Horticulture

Overview

These CRC programs offer students the opportunity to blend the disciplines of horticulture, construction, drafting and business into a unique professional opportunity. A wide variety of employment opportunities are available in the Sacramento area for students completing the associate's degree or one of the certificate programs. The continued growth of the area and the need for specialized training are creating a demand for qualified individuals. A student majoring in a degree option program should, upon completion, be able to meet the standards imposed by local industries for proper placement within the selected job area of the student's choice. It should, however, be noted that each employment situation may require that additional standards be met.

Program Maps


Dean
Nancy Reitz (about-us/contact-us/faculty-and-staff-directory/nancy-reitz)

Department Chair
Dave Andrews (about-us/contact-us/faculty-and-staff-directory/dave-andrews)

Career and Academic Community
Agriculture, Food and Natural Resources (academics/career-and-academic-communities/agriculture-food-and-natural-resources)

Phone
(916) 691-7391

Email
reitzn@crc.losrios.edu (mailto:reitzn@crc.losrios.edu)

Associate Degrees

A.S. in General Agriculture
Agriculture is a vital component of our local, state, and national economies and offers many exciting employment opportunities. In addition to the production of a wide range of valuable agricultural commodities, the Sacramento region is home to numerous multi-national agricultural corporations and statewide governmental agencies. It is also a center for international agricultural trade and commerce. This program is designed for students majoring in Agriculture while also allowing the student to select courses that fit his/her individual needs and desires.

As a General Agriculture major, you will:

*Study a general agriculture curriculum representing all of the departments of the Cosumnes River College agriculture program including: agriculture business, horticulture, welding, veterinary technology and plant science.

*Develop your leadership and communication skills.

*Identify the agricultural career you are most interested in and build a course of study to better qualify you for a profession.

**HIGHLIGHTS**

*As the only community college agriculture program in the Sacramento region, the CRC General Agriculture program provides an excellent opportunity for individuals who wish to pursue a career in agriculture and receive a General Agriculture Associate of Science degree.

*The faculty in this program works closely with the five California agricultural degree offering universities to provide a quality program for students interested in agriculture business, management and economics.

*The Sacramento region is fortunate to have some of the best high school agriculture programs in California. The faculty in the CRC Ag program works closely with these feeder schools to articulate coursework and facilitate the successful transition of agriculture students from high school to the university.

*Internships in agriculture are available for students interested in work experience opportunities.

NOTE TO TRANSFER STUDENTS: If you are interested in transferring to a four-year college or university to pursue a bachelor's degree in this major, it is critical that you meet with a CRC counselor to select and plan the courses for your major. Schools vary widely in terms of the required preparation. The courses that CRC requires for an Associate's degree in this major may be different from the requirements needed for the Bachelor's degree.

**Catalog Date:** June 1, 2020

### Degree Requirements

<table>
<thead>
<tr>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
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<tbody>
<tr>
<td>AGB 310</td>
<td>Agriculture Computer Applications</td>
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<td>Soils, Soil Management, and Plant Nutrition (3)</td>
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<td>or HORT 302</td>
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**Subtotal Units:** 29

### Agriculture Business

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<td>Agriculture Sales and Communication</td>
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<td>AGB 331</td>
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**Agriculture Business Units:** 9

**Total Units:** 38

### Horticulture

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<td>HORT 305</td>
<td>Plant Identification-Fall Selections</td>
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<td>HORT 312</td>
<td>Plant Propagation</td>
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**Horticulture Units:** 6

**Total Units:** 35

### Landscape

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**Landscape Units:** 6
### Welding

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<td>WELD 110</td>
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Welding Units: 4

Total Units: 33

### Degree Requirements

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<tr>
<td>HORT 303</td>
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<td>or PLTS 332</td>
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<td>HORT 306</td>
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<td>HORT 307</td>
<td>Plant Identification - Sustainable and CA Native Selections (3)</td>
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<td>HORT 320</td>
<td>Sustainable Landscape Construction</td>
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<td>HORT 324</td>
<td>Sustainable Landscape Maintenance (3)</td>
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<td>HORT 340</td>
<td>Landscape and Irrigation Graphics and Design</td>
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<td>HORT 350</td>
<td>Landscape Irrigation</td>
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<tr>
<td>HORT 351</td>
<td>Drip and Subsurface Irrigation</td>
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<tr>
<td>HORT 353</td>
<td>Sustainable Water Management</td>
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<tr>
<td>HORT 360</td>
<td>Introduction to Tree Care and Urban Forestry</td>
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<td>HORT 498</td>
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Total Units: 39

1Horticulture 100 at American River College meets the HORT 303 course requirement.

2Horticulture 322 at American River College meets the HORT 340 course requirement.
• PSLO 1: Demonstrate a fundamental understanding of basic horticultural principles and practices.
• PSLO 2: Demonstrate a fundamental understanding of soils, soil development, soil building and preparation, and sustainable soil management.
• PSLO 3: Demonstrate a fundamental understanding of plant identification, selection, use, and maintenance of plant material best suited for conventional and sustainable landscapes.
• PSLO 4: Demonstrate a fundamental understanding of basic landscape design principles and practices.
• PSLO 5: Demonstrate proficiency at implementing sustainable landscape construction principles and practices to install landscapes and landscape systems.
• PSLO 6: Demonstrate proficiency at implementing sustainable tree care, landscape maintenance, and integrated pest management principles and practices to care for and maintain landscapes and green spaces.
• PSLO 7: Demonstrate proficiency at implementing the principles and practices of irrigation design and installation to design, install, and manage water efficient irrigation systems.

