORTS AND RECREATIONAL TURF OPERATIONS

OCCUPATIONAL COMPLETION POINT - DATA CODE A

- Landscaping and Groundskeeping Workers - SOC Code - 37-3011.00
CORE
- 8106810 - Agriscience Foundations 1 - 1 secondary credit
- 8121510 - Introductory Horticulture 2 - 1 secondary credit
- 8121520 - Horticultural Science 3 - 1 secondary credit

OCCUPATIONAL COMPLETION POINT - DATA CODE B

- First-Line Supervisors/Managers of Landscaping, Lawn Service and Groundskeeping Workers - SOC Code 37-1012.00
- 8121310 - Landscape and Turf Science 4 - 1 secondary credit
- 8121320 - Landscape and Turf Science 5 - 1 secondary credit
- 8121410 - Sports and Recreational Turf Operations 6 - 1 secondary credit

III. **SPECIAL NOTE:** FFA is the appropriate Career Student Organization for providing leadership training and for reinforcing specific vocational skills. Career Student Organizations, when provided, shall be an integral part of the vocational instructional program, and the activities of such organizations are defined as part of the curriculum in accordance with Rule 6A-6.065(8), FAC. The Florida Nurserymen and Growers Association is the appropriate industry related organization and participation should be encouraged.

Classroom, shop, and plant nursery/land laboratory activities are an integral part of this cluster including the general maintenance and safe use of all instructional resources.

Planned and supervised instructional activities must be provided through one or more of the following: (1) directed laboratory experience, (2) student projects, (3) placement for experience, (4) cooperative experience.

Because of the production and marketing cycle of the horticultural and landscape industries, these programs require individual instruction and supervision of students for the entire period beyond the 180-day school year.

Cooperative training - OJT is appropriate for this program. Whenever cooperative training - OJT is offered, the following are 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 workstation that reflects equipment, skills, and tasks that are relevant to the occupation which the student has chosen as a career goal. The student must receive compensation for work performed.

Federal and state legislation requires the provision of accommodations for students with disabilities to meet individual needs and ensure equal access. Adult students with disabilities must self-identify and request such services. 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.

SCANS Competencies: Instructional strategies for this program must include methods that require students to identify, organize, and use resources appropriately; to work with each other cooperatively and productively; to acquire and use information; to understand social, organizational, and technological systems; and to work with a variety of tools and equipment. Instructional strategies must also incorporate the methods to improve students' personal qualities and high-order thinking skills.

Florida Department of Education
INTENDED OUTCOMES

Program Title: Landscape Operations

	SECONDARY
Program Number	8121300
CIP Number	0101.060510
Grade Level	9-12, 30, 31
Standard Length	6 credits
Certification	VOC AGRI @4 AGRICULTUR 1 @2 AGRI @4 HORTICULT #7
Program SOC Code 37-1012.00 - First-Line Supervisors/Managers of Landscaping, Lawn Service and Groundskeeping Workers	

INTENDED OUTCOMES: After successfully completing appropriate outcomes for each occupational completion point of this program, the student will be able to perform the following:

OCCUPATIONAL COMPLETION POINT - DATA CODE A

Landscape Specialist - DOT Code 406.687-010

- 01.0 Describe the history of agriculture and its influence on the global economy.
- 02.0 Practice agriscience safety skills and procedures.
- 03.0 Apply scientific and technological principles to agriscience issues.
- 04.0 Apply environmental principles to the agricultural industry.
- 05.0 Investigate and utilize basic scientific skills and principles in plant science.
- 06.0 Investigate and utilize basic scientific skills and principles in animal science.
- 07.0 Demonstrate the use of agriscience tools, equipment, and instruments.
- 08.0 Demonstrate agribusiness, employability & human relation skills.
- 09.0 Apply leadership and citizenship skills.
- 10.0 Describe the horticulture industry.
- 11.0 Identify and classify plants.
- 12.0 Propagate plants.
- 13.0 Identify growing media and apply fertilizers.
- 14.0 Irrigate plants and turf.
- 15.0 Describe pest control approaches.
- 16.0 Control plant growth.
- 17.0 Harvest, transport, and install plant materials.
- 18.0 Operate, repair, and maintain tools and equipment.
- 19.0 Demonstrate leadership, employability, communications, and human relations skills.

OCCUPATIONAL COMPLETION POINT - DATA CODE B

Landscape Gardner - DOT Code 408.161-010

- 20.0 Maintain tools and equipment.
- 21.0 Apply chemical and calibrate spray equipment.
- 22.0 Classify plants and turfgrass.
- 23.0 Demonstrate fertilization skills.
- 24.0 Irrigate plants and turf.
- 25.0 Layout and install landscape and/or interiorscape.
- 26.0 Maintain landscape.

27.0 Maintain customer relations and observe follow-up procedures.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Landscape Operations
Secondary Number: 8121300
Postsecondary Number:

OCCUPATIONAL COMPLETION POINT - DATA CODE A

Landscaping and Groundskeeping Workers - SOC Code - 37-3011.00

- 01.0 Describe the history of agriculture and its influence on the global economy--The student will be able to:
- 01.01 Investigate the history of agriculture and its relationship to science and technology.
 - 01.02 Analyze the impact of agriculture on the local, state, national and global economy.
 - 01.03 Identify significant career patterns/shifts in the history of the agricultural industry.
 - 01.04 Examine the role of the agricultural industry in the interaction of population, food, energy, and the environment.
- 02.0 Practice agriscience safety skills and procedures --The student will be able to:
- 02.01 List the common causes of accidents in agriscience operations.
 - 02.02 Demonstrate proper safety precautions and use of personal protective equipment.
 - 02.03 Extract and utilize pertinent information from a container label and/or Material Safety Data Sheet (MSDS) following Environmental Protection Agency (EPA), Worker Protection Standard, and Occupational Safety and Health Agency (OSHA) regulations.
 - 02.04 Identify proper disposal of hazardous waste materials and biohazards.
 - 02.05 Describe emergency procedures.
- 03.0 Apply scientific and technological principles to agriscience issues--The student will be able to:
- 03.01 Employ scientific measurement skills.
 - 03.02 Demonstrate safe and effective use of common laboratory equipment.
 - 03.03 Identify the parts and functions of plant and animal cells.
 - 03.04 Describe the phases of cell reproduction.
 - 03.05 Implement the scientific method and science process skills through the design and completion of an agriscience research project.
 - 03.06 Interpret, analyze, and report data.
 - 03.07 Investigate DNA and genetics applications in agriscience including the theory of probability.
 - 03.08 Evaluate advances in biotechnology that impact agriculture (e.g. transgenic crops, biological controls, etc.).
- 04.0 Apply environmental principles to the agricultural industry --The student will be able to:

- 04.01 Determine how different climactic and geological activity influences agriculture.
 - 04.02 Describe various ecosystems as they relate to the agriculture industry.
 - 04.03 Describe the environmental resources (soil, water, air) necessary for agriculture production.
 - 04.04 Identify regulatory agencies that impact agricultural practices.
 - 04.05 Apply Best Management Practices that enhance the natural environment.
 - 04.06 Identify conservation practices related to natural resources.
- 05.0 Investigate and utilize basic scientific skills and principles in plant science --The student will be able to:
- 05.01 Identify and describe the specializations within the plant science industry.
 - 05.02 Categorize plants based on specific characteristics according to industry and scientific standards.
 - 05.03 Examine the processes of plant growth including photosynthesis and respiration.
 - 05.04 Identify the nutrients required for plant growth from the periodic table and explain their functions.
 - 05.05 Analyze information from a fertilizer label.
 - 05.06 Propagate and grow plants through sexual and/or asexual reproduction.
 - 05.07 Investigate the impacts of various pests and propose solutions for their control.
 - 05.08 Investigate the nature and properties of food, fiber, and by-products from plants.
 - 05.09 Explore career opportunities in plant science.
- 06.0 Investigate and utilize basic scientific skills and principles in animal science --The student will be able to:
- 06.01 Investigate the origin, history, and domestication of animals.
 - 06.02 Explain the economic importance of animals and the products obtained from animals.
 - 06.03 Categorize animals according to use, type, breed, and scientific classification.
 - 06.04 Employ correct terminologies for animal species and conditions (e.g. age, sex, etc.) within those species.
 - 06.05 Compare basic internal & external anatomy of animals.
 - 06.06 Demonstrate approved practices in the management, health, safety, and technology of the animal industry.
 - 06.07 Discuss animal welfare issues.
 - 06.08 Investigate the nature and properties of food, fiber, and by-products from animals.
 - 06.09 Explore career opportunities in animal science.
- 07.0 Demonstrate the use of agriscience tools, equipment, and instruments -
-The student will be able to:
- 07.01 Select and demonstrate the use of agriscience tools, equipment, and instruments.
 - 07.02 Describe various physical science principles as applied in selected mechanical applications (e.g. levers, pulleys, hydraulics, and internal combustion).
 - 07.03 Solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

- 07.04 Service and maintain agriscience equipment, instruments, facilities, and supplies.
- 08.0 Demonstrate agribusiness, employability & human relation skills --The student will be able to:
 - 08.01 Develop, implement, and maintain work based learning through Supervised Agricultural Experiences (SAE).
 - 08.02 Utilize a record keeping system to collect, interpret, and analyze data.
 - 08.03 Enhance oral communications through telephone, interview and presentation skills.
 - 08.04 Enhance written communication by developing resumes and business letters.
 - 08.05 Demonstrate interpersonal (nonverbal) communication skills.
 - 08.06 Demonstrate good listening skills.
- 09.0 Apply leadership and citizenship skills --The student will be able to:
 - 09.01 Identify and describe leadership characteristics.
 - 09.02 Identify opportunities to apply acquired leadership skills.
 - 09.03 Identify and demonstrate ways to be an active citizen.
 - 09.04 Participate in community based learning activities.
 - 09.05 Demonstrate the ability to work cooperatively.
 - 09.06 Conduct formal and informal meetings using correct parliamentary procedure skills.
 - 09.07 Identify the opportunities for leadership development available through the National FFA Organization and/or professional organizations.
- 10.0 DESCRIBE THE HORTICULTURE INDUSTRY--The student will be able to:
 - 10.01 Describe the importance of horticulture to the American and global economies.
 - 10.02 Identify career opportunities in horticulture and educational requirements and continuing education opportunities for horticulture careers.
 - 10.03 Describe the importance of horticulture to the environment.
 - 10.04 Identify professional organizations and certifications for the horticultural industry.
- 11.0 IDENTIFY AND CLASSIFY PLANTS--The student will be able to:
 - 11.01 Identify plants by scientific and common names.
 - 11.02 Classify plants botanically.
 - 11.03 Describe principles of plant biology and growth.
 - 11.04 Explain the functional use of plants.
- 12.0 PROPAGATE PLANTS--The student will be able to:
 - 12.01 Identify propagating and growing facilities and structures.
 - 12.02 Prepare propagation media.
 - 12.03 Select and collect propagation materials.
 - 12.04 Demonstrate propagation by sexual and asexual methods.
 - 12.05 Demonstrate environmental controls for propagation materials.
- 13.0 IDENTIFY GROWING MEDIA AND APPLY FERTILIZERS--The student will be able to:
 - 13.01 Identify soil and media materials.

- 13.02 Identify nutritional needs of plants.
 - 13.03 Identify symptoms of nutritional deficiencies and toxicities of plants.
 - 13.04 Identify types and kinds of fertilizers.
 - 13.05 Identify methods of distributing fertilizers.
 - 13.06 Interpret information on fertilizer label.
 - 13.07 Apply fertilizer and soil amendments.
- 14.0 IRRIGATE PLANTS AND TURF--The student will be able to:
- 14.01 Identify water needs of plants.
 - 14.02 Irrigate plants at recommended rates.
- 15.0 DESCRIBE PEST CONTROL APPROACHES--The student will be able to:
- 15.01 Identify common pests of plants.
 - 15.02 Describe life cycles of common pests of plants.
 - 15.03 Classify insects according to feeding habits.
 - 15.04 Describe biological, chemical, and cultural methods of controlling plant pests.
- 16.0 CONTROL PLANT GROWTH--The student will be able to:
- 16.01 Identify methods of pruning plants.
 - 16.02 Identify appropriate time to prune plants.
 - 16.03 Identify and select pruning tools.
- 17.0 HARVEST, TRANSPORT, AND INSTALL PLANT MATERIALS--The student will be able to:
- 17.01 Determine requirements for preserving plant viability.
 - 17.02 Install containerized plant materials.
 - 17.03 Select and prepare plants for transporting and transplanting.
- 18.0 OPERATE, REPAIR, AND MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:
- 18.01 Perform equipment pre-operational check.
 - 18.02 Identify, maintain, and operate hand tools and power tools.
- 19.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATIONS AND HUMAN RELATIONS SKILLS--The student will be able to:
- 19.01 Conduct group meetings using parliamentary procedure and public speaking skills.
 - 19.02 Identify acceptable work habits and personal characteristics.
 - 19.03 Identify acceptable employee hygiene habits.
 - 19.04 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
 - 19.05 Describe the importance of industry certifications.

OCCUPATIONAL COMPLETION POINT - DATA CODE B

SOC Code 37-1012.00 - First-Line Supervisors/Managers of Landscaping, Lawn Service and Groundskeeping Workers

- 20.0 MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:
- 20.01 Maintain oil level in engines of power equipment.
 - 20.02 Check and maintain tire air pressure on equipment.
 - 20.03 Maintain fuel levels using proper fuel or fuel mixtures.

- 20.04 Operate manual transmissions.
 - 20.05 Identify, operate, and maintain tractor and power equipment.
 - 20.06 Service and maintain battery and electrical systems.
 - 20.07 Perform minor tune-up on engines.
 - 20.08 Load, secure, and transport equipment.
 - 20.09 Demonstrate safety precautions while working with tools and equipment.
- 21.0 APPLY CHEMICAL AND CALIBRATE SPRAY EQUIPMENT--The student will be able to:
- 21.01 Select, mix, and apply a nonrestricted chemical according to the label and local, state, federal, and EPA regulations.
 - 21.02 Calibrate spray and spread equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.
 - 21.03 Identify and report insect and disease damage.
 - 21.04 Determine chemical compatibility.
 - 21.05 Determine appropriate time frequency and method of chemical application.
- 22.0 CLASSIFY PLANTS AND TURFGRASS--The student will be able to:
- 22.01 Classify plants as monocots or dicots.
 - 22.02 Classify plants and turfgrass as annuals, biennials, and perennials.
 - 22.03 Identify plants and turfgrass that are specific to a region.
 - 22.04 Classify plants and turfgrass according to growth habit.
 - 22.05 Identify poisonous plants.
- 23.0 DEMONSTRATE FERTILIZATION SKILLS--The students will be able to:
- 23.01 Develop a fertilization schedule.
 - 23.02 Determine rate of fertilizer application and calibration equipment.
 - 23.03 Calibrate fertilizer equipment.
- 24.0 IRRIGATE PLANTS AND TURF--The student will be able to:
- 24.01 Identify various types of irrigation systems.
 - 24.02 Install and maintain piping and water distribution components.
 - 24.03 Install valves, timers, rain shut-offs, moisture sensors, and back flow prevention devices.
 - 24.04 Check and evaluate irrigation system performance.
 - 24.05 Maintain irrigation system.
- 25.0 LAYOUT AND/OR INSTALL LANDSCAPE AND INTERIORSCAPE--The student will be able to:
- 25.01 Layout and install plants based on the landscape plan.
 - 25.02 Prepare landscape and/or interiorscape.
 - 25.03 Prepare final grade.
 - 25.04 Install mulch and perform final cleanup.
- 26.0 MAINTAIN LANDSCAPE--The student will be able to:
- 26.01 Perform maintenance inspection of the project.
 - 26.02 Determine water requirements and apply at proper rates.
 - 26.03 Identify weeds and apply herbicides safely.

