

Course Outline

Agriculture and Natural Resources

REVISED: August/2017

Job Title:
Landscaper

Career Pathway:
Ornamental Horticulture

Industry Sector:
Agriculture and Natural
Resources

O*NET-SOC CODE:
37-3011.00

CBEDS Title:
Introduction to Ornamental
Horticulture

CBEDS No.:
4051

70-25-75

Landscaping/2

Credits: 15

Hours: 180

Course Description:

This competency-based course is the second in a sequence of three designed for landscaping. It provides students with technical instruction and practical experience in workplace safety, handling and caring for power hand tools, part two of plant identification, soil analysis, landscape irrigation, weed abatement, pruning, plant propagation and a review of water management. The competencies in this course are aligned with the California High School Academic Content Standards and the California Career Technical Education Model Curriculum Standards.

Prerequisites:

Enrollment requires completion of the Landscaping/1 (70-25-70) course.

NOTE: For Perkins purposes this course has been designated as a **concentrator** course.

This course cannot be repeated once a student receives a Certificate of Completion.



COURSE OUTLINE COMPETENCY-BASED COMPONENTS

A course outline reflects the essential intent and content of the course described. Acceptable course outlines have six components. (Education Code Section 52506). Course outlines for all apportionment classes, including those in jails, state hospitals, and convalescent hospitals, contain the six required elements:

(EC 52504; 5CCR 10508 [b]; Adult Education Handbook for California [1977], Section 100)

COURSE OUTLINE COMPONENTS

LOCATION

GOALS AND PURPOSES

Cover

The educational goals or purposes of every course are clearly stated and the class periods are devoted to instruction. The course should be broad enough in scope and should have sufficient educational worth to justify the expenditure of public funds.

The goals and purpose of a course are stated in the COURSE DESCRIPTION. Course descriptions state the major emphasis and content of a course, and are written to be understandable by a prospective student.

PERFORMANCE OBJECTIVES OR COMPETENCIES

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Objectives should be delineated and described in terms of measurable results for the student and include the possible ways in which the objectives contribute to the student's acquisition of skills and competencies.

Performance Objectives are sequentially listed in the COMPETENCY-BASED COMPONENTS section of the course outline. Competency Areas are units of instruction based on related competencies. Competency Statements are competency area goals that together define the framework and purpose of a course. Competencies fall on a continuum between goals and performance objectives and denote the outcome of instruction.

Competency-based instruction tells a student before instruction what skills or knowledge they will demonstrate after instruction. Competency-based education provides instruction which enables each student to attain individual goals as measured against pre-stated standards.

Competency-based instruction provides immediate and continual repetition and In competency-based education the curriculum, instruction, and assessment share common characteristics based on clearly stated competencies. Curriculum, instruction and assessment in competency-based education are: explicit, known, agreed upon, integrated, performance oriented, and adaptive.

COURSE OUTLINE COMPETENCY-BASED COMPONENTS
(continued)

COURSE OUTLINE COMPONENTS

LOCATION

INSTRUCTIONAL STRATEGIES

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Instructional techniques or methods could include laboratory techniques, lecture method, small-group discussion, grouping plans, and other strategies used in the classroom.

Instructional strategies for this course are listed in the TEACHING STRATEGIES AND EVALUATION section of the course outline. Instructional strategies and activities for a course should be selected so that the overall teaching approach takes into account the instructional standards of a particular program, i.e., English as a Second Language, Programs for Adults with Disabilities.

UNITS OF STUDY, WITH APPROXIMATE HOURS ALLOTTED FOR EACH UNIT

Cover

The approximate time devoted to each instructional unit within the course, as well as the total hours for the course, is indicated. The time in class is consistent with the needs of the student, and the length of the class should be that it ensures the student will learn at an optimum level.

pp. 7-11

Units of study, with approximate hours allotted for each unit are listed in the COMPETENCY AREA STATEMENT(S) of the course outline. The total hours of the course, including work-based learning hours (community classroom and cooperative vocational education) is listed on the cover of every CBE course outline. Each Competency Area listed within a CBE outline is assigned hours of instruction per unit.

EVALUATION PROCEDURES

p. 13

The evaluation describes measurable evaluation criteria clearly within the reach of the student. The evaluation indicates anticipated improvement in performances as well as anticipated skills and competencies to be achieved.

Evaluation procedures are detailed in the TEACHING STRATEGIES AND EVALUATION section of the course outline. Instructors monitor students' progress on a continuing basis, assessing students on attainment of objectives identified in the course outline through a variety of formal and informal tests (applied performance procedures, observations, and simulations), paper and pencil exams, and standardized tests.