Career Information
Students who complete the Sustainable Landscape A.S. degree may find employment in a wide range of areas including landscape contracting, landscape construction and installation, landscape and grounds maintenance, turf management, arboriculture and tree care, parks and recreation, landscape irrigation and water management, landscape design and consulting, nurseries and garden centers, landscape pest management, horticulture materials supply and power equipment servicing, and/or in a variety of other horticultural specialties.

Certificates of Achievement

Horticulture, General Horticulture Certificate
This program provides students with the essential knowledge and skills for entry level employment in the Horticulture industry. Students gain core knowledge and skills in basic plant science, soil science, integrated pest management, and plant identification and use. Students then complete two advanced horticulture courses of their choice. This is the base certificate in a stackable series that leads to an additional certificate or degree in Horticulture.

Catalog Date: June 1, 2020

Certificate Requirements

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<th>COURSE CODE</th>
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<td>Soils, Soil Management, and Plant Nutrition (3)</td>
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<td>HORT 303</td>
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<td>or HORT 305</td>
<td>Plant Identification-Fall Selections (3)</td>
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<td>or HORT 307</td>
<td>Plant Identification - Sustainable and CA Native Selections (3)</td>
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A minimum of 6 units from the following:

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<td>or HORT 495</td>
<td>Independent Studies in Horticulture (1 - 3)</td>
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<td>or HORT 324</td>
<td>Sustainable Landscape Maintenance (3)</td>
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<tr>
<td>or HORT 320</td>
<td>Sustainable Landscape Construction (3)</td>
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<tr>
<td>or HORT 340</td>
<td>Landscape and Irrigation Graphics and Design (3)</td>
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<td>or HORT 350</td>
<td>Landscape Irrigation (3)</td>
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<tr>
<td>or HORT 351</td>
<td>Drip and Subsurface Irrigation (2)</td>
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<td>or HORT 105</td>
<td>Pest Control Licensing or Certification (2)</td>
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<tr>
<td>or HORT 360</td>
<td>Introduction to Tree Care and Urban Forestry (3)</td>
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Total Units: 18

1Horticulture 100 at American River College meets the HORT 303 course requirement.
2Horticulture 322 at American River College meets the HORT 340 course requirement.

Student Learning Outcomes
Upon completion of this program, the student will be able to:

• PSLO 1: Demonstrate a fundamental understanding of basic horticultural principles and practices.
• PSLO 2: Demonstrate the knowledge and skills required landscape soil sustainably.
• PSLO 3: Demonstrate the knowledge and skills required to perform basic landscape and nursery operations.
• PSLO 4: Demonstrate the knowledge and skills required to design and implement a successful integrated pest management program.
• PSLO 5: Demonstrate the ability to identify selected plant material and make appropriate recommendations for its use in the landscape.
• PSLO 6: Demonstrate knowledge and skills in one or more horticulture specialties through advanced coursework, and/or a combination of courses, work experience in horticulture, or independent studies in horticulture.

Career Information
A multitude of entry-level opportunities await those who earn a certificate in General Horticulture. Students may find gainful employment opportunities in landscape construction and maintenance, irrigation systems installation and maintenance, landscape planning, tree care, wholesale or retail nursery sales and support, landscape materials sales and/or services, or other specialty areas in Horticulture.
Horticulture, Sustainable Irrigation and Water Management Technology Certificate

The certificate in Sustainable Irrigation and Water Management Technology concentrates on those courses that develop the knowledge, skills, and attitudes essential to designing, installing, and managing water efficient irrigation systems that are compliant with current California state and local ordinances. The required courses are designed to develop a strong foundational understanding of basic botany and plant growth requirements, and provide advanced education and training in sound principles of soil/water relationship testing and evaluation, soil development and management, proper sprinkler and drip irrigation design, irrigation systems troubleshooting and retrofitting, and irrigation systems management for water conservation. Students will have the opportunity to become QWEL (Qualified Water Efficient Landscaper) certified through this certificate program. QWEL is an EPA WaterSense Partnership program.

Catalog Date: June 1, 2020

Certificate Requirements

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<th>COURSE CODE</th>
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<td>HORT 300</td>
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<tbody>
<tr>
<td>HORT 498</td>
<td>Work Experience in Horticulture (1 - 4)</td>
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Total Units: 16

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- PSLO 1: Demonstrate a fundamental understanding of basic horticultural principles and practices.
- PSLO 2: Demonstrate the knowledge and skills required to sustainably manage landscape soils.
- PSLO 3: Demonstrate the knowledge and skills required to perform basic tasks related to landscape irrigation systems design, installation, and maintenance.
- PSLO 4: Demonstrate the knowledge and skills required to perform advanced tasks related to sustainable irrigation systems design, installation, retrofitting, and troubleshooting.
- PSLO 5: Demonstrate the knowledge and skills required to perform advanced tasks related to landscape water use efficiency and sustainable water management.

Career Information

Students who complete a certificate in Sustainable Irrigation and Water Management Technology can find employment opportunities in sprinkler and surface/subsurface irrigation design, consultation, installation, maintenance and irrigation/water management. Students may be self-employed, or find employment with landscape and/or irrigation design firms, landscape contractors, landscape maintenance companies, golf courses, parks departments, water agencies, or other water/water service providers. This certificate will also prepare students for advanced training and certification through industry sponsored programs such as the Irrigation Association’s (IA) Certified Irrigation Designer, Certified Irrigation Contractor, Certified Water Auditor, and Certified Water Manager programs, as well as the California Landscape Contractors Association (CLCA) Water Management Certification program.

Horticulture, Sustainable Landscape Design Certificate

The certificate in Sustainable Landscape Design concentrates on those courses that develop the knowledge, skills, and attitudes essential to creating landscape and irrigation designs that make best use of local resources including soil, water, and construction materials. The courses of this certificate focus on sound horticultural science and principles, proper soil development and management, sustainable landscape and irrigation design, water conservation, sustainable landscape construction and maintenance practices, and integrated pest management.