- 26.04 Determine fertilization requirements and apply at proper rates.
 - 26.05 Identify plant pest and disease problems and apply corrective measures.
 - 26.06 Trim and prune landscape plants.
 - 26.07 Maintain turf viability; mow at proper height and frequency, blade edge, line trim, and remove trash.
 - 26.08 Explain cause and effect of soil compaction and thatch buildups, and determine appropriate methods of correction.
 - 26.09 Cultivate and mulch plants.
 - 26.10 Brace and repair trees.
 - 26.11 Provide protection for plants from adverse weather conditions.
 - 26.12 Comply with local, state, and federal regulations regarding landscape maintenance and pesticide applications.
 - 26.13 Demonstrate sanitation and safety practices when maintaining landscape.
- 27.0 MAINTAIN CUSTOMER RELATIONS AND OBSERVE FOLLOW-UP PROCEDURES--The student will be able to:
- 27.01 Conduct walk-through of project with client to assure satisfaction.
 - 27.02 Identify current and future maintenance requirements.
 - 27.03 Analyze project records for profitability and employee performance.

**Florida Department of Education
STUDENT PERFORMANCE STANDARDS**

Course Number: 8106810
Course Title: Agriscience Foundations I
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of agricultural history; global importance of agriculture; career opportunities; applied scientific and technological concepts; ecosystems; agricultural safety; principles of integrated pest management; principles of plant and animal growth; economic principles; agricultural marketing; and human relations skills. The laboratory activities are an integral part of this course, which includes the safe use and application of high technology equipment, telecommunications equipment, and scientific testing and observation equipment.

01.00 DESCRIBE THE SOCIOECONOMIC ROLE OF THE AGRICULTURAL INDUSTRY--The student will be able to:

- 01.01 Prepare a report on the history of the agricultural industry. LAA.1.4, 2.4; LAB 1.4, 2.4; LAD 1.4, 2.4; LAE 1.4, 2.4 SSA 1.4, 2.4, 3.4, 4.4, 5.4
- 01.02 Discuss the impact of agricultural products and services on the local, state, national, and global economy. LAA 1.4, 2.4; LAB 1.4,2.4; LAC 1.4, 2.4,3.4; LAD 1.4,2.4;LAE 1.4, 2.4; MAE 1.4, 2.4,3.4; SSB 1.4, 2.4; SSD 1.4,2.4
- 01.03 Investigate career opportunities in the agricultural industry and identify educational experiences necessary to prepare for those careers. LAA 1.4, 2.4; LAB 1.4,2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; LAE 1.4, 2.4; SSC 1.4
- 01.04 Discuss the role of the agricultural industry in the interaction of population, food, energy, and the environment. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4,2.4,3.4; LAD 1.4, 2.4; LAE 1.4,2.4; MAD 1.4, 2.4; MAE 1.4, 2.4, 3.4; SSB 1.4, 2.4; SSD 1.4, 2.4; SCB 1.4,2.4; SCD 1.4,2.4; SCE 1.4; SCF 2.4; SCG 1.4, 2.4; SCH 1.4,3.4

02.00 APPLY SCIENTIFIC AND TECHNOLOGICAL PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

- 02.01 Discuss the importance of scientific classification in agriculture. LAA 1.4,2.4; LAC 1.4,2.4,3.4; LAD 1.4,2.4; LAE 2.4; SCA 1.4; SCH 1.4, 3.4
- 02.02 Use the scientific method to solve problems in agriculture. LAA 1.4, 2.4; LAB 1.4, 2.4; LAD 1.4, 2.4; LAE 1.4, 2.4 MAA 4.4; MAB 3.4, 4.4; MAD 1.4, 2.4; MAE 1.4, 2.4, 3.4; SCH 1.4, 2.4, 3.4
- 02.03 Explain the use of genetics in agriculture, including probability applications. LAA 1.4,2.4; LAB 1.4, 2.4; LAD 1.4,2.4; MAA 4.4; MAB 3.4,4.4; MAD 1.4, 2.4; MAE 1.4, 2.4, 3.4; SCA 2.4; SCF 1.4,2.4; SCG 1.4,2.4; SCH 1.4, 2.4, 3.4
- 02.04 Analyze the impact of recent technology on the agricultural industry. LAA 1.4,2.4; LAB 1.4, 2.4; LAD 1.4,2.4; MAE 1.4, 2.4, 3.4; SSB 1.4; SCH 3.4

- 02.05 Identify and describe the components of an ecosystem both biotic and abiotic. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; LAE 1.4, 2.4; SSB 2.4; SCA 1.4, 2.4; SCB 1.4, 2.4; SCD 1.4, 2.4; SCE 1.4; SCF 1.4, 2.4; SCG 1.4, 2.4; SCH 2.4
- 02.06 Construct and analyze a diagram of a biological food web and subsequent food chains. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 3.4; LAD 1.4; SCG 1.4, 2.4
- 02.07 Describe and diagram the water, carbon, nitrogen, oxygen, sulfur, and phosphorus cycles. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 3.4; LAD 1.4; SCA 1.4, 2.4; SCB 1.4, 2.4; SCD 1.4, 2.4; SCF 1.4, 2.4; SCG 1.4, 2.4
- 02.08 Evaluate soil profiles, land-capability classes, and soil conservation practices. LAA 1.4,2.4; LAB 1.4, 2.4; LAD 1.4, 2.4; MAA 4.4; MAB 1.4, 2.4, 3.4; SSB 1.4, 2.4; SCA 1.4, 2.4; SCC 2.4; SCD 1.4, 2.4; SCE 1.4; SCG 2.4
- 02.09 List the components of Florida's fresh water systems (lakes, ground water, aquifer, sink holes, rivers, and swamps) and explain the importance of managing these resources. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; LAE 1.4, 2.4; SSB 1.4, 2.4; SCF 1.4, 2.4; SCG 1.4, 2.4; SCH 1.4, 3.4
- 02.10 Explain the interaction of one natural resource on another. LAA 1.4,2.4; LAB 1.4, 2.4; LAD 1.4, 2.4; SSB 2.4; SCB 2.4; SCD 1.4, 2.4; SCF 1.4, 2.4; SCG 1.4, 2.4
- 02.11 Describe the causes and effects of air, water, and land pollution and identify ways to prevent pollution. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; LAE 1.4, 2.4; SSB 2.4; SCA 1.4, 2.4; SCD 1.4, 2.4; SCG 1.4, 2.4; SCH 1.4, 3.4
- 02.12 Explain the flow of energy from the sun through agricultural systems. LAA 1.4,2.4; LAB 1.4, 2.4; LAD 1.4,2.4; SCA 1.4, 2.4; SCB 1.4, 2.4; SCD 1.4, 2.4; SCE 1.4, 2.4; SCF 1.4; SCG 1.4, 2.4
- 02.13 Describe the environmental requirements necessary for a productive natural or man-made aquaculture system. LAA 1.4,2.4; LAB 1.4, 2.4; LAD 1.4,2.4; MAB 2.4; SSB 2.4; SCA 1.4, 2.4; SCD 1.4, 2.4; SCF 1.4; SCG 1.4, 2.4
- 02.14 Apply principles of waste management to environmental problems common to agricultural systems. LAA 1.4, 2.4; LAB 1.4, 2.4; LAD 1.4, 2.4; LAE 1.4, 2.4; MAB 2.4; SSB 2.4; SCD 1.4, 2.4; SCG 1.4, 2.4; SCH 1.4, 3.4
- 02.15 Understand the concept of best management practices (BMP) as applied to agriculture. LAA 1.4, 2.4; LAB 1.4,2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; LAE 1.4, 2.4; SSB 2.4
- 02.16 Identify advances in biotechnology impacting agriculture such as transgenic crops and biological controls. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; LAE 1.4, 2.4; SSA 1.4; SSB 1.4; SCF 1.4, 2.4; SCG 1.4, 2.4
- 02.17 Identify computer technology advances such as Geographic Information Systems (GIS) and Global Positioning Systems (GPS). LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; LAE 1.4, 2.4; MAC 1.4, 3.4; SSB 1.4; SCE 1.4, 2.4; SCD 1.4

03.0 PRACTICE AGRICULTURAL SAFETY--The student will be able to:

- 03.01 List the most common causes of agricultural accidents. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; LAE 1.4, 2.4; SSA 1.4
- 03.02 Discuss the importance of following proper safety precautions in the agricultural industry. LAA 1.4,2.4; LAC 1.4,2.4,3.4; LAD 1.4,2.4; LAE 2.4

- 03.03 Demonstrate safety procedures in the classroom, laboratory, and workplace. LAC 2.4
 - 03.04 Describe symptoms of pesticide poisoning. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; LAE 1.4, 2.4; SSB 2.4, SSC 3.4
 - 03.05 Extract pertinent information from a pesticide label and Material Safety Data Sheet (MSDS). LAA 1.4, 2.4; MAB 1.4, 2.4, 3.4, 4.4; MAE 1.4
 - 03.06 Select, mix, and apply a nonrestricted chemical, according to the label and according to Environmental Protection Agency (EPA), MSDS, and Worker Protection Standard regulations. LAA 1.4, LAA 2.4; MAB 2.4, MAB 3.4, MAB 1.4, MAB 4.4
 - 03.07 Clean and store pesticide application equipment, safety clothing, and safety equipment. SSC 2.4
 - 03.08 Identify the proper disposal of containers and residual pesticides. LAA 1.4, 2.4; LAB 1.4,2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; LAE 1.4, 2.4; SSC 2.4
 - 03.09 Discuss the proper procedures of basic first aid and cardiopulmonary resuscitation (CPR). LAA 1.4, 2.4; LAB 1.4,2.4; LAC 1.4, 2.4,3.4; LAD 1.4,2.4;LAE 1.4, 2.4; MAA 2.4,
- 04.0 DEMONSTRATE THE USE OF TOOLS, EQUIPMENT AND INSTRUMENTS IN THE AGRICULTURAL INDUSTRY--The student will be able to:
- 04.01 Choose the proper tools, equipment, and instruments for a specific job. MAA 1.4, MAA 2.4, MAB 2.4, MAB 1.4, MAB 4.4
 - 04.02 Describe the principles of selected mechanical applications (e.g. levers, pulleys, hydraulics, internal combustion). LAA 1.4, 2.4; LAB 2.4; MAA 1.4, 2.4, 3.4, 4.4, 5.4; MAB 1.4, 2.4, 3.4, 4.4; MAC 1.4, 2.4, 3.4; MAD 1.4, 2.4; MAE 1.4, 2.4, 3.4; SCC 1.4, 2.4
 - 04.03 Calibrate spray equipment; solve time, distance, area, volume ratio, proportion, and percentage problems in agriscience. MAA 1.4, 2.4, 3.4, 4.4, 5.4; MAB 1.4, 2.4, 3.4, 4.4; MAC 1.4, 2.4, 3.4; MAD 1.4, 2.4; MAE 1.4, 2.4, 3.4
 - 04.04 Demonstrate the ability to use an equipment manual. LAC 2.4; MAA 1.4, 2.4, 3.4; MAB 2.4; MAE 1.4
 - 04.05 Demonstrate the use of selected tools, equipment, and instruments. LAC 1.4; MAB 3.4, 4.4; MAC 1.4, 2.4, 3.4
 - 04.06 Service, maintain, and store tools, equipment, instruments, and supplies. MAA 1.4, 2.4, 3.4, 4.4, 5.4; MAB 1.4, 2.4, 3.4, 4.4; MAC 1.4, 2.4, 3.4; MAD 1.4, 2.4; MAE 1.4, 2.4, 3.4
- 05.0 DESCRIBE THE PRINCIPLES OF PEST MANAGEMENT --The student will be able to:
- 05.01 Identify types of pests and beneficials. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; LAE 1.4, 2.4; SSB 1.4, 2.4; SCF 1.4, 2.4; SCG 1.4, 2.4; SCH 3.4
 - 05.02 Identify and select an appropriate control for each type of pest and/or weed. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; LAE 1.4, 2.4; SCA 1.4, 2.4; SCF 1.4, 2.4; SCG 1.4, 2.4; SCH 1.4, 3.4
 - 05.03 Describe the principles and benefits of integrated pest management. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; LAE 1.4, 2.4; MAB 1.4, 2.4, 3.4, 4.4; MAE 1.4, 2.4, 3.4; SSB 1.4, 2.4; SCG 1.4; SCH 3.4
- 06.0 DESCRIBE THE PRINCIPLES OF PLANT AND/OR ANIMAL NUTRIENT GROWTH AND REPRODUCTION--The student will be able to:

For plant:

- 06.01 Describe the structure functions of plant parts including roots, stems, leaves, and flowers. LAA 1.4,2.4; LAB 1.4, 2.4; LAD 1.4, 2.4; SCF 1.4, 2.4
- 06.02 Describe the processes of plant growth including photosynthesis, respiration and nutrient uptake. LAA 1.4,2.4; LAB 1.4, 2.4; LAD 1.4, 2.4; MAA 1.4, 2.4, 3.4; SCA 1.4, 2.4; SCB 1.4, 2.4; SCF 1.4, 2.4
- 06.03 Propagate plants through sexual and asexual means. MAA 1.4, 2.4, 3.4; MAB 1.4; SCF 2.4
- 06.04 Identify the nutrients required for plant growth and development and the role of each. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; LAE 1.4, 2.4; SCA 1.4, 2.4; SCB 1.4, 2.4; SCF 1.4, 2.4
- 06.05 Extract pertinent information from a fertilizer label. LAA 1.4, 2.4; MAB 1.4, 2.4, 3.4, 4.4; MAE 1.4

For animal:

- 06.06 Identify the nutrients required for animal growth and development and the role of each. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; LAE 1.4, 2.4; SCA 1.4, 2.4; SCB 1.4, 2.4; SCF 1.4, 2.4
- 06.07 Identify and describe the anatomical systems of animals and the functions of each including major components. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; LAE 1.4, 2.4; SCA 1.4, 2.4; SCB 1.4, 2.4; SCF 1.4, 2.4
- 06.08 Describe the process of animal reproduction. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; LAE 1.4, 2.4; MAA 1.4, 2.4, 3.4, 4.4; MAB 1.4; MAE 1.4, 2.4, 3.4; SCF 1.4, 2.4; SCH 1.4, 3.4

07.0 APPLY BUSINESS SKILLS AND ECONOMIC PRINCIPLES TO THE AGRICULTURAL INDUSTRY--The student will be able to:

- 07.01 Explain the basic economic principles in the agricultural industry. LAA 1.4,2.4; LAB 1.4, 2.4; LAD 1.4, 2.4; MAE 1.4, 2.4, 3.4; MAC 3.4; MAD 1.4, 2.4; SSD 1.4, 2.4
- 07.02 Explain the importance and impacts of local, state, and federal regulations and required documentation affecting the agricultural industry. LAA 1.4,2.4; LAB 1.4, 2.4; LAD 1.4, 2.4; MAE 1.4, 2.4, 3.4; MAC 3.4; MAD 1.4, 2.4; SSC 1.4, 2.4
- 07.03 Describe the types of agribusiness by organizational structure (i.e. sole proprietorship, partnership, corporation, cooperatives). LAA 1.4,2.4; LAB 1.4, 2.4; LAD 1.4, 2.4; MAA 1.4; MAB 2.4; SSD 2.4
- 07.04 Select and use computer applications. LAA 1.4, 2.4
- 07.05 Analyze and interpret agribusiness data. LAA 1.4,2.4; LAB 1.4, 2.4; LAD 1.4, 2.4; MAE 1.4, 2.4, 3.4; MAD 1.4; 2.4; SSD 1.4, 2.4
- 07.06 Keep and maintain supervised agricultural experience (SAE) records. LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 1.4, 2.4, 3.4, 4.4, 5.4; MAB 1.4, 2.4, 3.4, 4.4; MAC 1.4, 2.4, 3.4; MAD 1.4, 2.4; MAE 1.4, 2.4, 3.4; SSA 1.4
- 07.07 Interpret legal descriptions of land. LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 1.4; 4.4; MAB 2.4; MAC 1.4, 2.4, 3.4; MAE 1.4; SSB 1.4; 2.4

08.0 EXPLAIN THE BASIC MARKETING PROCESSES IN THE AGRICULTURAL INDUSTRY--
The student will be able to:

- 08.01 Describe key factors in marketing agricultural products. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; LAE 1.4, 2.4; MAE 1.4, 2.4, 3.4; MAC 3.4; MAD 1.4, 2.4; SSC 1.4; SSD 1.4, 2.4
- 08.02 Select agricultural products according to grades and standards. LAA 1.4, LAA 2.4; MAA 1.4, 2.4, 3.4, 4.4; MAB 1.4, 2.4, 3.4, 4.4; MAC 1.4, 2.4, 3.4; MAD 1.4, 2.4; MAE 1.4, 2.4, 3.4; SSD 1.4, 2.4

09.0 DEMONSTRATE HUMAN-RELATIONS, COMMUNICATIONS, AND LEADERSHIP SKILLS--
The student will be able to:

- 09.01 Demonstrate acceptable work habits and attitudes. LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; SSB 2.4; SSC 1.4
- 09.02 Correctly follow oral and written directions and ask questions that clarify directions, as needed. LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4
- 09.03 Communicate effectively in verbal, written, and nonverbal modes. LAC 1.4, 2.4, 3.4
- 09.04 Recognize and demonstrate good listening skills. LAC 1.4
- 09.05 Conduct small informal and formal group meetings. LAC 1.4, 2.4, 3.4; SSC 1.4, 2.4
- 09.06 Identify the opportunities for leadership development available through an appropriate student and/or professional organization. LAC 1.4, 2.4, 3.4; SSC 1.4, 2.4
- 09.07 Recognize and demonstrate communications skills in the workplace. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4
- 09.08 Demonstrate effective telephone skills. LAB 2.4; LAC 1.4, 3.4; LAD 1.4, 2.4

**Florida Department of Education
STUDENT PERFORMANCE STANDARDS**

Course Number: 8121510
Course Title: Introductory Horticulture 2
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of career opportunities; global importance of agriculture; plant classification; propagation; growing media; nutritional needs; fertilization; irrigation; pest identification; pest control, pruning; plant installation; transplanting; safe hand-tool use; and employability skills.