REPETITION POLICY THAT PREVENTS PERPETUATION OF STUDENT ENROLLMENT

Cover

After a student has completed all the objectives of the course, he or she should not be allowed to reenroll in the course. There is, therefore, a need for a statement about the conditions for possible repetition of a course to prevent perpetuation of students in a particular program for an indefinite period of time.

ACKNOWLEDGMENTS

Thanks to ALEJANDRA SALCEDO and NAZELI ZELYAN for developing and editing this course outline. Acknowledgment is also given to ERICA ROSARIO for designing the original artwork for the course covers.

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CALIFORNIA CAREER TECHNICAL EDUCATION MODEL CURRICULUM STANDARDS

Agriculture and Natural Resources Industry Sector

Knowledge and Performance 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.

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.

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.

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.

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.

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.

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.

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.

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.

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.

Agriculture and Natural Resources Pathway Standards

F. Ornamental Horticulture Pathway

The Ornamental Horticulture pathway prepares students for careers in the nursery, landscaping, and floral industries. Topics include plant identification, plant physiology, soil science, plant reproduction, nursery production, and floriculture, as well as landscaping design, installation, and maintenance.

Sample occupations associated with this pathway:

- ◆ Florist/Floral Designer
- ◆ Landscape Design/Architect
- ◆ Hydroponics Grower
- ◆ Botanical Specialist
- ◆ Nursery/Greenhouse Manager

- F1.0 Compare and contrast the hierarchical classification of plants.
- F2.0 Summarize plant physiology and growth principles.
- F3.0 Demonstrate plant propagation techniques.
- F4.0 Develop and implement a plan for basic integrated pest management.
- F5.0 Summarize water and soil (media) management practices.
- F6.0 Apply ornamental plant nutrition practices.
- F7.0 Develop a plan for the selection, installation, and maintenance of turf.
- F8.0 Employ nursery production principles.
- F9.0 Demonstrate the proper use of containers and horticultural tools, equipment, and facilities.
- F10.0 Understand basic landscape planning, design, construction, and maintenance.
- F11.0 Understand basic floral design principles.

CBE
Competency-Based Education

COMPETENCY-BASED COMPONENTS
for the Landscaping/2 Course

| COMPETENCY AREAS AND STATEMENTS | MINIMAL COMPETENCIES | STANDARDS |
|--|--|---|
| <p>A. WORKPLACE SAFETY</p> <p>Understand classroom and workplace safety policies and procedures.</p> <p>(5 hours)</p> | <ol style="list-style-type: none"> 1. Review the scope and purpose of the course. 2. Review classroom policies and procedures. 3. Review job safety requirements. 4. Review various first aid techniques. 5. Review the safe use and care of various landscape tools. 6. Describe the California Occupational Safety and Health Administration (Cal/OSHA) workplace requirements for landscapers. 7. Pass the safety test with 100% accuracy. | <p>Career Ready Practice: 1, 5</p> <p>CTE Anchor: Communications: 2.5 Problem Solving and Critical Thinking: 5.4 Health and Safety: 6.3, 6.6, 6.7</p> <p>CTE Pathway: F6.3, F6.4, F6.5, F6.6, F9.2, F10.3, F11.1</p> |
| <p>B. POWER HAND TOOLS</p> <p>Understand the types of and use landscaping power hand tools, equipment, and materials.</p> <p>(7 hours)</p> | <ol style="list-style-type: none"> 1. Identify the different types of power hand tools used in landscape installation. 2. Describe and demonstrate each of the following as it applies to power hand tools used in landscape installation: <ol style="list-style-type: none"> a. proper use b. maintenance c. storage 3. Identify the different types of power equipment used in landscape installation. 4. Describe and demonstrate each of the following as it applies to power equipment used in landscape installation: <ol style="list-style-type: none"> a. proper use b. maintenance c. storage | <p>Career Ready Practice: 2</p> <p>CTE Anchor: Communications: 2.5 Technical Knowledge and Skills: 10.3 Demonstration and Application: 11.1</p> <p>CTE Pathway: F9.2, F9.3, F11.1</p> |