Catalog Date: June 1, 2020

Certificate Requirements

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Total Units: 22

Horticulture 100 at American River College meets the Hort 303 course requirement.

Horticulture 322 at American River College meets the Hort 340 course requirement.

Student Learning Outcomes

Upon completion of this program, the student will be able to:
Career Information

The certificate in Sustainable Landscape Design provides a strong horticulture foundation, along with the specialized skills and technical knowledge to prepare students for employment opportunities in the field of sustainable landscape planning and irrigation design. Students who complete a certificate in Sustainable Landscape Design find employment in landscape and irrigation design, planning, consultation, installation management, and water systems management. Students may be self-employed, or find employment with landscape design firms, landscape contractors, landscape maintenance firms, or other related service providers. Students will have the opportunity to become QWEL (Qualified Water Efficient Landscaper) certified through this certificate program. QWEL is an EPA WaterSense Partnership program. This certificate will also prepare students for advanced training and certification through industry sponsored programs such as the Irrigation Association (IA) Certified Water Auditor and Certified Water Manager programs.

Horticulture, Sustainable Landscape Certificate

A variety of professional career opportunities are available to those who wish to provide professional landscape installation and/or support services. Landscapers design, install, and maintain private and public outdoor spaces in which people live, work, and play. The Sustainable Landscape Certificate concentrates on those courses that develop the knowledge, skills, and attitudes essential for entry-level careers in developing, constructing, and maintaining functional and sustainable landscapes, green spaces, and irrigation systems, as well as careers in tree care, and landscape material, supply, and specialty services. The courses in this certificate focus on sound horticultural science and principles, plant identification, proper soil development and management, sustainable landscape and irrigation design, water conservation, sustainable construction and landscape maintenance, tree care, and integrated pest management.

Catalog Date: June 1, 2020

Certificate Requirements

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<td>or HORT 324</td>
<td>Sustainable Landscape Maintenance (3)</td>
<td></td>
</tr>
<tr>
<td>or HORT 360</td>
<td>Introduction to Tree Care and Urban Forestry (3)</td>
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</tr>
<tr>
<td>HORT 498</td>
<td>Work Experience in Horticulture (1 - 4)</td>
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</tr>
</tbody>
</table>

Total Units: 20

1Horticulture 100 at American River College meets the Hort 303 course requirement.

Student Learning Outcomes

Upon completion of this program, the student will be able to:

- PSLO 1: Demonstrate a fundamental understanding of basic horticultural principles and practices.
- PSLO 2: Demonstrate a fundamental understanding of soils, soil development, soil building and preparation, and sustainable soil management.
- PSLO 3: Demonstrate a fundamental understanding of plant identification, selection, use, and maintenance of plant material best suited for sustainable landscapes.
- PSLO 4: Demonstrate proficiency at implementing the principles and practices of Integrated Pest Management for sustainable landscapes.
- PSLO 5: Demonstrate proficiency at implementing the principles and practices of sustainable landscape construction, sustainable landscape maintenance, or arboriculture to install and/or maintain sustainable landscapes.
- PSLO 6: Demonstrate proficiency at implementing the principles and practices of irrigation design and water efficiency to design, install, and manage landscape irrigation systems.

Career Information

Students who complete a certificate in Landscape Technology may find entry-level employment in a wide range of areas including landscape contracting, landscape construction and installation, landscape and grounds maintenance, turf management, tree care, parks and recreation, landscape irrigation, landscape design and consulting, nurseries and garden centers, landscape pest management, and horticulture materials supply and power equipment servicing.

Plant-Based Nutrition and Sustainable Agriculture Certificate

The Plant-Based Nutrition and Sustainable Agriculture Certificate Program brings farm-to-fork into the classroom. It provides the science that supports the benefits of whole plant-based foods to the health of the individual as well as the environment. Students will gain knowledge in the function of plant-based foods towards the treatment and prevention of chronic diseases. The program addresses the environmental and social concerns with strategies and principles of sustainable agriculture. Students will master the theories and skills of plant-based food preparation bringing the food to the fork and into everyday food choices.

Catalog Date: June 1, 2020
Horticulture (HORT) Courses

HORT 105 Pest Control Licensing or Certification

This course covers the laws, regulations, and safety requirements for individuals preparing to obtain a Qualified Applicator's Certificate (QAC) in California Department of Pesticide Regulation (CDPR) category Q or a Qualified Applicator's License (QAL) in CDPR category B. This course will also cover the requirements and process of obtaining a Maintenance Gardener Pest Control Business License. Topics include pesticide safety and application, pesticide modes of action, pesticide regulation, applicator licensing and certification, accepted standards for integrated pest management, and the methods and practices of preventing and controlling common landscape weeds, invertebrate and vertebrate pests, nematodes, and infectious and noninfectious plant diseases. Environmental concerns regarding pesticide resistance, surface and groundwater contamination, and other exposures will be covered. Field trips may be required.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- Evaluate the role of plant-based foods on health and the environment.
- Demonstrate a fundamental understanding of health behaviors on nutritional and health status.
- Schematize the effects of personal food choice on health, the environment and public policy.
- Demonstrate and apply the theories of sustainable and organic agriculture.
- Demonstrate a fundamental understanding of soils, soil development, soil building and preparation and sustainable soil management.
- Demonstrate a fundamental understanding of hydraulics and irrigation design, installation, and water management principles and practices.
- Create agriculture design concepts based on sound, sustainable soil management, water conservation, construction and maintenance, and integrated pest management best practices.
- Effectively and accurately prepare and analyze raw ingredients and prepared foods.
- Analyze quality defects in cooked products and specify possible errors in techniques or ingredient selection.
- Implement proper sanitary and safety techniques.
- Utilize kitchen tools/equipment appropriately.

