LANDSCAPE DESIGN

INDUSTRY SECTOR | Agriculture and Natural Resources

PATHWAY | Ornamental Horticulture

COURSE ESSENTIAL QUESTION:

When landscape is your trade, the world is your office!

COURSE OVERVIEW:

This course is designed to prepare students with the knowledge and skills for an entry level position in the landscape and nursery occupations. Students will have an opportunity to develop skills in pruning, landscaping, and caring for plants; and, learn the safe use of chemicals and fertilizers used in landscape gardening. Students will be equipped with the knowledge and skills necessary to establish and maintain not only landscape and turf in residential settings, but in commercial settings as well. Integrated throughout the course are Common Core State Standards and Career Technical Education Standards, which include safety, communication, technology, ethics, career planning and other employability skills.

INFORMATION:

A. **Pre-requisite**: 16 years old or a 11th / 12th grader
B. **Abilities Required:** Able to lift 50 pounds, willing to work outside, take care of tools and equipment.
C. **Dress Requirement and Grooming**: As required by Industry Standards
D. **Students must master** 75**% of the certificate competencies to receive a certificate.**
E. **Fee:** No
F. **Course Length:** 180 hours
G. **Textbook**: Western Garden Handbook & Landscaping Principles & Practices
H. **UC a-g Approved:** No
I. **Industry Certification:** No
J. **Sequencing to Include a Capstone:** Not Applicable
K. **Community College Articulation:** No
L. **Common Core Alignment:** Yes
M. **Community Classroom:** No
N. **Career Technical Student Organization:** No
O. **Work-Based Learning:** Yes

IDEA/THEME: UNIT 1. SAFETY FIRST
ENGAGING TITLE:
ESSENTIAL QUESTION: ***What body part are you willing to part with?***
INSTRUCTIONAL HOURS: 15.00 HOURS

Common Core Unit Objective

Safety First! Students listen, observe and demonstrate proper safety measures, basic First Aid and use of PPE's (Personal Protective Equipment).

Key Assignments

- Select tool(s)/equipment and identify which PPEs are required and demonstrate proper use (ear plugs, harness, leather or rubber gloves, etc.). Describe common/obvious dangers and First Aid steps. Demonstrate proper use of tool(s)/equipment.
- Describe common/obvious dangers.
- First Aid demo for cuts, burns, heat stroke, fractures.
- Demonstrate proper use of tools & equipment.
- Locate MSDS and explain safety steps.

Anchor Standards

6.0 Health and Safety
Demonstrate health and safety procedures, regulations, and personal health practices and determine the meaning of symbols, key terms, and domain-specific words and phrases as related to the Agriculture and Natural Resources sector workplace environment.

6.1 Locate and adhere to Material Safety Data Sheet (MSDS) instructions.
6.3 Use health and safety practices for storing, cleaning, and maintaining tools, equipment, and supplies.
6.4 Practice personal safety when lifting, bending, or moving equipment and supplies.
6.5 Demonstrate how to prevent and respond to work-related accidents or injuries; this includes demonstrating an understanding of ergonomics.
6.6 Maintain a safe and healthful working environment.
6.7 Be informed of laws/acts pertaining to the Occupational Safety and Health Administration (OSHA).

Pathway Standards

F6.0 Apply ornamental plant nutrition practices.
- F6.4 Read and interpret labels to properly apply fertilizers

F9.0 Demonstrate the proper use of containers and horticultural tools, equipment, and facilities.
- F9.2 Operate and maintain selected hand and power equipment safely and appropriately.

Common Core Standards

RLST 9-10.3 Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.

RESOURCES:

Resources

MSDS, PPE's of the Trade, Chart of Elements

IDEA/THEME: UNIT 2. SOILS
ENGAGING TITLE:
ESSENTIAL QUESTION: What kind of dirt do you have on me?
INSTRUCTIONAL HOURS: 10.00 HOURS

Common Core Unit Objective

In this unit of instruction, students will analyze and identify three basic soil types, benefits and potential problems of each soil type and how to amend them.

Key Assignments

- Test percolation rates of various types of soils.
- Identify each soil type in its natural setting.
- Perform calculations to determine type and amount of amendments to add to soil.
- Describe types of top dressings and demonstrate how to install.
- Explain purpose of top dressings.

Anchor Standards

5.0 **Problem Solving and Critical Thinking:** Conduct short as well as more sustained research to create alternative solutions to answer a question or solve a problem unique to the Agriculture and Natural Resources sector, using critical and creative thinking, logical reasoning, analysis, inquiry, and problem-solving techniques.