10.0 DESCRIBE THE HORTICULTURE INDUSTRY--The student will be able to:

- 10.01 Describe the importance of horticulture to the American and global economies. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 2.4, 3.4; LAD 1.4, 2.4; MAA 1.4, 2.4, 3.4; MAE 1.4, 2.4, 3.4; SCA 1.4; SSA 5.4, SSD 1.4, 2.4
- 10.02 Identify career opportunities in horticulture and educational requirements and continuing education opportunities for horticulture careers. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 2.4, 3.4; LAD 1.4, 2.4; MAD 1.4, 2.4; MAE 1., 2.4, 3.4; SCD 2.4; SCG 1.4, 2.4; SCH 3.4; SSD 1.4, 2.4
- 10.03 Describe the importance of horticulture to the environment. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAD 1.4, 2.4; MAE 1.4, 2.4, 3.4; SCD 2.4; SCG 1.4, 2.4; SCH 3.4; SSA 1.4; SSB 2.4; SSD 1.4, 2.4
- 10.04 Identify professional organizations and certifications for the horticultural industry. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; LAE 1.4, 2.4

11.0 IDENTIFY AND CLASSIFY PLANTS--The student will be able to:

- 11.01 Identify plants by scientific and common names. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4
- 11.02 Classify plants botanically. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 1.4, 2.4, 3.4; SCF 1.4, 2.4; SCG 1.4, 2.4; SCH 14, 2.4, 3.4

12.0 PROPAGATE PLANTS--The student will be able to:

- 12.01 Identify propagating and growing facilities and structures. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4
- 12.02 Prepare propagation media. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAB 3.4, 4.4; SCB 1.4, 2.4; SCD 1.4, 2.4; SCF 1.4, 2.4; SCG 1.4, 2.4
- 12.03 Select and collect propagation materials. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAB 3.4, 4.4; SCF 2.4; SCG 1.4
- 12.04 Demonstrate propagation by sexual and asexual methods. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 1.4, 2.4, 3.4; MAD 1.4, 3.4; SCG 1.4

- 12.05 Demonstrate environmental controls for propagation materials. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 1.4, 2.4, 3.4; MAD 1.4, 3.4; SCD 1.4
- 13.0 IDENTIFY GROWING MEDIA AND APPLY FERTILIZERS--The student will be able to:
- 13.01 Identify soil and media materials. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 3.4; MAB 1.4, 2.4, 3.4; MAD 2,4; SCA 1.4, 2.4; SCB 2.4, SCD 1.4, 2.4; SCE 1.4; SCF 1.4; SCG 1.4 2,4; SCH 1.4, 2.4, 3.4
- 13.02 Identify nutritional needs of plants. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 3.4; MAB 1.4, 2.4, 3.4; MAD 2,4; SCA 1.4, 2.4; SCB 2.4, SCD 1.4, 2.4; SCE 1.4; SCF 1.4 ; SCG 1.4 2,4; SCH 1.4, 2.4, 3.4
- 13.03 Identify symptoms of nutritional deficiencies and toxicities of plants. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 3.4; MAB 1.4, 2.4, 3.4; MAD 2,4; SCA 1.4, 2.4; SCB 2.4, SCD 1.4, 2.4; SCE 1.4; SCF 1.4; SCG 1.4 2,4; SCH 1.4, 2.4, 3.4
- 13.04 Identify types and kinds of fertilizers. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 3.4; MAB 1.4, 2.4, 3.4; MAD 2,4; SCA 1.4, 2.4; SCB 2.4, SCD 1.4, 2.4; SCE 1.4; SCF 1.4; SCG 1.4 2,4; SCH 1.4, 2.4, 3.4
- 13.05 Identify methods of distributing fertilizers. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 3.4; MAB 1.4, 2.4, 3.4; MAD 2,4; SCA 1.4, 2.4; SCB 2.4, SCD 1.4, 2.4; SCE 1.4; SCF 1.4; SCG 1.4 2,4; SCH 1.4, 2.4, 3.4
- 14.0 IRRIGATE PLANTS AND TURF--The student will be able to:
- 14.01 Identify water needs of plants. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; SCA 1.4, 2.4; SCD 1.4, 2.4; SCG 1.4, 2.4
- 14.02 Irrigate plants at recommended rates. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAB 1.4, 2.4, 3.4, 4.4; MAE 1.4, 2.4; SCA 1.4; SCG 1.4, 2.4; SCH 1.4
- 15.0 DESCRIBE PEST CONTROL APPROACHES--The student will be able to:
- 15.01 Identify common pests of plants. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; SCF 1.4, 2.4; SCG 1.4, 2.4; SCH 3.4
- 15.02 Describe life cycles of common pests of plants. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; SCF 1.4, 2.4; SCG 1.4, 2.4; SCH 3.4
- 19.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATIONS AND HUMAN RELATIONS SKILLS--The student will be able to:
- 19.01 Conduct group meetings using parliamentary procedure and public speaking skills. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; LAE 1.4, 2.4; SSA 5.4; SSB 2.4, SSC 1.4, 2.4

**Florida Department of Education
STUDENT PERFORMANCE STANDARDS**

Course Number: 8121520
Course Title: Horticulture Science 3
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of industry regulations; plant classification; plant transportation; soil sampling and analysis; fertilizer calculations; recording keeping; irrigation components, water quality; drainage; integrated pest management; pesticide safety and regulations; equipment calibration; chemical growth regulators; xeriscaping; integrated landscape management; safe use of power equipment; record keeping; and employability skills.

11.0 IDENTIFY AND CLASSIFY PLANTS--The student will be able to:

- 11.03 Describe principles of plant biology and growth. LAA 1.4, 2.4; LAB 1.4, 2.4; LAD 1.4, 2.4; MAA 1.4, 2.4, 3.4; SCA 1.4, 2.4; SCB 1.4, 2.4; SCF 1.4, 2.4; SCG 1.4, 2.4
- 11.04 Explain the functional use of plants. LAA 1.4,2.4; LAB 1.4, 2.4; LAD 1.4, 2.4; SCF 1.4, 2.4

13.0 IDENTIFY GROWING MEDIA AND APPLY FERTILIZERS--The student will be able to:

- 13.06 Interpret information on fertilizer label. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 3.4; MAB 1.4, 2.4, 3.4; MAD 2,4; SCA 1.4, 2.4; SCB 2.4, SCD 1.4, 2.4; SCE 1.4; SCF 1.4; SCG 1.4 2,4; SCH 1.4, 2.4, 3.4
- 13.07 Apply fertilizer and soil amendments. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 3.4; MAB 1.4, 2.4, 3.4; MAD 2,4; SCA 1.4, 2.4; SCB 2.4, SCD 1.4, 2.4; SCE 1.4; SCF 1.4; SCG 1.4 2,4; SCH 1.4, 2.4, 3.4

15.0 DESCRIBE PEST CONTROL APPROACHES--The student will be able to:

- 15.03 Classify insects according to feeding habits. LAA 14, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; SCA 1.4, 2,4; SCF 1.4, 2.4; SCG 1.4, 2.4; SCH 1.4, 3.4
- 15.04 Describe biological, chemical, and cultural methods of controlling plant pests. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; SCA 1.4, 2.4; SCD 2.4; SCF 1.4; SCG 1.4, 2.4

16.0 CONTROL PLANT GROWTH--The student will be able to:

- 16.01 Identify methods of pruning plants. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4
- 16.02 Identify appropriate time to prune plants. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; SCG 1.4, 2.4
- 16.03 Identify and select pruning tools. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4

- 17.0 HARVEST, TRANSPORT, AND INSTALL PLANT MATERIALS--The student will be able to:
- 17.01 Determine requirements for preserving plant viability. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 1.4; SCG 1.4; SCH 3.4
 - 17.02 Install containerized plant materials. LAA 1.4, LAB 1.4, 2.4; LAC 1.4 2.4, 3.4; LAD 1.4, 2.4; MAB 1.4, 2.4, 3.4, 4.4; MAC 3.4; SCG 1.4, 2.4; SCH 3.4
 - 17.03 Select and prepare plants for transporting and transplanting. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAC 3.4; SCG 1.4, 2.4; SCH 3.4
- 18.0 OPERATE, REPAIR, AND MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:
- 18.01 Perform equipment pre-operational check. LAA 1.4, LAB 1.4; LAC 1.4, 2.4; MAA 1.4, 2.4, 3.4, 4.4; MAB 1.4, 2.4, 3.4, 4.4
 - 18.02 Identify, maintain, and operate hand tools and power tools. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAB 2.4, 3.4
- 19.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATIONS AND HUMAN RELATIONS SKILLS--The student will be able to:
- 19.02 Identify acceptable work habits and personal characteristics. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; SSB 2.4
 - 19.03 Identify acceptable employee hygiene habits. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; SSB 2.4
 - 19.04 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; SSB 2.4
 - 19.05 Describe the importance of industry certifications. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; SSB 2.4

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8121310
Course Title: Landscape and Turf Science 4
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to further develop competencies in the areas of use and maintenance of landscape and turf equipment; classification of plants and turfgrass; fertilization; and irrigation.

20.0 MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:

- 20.01 Maintain oil level in engines of power equipment.
- 20.02 Check and maintain tire air pressure on equipment.
- 20.03 Maintain fuel levels using proper fuel or fuel mixtures.
- 20.04 Operate manual transmissions.
- 20.05 Identify, operate, and maintain tractor and power equipment.

21.0 APPLY CHEMICAL AND CALIBRATE SPRAY EQUIPMENT--The student will be able to:

- 21.01 Select, mix, and apply a nonrestricted chemical according to the label and local, state, federal, and EPA regulations.
- 21.03 Identify and report insect and disease damage.

22.0 CLASSIFY PLANTS AND TURFGRASS--The student will be able to:

- 22.01 Classify plants as monocots or dicots.
- 22.02 Classify plants and turfgrass as annuals, biennials, and perennials.
- 22.03 Identify plants and turfgrass that are specific to a region.

23.0 DEMONSTRATE FERTILIZATION SKILLS--The students will be able to:

- 23.01 Develop a fertilization schedule.

24.0 IRRIGATE PLANTS AND TURF--The student will be able to:

- 24.01 Identify various types of irrigation systems.
- 24.02 Install and maintain piping and water distribution components.
- 24.03 Install valves, timers, rain shut-offs, moisture sensors, and back flow prevention devices.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8121320
Course Title: Landscape and Turf Science 5
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to further develop competencies in the areas of chemical application; equipment calibration; analyzing and designing landscape and turf; preparing estimates and contracts; and lay out and installation of landscape, interiorscape and turf.

20.0 MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:

- 20.06 Service and maintain battery and electrical systems.
- 20.07 Perform minor tune-up on engines.
- 20.08 Load, secure, and transport equipment.
- 20.09 Demonstrate safety precautions while working with tools and equipment.

21.0 APPLY CHEMICAL AND CALIBRATE SPRAY EQUIPMENT--The student will be able to:

- 21.02 Calibrate spray and spread equipment.
- 21.04 Determine chemical compatibility.
- 21.05 Determine appropriate time frequency and method of chemical application.

22.0 CLASSIFY PLANTS AND TURFGRASS--The student will be able to:

- 22.04 Classify plants and turfgrass according to growth habit.
- 22.05 Identify poisonous plants.

23.0 DEMONSTRATE FERTILIZATION SKILLS--The students will be able to:

- 23.02 Determine rate of fertilizer application and calibration equipment.
- 23.03 Calibrate fertilizer equipment.

24.0 IRRIGATE PLANTS AND TURF--The student will be able to:

- 24.04 Check and evaluate irrigation system performance.
- 24.05 Maintain irrigation system.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8121330
Course Title: Landscape Operations 6
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to further develop competencies in the areas of chemical application; equipment calibration; analyzing and designing landscape and turf; preparing estimates and contracts; and lay out and installation of landscape, interiorscape and turf.

25.0 LAYOUT AND/OR INSTALL LANDSCAPE AND INTERIORSCAPE--The student will be able to:

- 25.01 Layout and install plants based on the landscape plan.
- 25.02 Prepare landscape and/or interiorscape.
- 25.03 Prepare final grade.
- 25.04 Install mulch and perform final cleanup.

26.0 MAINTAIN LANDSCAPE--The student will be able to:

- 26.01 Perform maintenance inspection of the project.
- 26.02 Determine water requirements and apply at proper rates.
- 26.03 Identify weeds and apply herbicides safely.
- 26.04 Determine fertilization requirements and apply at proper rates.
- 26.05 Identify plant pest and disease problems and apply corrective measures.
- 26.06 Trim and prune landscape plants.
- 26.07 Maintain turf viability; mow at proper height and frequency, blade edge, line trim, and remove trash.
- 26.08 Explain cause and effect of soil compaction and thatch buildups, and determine appropriate methods of correction.
- 26.09 Cultivate and mulch plants.
- 26.10 Brace and repair trees.
- 26.11 Provide protection for plants from adverse weather conditions.
- 26.12 Comply with local, state, and federal regulations regarding landscape maintenance and pesticide applications.
- 26.13 Demonstrate sanitation and safety practices when maintaining landscape.

27.0 MAINTAIN CUSTOMER RELATIONS AND OBSERVE FOLLOW-UP PROCEDURES--The student will be able to:

- 27.01 Conduct walk-through of project with client to assure satisfaction.
- 27.02 Identify current and future maintenance requirements.
- 27.03 Analyze project records for profitability and employee performance.