Career Information

In restaurants, food service facilities, farms, urban farms, sustainable/organic farms, school garden, health education. Some of these career options may require more than the certificate and two years of college study. Classes beyond the associate degree may be required to fulfill some career options or for preparation for transfer to a university program.

Certificate Requirements

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<tr>
<th>COURSE CODE</th>
<th>COURSE TITLE</th>
<th>UNITS</th>
</tr>
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<td>NUTRI 303</td>
<td>Plant-Based Nutrition</td>
<td>3</td>
</tr>
<tr>
<td>NUTRI 331</td>
<td>Plant-Based Food Principles and Preparation</td>
<td>3</td>
</tr>
<tr>
<td>HORT 313</td>
<td>Sustainable Agriculture</td>
<td>3</td>
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Horticulture (HORT) Courses

HORT 105 Pest Control Licensing or Certification

Units: 2
Hours: 36 hours LEC
Prerequisite: None
Advisory: HORT 300, HORT 303, PLTS 300, or PLTS 332
Catalog Date: June 1, 2020

This course covers the laws, regulations, and safety requirements for individuals preparing to obtain a Qualified Applicator's Certificate (QAC) in California Department of Pesticide Regulation (CDPR) category Q or a Qualified Applicator's License (QAL) in CDPR category B. This course will also cover the requirements and process of obtaining a Maintenance Gardener Pest Control Business License. Topics include pesticide safety and application, pesticide modes of action, pesticide regulation, applicator licensing and certification, accepted standards for integrated pest management, and the methods and practices of preventing and controlling common landscape weeds, invertebrate and vertebrate pests, nematodes, and infectious and noninfectious plant diseases. Environmental concerns regarding pesticide resistance, surface and groundwater contamination, and other exposures will be covered. Field trips may be required.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- Demonstrate independent learning and effective communication skills.
- Demonstrate responsibility for personal action and choices.
- Communicate effectively both orally and in writing.
- Demonstrate a fundamental understanding of jobsite safety and effective and efficient work habits.
- Validate and demonstrate safety consciousness in work dress/apparel, tool use, jobsite demeanor, and personal protective equipment use.
- Assess jobsite hazards, reduce work related risks, and influence others to work in a safe and efficient manner.
- Select appropriate application tools and equipment for a variety of pesticide application activities.
- Demonstrate a fundamental understanding of the safe and efficient use of pesticides, adjuvants, and neutralizers.
- Demonstrate a fundamental understanding of California pesticide laws and regulations.
- Evaluate the requirements and process for obtaining a Qualified Applicators Certificate
- Evaluate the requirements and process for obtaining a Maintenance Gardener Pest Control Business License.
- Demonstrate a fundamental understanding of the exams and testing procedures of the California Department of Pesticide Regulation (CDPR).
Demonstrate a fundamental understanding of license and certificate maintenance requirements and procedures.

SLO 4: Demonstrate a fundamental understanding of integrated pest management (IPM).

Demonstrate the ability to identify weed, invertebrate, and vertebrate pests, as well as nematodes and disease causing pathogens visually or through symptom identification.

Demonstrate the ability to identify beneficial organisms affecting pest management decisions.

Demonstrate a fundamental understanding of invertebrate pest prevention and management.

Demonstrate a fundamental understanding of weed pest prevention and management.

Demonstrate a fundamental understanding of disease prevention and management.

Demonstrate a fundamental understanding of nematode prevention and management.

Demonstrate a fundamental understanding of vertebrate pest prevention and management.

SLO 5: Demonstrate a fundamental understanding of pesticides and pesticide function and use.

Differentiate pesticide categories and modes of action.

Assess various pesticide formulations and methods of application.

Demonstrate a fundamental understanding of pesticide storage, transportation, and disposal.

Explain the legal requirements of pesticide labels, material safety data sheets, and the worker safety standard with regards to the legal obligations of the end-user.

SLO 6: Demonstrate a fundamental understanding of pesticide application equipment and use.

Assess various types of pesticide application equipment.

Calculate appropriate amounts of pesticide material to apply to a given landscape area.

Examine methods for calibrating pesticide application equipment.

Discuss the approved methods for cleaning and neutralizing pesticide application equipment.

SLO 7: Demonstrate a fundamental understanding of business and professional standards in pest management.

Compile a list of requirements for registering a license with the county Department of Agriculture.

Demonstrate a fundamental understanding and ability to complete and file pesticide application reports as required by each county Department of Agriculture.

Demonstrate success on practice certification and licensing exams.

Recognize and explain the standard practices of various types of landscape construction/maintenance businesses, including estimating and bidding procedures, business practices, and working with state agencies.

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**HORT 299 Experimental Offering in Horticulture**

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<td>June 1, 2020</td>
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**HORT 300 Introduction to Horticulture**

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<tbody>
<tr>
<td>Hours:</td>
<td>54 hours LEC</td>
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<tr>
<td>Transferable:</td>
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<tr>
<td>General Education:</td>
<td>AA/AS Area IV</td>
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<tr>
<td>Catalog Date:</td>
<td>June 1, 2020</td>
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Introduction to Horticulture is a general, entry level course into environmental horticulture with an emphasis on basic plant science, plant use and care, and the landscape and nursery industries. Topics include basic botany, cultural practices, propagation, structures and layout, pest management, planting, container gardening, plant identification, turfgrass installation and care, and a survey of career opportunities.