5.4 Interpret information and draw conclusions, based on the best analysis, to make informed decisions.

9.0 **Leadership and Teamwork:** Work with peers to promote divergent and creative perspectives, effective leadership, group dynamics, team and individual decision making, benefits of workforce diversity, and conflict resolution as practiced in the Future Farmers of America (FFA) career technical student organization.

9.7 Participate in interactive teamwork to solve real Agriculture and Natural Resources sector issues and problems.

11.0 **Demonstration and Application:** Demonstrate and apply the knowledge and skills contained in the Agriculture and Natural Resources anchor standards, pathway standards, and performance indicators in classroom, laboratory, and workplace settings, and through the FFA career technical student organization.

11.1 Utilize work-based/ workplace learning experiences to demonstrate and expand upon knowledge and skills gained during classroom instruction and laboratory practices specific to the Agriculture and Natural Resources sector program of study.

Pathway Standards

F5.0 Summarize water and soil (media) management practices.
- F5.1 Explain how basic soil science and water principles affect plant growth.
- F5.3 Prepare and amend soils, implement soil conservation methods, and compare results.

Common Core Standards

G-MD: Explain volume formulas and use them to solve problems
G-MD: 3. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.
G-MG: 2. Apply concepts of density based on area and volume in modeling situations. (eg., persons per square mile, BTUs per cubic foot).

RESOURCES:

Resources

Soil Test Kit

IDEA/THEME: UNIT 3. FERTILIZATION
ENGAGING TITLE:
ESSENTIAL QUESTION: Remember NPK – No Plant Killers
INSTRUCTIONAL HOURS: 10.00 HOURS

Common Core Unit Objective

Upon completion of this unit of instruction students will understands basic plant needs, demonstrates how to test soil and safely provide necessary nutrients.

Key Assignments

- Determine square footage of target area.
- Locate and identify MSDS and demonstrate proper use of PPEs.
- Using Periodic Chart identify macro and micro nutrients and location on label.
- Calculate proper amount of fertilizer for target area.
- Safely and effectively apply fertilizer in criss-cross pattern.
- Describe what essential nutrients do for the plant.

Anchor Standards

5.0 **Problem Solving and Critical Thinking:** Conduct short as well as more sustained research to create alternative solutions to answer a question or solve a problem unique to the Agriculture and Natural Resources sector, using critical and creative thinking, logical reasoning, analysis, inquiry, and problem-solving techniques.

5.4 Interpret information and draw conclusions, based on the best analysis, to make informed decisions.

6.0 **Health and Safety:** Demonstrate health and safety procedures, regulations, and personal health practices and deter-mine the meaning of symbols, key terms, and domain-specific words and phrases as related to the Agriculture and Natural Resources sector workplace environment.

6.1 Locate, and adhere to, Material Safety Data Sheet (MSDS) instructions.

Pathway Standards

F6.0 Apply ornamental plant nutrition practices.
- F6.1 Analyze how primary and secondary nutrients and trace elements affect ornamental plants.
- F6.3 Analyze organic and inorganic fertilizers to understand their appropriate uses.
- F6.4 Read and interpret labels to properly apply fertilizers.

Common Core Standards

G-MD: 3. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.
LS-LS1.B: Growth & Development of Organisms

RESOURCES:

Resources

MSDS, Empty fertilizer bags for variety, Chart of Elements

IDEA/THEME: UNIT 4. PRUNING
ENGAGING TITLE:
ESSENTIAL QUESTION: Know the 3 Basic Rules
INSTRUCTIONAL HOURS: 10.00 HOURS

Common Core Unit Objective

This unit of instruction students will demonstrate ability to identify need for pruning, proper use of tools, safety concerns and recycling.

Key Assignments

- Recognize three basic reasons for pruning and what to prune first to last
- Describe tree pruning safety concerns
- Demonstrate how to prune with proper tools
- Explain various recycling options and uses
- Observe a trimming crew teamwork

Anchor Standards

5.0 **Problem Solving and Critical Thinking:** Conduct short as well as more sustained research to create alternative solutions to answer a question or solve a problem unique to the Agriculture and Natural Resources sector, using critical and creative thinking, logical reasoning, analysis, inquiry, and problem-solving techniques.

- 5.2 Solve predictable and unpredictable work-related problems using various types of reasoning (inductive, deductive) as appropriate.

6.0 **Health and Safety:** Demonstrate health and safety procedures, regulations, and personal health practices and deter-mine the meaning of symbols, key terms, and domain-specific words and phrases as related to the Agriculture and Natural Resources sector workplace environment.