Florida Department of Education
INTENDED OUTCOMES

Program Title: Horticulture Science and Services

SECONDARY

Program Number 8121600
 CIP Number 0101.060610
 Grade Level 9-12, 30, 31
 Standard Length 6 credits
 Certification VOC AGRI @4
 AGRICULTUR 1 @2
 AGRI @4
 HORTICULT #7

Program SOC Code 11.9011-01 - Nursery and Greenhouse Managers

INTENDED OUTCOMES: After successfully completing appropriate outcomes for each occupational completion point of this program, the student will be able to perform the following:

OCCUPATIONAL COMPLETION POINT - DATA CODE A

Horticulture Worker I - DOT Code 405.684-014 (CORE)

- 01.0 Describe the history of agriculture and its influence on the global economy.
- 02.0 Practice agriscience safety skills and procedures.
- 03.0 Apply scientific and technological principles to agriscience issues.
- 04.0 Apply environmental principles to the agricultural industry.
- 05.0 Investigate and utilize basic scientific skills and principles in plant science.
- 06.0 Investigate and utilize basic scientific skills and principles in animal science.
- 07.0 Demonstrate the use of agriscience tools, equipment, and instruments.
- 08.0 Demonstrate agribusiness, employability & human relation skills.
- 09.0 Apply leadership and citizenship skills.
- 10.0 Describe the horticulture industry.
- 11.0 Identify and classify plants.
- 12.0 Propagate plants.
- 13.0 Identify growing media and apply fertilizers.
- 14.0 Irrigate plants and turf.
- 15.0 Describe pest control approaches.
- 16.0 Control plant growth.
- 17.0 Harvest, transport, and install plant materials.
- 18.0 Operate, repair, and maintain tools and equipment.
- 19.0 Demonstrate leadership, employability, communications, and human relations skills.

OCCUPATIONAL COMPLETION POINT - DATA CODE B

Horticultural Specialty Grower, Inside - DOT Code 405.161-018

- 20.0 Identify and classify plants.
- 21.0 Control pests.
- 22.0 Operate, repair, and maintain tools and equipment.
- 23.0 Prepare growing media.
- 24.0 Irrigate plants.
- 25.0 Fertilize plant materials.
- 26.0 Maintain and analyze records.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Horticultural Science and Services
Secondary Number: 8121600
Postsecondary Number:

OCCUPATIONAL COMPLETION POINT - DATA CODE A

Nursery Workers - SOC Code - 45-2092.01 (CORE)

- 01.0 Describe the history of agriculture and its influence on the global economy--The student will be able to:
- 01.01 Investigate the history of agriculture and its relationship to science and technology.
 - 01.02 Analyze the impact of agriculture on the local, state, national and global economy.
 - 01.03 Identify significant career patterns/shifts in the history of the agricultural industry.
 - 01.04 Examine the role of the agricultural industry in the interaction of population, food, energy, and the environment.
- 02.0 Practice agriscience safety skills and procedures --The student will be able to:
- 02.01 List the common causes of accidents in agriscience operations.
 - 02.02 Demonstrate proper safety precautions and use of personal protective equipment.
 - 02.03 Extract and utilize pertinent information from a container label and/or Material Safety Data Sheet (MSDS) following Environmental Protection Agency (EPA), Worker Protection Standard, and Occupational Safety and Health Agency (OSHA) regulations.
 - 02.04 Identify proper disposal of hazardous waste materials and biohazards.
 - 02.05 Describe emergency procedures.
- 03.0 Apply scientific and technological principles to agriscience issues--The student will be able to:
- 03.01 Employ scientific measurement skills.
 - 03.02 Demonstrate safe and effective use of common laboratory equipment.
 - 03.03 Identify the parts and functions of plant and animal cells.
 - 03.04 Describe the phases of cell reproduction.
 - 03.05 Implement the scientific method and science process skills through the design and completion of an agriscience research project.
 - 03.06 Interpret, analyze, and report data.
 - 03.07 Investigate DNA and genetics applications in agriscience including the theory of probability.
 - 03.08 Evaluate advances in biotechnology that impact agriculture (e.g. transgenic crops, biological controls, etc.).
- 04.0 Apply environmental principles to the agricultural industry --The student will be able to:

- 04.01 Determine how different climactic and geological activity influences agriculture.
 - 04.02 Describe various ecosystems as they relate to the agriculture industry.
 - 04.03 Describe the environmental resources (soil, water, air) necessary for agriculture production.
 - 04.04 Identify regulatory agencies that impact agricultural practices.
 - 04.05 Apply Best Management Practices that enhance the natural environment.
 - 04.06 Identify conservation practices related to natural resources.
- 05.0 Investigate and utilize basic scientific skills and principles in plant science --The student will be able to:
- 05.01 Identify and describe the specializations within the plant science industry.
 - 05.02 Categorize plants based on specific characteristics according to industry and scientific standards.
 - 05.03 Examine the processes of plant growth including photosynthesis and respiration.
 - 05.04 Identify the nutrients required for plant growth from the periodic table and explain their functions.
 - 05.05 Analyze information from a fertilizer label.
 - 05.06 Propagate and grow plants through sexual and/or asexual reproduction.
 - 05.07 Investigate the impacts of various pests and propose solutions for their control.
 - 05.08 Investigate the nature and properties of food, fiber, and by-products from plants.
 - 05.09 Explore career opportunities in plant science.
- 06.0 Investigate and utilize basic scientific skills and principles in animal science --The student will be able to:
- 06.01 Investigate the origin, history, and domestication of animals.
 - 06.02 Explain the economic importance of animals and the products obtained from animals.
 - 06.03 Categorize animals according to use, type, breed, and scientific classification.
 - 06.04 Employ correct terminologies for animal species and conditions (e.g. age, sex, etc.) within those species.
 - 06.05 Compare basic internal & external anatomy of animals.
 - 06.06 Demonstrate approved practices in the management, health, safety, and technology of the animal industry.
 - 06.07 Discuss animal welfare issues.
 - 06.08 Investigate the nature and properties of food, fiber, and by-products from animals.
 - 06.09 Explore career opportunities in animal science.
- 07.0 Demonstrate the use of agriscience tools, equipment, and instruments -
-The student will be able to:
- 07.01 Select and demonstrate the use of agriscience tools, equipment, and instruments.
 - 07.02 Describe various physical science principles as applied in selected mechanical applications (e.g. levers, pulleys, hydraulics, and internal combustion).
 - 07.03 Solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

- 07.04 Service and maintain agriscience equipment, instruments, facilities, and supplies.
- 08.0 Demonstrate agribusiness, employability & human relation skills --The student will be able to:
 - 08.01 Develop, implement, and maintain work based learning through Supervised Agricultural Experiences (SAE).
 - 08.02 Utilize a record keeping system to collect, interpret, and analyze data.
 - 08.03 Enhance oral communications through telephone, interview and presentation skills.
 - 08.04 Enhance written communication by developing resumes and business letters.
 - 08.05 Demonstrate interpersonal (nonverbal) communication skills.
 - 08.06 Demonstrate good listening skills.
- 09.0 Apply leadership and citizenship skills --The student will be able to:
 - 09.01 Identify and describe leadership characteristics.
 - 09.02 Identify opportunities to apply acquired leadership skills.
 - 09.03 Identify and demonstrate ways to be an active citizen.
 - 09.04 Participate in community based learning activities.
 - 09.05 Demonstrate the ability to work cooperatively.
 - 09.06 Conduct formal and informal meetings using correct parliamentary procedure skills. Identify the opportunities for leadership development available through the National FFA Organization and/or professional organizations.
- 10.0 DESCRIBE THE HORTICULTURE INDUSTRY--The student will be able to:
 - 10.01 Describe the importance of horticulture to the American and global economies.
 - 10.02 Identify career opportunities in horticulture and educational requirements and continuing education opportunities for horticulture careers.
 - 10.03 Describe the importance of horticulture to the environment.
 - 10.04 Identify professional organizations and certifications for the horticultural industry.
- 11.0 IDENTIFY AND CLASSIFY PLANTS--The student will be able to:
 - 11.01 Identify plants by scientific and common names.
 - 11.02 Classify plants botanically.
 - 11.03 Describe principles of plant biology and growth.
 - 11.04 Explain the functional use of plants.
- 12.0 PROPAGATE PLANTS--The student will be able to:
 - 12.01 Identify propagating and growing facilities and structures.
 - 12.02 Prepare propagation media.
 - 12.03 Select and collect propagation materials.
 - 12.04 Demonstrate propagation by sexual and asexual methods.
 - 12.05 Demonstrate environmental controls for propagation materials.
- 13.0 IDENTIFY GROWING MEDIA AND APPLY FERTILIZERS--The student will be able to:
 - 13.01 Identify soil and media materials.
 - 13.02 Identify nutritional needs of plants.

- 13.03 Identify symptoms of nutritional deficiencies and toxicities of plants.
 - 13.04 Identify types and kinds of fertilizers.
 - 13.05 Identify methods of distributing fertilizers.
 - 13.06 Interpret information on fertilizer label.
 - 13.07 Apply fertilizer and soil amendments.
- 14.0 IRRIGATE PLANTS AND TURF--The student will be able to:
- 14.01 Identify water needs of plants.
 - 14.02 Irrigate plants at recommended rates.
- 15.0 DESCRIBE PEST CONTROL APPROACHES--The student will be able to:
- 15.01 Identify common pests of plants.
 - 15.02 Describe life cycles of common pests of plants.
 - 15.03 Classify insects according to feeding habits.
 - 15.04 Describe biological, chemical, and cultural methods of controlling plant pests.
- 16.0 CONTROL PLANT GROWTH--The student will be able to:
- 16.01 Identify methods of pruning plants.
 - 16.02 Identify appropriate time to prune plants.
 - 16.03 Identify and select pruning tools.
- 17.0 HARVEST, TRANSPORT, AND INSTALL PLANT MATERIALS--The student will be able to:
- 17.01 Determine requirements for preserving plant viability.
 - 17.02 Install containerized plant materials.
 - 17.03 Select and prepare plants for transporting and transplanting.
- 18.0 OPERATE, REPAIR, AND MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:
- 18.01 Perform equipment pre-operational check.
 - 18.02 Identify, maintain, and operate hand tools and power tools.
- 19.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATIONS AND HUMAN RELATIONS SKILLS--The student will be able to:
- 19.01 Conduct group meetings using parliamentary procedure and public speaking skills.
 - 19.02 Identify acceptable work habits and personal characteristics.
 - 19.03 Identify acceptable employee hygiene habits.
 - 19.04 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
 - 19.05 Describe the importance of industry certifications.
- OCCUPATIONAL COMPLETION POINT - DATA CODE B**
 SOC Code 11.9011-01 - Nursery and Greenhouse Managers
- 20.0 IDENTIFY AND CLASSIFY PLANTS--The student will be able to:
- 20.01 Classify plants as monocots or dicots.
 - 20.02 Classify plants as annuals, biennials, and perennials.
 - 20.03 Identify plants appropriate to a region.
 - 20.04 Classify plants according to growth habit.

- 20.05 Prepare propagation materials (seeds, cuttings, etc.) for planting.
 - 20.06 Apply growth stimulants to propagation materials.
 - 20.07 Demonstrate sanitation and safety practices when propagating.
 - 20.08 Prepare flats and seedbeds and plant seeds.
- 21.0 CONTROL PESTS--The student will be able to:
- 21.01 Report insect and disease damage.
 - 21.02 Identify chemical spray damage.
 - 21.03 Select proper IPM practices (biological, chemical and physical) for control of insects, diseases, vertebrates and weeds.
 - 21.04 Evaluate the efficacy and phytotoxicity of a chemical prior to inclusion in a growing program.
- 22.0 OPERATE, REPAIR, AND MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:
- 22.01 Identify, operate, and maintain tractor and power equipment.
 - 22.02 Load, secure, and transport equipment.
- 23.0 PREPARE GROWING MEDIA--The student will be able to:
- 23.01 Sterilize rooting, potting, and growing media.
 - 23.02 Adjust pH and nutritional levels of media.
 - 23.03 Fill and level benches and pots with media.
 - 23.04 Demonstrate sanitation practices when handling and storing plant media materials.
- 24.0 IRRIGATE PLANTS--The student will be able to:
- 24.01 Set up an irrigation system for a propagation area.
 - 24.02 Set up an irrigation system for a growing structure.
 - 24.03 Set up an irrigation system for a retail display.
 - 24.04 Maintain and repair an irrigation system.
 - 24.05 Identify and use various types of irrigation systems (low volume, ebb and flow, drip, mat, recirculating, etc.).
- 25.0 FERTILIZE PLANT MATERIALS--The student will be able to:
- 25.01 Collect soil and leaf tissue samples for analysis.
 - 25.02 Interpret and evaluate the results of soil and leaf tissue analysis and determine corrective actions.
 - 25.03 Demonstrate proper handling and storage of fertilizers, observing safety precautions.
 - 25.04 Evaluate, operate, and maintain fertilizer distribution equipment.
 - 25.05 Develop a fertilization schedule for various plant species.
 - 25.06 Determine rate of fertilizer application.
- 26.0 MAINTAIN AND ANALYZE RECORDS--The student will be able to:
- 26.01 Analyze and maintain production and sales records.
 - 26.02 Determine plant production costs.
 - 26.03 Prepare a budget.
 - 26.04 Prepare and maintain financial records using computer software.
 - 26.05 Maintain current plant inventory.
 - 26.06 Maintain job records, daily log sheets, and inventory.

**Florida Department of Education
STUDENT PERFORMANCE STANDARDS**

Course Number: **8106810**
 Course Title: **Agriscience Foundations I**
 Course Credit: **1**

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of agricultural history and the global impact of agriculture; career opportunities; scientific and research concepts; biological and physical science principles; environmental principles; agriscience safety; principles of leadership; and agribusiness, employability, and human relations skills in agriscience. Laboratory-based activities are an integral part of this course. These include the safe use and application of appropriate technology, scientific testing and observation equipment.