**Student Learning Outcomes**

Upon completion of this course, the student will be able to:

- SLO 1: Demonstrate independent learning and effective communication skills.
- Operate independently by attending or logging into class regularly.
- Utilize time management effectively and prioritize tasks to meet deadlines.
- Demonstrate effective oral and written communication.
- SLO 2: Demonstrate a fundamental understanding of the California horticulture industry.
- Identify the major markets of the horticulture industry and verify how these markets function in their county in the state of California.
- Identify and evaluate the various horticultural occupations and the associated employment requirements and opportunities.
- Identify and evaluate common practices of various horticultural business types.
- SLO 3: Demonstrate a fundamental understanding of scientific investigation and basic botany as it relates to gardening and landscaping.
- Apply the Scientific Method of research to appropriate horticulture and/or agriculture applications.
- Assess the role of plant cells, cells structures, and basic genetics in vegetative development, plant growth, and plant production.
- Recognize the major structures of plants and explain the function of each major plant structure.
- Identify and explain the requirements of plant growth.
- Utilize effectively plant identification and botanical terminology.
- Assess plant propagation through sexual and asexual methods.
- SLO 4: Demonstrate a fundamental understanding of soils and water in the garden/landscape.
- Explain soil development and structure, and describe sustainable soil maintenance practices.
- Formulate soils and container media.
- Evaluate various plant species and nutritional needs, and explain how to measure, mix, and apply fertilizers.
- Evaluate soil-water relationships.
- Assess water efficient irrigation methods and estimate watering needs.
- SLO 5: Demonstrate a fundamental understanding of common horticultural practices.
- Identify common horticulture tools and equipment.
- Identify common horticulturally related injuries when using tools incorrectly, and explain the safe and effective use of common horticulture tools and equipment.
- Identify the various types of horticultural structures and uses.
- Describe the methods utilized to plant and care for horticultural crops.
- Compare various cultural practices, and the resulting effect of each on plant health and development.
- Describe the process of plant selection and use.
- Recognize symptoms and signs of plant diseases and pests, and identify pest damage.
- Identify and explain common integrated pest management practices.
- Identify and explain common turf installation and maintenance practices.
- Identify and explain common pruning methods and practices.
- Identify and explain common sustainable landscape design methods.
- Describe the methods utilized to plant and care for horticultural crops.
- Identify and explain common vegetable and flower gardening practices.
- Formulate appropriate solutions for various garden/landscape scenarios.

**HORT 302 Soils, Soil Management, and Plant Nutrition**

This course provides a basic knowledge of the physical, chemical, and biological properties of soils. The course includes factors of: fundamental soil properties, soil and plant relationships, principles of soil formation, fertilizers and soil management, salinity, pH, erosion management, and non-agricultural uses. Field trips may be required. This course is the same as PLTS 310, and only one may be taken for credit.

**Student Learning Outcomes**

Upon completion of this course, the student will be able to:

- SLO 1: Demonstrate independent learning and effective communication skills. Operate independently by attending and / or logging into class regularly when the course is offered online or an online component is utilized as part of the course.
- SLO 2: Demonstrate a fundamental understanding of the physical and chemical properties of soils. Utilize time management effectively and prioritize tasks to meet deadlines. Demonstrate effective oral and written communication.
- SLO 3: Demonstrate a fundamental understanding of the role of soil in plant nutrition. Apply the Scientific Method of research through soils and plant specific laboratory applications. Demonstrate effective learning and communication.
- SLO 4: Demonstrate a fundamental understanding of best soil management practices in sustainable horticulture. Compare the textural classes of soil through laboratory analysis. Explain the role of soil structure and evaluate the effects of tillage management in soil productivity. Analyze the physical, chemical, and biological properties of soils, and understand their formation and how they are reservoirs for nutrients, water, and microscopic life. Assess the physical and chemical properties of soil through laboratory analysis. Explain why our soils, as a natural resource, must be managed and preserved. Demonstrate how to effectively manage the physical, chemical, and biological properties of soils for sustained productivity. Explain why irrigated soils must be managed in special ways to preserve its productivity. Demonstrate the methods and means of utilizing organic matter to improve soil structure, support soil biology, and to maintain and stimulate soil health. Analyze the effects of soil compaction in crop production and horticultural situations, and explain common methods utilized to alleviate soil compaction. Analyze the effects of soil erosion in crop production and horticultural situations, and explain common methods utilized to prevent soil erosion. Explain why irrigated soils must be managed in special ways to preserve its productivity. Explain the effects of salts and high sodium levels on soil structure, pH, drainage, and plant productivity. Validate the fundamentals of soil management through laboratory analysis.

**HORT 303 Integrated Pest Management**

- Same As: PLTS 332
- Units: 3
- Hours: 36 hours LEC; 54 hours LAB
- Prerequisite: None.
- Advisory: HORT 300 and PLTS 300
- Transferable: CSU
- Catalog Date: June 1, 2020

