

Agricultural and Environmental Systems Career Field Pathways and Course Structure

Courses in Horticulture (A5)

| PATHWAY COURSES | SUBJECT CODE |
|----------------------------------------------------------------|--------------|
| Agriculture, Food and Natural Resources ¹ | 010105 |
| Plant and Horticultural Science ² | 010155 |
| Floral Design and Marketing | 010625 |
| Greenhouse and Nursery Management | 010610 |
| Landscape Design and Build | 010630 |
| Landscape Systems Management | 010615 |
| Turf Science & Management | 010635 |
| Urban Forestry | 010740 |
| ELECTIVES | SUBJECT CODE |
| Animal and Plant Biotechnology ² | 012010 |
| Business Management for Agricultural and Environmental Systems | 010115 |
| Agricultural and Environmental Systems Capstone ³ | 010190 |
| Communications and Leadership | 010110 |
| Natural Resources ² | 010710 |
| Agricultural & Industrial Power ² | 010210 |

¹First course in the Career Field; ²First course in the Pathway; ³Does not count as one of the required four courses

Agriculture, Food and Natural Resources

Subject Code: 010105

This is the first course in the Agricultural and Environmental Systems career field. It introduces students to the pathways that are offered in the Agricultural and Environmental Systems career field. As such, learners will obtain fundamental knowledge and skills in food science, natural resource management, animal science & management, plant & horticultural science, power technology and biotechnology. Students will be introduced to the FFA organization and begin development of their leadership ability.

Plant and Horticultural Science

Subject Code: 010155

This first course in the pathway focuses on the broad knowledge and skills required to research, develop, produce and market agricultural, horticultural, and native plants and plant products. Students will apply principals and practices of plant physiology and anatomy, plant protection and health, reproductive biology in plants, influences in bioengineering, plant nutrition and disorders. Environmental aspects of irrigation, chemical application, soils, and pest management will be studied and applied. Projects and activities will enable students to develop communication, leadership, and business management skills.

Floral Design and Marketing

Subject Code: 010625

Students will use principles and elements of design to create various types and styles of floral arrangements with natural and artificial plants and plant products. Identification of ornamental plants and cut flowers, use of design materials, and storage and handling applications will be examined. Students will develop successful business, communication, marketing, and sales strategies for use in the floral industry.

Greenhouse and Nursery Management

Subject Code: 010610

The course will apply principles of science, engineering, and business to support the sustainable propagation and production of plants in a commercial nursery or greenhouse facility. Management of soil/media, water and nutrient distribution, lighting, ventilation and temperature, and pests will be learned and applied. Students will demonstrate knowledge of propagation methods, plant health, nutrition, and growth stimulation. Students will develop successful business, communication, marketing, and sales strategies for use in the greenhouse and nursery industries.

Landscape Design and Build

Subject Code: 010630

Students will develop skills in landscape planning, design, estimation and installation. Principles and elements of design and engineering will be emphasized. Students will design full-featured landscapes using computer-aided technology, construct hardscapes and install artificial lighting and water systems. Environmental effects of a landscape will be evaluated and eco-friendly techniques applied. Students will employ communication, business, and management strategies appropriate for the industry.

Landscape Systems Management

Subject Code: 010615

Students will learn methods for establishing and managing landscapes to promote growth and balance. The classification and care of woody and herbaceous landscape plants will be covered in-depth. Students will learn to optimize growing conditions, balance nutrients, and manage pests and disease. Horticultural skills including proper planting, fertilizing, and pruning techniques will be practiced while safely operating well maintained specialized equipment. The implications of landscape installation on the environment will be analyzed and eco-friendly practices applied. Students will employ communication, business, and management strategies appropriate for the industry.

Turf Science and Management

Subject Code: 010635

The course will apply principles of science, engineering, and business to support the establishment and maintenance of residential, athletic and recreational turf. Instruction in establishment, care, production, and marketing of turf grass along with safe operation and maintenance of specialized equipment will be provided. Environmental awareness and conservation practices will be applied. Students will employ communication, business, and management strategies appropriate for the industry.

Urban Forestry

Subject Code: 010740

The learner will promote the care and management of trees for residential and commercial purposes. Learners will apply principles of soil management, dendrology and pest management to the care and management of trees. Learners will analyze budgets; and develop short and long-range management plans that balance environmental and economic goals and that support sustainable land use patterns. Principles of rigging, advanced rope techniques, and chainsaw applications for tree pruning and removal will be learned.

Animal and Plant Biotechnology

Subject Code: 012010

Learners will apply principles of chemistry, microbiology and genetics to plant and animal research and product development. They will describe the importance of biotechnology in society, and analyze the issues that have affected agricultural biotechnology. Students will apply genetic principals to determine genotypes and phenotypes. Students will describe the parts and functions of animal and plant cells and their importance in biochemistry.

Business Management for Agricultural and Environmental Systems

Subject Code: 010115

Learners will examine elements of business, identify organizational structures and identify and apply management skills. Learners will develop business plans, financial reports and strategic goals for new ventures or existing businesses. Learners will use marketing concepts to evaluate the marketing environment and develop a marketing plan with marketing channels, product approaches, promotion and pricing strategies. Learners will practice customer sales techniques and apply concepts of ethics and professionalism while understanding related business regulations.

Agricultural and Environmental Systems Capstone

Subject Code: 010190

The capstone course is an opportunity for students to solve problems and demonstrate that they have achieved the requisite knowledge and skills in their chosen Agricultural and Environmental Systems career field pathway. The course is designed to assess cognitive, affective and psychomotor learning and to do so in a student-centered and student-directed manner. The capstone requires the application of learning to a project that serves as an instrument of evaluation.

Communications and Leadership

Subject Code: 010110

Students will analyze attributes and capabilities of those in leadership positions and develop their communication and leadership skills in authentic situations. The course prepares students to apply journalistic, communication and broadcasting principles to the development, production, and transmittal of agricultural and environmental systems information.

Natural Resources

Subject Code: 010710

Learners will apply science principles and management practices to the protection of renewable and non-renewable natural resources. Students will learn fundamentals of land use as well as watershed, wildlife, fishery and forest management. Students will be introduced to management practices related to managing air and water quality along with requirements for managing solid and liquid waste. Communications, business principles and leadership skill development are essential to the program.

Agricultural and Industrial Power

Subject Code: 010210

The *A&I Power Technology* course will introduce students to the breadth of the Agricultural and Industrial Power Technology pathway. Students will learn the principles of agricultural and industrial power technology equipment systems including electronic, electrical, engines, fuel, hydraulics, and power trains. Additionally, students will learn to operate and maintain agricultural & industrial equipment.