01.0 Describe the history of agriculture and its influence on the global economy--The student will be able to:

- 01.01 Investigate the history of agriculture and its relationship to science and technology. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SS.A.1.4.1, 4; SS.A.2.4.1, 2; SS.A.3.4.1, 5, 8; SS.A.3.4.9; SS.A.5.4.1; SS.B.1.4.1, 4; SC.H.3.4.2, 3, 5, 6; SC.D.1.4.3, 4
- 01.02 Analyze the impact of agriculture on the local, state, national and global economy. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; MA.A.2.4.1, 2; MA.A.3.4.1, 3; MA.E.1.4.1, 2; SS.A.3.4.3, 8, 10; SS.A.4.4.1, 6; SS.A.5.4.3, 5; SS.B.2.4.1, 4; SC.H.3.4.2, 3, 5, 6; SC.B.1.4.5; SC.D.1.4.1, 3; SC.D.2.4.1
- 01.03 Identify significant career patterns/shifts in the history of the agricultural industry. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SS.A.1.4.1; SS.A.3.4.5; SS.A.5.4.2; SS.B.2.4.4; SC.H.3.4.2, 3, 5, 6; SC.B.1.4.5; SC.D.1.4.1, 3; SC.D.1.4.4; SC.H.1.4.2
- 01.04 Examine the role of the agricultural industry in the interaction of population, food, energy, and the environment. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; MA.D.1.4.1; MA.D.2.4.1; MA.E.1.4.1; SS.A.4.4.1, 2; SS.A.5.4.1, 2; SS.B.1.4.4; SS.B.2.4.1; SS.B.2.4.2, 4, 6; SS.D.1.4.1; SC.H.3.4.2, 3, 5, 6; SC.B.1.4.5; SC.D.1.4.1, 3, 4; SC.D.2.4.1; SC.G.2.4.6

02.0 Practice agriscience safety skills and procedures --The student will be able to:

- 02.01 Identify the common causes of accidents in agriscience operations. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1
- 02.02 Demonstrate proper safety precautions and use of personal protective equipment.
- 02.03 Extract and utilize pertinent information from a container label and/or Material Safety Data Sheet (MSDS) following Environmental Protection Agency (EPA), Worker Protection Standard, and Occupational Safety and Health Agency (OSHA) regulations. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3;

- LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; MA.A.1.4.1; MA.A.3.4.1; MA.B.1.4.1, 2; MA.B.2.4.2; MA.B.3.4.1; MA.B.4.4.1, 2; MA.E.1.4.1
- 02.04 Identify proper disposal of hazardous waste materials and biohazards. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1
- 02.05 Describe emergency procedures. LA.C.3.4.1; LA.C.3.4.2; LA.C.3.4.3
- 03.0 Apply scientific and technological principles to agriscience issues--
The student will be able to:
- 03.01 Employ scientific measurement skills. MA.A.1.4.1; MA.A.2.4.2; MA.B.2.4.1, 2; MA.B.4.4.1; SC.B.1.4.3; SC.H.1.4.1
- 03.02 Demonstrate safe and effective use of common laboratory equipment. SC.H.1.4.1
- 03.03 Identify the parts and functions of plant and animal cells. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SC.B.1.4.1, 2; SC.F.1.4.1, 2, 3, 7, 8; SC.F.2.4.1
- 03.04 Describe the phases of cell reproduction. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SC.B.1.4.1, 2; SC.F.1.4.1, 2, 3, 7, 8; SC.F.2.4.1; SC.G.1.4.1
- 03.05 Implement the scientific method and science process skills through the design and completion of an agriscience research project. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; MA.E.3.4.1, 2; SC.H.1.4.1, 2, 3; SC.H.2.4.1, 2
- 03.06 Interpret, analyze, and report data. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; MA.E.1.4.1, 2, 3; MA.E.2.4.1, 2; SC.B.1.4.3, SC.H.1.4.1, 2, 3, 4, 7
- 03.07 Investigate DNA and genetics applications in agriscience including the theory of probability. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; MA.E.2.4.1, 2; SC.F.2.4.2, 3; SC.G.2.4.3
- 03.08 Evaluate advances in biotechnology that impact agriculture (e.g. transgenic crops, biological controls, etc.). LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SC.F.2.4.2, 3; SC.G.2.4.3
- 04.0 Apply environmental principles to the agricultural industry --The student will be able to:
- 04.01 Determine how different climactic and geological activity influences agriculture. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SS.B.1.4.1; SS.B.2.4.4; SC.B.1.4.5; SC.D.1.4.1, 2, 3; SC.D.2.4.1; SC.G.1.4.1
- 04.02 Describe various ecosystems as they relate to the agriculture industry. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SC.B.1.4.1, 2; SC.D.1.4.1, 2, 3; SC.D.2.4.1; SC.G.1.4.1; SC.G.2.4.2, 4; SC.G.2.4.5, 6
- 04.03 Describe the environmental resources (soil, water, air) necessary for agriculture production. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SS.B.2.4.1, 6; SC.B.1.4.1, 2, 5; SC.D.1.4.1, 2, 3; SC.D.2.4.1; SC.G.1.4.1; SC.G.2.4.2, 4, 5, 6
- 04.04 Identify regulatory agencies that impact agricultural practices. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SC.B.1.4.5; SC.D.1.4.1, 2, 3; SC.D.2.4.1; SC.G.1.4.1; SC.G.2.4.2, 4; SC.G.2.4.5, 6

- 04.05 Apply Best Management Practices that enhance the natural environment. SC.B.1.4.5; SC.D.1.4.1, 2, 3; SC.D.2.4.1; SC.G.1.4.1; SC.G.2.4.2, 4, 5, 6
- 04.06 Identify conservation practices related to natural resources. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SC.B.1.4.1, 2, 5; SC.D.1.4.1, 2, 3; SC.D.2.4.1; SC.G.1.4.1; SC.G.2.4.2, 3, 4, 5, 6
- 05.0 Investigate and utilize basic scientific skills and principles in plant science --The student will be able to:
- 05.01 Identify and describe the specializations within the plant science industry. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1
- 05.02 Categorize plants based on specific characteristics according to industry and scientific standards. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SC.G.1.4.1
- 05.03 Examine the processes of plant growth including photosynthesis and respiration. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SC.B.1.4.1, 2; SC.D.1.4.1; SC.F.1.4.1, 2, 3, 7, 8; SC.G.2.4.2
- 05.04 Identify the nutrients required for plant growth from the periodic table and explain their functions. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SC.D.1.4.1, 2; SC.F.1.4.1, 2, 3, 7, 8; SC.G.2.4.2
- 05.05 Analyze information from a fertilizer label. MA.E.1.4.1; MA.B.1.4.1, 2; MA.B.2.4.1, 2; MA.B.3.4.1; MA.B.4.4.1, 2; SC.A.2.4.5
- 05.06 Propagate and grow plants through sexual and/or asexual reproduction. SC.B.1.4.1, 2; SC.D.1.4.1, 2; SC.F.1.4.1, 2, 3, 7, 8; SC.F.2.4.1, 3; SC.G.2.4.3
- 05.07 Investigate the impacts of various pests and propose solutions for their control. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SC.B.1.4.1, 2; SC.D.1.4.1; SC.F.1.4.1, 2, 3, 7, 8; SC.G.1.4.1; SC.G.2.4.2
- 05.08 Investigate the nature and properties of food, fiber, and by-products from plants. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SC.B.1.4.1, 2, 3; SC.F.1.4.1, 2, 3, 7, 8; SC.G.1.4.1
- 05.09 Explore career opportunities in plant science. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1
- 06.0 Investigate and utilize basic scientific skills and principles in animal science --The student will be able to:
- 06.01 Investigate the origin, history, and domestication of animals. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SC.D.1.4.3, 4; SC.G.1.4.1
- 06.02 Explain the economic importance of animals and the products obtained from animals. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; MA.D.1.4.1; MA.E.1.4.1; MA.A.1.4.1, 2, 3, 4; MA.A.2.4.2; SC.D.1.4.1; SC.G.1.4.1
- 06.03 Categorize animals according to use, type, breed, and scientific classification. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SC.G.1.4.1
- 06.04 Employ correct terminologies for animal species and conditions (e.g. age, sex, etc.) within those species. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1
- 06.05 Compare basic internal & external anatomy of animals. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SC.F.1.4.1, 2, 3, 7, 8; SC.F.2.4.1

- 06.06 Demonstrate approved practices in the management, health, safety, and technology of the animal industry. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SC.B.1.4.1, 2; SC.D.1.4.1; SC.F.1.4.1, 2, 3, 7, 8; SC.F.2.4.1, 3; SC.G.1.4.1; SC.G.2.4.2, 3
- 06.07 Discuss animal welfare issues. LA.C.3.4.1; LA.C.3.4.2; LA.C.3.4.3; SC.D.1.4.1
- 06.08 Investigate the nature and properties of food, fiber, and by-products from animals. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SC.B.1.4.1, 2; SC.B.1.4.3; SC.F.1.4.1, 2, 3, 7, 8; SC.G.1.4.1
- 06.09 Explore career opportunities in animal science. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1
- 07.0 Demonstrate the use of agriscience tools, equipment, and instruments -
-The student will be able to:
- 07.01 Select and demonstrate the use of agriscience tools, equipment, and instruments. MA.A.1.4.1, 4; MA.B.1.4.1, 2, 3; MA.B.2.4.1; MA.B.1.4.2; MA.B.4.4.1, 2; SC.B.1.4.1, 2
- 07.02 Describe various physical science principles as applied in selected mechanical applications (e.g. levers, pulleys, hydraulics, and internal combustion). LA.A.1.4.1; LA.A.1.4.2; LA.A.1.4.3; LA.A.1.4.4; MA.B.1.4.1, 2, 3; MA.B.2.4.1, 2; MA.B.3.4.1; MA.B.4.4.1, 2; SC.B.1.4.1, 2, 3; SC.C.2.4.6
- 07.03 Solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience. SC.B.1.4.1, 2, 3
- 07.04 Service and maintain agriscience equipment, instruments, facilities, and supplies. LA.A.1.4.1; LA.A.1.4.2; LA.A.1.4.3; LA.A.1.4.4; SC.B.1.4.1, 2
- 08.0 Demonstrate agribusiness, employability & human relation skills --The student will be able to:
- 08.01 Develop, implement, and maintain work based learning through Supervised Agricultural Experiences (SAE). LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1
- 08.02 Utilize a record keeping system to collect, interpret, and analyze data. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; MA.B.2.4.1; MA.B.3.4.1; MA.B.4.4.2; MA.E.1.4.1; SC SC.H.1.4.7, SC.H.3.4.3
- 08.03 Enhance oral communications through telephone, interview and presentation skills. LA.C.1.4.3; LA.C.3.4.1; LA.C.3.4.2; LA.C.3.4.3; LA.C.3.4.4; LA.C.3.4.5; SC.H.1.4.7
- 08.04 Enhance written communication by developing resumes and business letters. LA.B.1.4.1; LA.B.1.4.2; LA.B.1.4.3; LA.B.2.4.1; LA.B.2.4.2; LA.B.2.4.3; SC.H.1.4.7
- 08.05 Demonstrate interpersonal (nonverbal) communication skills. LA.C.3.4.1; LA.C.3.4.2; LA.C.3.4.3; LA.C.3.4.4; LA.C.3.4.5
- 08.06 Demonstrate good listening skills. LA.C.1.4.1; LA.C.1.4.2; LA.C.1.4.3; LA.C.1.4.4
- 09.0 Apply leadership and citizenship skills --The student will be able to:
- 09.01 Identify and describe leadership characteristics. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1
- 09.02 Identify opportunities to apply acquired leadership skills. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1

- 09.03 Identify and demonstrate ways to be an active citizen.
LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3;
LA.C.1.4.1; LA.C.2.4.1; SC.H.1.4.7
- 09.04 Participate in community based learning activities. SC.H.1.4.7
- 09.05 Demonstrate the ability to work cooperatively. SC.H.1.4.4
- 09.06 Conduct formal and informal meetings using correct
parliamentary procedure skills. LA.C.3.4.1; LA.C.3.4.2;
LA.C.3.4.3; SC.H.1.4.7
- 09.07 Identify the opportunities for leadership development available
through the National FFA Organization and/or professional
organizations. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3;
LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1

**Florida Department of Education
STUDENT PERFORMANCE STANDARDS**

Course Number: 8121510
Course Title: Introductory Horticulture 2
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of career opportunities; global importance of agriculture; plant classification; propagation; growing media; nutritional needs; fertilization; irrigation; pest identification; pest control, pruning; plant installation; transplanting; safe hand-tool use; and employability skills.

10.0 DESCRIBE THE HORTICULTURE INDUSTRY--The student will be able to:

- 10.01 Describe the importance of horticulture to the American and global economies. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 2.4, 3.4; LAD 1.4, 2.4; MAA 1.4, 2.4, 3.4; MAE 1.4, 2.4, 3.4; SCA 1.4; SSA 5.4, SSD 1.4, 2.4
- 10.02 Identify career opportunities in horticulture and educational requirements and continuing education opportunities for horticulture careers. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 2.4, 3.4; LAD 1.4, 2.4; MAD 1.4, 2.4; MAE 1., 2.4, 3.4; SCD 2.4; SCG 1.4, 2.4; SCH 3.4; SSD 1.4, 2.4
- 10.03 Describe the importance of horticulture to the environment. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAD 1.4, 2.4; MAE 1.4, 2.4, 3.4; SCD 2.4; SCG 1.4, 2.4; SCH 3.4; SSA 1.4; SSB 2.4; SSD 1.4, 2.4
- 10.04 Identify professional organizations and certifications for the horticultural industry. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; LAE 1.4, 2.4

11.0 IDENTIFY AND CLASSIFY PLANTS--The student will be able to:

- 11.01 Identify plants by scientific and common names. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4
- 11.02 Classify plants botanically. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 1.4, 2.4, 3.4; SCF 1.4, 2.4; SCG 1.4, 2.4; SCH 14, 2.4, 3.4

13.0 PROPAGATE PLANTS--The student will be able to:

- 12.01 Identify propagating and growing facilities and structures. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4
- 12.02 Prepare propagation media. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAB 3.4, 4.4; SCB 1.4, 2.4; SCD 1.4, 2.4; SCF 1.4, 2.4; SCG 1.4, 2.4
- 12.03 Select and collect propagation materials. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAB 3.4, 4.4; SCF 2.4; SCG 1.4
- 12.04 Demonstrate propagation by sexual and asexual methods. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 1.4, 2.4, 3.4; MAD 1.4, 3.4; SCG 1.4

- 12.05 Demonstrate environmental controls for propagation materials. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 1.4, 2.4, 3.4; MAD 1.4, 3.4; SCD 1.4
- 13.0 IDENTIFY GROWING MEDIA AND APPLY FERTILIZERS--The student will be able to:
- 13.01 Identify soil and media materials. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 3.4; MAB 1.4, 2.4, 3.4; MAD 2,4; SCA 1.4, 2.4; SCB 2.4, SCD 1.4, 2.4; SCE 1.4; SCF 1.4; SCG 1.4 2,4; SCH 1.4, 2.4, 3.4
- 13.02 Identify nutritional needs of plants. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 3.4; MAB 1.4, 2.4, 3.4; MAD 2,4; SCA 1.4, 2.4; SCB 2.4, SCD 1.4, 2.4; SCE 1.4; SCF 1.4 ; SCG 1.4 2,4; SCH 1.4, 2.4, 3.4
- 13.03 Identify symptoms of nutritional deficiencies and toxicities of plants. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 3.4; MAB 1.4, 2.4, 3.4; MAD 2,4; SCA 1.4, 2.4; SCB 2.4, SCD 1.4, 2.4; SCE 1.4; SCF 1.4; SCG 1.4 2,4; SCH 1.4, 2.4, 3.4
- 13.04 Identify types and kinds of fertilizers. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 3.4; MAB 1.4, 2.4, 3.4; MAD 2,4; SCA 1.4, 2.4; SCB 2.4, SCD 1.4, 2.4; SCE 1.4; SCF 1.4; SCG 1.4 2,4; SCH 1.4, 2.4, 3.4
- 13.05 Identify methods of distributing fertilizers. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 3.4; MAB 1.4, 2.4, 3.4; MAD 2,4; SCA 1.4, 2.4; SCB 2.4, SCD 1.4, 2.4; SCE 1.4; SCF 1.4; SCG 1.4 2,4; SCH 1.4, 2.4, 3.4
- 14.0 IRRIGATE PLANTS AND TURF--The student will be able to:
- 14.01 Identify water needs of plants. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; SCA 1.4, 2.4; SCD 1.4, 2.4; SCG 1.4, 2.4
- 14.02 Irrigate plants at recommended rates. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAB 1.4, 2.4, 3.4, 4.4; MAE 1.4, 2.4; SCA 1.4; SCG 1.4, 2.4; SCH 1.4
- 15.0 DESCRIBE PEST CONTROL APPROACHES--The student will be able to:
- 15.01 Identify common pests of plants. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; SCF 1.4, 2.4; SCG 1.4, 2.4; SCH 3.4
- 15.02 Describe life cycles of common pests of plants. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; SCF 1.4, 2.4; SCG 1.4, 2.4; SCH 3.4
- 19.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATIONS AND HUMAN RELATIONS SKILLS--The student will be able to:
- 19.01 Conduct group meetings using parliamentary procedure and public speaking skills. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; LAE 1.4, 2.4; SSA 5.4; SSB 2.4, SSC 1.4, 2.4

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8121520
Course Title: Horticulture Science 3
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of industry regulations; plant classification; plant transportation; soil sampling and analysis; fertilizer calculations; recording keeping; irrigation components, water quality; drainage; integrated pest management; pesticide safety and regulations; equipment calibration; chemical growth regulators; xeriscaping; integrated landscape management; safe use of power equipment; record keeping; and employability skills.