This course is the same as PLTS 332, and only one may be taken for credit.
This course is a study of local plant pests including weeds, diseases, invertebrates, and vertebrates. It includes recognition of symptoms and causes, life cycle of the pests, host and habitat relationships, and the integrated pest management strategies and best management practices to achieve control. Field trips may be required. This course is the same as PLTS 332, and only one may be taken for credit.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Demonstrate independent learning and effective communication skills.
- Operate independently by attending or logging into class regularly.
- Utilize time management effectively and prioritize tasks to meet deadlines.
- Demonstrate effective oral and written communication.
- SLO 2: Demonstrate a fundamental understanding of job site safety and effective and efficient work habits.
- Validate and demonstrate safety consciousness in work dress/apparel, tool use, job site demeanor, and personal protective equipment use.
- Assess job site hazards, reduce work related risks, and influence others to work in a safe and efficient manner.
- Select appropriate personal protective equipment for a given pesticide.
- Demonstrate the safe and efficient use of pesticide application equipment.
- SLO 3: Assess, evaluate, and implement the principles and practices of integrated pest management.
- Evaluate the economic significance of plant pest problems in horticulture.
- Assess the reasons conventional pest control options are no longer desirable.
- Demonstrate the ability to diagnose and analyze pest damage, recommend integrated pest management strategies, and select proper control measures.
- Identify insects and closely related plant pests, common diseases and abiotic plant disorders, weed species, and beneficial organisms as evident from existing signs and symptoms.
- Compare and contrast various methods of conventional and integrated pest management strategies.
- Demonstrate the ability to safely and accurately prepare pesticide application equipment.
- Demonstrate the ability to safely and efficiently operate pesticide application equipment through the application of pesticide materials during a simulated exercise.
- Formulate a seasonal pest management plan using the principles of integrated pest management.
- SLO 4: Demonstrate a fundamental understanding of licensing and/or certification, and business and professional standards in integrated pest management.
- Analyze landscape pest management professions and identify and explain requirements for employment and/or licensing or certification.
- Recognize and explain the benefits of additional supplemental licensing and certification through state agencies and professional associations.
- Examine and explain the California state Department of Pesticide Regulation laws and regulations, and the CDPR rules governing the Qualified Applicator's Certificate and Landscape Maintenance Gardener's pesticide license.
- Validate and demonstrate the importance of professionalism in the landscape industry, and described the professional industry associations and certification programs.
- Recognize and explain the standard practices of various types of landscape construction/maintenance businesses, including estimating and bidding procedures, business practices, and working with state agencies.

HORT 305 Plant Identification-Fall Selections

Units: 3
Hours: 36 hours LEC; 54 hours LAB
Prerequisite: None.
Advisory: HORT 300
Transferable: CSU; UC (HORT 305 and 306 combined: maximum transfer credit is one course)
C-ID: C-ID AG - EH 112L
Catalog Date: June 1, 2020

This course is the identification and study of the growth habits, cultural practices, and ornamental uses of landscape and indoor plants adapted to climates of California. Plants emphasized will come from the current California Association of Nurseries and Garden Centers (CANGC) and California Landscape Contractors Association (CLCA) certification exams plant lists. The focus will be on those plants best observed and studied during California's fall and/or winter seasons. Field trips may be required.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Demonstrate independent learning and effective communication skills.
- Operate independently by attending or logging into class regularly.
- Utilize time management effectively and prioritize tasks to meet deadlines.
- Demonstrate effective oral and written communication.
- SLO 2: Demonstrate a fundamental understanding of job site safety and effective and efficient work habits.
- Validate and demonstrate safety consciousness in work dress/apparel, tool use, job site demeanor, and personal protective equipment use.
- Assess job site hazards, reduce work related risks, and influence others to work in a safe and efficient manner.
- Select appropriate personal protective equipment for a given landscape operations.
- Identify potential hazards created by improper pruning and training and/or poor cultural practices.
- SLO 3: Assess, evaluate, and implement the principles and practices of plant identification and use.
- Recognize, explain, and utilize the binomial method of plant nomenclature.
- Recognize, explain, and utilize plant identification and botanical terminology.
- Identify by leaf, bark, flower, fruit, and growth habit those plants best observed and studied during California's fall and/or winter seasons.
- Examine, compare, and explain soil requirements and ecology of different plants.
- Analyze the various uses of plants in the home and commercial landscape.
- Propose landscape uses for those plants possessing desirable characteristics during California's fall and/or winter seasons.
- Identify plants whose requirements fit selected criteria.
- Examine, formulate, and utilize plant keys to identify those plants best observed and studied during California's fall and/or winter seasons.
- Assemble a professional herbarium utilizing collected and preserve plant materials, scans, and/or pictures.
- Recognize ideal characteristics of plants best observed and studied during California's fall and/or winter seasons, and select quality plant material from nursery stock.
- Evaluate plant health and identify plant damage caused by pests, diseases, environmental conditions, nutritional deficiencies, or poor cultural practices.
- Examine, evaluate, and compare computerized plant selection software programs.
- Develop a plant characteristics key for future design work.
- SLO 4: Demonstrate a fundamental understanding of licensing and/or certification, and business and professional standards as related to plant identification in horticulture.
- Recognize and explain the benefits of additional/supplemental licensing and certification through state agencies and professional associations.
- Validate and demonstrate the importance of professionalism in the landscape industry, and described the professional industry associations and certification programs.

**HORT 306 Plant Identification-Spring Selections**

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<tr>
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<td>Prerequisite:</td>
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<td>Advisory:</td>
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<tr>
<td>Transferable:</td>
<td>CSU; UC (HORT 305 and 306 combined: maximum transfer credit is one course)</td>
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<td>C-ID:</td>
<td>C-ID AG - EH 108L</td>
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<tr>
<td>Catalog Date:</td>
<td>June 1, 2020</td>
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This course is the identification and study of the growth habits, cultural practices, and ornamental uses of landscape and indoor plants adapted to climates of California. Plants emphasized will come from the current California Association of Nurseries and Garden Centers (CANGC) and California Landscape Contractors Association (CLCA) certification exams plant lists. The focus will be on those plants best observed and studied during California’s spring and/or summer seasons. Field trips may be required.