- 6.4 Practice personal safety when lifting, bending, or moving equipment and supplies.
- 6.5 Demonstrate how to prevent and respond to work-related accidents or injuries; this includes demonstrating an understanding of ergonomics.
- 6.6 Maintain a safe and healthful working environment.
- 6.7 Be informed of laws/acts pertaining to the Occupational Safety and Health Administration (OSHA).

9.0 **Leadership and Teamwork:** Work with peers to promote divergent and creative perspectives, effective leadership, group dynamics, team and individual decision making, benefits of workforce diversity, and conflict resolution as practiced in the Future Farmers of America (FFA) career technical student organization.

- 9.10 Understand how to organize and structure work, individually and in teams, for effective performance and the attainment of goals.

Pathway Standards

F10.0 Understand basic landscape planning, design, construction, and maintenance.

- F10.4 Prune ornamental shrubs, trees, and fruit trees.

Common Core Standards

CC: 3. Scale, proportion, and quantity
CC: 6. Structure and function
LS-LS1.B Growth and Development of Organisms

RESOURCES:

Resources

Johnny's Tree Service or other arborist - Guest lecture and demonstration

IDEA/THEME: UNIT 5. PLANT AND TURF GRASS MAINTENANCE
ENGAGING TITLE:
ESSENTIAL QUESTION: Don't Just Mow, Blow and Go
INSTRUCTIONAL HOURS: 30.00 HOURS

Common Core Unit Objective

Upon completion of this unit of instruction students will be able to proper install plants and turf and demonstrate how to care for landscape. Students will be able to identify basic plant needs and conserve water.

Key Assignments

- Demonstrate how to use Western Garden Handbook for plant selection (including native plants) and design
- Perform planting project
- Demonstrate proficiency with turf power tools
- Explain best procedure for weekly turf maintenance

Anchor Standards

5.0 Problem Solving and Critical Thinking: Conduct short as well as more sustained research to create alternative solutions to answer a question or solve a problem unique to the Agriculture and Natural Resources sector, using critical and creative thinking, logical reasoning, analysis, inquiry, and problem-solving techniques.

- 5.3 Use systems thinking to analyze how various components interact with each other to produce outcomes in a complex work environment.

6.0 Health and Safety: Demonstrate health and safety procedures, regulations, and personal health practices and determine the meaning of symbols, key terms, and domain-specific words and phrases as related to the Agriculture and Natural Resources sector workplace environment.

- 6.2 Interpret policies, procedures, and regulations for the workplace environment, including employer and employee responsibilities.
- 6.3 Use health and safety practices for storing, cleaning, and maintaining tools, equipment, and supplies.
- 6.4 Practice personal safety when lifting, bending, or moving equipment and supplies.
- 6.5 Demonstrate how to prevent and respond to work-related accidents or injuries; this includes demonstrating an understanding of ergonomics.
- 6.6 Maintain a safe and healthful working environment.
- 6.7 Be informed of laws/acts pertaining to the Occupational Safety and Health Administration (OSHA).

7.0 Responsibility and Flexibility: Initiate, and participate in, a range of collaborations demonstrating behaviors that reflect personal and professional responsibility, flexibility, and respect in the Agriculture and Natural Resources sector workplace environment and community settings.

- 7.2 Explain the importance of accountability and responsibility in fulfilling personal, community, and workplace roles.
- 7.3 Understand the need to adapt to changing and varied roles and responsibilities.
- 7.4 Practice time management and efficiency to fulfill responsibilities.
- 7.7 Demonstrate the qualities and behaviors that constitute a positive and professional work demeanor, including appropriate attire for the profession.

9.0 Leadership and Teamwork: Work with peers to promote divergent and creative perspectives, effective leadership, group dynamics, team and individual decision making, benefits of workforce diversity, and conflict resolution as practiced in the Future Farmers of America (FFA) career technical student organization.

- 9.8 Define the characteristics and benefits of teamwork, leadership, and citizenship in the school, community, and workplace settings.
- 9.9 Identify the ways in which pre-professional associations, such as the Future Farmers of America (FFA), and competitive career development activities enhance academic skills, promote career choices, and contribute to employability.

9.10 Understand how to organize and structure work, individually and in teams, for effective performance and the attainment of goals.
9.11 Explain multiple approaches to conflict resolution and their appropriateness for a variety of situations in the workplace.
9.12 Demonstrate how to interact with others in ways that demonstrate respect for individual and cultural differences and for the attitudes and feelings of others.