11.0 IDENTIFY AND CLASSIFY PLANTS--The student will be able to:

- 11.01 Describe principles of plant biology and growth. LAA 1.4, 2.4; LAB 1.4, 2.4; LAD 1.4, 2.4; MAA 1.4, 2.4, 3.4; SCA 1.4, 2.4; SCB 1.4, 2.4; SCF 1.4, 2.4; SCG 1.4, 2.4
- 11.02 Explain the functional use of plants. LAA 1.4, 2.4; LAB 1.4, 2.4; LAD 1.4, 2.4; SCF 1.4, 2.4

13.0 IDENTIFY GROWING MEDIA AND APPLY FERTILIZERS--The student will be able to:

- 13.06 Interpret information on fertilizer label. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 3.4; MAB 1.4, 2.4, 3.4; MAD 2,4; SCA 1.4, 2.4; SCB 2.4, SCD 1.4, 2.4; SCE 1.4; SCF 1.4; SCG 1.4 2,4; SCH 1.4, 2.4, 3.4
- 13.07 Apply fertilizer and soil amendments. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 3.4; MAB 1.4, 2.4, 3.4; MAD 2,4; SCA 1.4, 2.4; SCB 2.4, SCD 1.4, 2.4; SCE 1.4; SCF 1.4; SCG 1.4 2,4; SCH 1.4, 2.4, 3.4

15.0 DESCRIBE PEST CONTROL APPROACHES--The student will be able to:

- 15.03 Classify insects according to feeding habits. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; SCA 1.4, 2,4; SCF 1.4, 2.4; SCG 1.4, 2.4; SCH 1.4, 3.4
- 15.04 Describe biological, chemical, and cultural methods of controlling plant pests. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; SCA 1.4, 2.4; SCD 2.4; SCF 1.4; SCG 1.4, 2.4

16.0 CONTROL PLANT GROWTH--The student will be able to:

- 16.01 Identify methods of pruning plants. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4
- 16.02 Identify appropriate time to prune plants. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; SCG 1.4, 2.4
- 16.03 Identify and select pruning tools. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4

17.0 HARVEST, TRANSPORT, AND INSTALL PLANT MATERIALS--The student will be able to:

- 17.01 Determine requirements for preserving plant viability. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 1.4; SCG 1.4; SCH 3.4
- 17.02 Install containerized plant materials. LAA 1.4, LAB 1.4, 2.4; LAC 1.4 2.4, 3.4; LAD 1.4, 2.4; MAB 1.4, 2.4, 3.4, 4.4; MAC 3.4; SCG 1.4, 2.4; SCH 3.4
- 17.03 Select and prepare plants for transporting and transplanting. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAC 3.4; SCG 1.4, 2.4; SCH 3.4

18.0 OPERATE, REPAIR, AND MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:

- 18.01 Perform equipment pre-operational check. LAA 1.4, LAB 1.4; LAC 1.4, 2.4; MAA 1.4, 2.4, 3.4, 4.4; MAB 1.4, 2.4, 3.4, 4.4
- 18.02 Identify, maintain, and operate hand tools and power tools. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAB 2.4, 3.4

19.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATIONS AND HUMAN RELATIONS SKILLS--The student will be able to:

- 19.02 Identify acceptable work habits and personal characteristics. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; SSB 2.4
- 19.03 Identify acceptable employee hygiene habits. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; SSB 2.4
- 19.04 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; SSB 2.4
- 19.05 Describe the importance of industry certifications. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; SSB 2.4

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8121610
Course Title: Horticulture Science and Services 4
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to further develop competencies in the areas of plant identification and classification; growing media; irrigation system set up; and maintaining and analyzing records including production costs.

20.0 IDENTIFY AND CLASSIFY PLANTS--The student will be able to:

- 20.01 Classify plants as monocots or dicots.
- 20.02 Classify plants as annuals, biennials, and perennials.
- 20.05 Prepare propagation materials (seeds, cuttings, etc.) for planting.
- 20.07 Demonstrate sanitation and safety practices when propagating.

22.0 OPERATE, REPAIR, AND MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:

- 22.01 Identify, operate, and maintain tractor and power equipment.

23.0 PREPARE GROWING MEDIA--The student will be able to:

- 23.01 Sterilize rooting, potting, and growing media.
- 23.02 Adjust pH and nutritional levels of media.
- 23.03 Fill and level benches and pots with media.
- 23.04 Demonstrate sanitation practices when handling and storing plant media materials.

24.0 IRRIGATE PLANTS--The student will be able to:

- 24.01 Set up an irrigation system for a propagation area.
- 24.02 Set up an irrigation system for a growing structure.
- 24.03 Set up an irrigation system for a retail display.

26.0 MAINTAIN AND ANALYZE RECORDS--The student will be able to:

- 26.05 Maintain current plant inventory.
- 26.06 Maintain job records, daily log sheets, and inventory.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8121620
Course Title: Horticulture Science and Services 5
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to further develop competencies in the areas of identifying and evaluating IPM practices; maintaining and repairing irrigation systems; analyzing and evaluating fertilizer usage.

20.0 IDENTIFY AND CLASSIFY PLANTS--The student will be able to:

- 20.03 Identify plants appropriate to a region.
- 20.04 Classify plants according to growth habit.
- 20.06 Apply growth stimulants to propagation materials
- 20.08 Prepare flats and seedbeds and plant seeds.

21.0 CONTROL PESTS--The student will be able to:

- 21.01 Report insect and disease damage.
- 21.02 Identify chemical spray damage.

24.0 IRRIGATE PLANTS--The student will be able to:

- 24.05 Identify and use various types of irrigation systems (low volume, ebb and flow, drip, mat, recirculating, etc.).

25.0 FERTILIZE PLANT MATERIALS--The student will be able to:

- 25.01 Collect soil and leaf tissue samples for analysis.
- 25.03 Demonstrate proper handling and storage of fertilizers, observing safety precautions.
- 25.04 Evaluate, operate, and maintain fertilizer distribution equipment.

26.0 MAINTAIN AND ANALYZE RECORDS--The student will be able to:

- 26.04 Prepare and maintain financial records using computer software.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8121630
Course Title: Horticulture Science and Services 6
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to further develop competencies in the areas of irrigation; growing media; planting beds and sites; propagation; marketing; repair and maintenance of nursery equipment and facilities.

21.0 CONTROL PESTS--The student will be able to:

21.03 Select proper IPM practices (biological, chemical and physical) for control of insects, diseases, vertebrates and weeds.

21.04 Evaluate the efficacy and phytotoxicity of a chemical prior to inclusion in a growing program.

22.0 OPERATE, REPAIR, AND MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:

22.02 Load, secure, and transport equipment.

24.0 IRRIGATE PLANTS--The student will be able to:

24.04 Maintain and repair an irrigation system.

25.0 FERTILIZE PLANT MATERIALS--The student will be able to:

25.02 Interpret and evaluate the results of soil and leaf tissue analysis and determine corrective actions.

25.05 Develop a fertilization schedule for various plant species.

25.06 Determine rate of fertilizer application.

26.0 MAINTAIN AND ANALYZE RECORDS--The student will be able to:

26.01 Analyze and maintain production and sales records.

26.02 Determine plant production costs.

26.03 Prepare a budget.

Florida Department of Education
INTENDED OUTCOMES

Program Title: Sports and Recreational Turf Operations

SECONDARY

Program Number 8121400
 CIP Number 0101.060700
 Grade Level 9-12, 30, 31
 Standard Length 6 credits
 Certification VOC AGRI @4
 AGRICULTUR 1 @2
 AGRI @4
 HORTICULT #7

Program SOC Code 37-1012.00 - First-Line Supervisors/Managers of
 Landscaping, Lawn Service and Groundskeeping Workers

INTENDED OUTCOMES: After successfully completing appropriate outcomes for each occupational completion point of this program, the student will be able to perform the following:

OCCUPATIONAL COMPLETION POINT - DATA CODE A

Landscape Specialists - DOT Code 406.687-010

- 01.0 Describe the history of agriculture and its influence on the global economy.
- 02.0 Practice agriscience safety skills and procedures.
- 03.0 Apply scientific and technological principles to agriscience issues.
- 04.0 Apply environmental principles to the agricultural industry.
- 05.0 Investigate and utilize basic scientific skills and principles in plant science.
- 06.0 Investigate and utilize basic scientific skills and principles in animal science.
- 07.0 Demonstrate the use of agriscience tools, equipment, and instruments.
- 08.0 Demonstrate agribusiness, employability & human relation skills.
- 09.0 Apply leadership and citizenship skills.
- 10.0 Describe the horticulture industry.
- 11.0 Identify and classify plants.
- 12.0 Propagate plants.
- 13.0 Identify growing media and apply fertilizers.
- 14.0 Irrigate plants and turf.
- 15.0 Describe pest control approaches.
- 16.0 Control plant growth.
- 17.0 Harvest, transport, and install plant materials.
- 18.0 Operate, repair, and maintain tools and equipment.
- 19.0 Demonstrate leadership, employability, communications, and human relations skills.

OCCUPATIONAL COMPLETION POINT - DATA CODE B

Greenskeeper II - DOT Code 406.683-010

- 20.0 Maintain tools and equipment.
- 21.0 Apply chemical and calibrate spray equipment.
- 22.0 Classify plants and turfgrass.
- 23.0 Demonstrate fertilization skills.
- 24.0 Irrigate plants and turf.
- 25.0 Maintain greens and tees.

- 26.0 Maintain fairways, roughs, and traps.
- 27.0 Fertilize turf.
- 28.0 Establish turfgrass.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Program Title: Sports and Recreational Turf Operations
Secondary Number: 8121400
Postsecondary Number:

OCCUPATIONAL COMPLETION POINT - DATA CODE A

Landscaping and Groundskeeping Workers - SOC Code - 37-3011.00

- 01.0 Describe the history of agriculture and its influence on the global economy--The student will be able to:
 - 01.01 Investigate the history of agriculture and its relationship to science and technology.
 - 01.02 Analyze the impact of agriculture on the local, state, national and global economy.
 - 01.03 Identify significant career patterns/shifts in the history of the agricultural industry.
 - 01.04 Examine the role of the agricultural industry in the interaction of population, food, energy, and the environment.

- 02.0 Practice agriscience safety skills and procedures --The student will be able to:
 - 02.01 List the common causes of accidents in agriscience operations.
 - 02.02 Demonstrate proper safety precautions and use of personal protective equipment.
 - 02.03 Extract and utilize pertinent information from a container label and/or Material Safety Data Sheet (MSDS) following Environmental Protection Agency (EPA), Worker Protection Standard, and Occupational Safety and Health Agency (OSHA) regulations.
 - 02.04 Identify proper disposal of hazardous waste materials and biohazards.
 - 02.05 Describe emergency procedures.

- 03.0 Apply scientific and technological principles to agriscience issues--The student will be able to:
 - 03.01 Employ scientific measurement skills.
 - 03.02 Demonstrate safe and effective use of common laboratory equipment.
 - 03.03 Identify the parts and functions of plant and animal cells.
 - 03.04 Describe the phases of cell reproduction.
 - 03.05 Implement the scientific method and science process skills through the design and completion of an agriscience research project.
 - 03.06 Interpret, analyze, and report data.
 - 03.07 Investigate DNA and genetics applications in agriscience including the theory of probability.
 - 03.08 Evaluate advances in biotechnology that impact agriculture (e.g. transgenic crops, biological controls, etc.).

- 04.0 Apply environmental principles to the agricultural industry --The student will be able to:

- 04.01 Determine how different climactic and geological activity influences agriculture.
 - 04.02 Describe various ecosystems as they relate to the agriculture industry.
 - 04.03 Describe the environmental resources (soil, water, air) necessary for agriculture production.
 - 04.04 Identify regulatory agencies that impact agricultural practices.
 - 04.05 Apply Best Management Practices that enhance the natural environment.
 - 04.06 Identify conservation practices related to natural resources.
- 05.0 Investigate and utilize basic scientific skills and principles in plant science --The student will be able to:
- 05.01 Identify and describe the specializations within the plant science industry.
 - 05.02 Categorize plants based on specific characteristics according to industry and scientific standards.
 - 05.03 Examine the processes of plant growth including photosynthesis and respiration.
 - 05.04 Identify the nutrients required for plant growth from the periodic table and explain their functions.
 - 05.05 Analyze information from a fertilizer label.
 - 05.06 Propagate and grow plants through sexual and/or asexual reproduction.
 - 05.07 Investigate the impacts of various pests and propose solutions for their control.
 - 05.08 Investigate the nature and properties of food, fiber, and by-products from plants.
 - 05.09 Explore career opportunities in plant science.
- 06.0 Investigate and utilize basic scientific skills and principles in animal science --The student will be able to:
- 06.01 Investigate the origin, history, and domestication of animals.
 - 06.02 Explain the economic importance of animals and the products obtained from animals.
 - 06.03 Categorize animals according to use, type, breed, and scientific classification.
 - 06.04 Employ correct terminologies for animal species and conditions (e.g. age, sex, etc.) within those species.
 - 06.05 Compare basic internal & external anatomy of animals.
 - 06.06 Demonstrate approved practices in the management, health, safety, and technology of the animal industry.
 - 06.07 Discuss animal welfare issues.
 - 06.08 Investigate the nature and properties of food, fiber, and by-products from animals.
 - 06.09 Explore career opportunities in animal science.
- 07.0 Demonstrate the use of agriscience tools, equipment, and instruments -
-The student will be able to:
- 07.01 Select and demonstrate the use of agriscience tools, equipment, and instruments.
 - 07.02 Describe various physical science principles as applied in selected mechanical applications (e.g. levers, pulleys, hydraulics, and internal combustion).
 - 07.03 Solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.

- 07.04 Service and maintain agriscience equipment, instruments, facilities, and supplies.
- 08.0 Demonstrate agribusiness, employability & human relation skills --The student will be able to:
 - 08.01 Develop, implement, and maintain work based learning through Supervised Agricultural Experiences (SAE).
 - 08.02 Utilize a record keeping system to collect, interpret, and analyze data.
 - 08.03 Enhance oral communications through telephone, interview and presentation skills.
 - 08.04 Enhance written communication by developing resumes and business letters.
 - 08.05 Demonstrate interpersonal (nonverbal) communication skills.
 - 08.06 Demonstrate good listening skills.
- 09.0 Apply leadership and citizenship skills --The student will be able to:
 - 09.01 Identify and describe leadership characteristics.
 - 09.02 Identify opportunities to apply acquired leadership skills.
 - 09.03 Identify and demonstrate ways to be an active citizen.
 - 09.04 Participate in community based learning activities.
 - 09.05 Demonstrate the ability to work cooperatively.
 - 09.06 Conduct formal and informal meetings using correct parliamentary procedure skills.
 - 09.07 Identify the opportunities for leadership development available through the National FFA Organization and/or professional organizations.
- 10.0 DESCRIBE THE HORTICULTURE INDUSTRY--The student will be able to:
 - 10.01 Describe the importance of horticulture to the American and global economies.
 - 10.02 Identify career opportunities in horticulture and educational requirements and continuing education opportunities for horticulture careers.
 - 10.03 Describe the importance of horticulture to the environment.
 - 10.04 Identify professional organizations and certifications for the horticultural industry.
- 11.0 IDENTIFY AND CLASSIFY PLANTS--The student will be able to:
 - 11.01 Identify plants by scientific and common names.
 - 11.02 Classify plants botanically.
 - 11.03 Describe principles of plant biology and growth.
 - 11.04 Explain the functional use of plants.
- 12.0 PROPAGATE PLANTS--The student will be able to:
 - 12.01 Identify propagating and growing facilities and structures.
 - 12.02 Prepare propagation media.
 - 12.03 Select and collect propagation materials.
 - 12.04 Demonstrate propagation by sexual and asexual methods.
 - 12.05 Demonstrate environmental controls for propagation materials.
- 13.0 IDENTIFY GROWING MEDIA AND APPLY FERTILIZERS--The student will be able to:
 - 13.01 Identify soil and media materials.