**Student Learning Outcomes**

Upon completion of this course, the student will be able to:

- SLO 1: Demonstrate independent learning and effective communication skills.
- Operate independently by attending or logging into class regularly.
- Utilize time management effectively and prioritize tasks to meet deadlines.
- Demonstrate effective oral and written communication.
- SLO 2: Demonstrate a fundamental understanding of jobsite safety and effective and efficient work habits.
- Validate and demonstrate safety consciousness in work dress/apparel, tool use, jobsite demeanor, and personal protective equipment use.
- Assess jobsite hazards, reduce work related risks, and influence others to work in a safe and efficient manner.
- Select appropriate personal protective equipment for given landscape operations.
- Identify potential hazards created by improper pruning and training and/or poor cultural practices.
- SLO 3: Assess, evaluate, and implement the principles and practices of plant identification and use.
- Recognize, explain, and utilize the binomial method of plant nomenclature.
- Recognize, explain, and utilize plant identification and botanical terminology.
- Identify by leaf, bark, flower, fruit, and growth habit those plants best observed and studied during California’s spring and/or summer seasons.
- Examine, compare, and explain soil requirements and ecology of different plants.
- Analyze the various uses of plants in the home and commercial landscape.
- Propose landscape uses for those plants possessing desirable characteristics during California’s spring and/or summer seasons.
- Identify plants whose requirements fit selected criteria.
- Examine, formulate, and utilize plant keys to identify those plants best observed and studied during California’s spring and/or summer seasons.
- Assemble a professional herbarium utilizing collected and preserve plant materials, scans, and/or pictures.
- Recognize ideal characteristics of plants best observed and studied during California’s spring and/or summer seasons, and select quality plant material from nursery stock.
- Evaluate plant health and identify plant damage caused by pests, diseases, environmental conditions, nutritional deficiencies, or poor cultural practices.
- Examine, evaluate, and compare computerized plant selection software programs.
- Develop a plant characteristics key for future design work.
- SLO 4: Demonstrate a fundamental understanding of licensing and/or certification, and business and professional standards as related to plant identification in horticulture.
- Recognize and explain the benefits of additional/supplemental licensing and certification through state agencies and professional associations.
- Validate and demonstrate the importance of professionalism in the landscape industry, and described the professional industry associations and certification programs.

**HORT 307 Plant Identification - Sustainable and CA Native Selections**

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<td>Transferable:</td>
<td>CSU; UC</td>
</tr>
<tr>
<td>Catalog Date:</td>
<td>June 1, 2020</td>
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This course is the identification and study of the growth habits, cultural practices, and ornamental uses of California native plants, as well as plant material appropriate for sustainable landscaping. Plants emphasized will come from the current California Native Plant Society (CNPS), California Association of Nurseries and Garden Centers (CANGC), and California Landscape Contractors Association (CLCA) plant lists. Field trips may be required.

**Student Learning Outcomes**

Upon completion of this course, the student will be able to:

- SLO 1: Demonstrate independent learning and effective communication skills.
- Operate independently by attending or logging into class regularly.
- Utilize time management effectively and prioritize tasks to meet deadlines.
• Demonstrate effective oral and written communication.

SLO 2: Demonstrate a fundamental understanding of jobsite safety and effective and efficient work habits.

Validate and demonstrate safety consciousness in work dress/apparel, tool use, jobsite demeanor, and personal protective equipment use.

Assess jobsite hazards, reduce work related risks, and influence others to work in a safe and efficient manner.

Select appropriate personal protective equipment for given landscape operations.

Identify potential hazards created by improper pruning and training and/or poor cultural practices.

SLO 3: Assess, evaluate, and implement the principles and practices of plant identification and use.

Recognize, explain, and utilize the binomial method of plant nomenclature.

Recognize, explain, and utilize plant identification and botanical terminology.

Identify by leaf, bark, flower, fruit, and growth habit of California native and sustainable plant material.

Examine, compare, and explain soil requirements and ecology of different plants.

Analyze the various uses of plants in the home and commercial landscape.

Propose landscape uses for California native and sustainable plant material possessing desirable characteristics.

Identify plants whose requirements fit selected criteria.

Examine, formulate, and utilize plant keys to identify California native and sustainable plant material.

Assemble a professional herbarium utilizing collected and preserve plant materials, scans, and/or pictures.

Recognize ideal characteristics of California native and sustainable plant material, and select quality plant material from nursery stock.

Evaluate plant health and identify plant damage caused by pests, diseases, environmental conditions, nutritional deficiencies, or poor cultural practices.

Examine, evaluate, and compare computerized plant selection software programs.

Develop a plant characteristics key for future design work.

SLO 4: Demonstrate a fundamental understanding of licensing and/or certification, and business and professional standards as related to plant identification in horticulture.

Recognize and explain the benefits of additional/supplemental licensing and certification through state agencies and professional associations.

Validate and demonstrate the importance of professionalism in the landscape industry, and described the professional industry associations and certification programs.

**HORT 312 Plant Propagation**

**Units:** 3

**Hours:** 36 hours LEC; 54 hours LAB

**Prerequisite:** None.

**Advisory:** HORT 300

**Transferable:** CSU

**C-ID:** C-ID AG - EH 116L

**Catalog Date:** June 1, 2020

Plant Propagation is a study and practice of the sexual and asexual reproduction of landscape plant species. The emphasis of Horticulture 312 will be on the preparation and use of propagating and planting mediums, planting, transplanting, fertilizing, propagation facility pest and disease control, propagation structure utilization and site layout. Additional topics include the maintenance of common tools and equipment, and the laws and regulations pertaining to plant propagation and nursery production.

**Student Learning Outcomes**

Upon completion of this course, the student will be able to:

- **SLO 1:** Demonstrate independent learning and effective communications skills.
- **SLO 2:** Demonstrate a fundamental understanding of jobsite safety and effective and efficient work habits.
- **SLO 3:** Demonstrate a fundamental understanding of the wholesale and retail nursery industry.
- **SLO 4:** Demonstrate a fundamental understanding of plant propagation principles and practices.