| COMPETENCY AREAS AND STATEMENTS | MINIMAL COMPETENCIES | STANDARDS |
|--|--|---|
| <p>C. PLANT IDENTIFICATION – PART II</p> <p>Understand the botanical names, appearance, and characteristics of 25 commonly used plant materials.</p> <p>(15 hours)</p> | <ol style="list-style-type: none"> 1. Review the functions of leaves. 2. Review the functions of roots. 3. Review the functions of stems. 4. Review the functions of flowers and fruits. 5. Review the process of photosynthesis. 6. Review the movement of water and nutrients in plants. 7. Review the plant classification systems. 8. Identify the appropriate trees to be used in prescribed landscaping requirements. 9. Identify the appropriate shrubs to be used in prescribed landscaping requirements. 10. Identify the appropriate vines to be used in prescribed landscaping requirements. 11. Identify the appropriate perennials to be used in prescribed landscaping requirements. 12. Identify the appropriate biennials to be used in prescribed landscaping requirements. 13. Identify the appropriate annuals to be used in prescribed landscaping requirements. 14. Identify the appropriate grasses and broad leaves that can be used as a lawn. | <p>Career Ready Practice: 2</p> <p>CTE Anchor: Communications: 2.5 Ethics and Legal Responsibilities: 8.2 Technical Knowledge and Skills: 10.1</p> <p>CTE Pathway: F8.2, F10.1</p> |
| <p>D. SOIL ANALYSIS</p> <p>Understand the importance of, and apply soil analysis techniques in landscaping.</p> <p>(6 hours)</p> | <ol style="list-style-type: none"> 1. Review the features of each type of soil. 2. Review the procedures used in soil sampling. 3. Identify the different types of soil problems. 4. Identify the appropriate remedies for each type of soil problem. 5. Describe and demonstrate the procedures used in analyzing soil problems. 6. Describe and demonstrate the proper application of the appropriate remedies to soil problems. | <p>Career Ready Practice: 2</p> <p>CTE Anchor: Communications: 2.5 Technical Knowledge and Skills: 10.3 Demonstration and Application: 11.1</p> <p>CTE Pathway: F5.1</p> |

| COMPETENCY AREAS AND STATEMENTS | MINIMAL COMPETENCIES | STANDARDS |
|---|---|---|
| <p>E. LANDSCAPE IRRIGATION</p> <p>Understand the importance of, and apply irrigation techniques in landscaping.</p> <p>(90 hours)</p> | <ol style="list-style-type: none"> 1. Define irrigation. 2. Describe the features and functions of the following: <ol style="list-style-type: none"> a. various types of pipes b. various types of valves c. various types of fittings d. various types of heads e. various tools used in irrigation installation 3. Describe the factors that affect an irrigation plan. 4. Obtain site information. 5. Determine irrigation requirements including the following: <ol style="list-style-type: none"> a. technologically advanced irrigation products for the prescribed site and irrigation plan b. efficient watering practices for the prescribed site and irrigation plan 6. Determine water and power supply. 7. Describe and demonstrate the selection of appropriate sprinklers. 8. Describe and demonstrate how to circuit sprinklers and locate valves and mainlines. 9. Describe and demonstrate the selection of appropriate pipe and valve sizes. 10. Calculate total system pressure loss. 11. Describe and demonstrate the selection of the appropriate location for controllers. 12. Describe and demonstrate the selection of the appropriate wire sizes for various applications. 13. Describe and demonstrate the use of irrigation symbols in drawing plans. 14. Prepare a final irrigation plan. 15. Describe and demonstrate the proper estimation of the quantity and cost of all materials. 16. Describe and demonstrate the proper diagnoses of various irrigation problems. 17. Describe and demonstrate the proper repair procedures for an irrigation system. 18. Describe and demonstrate safety procedures related to irrigation repair. | <p>Career Ready Practice: 1, 2, 5</p> <p>CTE Anchor: Communications: 2.5 Technical Knowledge and Skills: 10.1, 10.3 Demonstration and Application: 11.1</p> <p>CTE Pathway: F5.2</p> |
| <p>F. WEED ABATEMENT</p> <p>Understand the importance of, and apply weed abatement techniques in landscaping.</p> | <ol style="list-style-type: none"> 1. Define weed abatement. 2. Identify the different types of weeds. 3. Describe the detrimental effects of weeds on the following areas: <ol style="list-style-type: none"> a. lawns b. landscapes c. grounds 4. Describe and demonstrate various mechanical weed abatement techniques. 5. Describe and demonstrate the proper use of weeding tools. 6. Describe and demonstrate the selective removal of weeds from landscaped areas. | <p>Career Ready Practice: 1, 2, 5</p> <p>CTE Anchor: Communications: 2.5</p> |