- 13.02 Identify nutritional needs of plants.
 - 13.03 Identify symptoms of nutritional deficiencies and toxicities of plants.
 - 13.04 Identify types and kinds of fertilizers.
 - 13.05 Identify methods of distributing fertilizers.
 - 13.06 Interpret information on fertilizer label.
 - 13.07 Apply fertilizer and soil amendments.
- 14.0 IRRIGATE PLANTS AND TURF--The student will be able to:
- 14.01 Identify water needs of plants.
 - 14.02 Irrigate plants at recommended rates.
- 15.0 DESCRIBE PEST CONTROL APPROACHES--The student will be able to:
- 15.01 Identify common pests of plants.
 - 15.02 Describe life cycles of common pests of plants.
 - 15.03 Classify insects according to feeding habits.
 - 15.04 Describe biological, chemical, and cultural methods of controlling plant pests.
- 16.0 CONTROL PLANT GROWTH--The student will be able to:
- 16.01 Identify methods of pruning plants.
 - 16.02 Identify appropriate time to prune plants.
 - 16.03 Identify and select pruning tools.
- 17.0 HARVEST, TRANSPORT, AND INSTALL PLANT MATERIALS--The student will be able to:
- 17.01 Determine requirements for preserving plant viability.
 - 17.02 Install containerized plant materials.
 - 17.03 Select and prepare plants for transporting and transplanting.
- 18.0 OPERATE, REPAIR, AND MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:
- 18.01 Perform equipment pre-operational check.
 - 18.02 Identify, maintain, and operate hand tools and power tools.
- 19.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATIONS AND HUMAN RELATIONS SKILLS--The student will be able to:
- 19.01 Conduct group meetings using parliamentary procedure and public speaking skills.
 - 19.02 Identify acceptable work habits and personal characteristics.
 - 19.03 Identify acceptable employee hygiene habits.
 - 19.04 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons.
 - 19.05 Describe the importance of industry certifications.

OCCUPATIONAL COMPLETION POINT - DATA CODE B

First-Line Supervisors/Managers of Landscaping, Lawn Service and Groundskeeping Workers - SOC Code 37-1012.00

- 20.0 MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:
- 20.01 Maintain oil level in engines of power equipment.
 - 20.02 Check and maintain tire air pressure on equipment.
 - 20.03 Maintain fuel levels using proper fuel or fuel mixtures.

- 20.04 Operate manual transmissions.
 - 20.05 Identify, operate, and maintain tractor and power equipment.
 - 20.06 Service and maintain battery and electrical systems.
 - 20.07 Perform minor tune-up on engines.
 - 20.08 Load, secure, and transport equipment.
 - 20.09 Demonstrate safety precautions while working with tools and equipment.
- 21.0 APPLY CHEMICAL AND CALIBRATE SPRAY EQUIPMENT--The student will be able to:
- 21.01 Select, mix, and apply a nonrestricted chemical according to the label and local, state, federal, and EPA regulations.
 - 21.02 Calibrate spray and spread equipment; solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience.
 - 21.03 Identify and report insect and disease damage.
 - 21.04 Determine chemical compatibility.
 - 21.05 Determine appropriate time frequency and method of chemical application.
- 22.0 CLASSIFY PLANTS AND TURFGRASS--The student will be able to:
- 22.01 Classify plants as monocots or dicots.
 - 22.02 Classify plants and turfgrass as annuals, biennials, and perennials.
 - 22.03 Identify plants and turfgrass that are specific to a region.
 - 22.04 Classify plants and turfgrass according to growth habit.
 - 22.05 Identify poisonous plants.
- 23.0 DEMONSTRATE FERTILIZATION SKILLS--The students will be able to:
- 23.01 Develop a fertilization schedule.
 - 23.02 Determine rate of fertilizer application and calibration equipment.
 - 23.03 Calibrate fertilizer equipment.
- 24.0 IRRIGATE PLANTS AND TURF--The student will be able to:
- 24.01 Identify various types of irrigation systems.
 - 24.02 Install and maintain piping and water distribution components.
 - 24.03 Install valves, timers, rain shut-offs, moisture sensors, and back flow prevention devices.
 - 24.04 Check and evaluate irrigation system performance.
 - 24.05 Maintain irrigation system.
- 25.0 MAINTAIN SPORTS TURF--The student will be able to:
- 25.01 Mow sport turf with reel mowers.
 - 25.02 Relocate cups and markers.
 - 25.03 Irrigate turf.
 - 25.04 Verticut turf.
 - 25.05 Aerate turf and remove debris.
 - 25.06 Repair ball marks on greens.
- 26.0 MAINTAIN FAIRWAYS, ROUGHS, AND TRAPS--The student will be able to:
- 26.01 Irrigate fairways.
 - 26.02 Repair divots.
 - 26.03 Add sand to traps.

- 26.04 Rake and trim sand traps.
- 26.05 Edge sand traps.

27.0 FERTILIZE TURF--The student will be able to:

- 27.01 Apply top dressing.
- 27.02 Overseed turf.
- 27.03 Apply fertilizer.

28.0 ESTABLISH TURFGRASS--The student will be able to:

- 28.01 Level seedbed.
- 28.02 Plant turf by sprigs, plugs or sod.
- 28.03 Remove sod with sod cutter.

**Florida Department of Education
STUDENT PERFORMANCE STANDARDS**

Course Number: **8106810**
 Course Title: **Agriscience Foundations I**
 Course Credit: **1**

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of agricultural history and the global impact of agriculture; career opportunities; scientific and research concepts; biological and physical science principles; environmental principles; agriscience safety; principles of leadership; and agribusiness, employability, and human relations skills in agriscience. Laboratory-based activities are an integral part of this course. These include the safe use and application of appropriate technology, scientific testing and observation equipment.

- 01.0 Describe the history of agriculture and its influence on the global economy--The student will be able to:
- 01.01 Investigate the history of agriculture and its relationship to science and technology. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SS.A.1.4.1, 4; SS.A.2.4.1, 2; SS.A.3.4.1, 5, 8; SS.A.3.4.9; SS.A.5.4.1; SS.B.1.4.1, 4; SC.H.3.4.2, 3, 5, 6; SC.D.1.4.3, 4
 - 01.02 Analyze the impact of agriculture on the local, state, national and global economy. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; MA.A.2.4.1, 2; MA.A.3.4.1, 3; MA.E.1.4.1, 2; SS.A.3.4.3, 8, 10; SS.A.4.4.1, 6; SS.A.5.4.3, 5; SS.B.2.4.1, 4; SC.H.3.4.2, 3, 5, 6; SC.B.1.4.5; SC.D.1.4.1, 3; SC.D.2.4.1
 - 01.03 Identify significant career patterns/shifts in the history of the agricultural industry. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SS.A.1.4.1; SS.A.3.4.5; SS.A.5.4.2; SS.B.2.4.4; SC.H.3.4.2, 3, 5, 6; SC.B.1.4.5; SC.D.1.4.1, 3; SC.D.1.4.4; SC.H.1.4.2
 - 01.04 Examine the role of the agricultural industry in the interaction of population, food, energy, and the environment. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; MA.D.1.4.1; MA.D.2.4.1; MA.E.1.4.1; SS.A.4.4.1, 2; SS.A.5.4.1, 2; SS.B.1.4.4; SS.B.2.4.1; SS.B.2.4.2, 4, 6; SS.D.1.4.1; SC.H.3.4.2, 3, 5, 6; SC.B.1.4.5; SC.D.1.4.1, 3, 4; SC.D.2.4.1; SC.G.2.4.6
- 02.0 Practice agriscience safety skills and procedures --The student will be able to:
- 02.01 Identify the common causes of accidents in agriscience operations. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1
 - 02.02 Demonstrate proper safety precautions and use of personal protective equipment.
 - 02.03 Extract and utilize pertinent information from a container label and/or Material Safety Data Sheet (MSDS) following Environmental Protection Agency (EPA), Worker Protection Standard, and Occupational Safety and Health Agency (OSHA) regulations. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3;

- LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; MA.A.1.4.1; MA.A.3.4.1; MA.B.1.4.1, 2; MA.B.2.4.2; MA.B.3.4.1; MA.B.4.4.1, 2; MA.E.1.4.1
- 02.04 Identify proper disposal of hazardous waste materials and biohazards. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1
- 02.05 Describe emergency procedures. LA.C.3.4.1; LA.C.3.4.2; LA.C.3.4.3
- 03.0 Apply scientific and technological principles to agriscience issues--
The student will be able to:
- 03.01 Employ scientific measurement skills. MA.A.1.4.1; MA.A.2.4.2; MA.B.2.4.1, 2; MA.B.4.4.1; SC.B.1.4.3; SC.H.1.4.1
- 03.02 Demonstrate safe and effective use of common laboratory equipment. SC.H.1.4.1
- 03.03 Identify the parts and functions of plant and animal cells. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SC.B.1.4.1, 2; SC.F.1.4.1, 2, 3, 7, 8; SC.F.2.4.1
- 03.04 Describe the phases of cell reproduction. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SC.B.1.4.1, 2; SC.F.1.4.1, 2, 3, 7, 8; SC.F.2.4.1; SC.G.1.4.1
- 03.05 Implement the scientific method and science process skills through the design and completion of an agriscience research project. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; MA.E.3.4.1, 2; SC.H.1.4.1, 2, 3; SC.H.2.4.1, 2
- 03.06 Interpret, analyze, and report data. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; MA.E.1.4.1, 2, 3; MA.E.2.4.1, 2; SC.B.1.4.3, SC.H.1.4.1, 2, 3, 4, 7
- 03.07 Investigate DNA and genetics applications in agriscience including the theory of probability. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; MA.E.2.4.1, 2; SC.F.2.4.2, 3; SC.G.2.4.3
- 03.08 Evaluate advances in biotechnology that impact agriculture (e.g. transgenic crops, biological controls, etc.). LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SC.F.2.4.2, 3; SC.G.2.4.3
- 04.0 Apply environmental principles to the agricultural industry --The student will be able to:
- 04.01 Determine how different climactic and geological activity influences agriculture. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SS.B.1.4.1; SS.B.2.4.4; SC.B.1.4.5; SC.D.1.4.1, 2, 3; SC.D.2.4.1; SC.G.1.4.1
- 04.02 Describe various ecosystems as they relate to the agriculture industry. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SC.B.1.4.1, 2; SC.D.1.4.1, 2, 3; SC.D.2.4.1; SC.G.1.4.1; SC.G.2.4.2, 4; SC.G.2.4.5, 6
- 04.03 Describe the environmental resources (soil, water, air) necessary for agriculture production. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SS.B.2.4.1, 6; SC.B.1.4.1, 2, 5; SC.D.1.4.1, 2, 3; SC.D.2.4.1; SC.G.1.4.1; SC.G.2.4.2, 4, 5, 6
- 04.04 Identify regulatory agencies that impact agricultural practices. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SC.B.1.4.5; SC.D.1.4.1, 2, 3; SC.D.2.4.1; SC.G.1.4.1; SC.G.2.4.2, 4; SC.G.2.4.5, 6

- 04.05 Apply Best Management Practices that enhance the natural environment. SC.B.1.4.5; SC.D.1.4.1, 2, 3; SC.D.2.4.1; SC.G.1.4.1; SC.G.2.4.2, 4, 5, 6
- 04.06 Identify conservation practices related to natural resources. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SC.B.1.4.1, 2, 5; SC.D.1.4.1, 2, 3; SC.D.2.4.1; SC.G.1.4.1; SC.G.2.4.2, 3, 4, 5, 6
- 05.0 Investigate and utilize basic scientific skills and principles in plant science --The student will be able to:
- 05.01 Identify and describe the specializations within the plant science industry. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1
- 05.02 Categorize plants based on specific characteristics according to industry and scientific standards. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SC.G.1.4.1
- 05.03 Examine the processes of plant growth including photosynthesis and respiration. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SC.B.1.4.1, 2; SC.D.1.4.1; SC.F.1.4.1, 2, 3, 7, 8; SC.G.2.4.2
- 05.04 Identify the nutrients required for plant growth from the periodic table and explain their functions. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SC.D.1.4.1, 2; SC.F.1.4.1, 2, 3, 7, 8; SC.G.2.4.2
- 05.05 Analyze information from a fertilizer label. MA.E.1.4.1; MA.B.1.4.1, 2; MA.B.2.4.1, 2; MA.B.3.4.1; MA.B.4.4.1, 2; SC.A.2.4.5
- 05.06 Propagate and grow plants through sexual and/or asexual reproduction. SC.B.1.4.1, 2; SC.D.1.4.1, 2; SC.F.1.4.1, 2, 3, 7, 8; SC.F.2.4.1, 3; SC.G.2.4.3
- 05.07 Investigate the impacts of various pests and propose solutions for their control. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SC.B.1.4.1, 2; SC.D.1.4.1; SC.F.1.4.1, 2, 3, 7, 8; SC.G.1.4.1; SC.G.2.4.2
- 05.08 Investigate the nature and properties of food, fiber, and by-products from plants. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SC.B.1.4.1, 2, 3; SC.F.1.4.1, 2, 3, 7, 8; SC.G.1.4.1
- 05.09 Explore career opportunities in plant science. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1
- 06.0 Investigate and utilize basic scientific skills and principles in animal science --The student will be able to:
- 06.01 Investigate the origin, history, and domestication of animals. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SC.D.1.4.3, 4; SC.G.1.4.1
- 06.02 Explain the economic importance of animals and the products obtained from animals. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; MA.D.1.4.1; MA.E.1.4.1; MA.A.1.4.1, 2, 3, 4; MA.A.2.4.2; SC.D.1.4.1; SC.G.1.4.1
- 06.03 Categorize animals according to use, type, breed, and scientific classification. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SC.G.1.4.1
- 06.04 Employ correct terminologies for animal species and conditions (e.g. age, sex, etc.) within those species. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1
- 06.05 Compare basic internal & external anatomy of animals. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SC.F.1.4.1, 2, 3, 7, 8; SC.F.2.4.1

- 06.06 Demonstrate approved practices in the management, health, safety, and technology of the animal industry. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SC.B.1.4.1, 2; SC.D.1.4.1; SC.F.1.4.1, 2, 3, 7, 8; SC.F.2.4.1, 3; SC.G.1.4.1; SC.G.2.4.2, 3
- 06.07 Discuss animal welfare issues. LA.C.3.4.1; LA.C.3.4.2; LA.C.3.4.3; SC.D.1.4.1
- 06.08 Investigate the nature and properties of food, fiber, and by-products from animals. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; SC.B.1.4.1, 2; SC.B.1.4.3; SC.F.1.4.1, 2, 3, 7, 8; SC.G.1.4.1
- 06.09 Explore career opportunities in animal science. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1
- 07.0 Demonstrate the use of agriscience tools, equipment, and instruments -
-The student will be able to:
- 07.01 Select and demonstrate the use of agriscience tools, equipment, and instruments. MA.A.1.4.1, 4; MA.B.1.4.1, 2, 3; MA.B.2.4.1; MA.B.1.4.2; MA.B.4.4.1, 2; SC.B.1.4.1, 2
- 07.02 Describe various physical science principles as applied in selected mechanical applications (e.g. levers, pulleys, hydraulics, and internal combustion). LA.A.1.4.1; LA.A.1.4.2; LA.A.1.4.3; LA.A.1.4.4; MA.B.1.4.1, 2, 3; MA.B.2.4.1, 2; MA.B.3.4.1; MA.B.4.4.1, 2; SC.B.1.4.1, 2, 3; SC.C.2.4.6
- 07.03 Solve time, distance, area, volume, ratio, proportion, and percentage problems in agriscience. SC.B.1.4.1, 2, 3
- 07.04 Service and maintain agriscience equipment, instruments, facilities, and supplies. LA.A.1.4.1; LA.A.1.4.2; LA.A.1.4.3; LA.A.1.4.4; SC.B.1.4.1, 2
- 08.0 Demonstrate agribusiness, employability & human relation skills --The student will be able to:
- 08.01 Develop, implement, and maintain work based learning through Supervised Agricultural Experiences (SAE). LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1
- 08.02 Utilize a record keeping system to collect, interpret, and analyze data. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1; MA.B.2.4.1; MA.B.3.4.1; MA.B.4.4.2; MA.E.1.4.1; SC SC.H.1.4.7, SC.H.3.4.3
- 08.03 Enhance oral communications through telephone, interview and presentation skills. LA.C.1.4.3; LA.C.3.4.1; LA.C.3.4.2; LA.C.3.4.3; LA.C.3.4.4; LA.C.3.4.5; SC.H.1.4.7
- 08.04 Enhance written communication by developing resumes and business letters. LA.B.1.4.1; LA.B.1.4.2; LA.B.1.4.3; LA.B.2.4.1; LA.B.2.4.2; LA.B.2.4.3; SC.H.1.4.7
- 08.05 Demonstrate interpersonal (nonverbal) communication skills. LA.C.3.4.1; LA.C.3.4.2; LA.C.3.4.3; LA.C.3.4.4; LA.C.3.4.5
- 08.06 Demonstrate good listening skills. LA.C.1.4.1; LA.C.1.4.2; LA.C.1.4.3; LA.C.1.4.4
- 09.0 Apply leadership and citizenship skills --The student will be able to:
- 09.01 Identify and describe leadership characteristics. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1
- 09.02 Identify opportunities to apply acquired leadership skills. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1