Pathway Standards

F1.0 Compare and contrast the hierarchical classification of plants.
F1.5 Identify and select plants for local landscape applications.
F7.0 Develop a plan for the selection, installation, and maintenance of turf.
F7.2 Demonstrate how to select, install, and maintain a designated turf grass area.
F9.0 Demonstrate the proper use of containers and horticultural tools, equipment, and facilities.
F9.2 Operate and maintain selected hand and power equipment safely and appropriately.
F9.3 Select proper tools for specific horticultural jobs.
F10.0 Understand basic landscape planning, design, construction, and maintenance.
F10.3 Use proper landscape planting and maintenance practices.

Common Core Standards

CC 5. Energy and matter: Flows, cycles, and conservation

RESOURCES:

Resources

Manufacturer's Catalogs

IDEA/THEME: UNIT 6. TOOLS AND EQUIPMENT
ENGAGING TITLE:
ESSENTIAL QUESTION: How to select and operate the right tool for the right job?
INSTRUCTIONAL HOURS: 20.00 HOURS

Common Core Unit Objective

In this unit of instruction, students will explore the proper use of tools and equipment in a safe, effective manner.

Key Assignments

- Learn and identify tools/ equipment names
- Demonstrate proper PPE and safety steps for each tool/ equipment
- Safely operate tools and equipment
- Explain basic maintenance procedures

Anchor Standards

4.0 **Technology:** Use existing and emerging technology to investigate, research, and produce products and services, including new information, as required in the Agriculture and Natural Resources sector workplace environment.

4.7 Demonstrate the use of appropriate tools and technology used in the Agriculture and Natural Resources sector.

6.0 **Health and Safety:** Demonstrate health and safety procedures, regulations, and personal health practices and deter-mine the meaning of symbols, key terms, and domain-specific words and phrases as related to the Agriculture and Natural Resources sector workplace environment.

6.3 Use health and safety practices for storing, cleaning, and maintaining tools, equipment, and supplies.

6.4 Practice personal safety when lifting, bending, or moving equipment and supplies.

6.5 Demonstrate how to prevent and respond to work-related accidents or injuries; this includes demonstrating an understanding of ergonomics.

6.6 Maintain a safe and healthful working environment.

6.7 Be informed of laws/acts pertaining to the Occupational Safety and Health Administration (OSHA).

Pathway Standards

F9.0 Demonstrate the proper use of containers and horticultural tools, equipment, and facilities.
- F9.2 Operate and maintain selected hand and power equipment safely and appropriately.
- F9.3 Select proper tools for specific horticultural jobs.

Common Core Standards

RLST 9-10.3 Follow precisely a complex multistep procedure when carry out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text.

RESOURCES:

Resources

Exmark Mowers and Chino Mower Personnel

IDEA/THEME: UNIT 7. IRRIGATION BASICS
ENGAGING TITLE:
ESSENTIAL QUESTION: Why is the grass always greener on the other side of the fence?
INSTRUCTIONAL HOURS: 30.00 HOURS

Common Core Unit Objective

In this unit of instruction, students will explore proper use of tools and equipment in a safe, effective manner.

Key Assignments

- How to perform a water audit
- Measure and record PSI & GPM
- Calculate total GPM and system's safe operating range
- Demonstrate proficiency in reading a sprinkler chart
- Measure, diagram, scale and design head-to-head coverage
- Demonstrate ability to build-to-scale simple irrigation plans
- Prepare an irrigation estimate, bid proposal and contract
- Install a basic drip system

Anchor Standards

1.0 **Academics:** Analyze and apply appropriate academic standards required for successful industry sector pathway completion leading to postsecondary education and employment. Refer to the Agriculture and Natural Resources academic alignment matrix for identification of standards.

2.0 **Communications:** Acquire and accurately use Agriculture and Natural Resources sector terminology and protocols at the career and college readiness level for communicating effectively in oral, written, and multimedia formats.

2.4 Demonstrate elements of written and electronic communication, such as accurate spelling, grammar, and format.

2.5 Communicate information and ideas effectively to multiple audiences using a variety of media and formats.

8.0 **Ethics and Legal Responsibilities:** Practice professional, ethical, and legal behavior, responding thoughtfully to diverse perspectives and resolving contradictions when possible, consistent with applicable laws, regulations, and organizational norms.

8.4 Explain the importance of personal integrity, confidentiality, and ethical behavior in the workplace.

Pathway Standards

F5.0 Summarize water and soil (media) management practices.
F5.2 Illustrate basic irrigation design and installation methods.

Common Core Standards

RLST 9-10.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics.
G-CO Make geometric constructions
G-CO 12. Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.

RESOURCES:

Resources

Irrigation manufacturer's catalog, Hunter, Rainbird, Toro, etc.