| COMPETENCY AREAS AND STATEMENTS | MINIMAL COMPETENCIES | STANDARDS |
|---|--|--|
| (10 hours) | <ol style="list-style-type: none"> 7. Describe and demonstrate the selective removal of weeds from lawns. 8. Describe and demonstrate the selective removal of weeds from grounds areas. 9. Analyze the effectiveness of various chemicals on the different types of weeds. 10. Describe and demonstrate chemical weed abatement techniques. | <p>Technical Knowledge and Skills: 10.3 Demonstration and Application: 11.1</p> <p>CTE Pathway: F9.3, F10.1</p> |
| <p>G. PRUNING</p> <p>Understand the importance of, and apply pruning techniques in landscaping.</p> <p>(15 hours)</p> | <ol style="list-style-type: none"> 1. Define pruning. 2. Identify basic tools and their uses in the pruning process. 3. Identify reasons for pruning. 4. Identify various types of pruning. 5. Discuss and demonstrate safe working practices in the pruning process. 6. Describe the appropriate location for a “cut” on a limb. | <p>Career Ready Practice: 1, 2, 5</p> <p>CTE Anchor: Communications: 2.5 Technical Knowledge and Skills: 10.3 Demonstration and Application: 11.1</p> <p>CTE Pathway: F9.3, F10.1</p> |
| <p>H. PLANT PROPAGATION</p> <p>Understand the importance of, and apply plant propagation techniques in landscaping.</p> <p>(30 hours)</p> | <ol style="list-style-type: none"> 1. Define propagation. 2. Discuss and demonstrate how plants multiply. 3. Discuss and demonstrate seeding in containers and in the open ground. 4. Discuss the advantages of vegetative propagation. 5. Demonstrate the vegetative means of propagation. 6. Discuss and demonstrate transplanting procedures. | <p>Career Ready Practice: 1, 2, 5</p> <p>CTE Anchor: Communications: 2.5</p> <p>CTE Pathway: F3.1, F3.2, F10.1</p> |

| COMPETENCY AREAS AND STATEMENTS | MINIMAL COMPETENCIES | STANDARDS |
|---|--|--|
| <p>I. WATER MANAGEMENT REVIEW</p> <p>Review the importance of water management in landscaping.</p> <p>(2 hours)</p> | <ol style="list-style-type: none"> 1. Review the definition of the following: <ol style="list-style-type: none"> a. water resources b. water management c. water sustainability 2. Review the importance of managing the following resources and the role they play in water management: <ol style="list-style-type: none"> a. time b. materials c. personnel 3. Review the specific examples of effective management of the following in landscaping: <ol style="list-style-type: none"> a. time b. materials c. personnel 4. Review the following benefits of effective water management in landscaping: <ol style="list-style-type: none"> a. profitability b. sustainability c. company growth | <p>Career Ready Practice: 2</p> <p>CTE Anchor: Communications: 2.5 Knowledge and Skills: 10.1</p> <p>CTE Pathway: F10.1</p> |

SUGGESTED INSTRUCTIONAL MATERIALS and OTHER RESOURCES

TEXTS AND SUPPLEMENTAL BOOKS

Hannebaum, Leroy G. Landscape Operations: Management, Methods, and Materials 3rd Edition. Prentice Hall, 1999.

Ingels, Jack, Landscaping: Principles and Practices, 7th Edition. Cengage Learning, 2009.

Johnson, Hugh. The Principles of Gardening: The Practice of the Gardener's Art. Simon & Schuster, 1997.

Melby, Pete. Simplified Irrigation Design, 2nd Edition. Wiley, John & Sons, Inc., 1995.

Naylor, Robert, E.L. Weed Management Handbook, 9th Edition. Wiley, John & Sons, Inc., 2002.

Schrock, Denny. Scott's Landscaping. Meredith Books, 2004.

Smith, Miranda. The Plant Propagator's Bible. St. Martin's Press, 2007.

Symonds, George W. and Stephen V. Chelminski. Tree Identification. Harper Collins Publisher, 1973.

RESOURCES

Employer Advisory Board members

CTE Model Curriculum Standards for Agriculture and Natural Resources:

<http://www.cde.ca.gov/ci/ct/sf/documents/agnatural.pdf>

COMPETENCY CHECKLIST

TEACHING STRATEGIES and EVALUATION

METHODS AND PROCEDURES

- A. Lecture and discussion
- B. Visual aids
- C. Projects
- D. Demonstration/participation
- E. Guest lecturers

EVALUATION

SECTION A – Workplace Safety - Pass the safety test with 100% accuracy.

SECTION B – Power Hand Tools – Pass all assignments and exams on power hand tools with a minimum score of 80% or higher.

SECTION C – Plant Identification – Part II – Pass all assignments and exams on plant identification – part II with a minimum score of 80% or higher.

SECTION D – Soil Analysis – Pass all assignments and exams on soil analysis with a minimum score of 80% or higher.

SECTION E – Landscape Irrigation – Pass all assignments and exams on landscape irrigation with a minimum score of 80% or higher.

SECTION F – Weed Abatement – Pass all assignments and exams on weed abatement with a minimum score of 80% or higher.

SECTION G – Pruning – Pass all assignments and exams on pruning with a minimum score of 80% or higher.

SECTION H – Plant Propagation – Pass all assignments and exams on plant propagation with a minimum score of 80% or higher.

SECTION I – Water Management Review – Pass all assignments and exams on water management review with a minimum score of 80% or higher.

Statement for Civil Rights

All educational and vocational opportunities are offered without regard to race, color, national origin, gender, or physical disability.