- 09.03 Identify and demonstrate ways to be an active citizen.
LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3; LA.B.2.4.1, 2, 3;
LA.C.1.4.1; LA.C.2.4.1; SC.H.1.4.7
- 09.04 Participate in community based learning activities. SC.H.1.4.7
- 09.05 Demonstrate the ability to work cooperatively. SC.H.1.4.4
- 09.06 Conduct formal and informal meetings using correct
parliamentary procedure skills. LA.C.3.4.1; LA.C.3.4.2;
LA.C.3.4.3; SC.H.1.4.7
- 09.07 Identify the opportunities for leadership development available
through the National FFA Organization and/or professional
organizations. LA.A.1.4.1, 2, 3, 4; LA.A.2.4.4; LA.B.1.4.1, 2, 3;
LA.B.2.4.1, 2, 3; LA.C.1.4.1; LA.C.2.4.1

**Florida Department of Education
STUDENT PERFORMANCE STANDARDS**

Course Number: 8121510
Course Title: Introductory Horticulture 2
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of career opportunities; global importance of agriculture; plant classification; propagation; growing media; nutritional needs; fertilization; irrigation; pest identification; pest control, pruning; plant installation; transplanting; safe hand-tool use; and employability skills.

10.0 DESCRIBE THE HORTICULTURE INDUSTRY--The student will be able to:

- 10.01 Describe the importance of horticulture to the American and global economies. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 2.4, 3.4; LAD 1.4, 2.4; MAA 1.4, 2.4, 3.4; MAE 1.4, 2.4, 3.4; SCA 1.4; SSA 5.4, SSD 1.4, 2.4
- 10.02 Identify career opportunities in horticulture and educational requirements and continuing education opportunities for horticulture careers. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 2.4, 3.4; LAD 1.4, 2.4; MAD 1.4, 2.4; MAE 1., 2.4, 3.4; SCD 2.4; SCG 1.4, 2.4; SCH 3.4; SSD 1.4, 2.4
- 10.03 Describe the importance of horticulture to the environment. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAD 1.4, 2.4; MAE 1.4, 2.4, 3.4; SCD 2.4; SCG 1.4, 2.4; SCH 3.4; SSA 1.4; SSB 2.4; SSD 1.4, 2.4
- 10.04 Identify professional organizations and certifications for the horticultural industry. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; LAE 1.4, 2.4

11.0 IDENTIFY AND CLASSIFY PLANTS--The student will be able to:

- 11.01 Identify plants by scientific and common names. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4
- 11.02 Classify plants botanically. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 1.4, 2.4, 3.4; SCF 1.4, 2.4; SCG 1.4, 2.4; SCH 14, 2.4, 3.4

12.0 PROPAGATE PLANTS--The student will be able to:

- 12.01 Identify propagating and growing facilities and structures. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4
- 12.02 Prepare propagation media. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAB 3.4, 4.4; SCB 1.4, 2.4; SCD 1.4, 2.4; SCF 1.4, 2.4; SCG 1.4, 2.4
- 12.03 Select and collect propagation materials. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAB 3.4, 4.4; SCF 2.4; SCG 1.4
- 12.04 Demonstrate propagation by sexual and asexual methods. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 1.4, 2.4, 3.4; MAD 1.4, 3.4; SCG 1.4

- 12.05 Demonstrate environmental controls for propagation materials. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 1.4, 2.4, 3.4; MAD 1.4, 3.4; SCD 1.4
- 13.0 IDENTIFY GROWING MEDIA AND APPLY FERTILIZERS--The student will be able to:
- 13.01 Identify soil and media materials. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 3.4; MAB 1.4, 2.4, 3.4; MAD 2,4; SCA 1.4, 2.4; SCB 2.4, SCD 1.4, 2.4; SCE 1.4; SCF 1.4; SCG 1.4 2,4; SCH 1.4, 2.4, 3.4
- 13.02 Identify nutritional needs of plants. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 3.4; MAB 1.4, 2.4, 3.4; MAD 2,4; SCA 1.4, 2.4; SCB 2.4, SCD 1.4, 2.4; SCE 1.4; SCF 1.4 ; SCG 1.4 2,4; SCH 1.4, 2.4, 3.4
- 13.03 Identify symptoms of nutritional deficiencies and toxicities of plants. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 3.4; MAB 1.4, 2.4, 3.4; MAD 2,4; SCA 1.4, 2.4; SCB 2.4, SCD 1.4, 2.4; SCE 1.4; SCF 1.4; SCG 1.4 2,4; SCH 1.4, 2.4, 3.4
- 13.04 Identify types and kinds of fertilizers. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 3.4; MAB 1.4, 2.4, 3.4; MAD 2,4; SCA 1.4, 2.4; SCB 2.4, SCD 1.4, 2.4; SCE 1.4; SCF 1.4; SCG 1.4 2,4; SCH 1.4, 2.4, 3.4
- 13.05 Identify methods of distributing fertilizers. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 3.4; MAB 1.4, 2.4, 3.4; MAD 2,4; SCA 1.4, 2.4; SCB 2.4, SCD 1.4, 2.4; SCE 1.4; SCF 1.4; SCG 1.4 2,4; SCH 1.4, 2.4, 3.4
- 14.0 IRRIGATE PLANTS AND TURF--The student will be able to:
- 14.01 Identify water needs of plants. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; SCA 1.4, 2.4; SCD 1.4, 2.4; SCG 1.4, 2.4
- 14.02 Irrigate plants at recommended rates. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAB 1.4, 2.4, 3.4, 4.4; MAE 1.4, 2.4; SCA 1.4; SCG 1.4, 2.4; SCH 1.4
- 15.0 DESCRIBE PEST CONTROL APPROACHES--The student will be able to:
- 15.01 Identify common pests of plants. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; SCF 1.4, 2.4; SCG 1.4, 2.4; SCH 3.4
- 15.02 Describe life cycles of common pests of plants. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; SCF 1.4, 2.4; SCG 1.4, 2.4; SCH 3.4
- 19.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATIONS AND HUMAN RELATIONS SKILLS--The student will be able to:
- 19.01 Conduct group meetings using parliamentary procedure and public speaking skills. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; LAE 1.4, 2.4; SSA 5.4; SSB 2.4, SSC 1.4, 2.4

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8121520
Course Title: Horticulture Science 3
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to develop competencies in the areas of industry regulations; plant classification; plant transportation; soil sampling and analysis; fertilizer calculations; recording keeping; irrigation components, water quality; drainage; integrated pest management; pesticide safety and regulations; equipment calibration; chemical growth regulators; xeriscaping; integrated landscape management; safe use of power equipment; record keeping; and employability skills.

11.0 IDENTIFY AND CLASSIFY PLANTS--The student will be able to:

- 11.01 Describe principles of plant biology and growth. LAA 1.4, 2.4; LAB 1.4, 2.4; LAD 1.4, 2.4; MAA 1.4, 2.4, 3.4; SCA 1.4, 2.4; SCB 1.4, 2.4; SCF 1.4, 2.4; SCG 1.4, 2.4
- 11.02 Explain the functional use of plants. LAA 1.4, 2.4; LAB 1.4, 2.4; LAD 1.4, 2.4; SCF 1.4, 2.4

13.0 IDENTIFY GROWING MEDIA AND APPLY FERTILIZERS--The student will be able to:

- 13.06 Interpret information on fertilizer label. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 3.4; MAB 1.4, 2.4, 3.4; MAD 2,4; SCA 1.4, 2.4; SCB 2.4, SCD 1.4, 2.4; SCE 1.4; SCF 1.4; SCG 1.4 2,4; SCH 1.4, 2.4, 3.4
- 13.07 Apply fertilizer and soil amendments. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 3.4; MAB 1.4, 2.4, 3.4; MAD 2,4; SCA 1.4, 2.4; SCB 2.4, SCD 1.4, 2.4; SCE 1.4; SCF 1.4; SCG 1.4 2,4; SCH 1.4, 2.4, 3.4

15.0 DESCRIBE PEST CONTROL APPROACHES--The student will be able to:

- 15.03 Classify insects according to feeding habits. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; SCA 1.4, 2,4; SCF 1.4, 2.4; SCG 1.4, 2.4; SCH 1.4, 3.4
- 15.04 Describe biological, chemical, and cultural methods of controlling plant pests. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; SCA 1.4, 2.4; SCD 2.4; SCF 1.4; SCG 1.4, 2.4

16.0 CONTROL PLANT GROWTH--The student will be able to:

- 16.01 Identify methods of pruning plants. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4
- 16.02 Identify appropriate time to prune plants. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; SCG 1.4, 2.4
- 16.03 Identify and select pruning tools. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4

17.0 HARVEST, TRANSPORT, AND INSTALL PLANT MATERIALS--The student will be able to:

- 17.01 Determine requirements for preserving plant viability. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAA 1.4; SCG 1.4; SCH 3.4
- 17.02 Install containerized plant materials. LAA 1.4, LAB 1.4, 2.4; LAC 1.4 2.4, 3.4; LAD 1.4, 2.4; MAB 1.4, 2.4, 3.4, 4.4; MAC 3.4; SCG 1.4, 2.4; SCH 3.4
- 17.03 Select and prepare plants for transporting and transplanting. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAC 3.4; SCG 1.4, 2.4; SCH 3.4

18.0 OPERATE, REPAIR, AND MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:

- 18.01 Perform equipment pre-operational check. LAA 1.4, LAB 1.4; LAC 1.4, 2.4; MAA 1.4, 2.4, 3.4, 4.4; MAB 1.4, 2.4, 3.4, 4.4
- 18.02 Identify, maintain, and operate hand tools and power tools. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; MAB 2.4, 3.4

19.0 DEMONSTRATE LEADERSHIP, EMPLOYABILITY, COMMUNICATIONS AND HUMAN RELATIONS SKILLS--The student will be able to:

- 19.02 Identify acceptable work habits and personal characteristics. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; SSB 2.4
- 19.03 Identify acceptable employee hygiene habits. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; SSB 2.4
- 19.04 Identify or demonstrate appropriate responses to criticism from employer, supervisor, or other persons. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; SSB 2.4
- 19.06 Describe the importance of industry certifications. LAA 1.4, 2.4; LAB 1.4, 2.4; LAC 1.4, 2.4, 3.4; LAD 1.4, 2.4; SSB 2.4

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8121310
Course Title: Landscape and Turf Science 4
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to further develop competencies in the areas of use and maintenance of landscape and turf equipment; classification of plants and turfgrass; fertilization; and irrigation.

20.0 MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:

- 20.01 Maintain oil level in engines of power equipment.
- 20.02 Check and maintain tire air pressure on equipment.
- 20.03 Maintain fuel levels using proper fuel or fuel mixtures.
- 20.04 Operate manual transmissions.
- 20.05 Identify, operate, and maintain tractor and power equipment.

21.0 APPLY CHEMICAL AND CALIBRATE SPRAY EQUIPMENT--The student will be able to:

- 21.01 Select, mix, and apply a nonrestricted chemical according to the label and local, state, federal, and EPA regulations.
- 21.03 Identify and report insect and disease damage.

22.0 CLASSIFY PLANTS AND TURFGRASS--The student will be able to:

- 22.01 Classify plants as monocots or dicots.
- 22.02 Classify plants and turfgrass as annuals, biennials, and perennials.
- 22.03 Identify plants and turfgrass that are specific to a region.

23.0 DEMONSTRATE FERTILIZATION SKILLS--The students will be able to:

- 23.01 Develop a fertilization schedule.

24.0 IRRIGATE PLANTS AND TURF--The student will be able to:

- 24.01 Identify various types of irrigation systems.
- 24.02 Install and maintain piping and water distribution components.
- 24.03 Install valves, timers, rain shut-offs, moisture sensors, and back flow prevention devices.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8121320
Course Title: Landscape and Turf Science 5
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to further develop competencies in the areas of chemical application; equipment calibration; analyzing and designing landscape and turf; preparing estimates and contracts; and lay out and installation of landscape, interiorscape and turf.

20.0 MAINTAIN TOOLS AND EQUIPMENT--The student will be able to:

- 20.06 Service and maintain battery and electrical systems.
- 20.07 Perform minor tune-up on engines.
- 20.08 Load, secure, and transport equipment.
- 20.09 Demonstrate safety precautions while working with tools and equipment.

21.0 APPLY CHEMICAL AND CALIBRATE SPRAY EQUIPMENT--The student will be able to:

- 21.02 Calibrate spray and spread equipment.
- 21.04 Determine chemical compatibility.
- 21.05 Determine appropriate time frequency and method of chemical application.

22.0 CLASSIFY PLANTS AND TURFGRASS--The student will be able to:

- 22.04 Classify plants and turfgrass according to growth habit.
- 22.05 Identify poisonous plants.

23.0 DEMONSTRATE FERTILIZATION SKILLS--The students will be able to:

- 23.02 Determine rate of fertilizer application and calibration equipment.
- 23.03 Calibrate fertilizer equipment.

24.0 IRRIGATE PLANTS AND TURF--The student will be able to:

- 24.04 Check and evaluate irrigation system performance.
- 24.05 Maintain irrigation system.

Florida Department of Education
STUDENT PERFORMANCE STANDARDS

Course Number: 8121410
Course Title: Sports and Recreational Turf Operations 6
Course Credit: 1

COURSE DESCRIPTION:

This course is designed to further develop competencies in the areas of maintenance of greens and tees; maintenance of fairways, roughs and traps; fertilization of turf and establishing turfgrass.

25.0 MAINTAIN SPORTS TURF--The student will be able to:

- 25.01 Mow sport turf with reel mowers.
- 25.02 Relocate cups and markers.
- 25.03 Irrigate turf.
- 25.04 Verticut turf.
- 25.05 Aerate turf and remove debris.
- 25.06 Repair ball marks on greens.

26.0 MAINTAIN FAIRWAYS, ROUGHS, AND TRAPS--The student will be able to:

- 26.01 Irrigate fairways.
- 26.02 Repair divots.
- 26.03 Add sand to traps.
- 26.04 Rake and trim sand traps.
- 26.05 Edge sand traps.

27.0 FERTILIZE TURF--The student will be able to:

- 27.01 Apply top dressing.
- 27.02 Overseed turf.
- 27.03 Apply fertilizer.

28.0 ESTABLISH TURFGRASS--The student will be able to:

- 28.01 Level seedbed.
- 28.02 Plant turf by sprigs, plugs or sod.
- 28.03 Remove sod with sod cutter.