IDEA/THEME: UNIT 8. XERISCAPE, HARDSCAPE, LIGHTING AND OTHER FEATURES
ENGAGING TITLE:
ESSENTIAL QUESTION: What else can I do as a landscape?
INSTRUCTIONAL HOURS: 10.00 HOURS

Common Core Unit Objective

In this unit of instruction, students will identify common landscape features.

Key Assignments

- Hardscape including pavers, mow curbs, forming and pouring walks, fire rings
- Fencing, grout-less retaining walls
- Xeriscape and low voltage lighting
- Water features

Anchor Standards

2.0 **Communications:** Acquire and accurately use Agriculture and Natural Resources sector terminology and protocols at the career and college readiness level for communicating effectively in oral, written, and multimedia formats.
- 2.5 Communicate information and ideas effectively to multiple audiences using a variety of media and formats.

10.0 **Technical Knowledge and Skills:** Apply essential technical knowledge and skills common to all pathways in the Agriculture and Natural Resources sector, following procedures when carrying out experiments or performing technical tasks.
- 10.4 Collaborate with industry experts for specific technical knowledge and skills.

11.0 **Demonstration and Application:** Demonstrate and apply the knowledge and skills contained in the Agriculture and Natural Resources anchor standards, pathway standards, and performance indicators in classroom, laboratory, and workplace settings, and through the FFA career technical student organization.
- 11.1 Utilize work-based/workplace learning experiences to demonstrate and expand upon knowledge and skills gained during classroom instruction and laboratory practices specific to the Agriculture and Natural Resources sector program of study.
- 11.3 Demonstrate entrepreneurship skills and knowledge of self-employment options and innovative ventures.
- 11.4 Employ entrepreneurial practices and behaviors appropriate to Agriculture and Natural Resources sector opportunities.

Pathway Standards

B6.0 Understand concrete and masonry practices commonly used in agriculture.
- B6.1 Identify and explain the use of concrete and masonry tools and demonstrate proper handling of concrete materials.
- B6.2 Practice bed preparation, concrete forms layout, and construction.
- B6.3 Complete a concrete or masonry project, including calculating volume, developing a bill of materials, assembling, mixing, placing, and finishing.

Common Core Standards

RLST 9-10.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics.

G-MD: Explain volume formulas and use them to solve problems

G-MD: 3. Use volume formulas for cylinders, pyramids, cones, and spheres to solve problems.

RESOURCES:

Resources

Professional Landscaper Magazine for “book report” and photos

IDEA/THEME: UNIT 9. LANDSCAPE DESIGN BASICS AND LICENSING
ENGAGING TITLE:
ESSENTIAL QUESTION: Can you read and do you have a C-27?
INSTRUCTIONAL HOURS: 10.00 HOURS

Common Core Unit Objective

This unit of instruction will familiarize students with performing calculations, demonstrating the correct application of equations, and reading blueprints. Students will explore C-27 licensing requirements, become familiar with industry standards and up-sell your project.

Key Assignments

- Become familiar with plans and specifications
- Demonstrate how to read irrigation and planting sheets
- Use legends to explain plan details

Anchor Standards

1.0 **Academics:** Analyze and apply appropriate academic standards required for successful industry sector pathway completion leading to postsecondary education and employment. Refer to the Agriculture and Natural Resources academic alignment matrix for identification of standards.

3.0 **Career Planning and Management:** Integrate multiple sources of career information from diverse formats to make informed career decisions, solve problems, and manage personal career plans.

- 3.1 Identify personal interests, aptitudes, information, and skills necessary for informed career decision making.
- 3.2 Evaluate personal character traits, such as trust, respect, and responsibility, and understand the impact they can have on career success.

8.0 **Ethics and Legal Responsibilities:** Practice professional, ethical, and legal behavior, responding thoughtfully to diverse perspectives and resolving contradictions when possible, consistent with applicable laws, regulations, and organizational norms.

- 8.3 Demonstrate ethical and legal practices consistent with Agriculture and Natural Resources sector workplace standards.
- 8.4 Explain the importance of personal integrity, confidentiality, and ethical behavior in the workplace.

Pathway Standards

B12.0 Apply land measurement and construction techniques commonly used in agriculture.
- B12.2 Draw and interpret architectural plans.

F10.0 Understand basic landscape planning, design, construction, and maintenance.
- F10.2 Produce a residential design, including how to render design to scale using design technology and principles.
- F10.5 Produce clear and concise landscape business contracts.

Common Core Standards

RLST 9-10.4 Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to grades 9-10 texts and topics.

SEP 4. Analyzing and interpreting data

SEP 5. Using mathematics and computational thinking

CC 3. Scale, proportion, and quantity

CC 5. Energy and matter: Flows, cycles, and conservation

RESOURCES:

Resources

Blue Prints and specification books