- Operate independently by attending or logging into class regularly if and when an online component is integrated into this course.
- Utilize time management effectively and prioritize tasks to meet deadlines.
- Communicate effectively (orally and/or written).
- Demonstrate effective oral and written communication.
- Validate and demonstrate safety consciousness in work dress/apparel, tool use, jobsite demeanor, and personal protective equipment use.
- Assess jobsite hazards, reduce work related risks, and influence others to work in a safe and efficient manner.
- Identify and safely use specialized nursery tools and equipment.
- Identify and assess the major markets of the nursery industry and verify how these markets function within the local horticulture industry and in the county and state economy.
- Identify and evaluate the various nursery occupations and the associated employment requirements.
- Explain the industry accepted cultural practices utilized in the production, growth, and care of nursery and container stock.
- Assess and exhibit the personal skills (attitude, work habits, etc.) for successful employment in the wholesale and retail nursery industry.
- Evaluate and describe the various types of wholesale plant production industries.
- Analyze and assess the major federal and state laws governing plant propagation and protection.
- Evaluate and explain the effect of temperature, water, humidity, and fertility on plant growth.
- Assess and describe the principles of sexual and asexual plant reproduction.
- Compare the various propagation methods and select the most appropriate method for a given plant species.
- Create and implement a propagation program, and grow plants from propagation stage to salable size including: Mastering the procedures of plant propagation including seed, cuttings, layering, and division; Practicing the procedures of plant propagation including budding, grafting, and micro-propagation; Calculating the proper timing for the various propagation and production techniques appropriate to the plant species and propagation method; Formulating and preparing specialized planting and propagating media; Calculating, measuring, blending, and applying fertilizers; Planting and transplanting a variety of plants into appropriate containers.
- Select and explain common integrated pest management procedures for common garden, landscape, and greenhouse pests.
- Devise and implement a marketing plan, and demonstrate proper merchandising techniques.
- Identify common propagation, nursery, and landscape tools and equipment, and demonstrate the ability to use and maintain nursery tools and equipment.
- Create a retail nursery layout plan.
- Evaluate and select appropriate methods used to construct nursery facilities.
- Demonstrate various methods of plant propagation.
HORT 313 Sustainable Agriculture

This course provides a comprehensive study of sustainable agriculture that addresses many environmental and social concerns while providing innovative and economically viable techniques for growers. It integrates the theoretical aspects of sustainable agriculture, principles and practices with field-based laboratory and participatory learning of sustainable agriculture practices. This course may include field trips.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Demonstrate independent learning and effective communication skills.
- Demonstrate responsibility for personal actions and choices.
- Communicate effectively both orally and in writing.
- SLO 2: Demonstrate basic and advanced plant science/horticulture skills development and improvement.
- Demonstrate and apply the theories of sustainable and organic agriculture.
- Demonstrate a fundamental understanding of soils, soil development, soil building and preparation and sustainable soil management.
- Demonstrate a fundamental understanding of hydraulic and irrigation design, installation, and water management principles and practices.
- Create agriculture design concepts based on sound, sustainable soil management, water conservation, construction and maintenance, and integrated pest management best practices.
- Describe the development and dissemination of modern agricultural technologies and land use practices.
- Detail the extent of agricultural land use today and how trends in human population growth have and may continue to place additional demands upon agricultural ecosystems.
- Explain the agro-ecosystem, environmental quality and human health risks associated with the technologies and land use practices common in modern US agriculture.
- Explain the differences and similarities of several types of sustainable agriculture.
- Describe the basic plant anatomy and physiology as it relates to crop production.
- Explain and apply the scientific method to sustainable agriculture production practices.

HORT 320 Sustainable Landscape Construction

This course covers the fundamentals of landscape construction, including soil preparation, paving and construction materials, hand and power tool use, turf and plant installation, plan reading, estimating, and bid preparation. It will emphasize approved traditional industry construction methods, as well as sustainable alternative and techniques. Local codes and state requirements will also be covered. This course is an initial step in preparation for the California State C-27 Landscape Contractor License exam. Field trips may be required.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Demonstrate independent learning and effective communication skills.
- Operate independently by attending or logging into class regularly.
- Utilize time management effectively and prioritize tasks to meet deadlines.
- Demonstrate effective oral and written communication.
- SLO 2: Demonstrate a fundamental understanding of jobsite safety and effective and efficient work habits.
- Validate and demonstrate safety consciousness in work dress/apparel, tool use, jobsite demeanor, and personal protective equipment use.
- Assess jobsite hazards, reduce work related risks, and influence others to work in a safe and efficient manner.
- Select appropriate hand and/or power tools for a variety of landscape projects.
- Demonstrate the safe and efficient use of hand, power, and powder-actuated tools to construct wood, masonry, and concrete projects.
- Demonstrate the safe and efficient use of gas/fuel powered landscape equipment.
- SLO 3: Assess, evaluate, and implement the principles and practices of sustainable landscape construction.
- Select appropriate soil preparation methods for various soil conditions.
- Select and utilize appropriate measuring and leveling devices to alter landforms, establish finish grades, calculate proper slope, and control drainage and runoff.
- Analyze and explain the fundamentals of construction material selection, including the use of recycled materials.
- Analyze and explain the fundamentals of walk, deck, patio, and fence construction.
- Analyze and explain the fundamentals of water feature installation.
- Analyze and explain the fundamentals of landscape lighting design and installation.
- Plan and install a water efficient, automated irrigation system.
- Compare and appraise the use of seed, sprigs, sod, and artificial turf as a means of lawn establishment.
- Explain and demonstrate the steps required when installing lawn seed, sod, and artificial turf.
- Examine and select the appropriate shrub and tree planting method and staking system for a given slope, environment, and soil condition.
- Utilize a complete set of landscape plans to estimate material quantities, material and supply costs, and labor costs.
- Analyze a complete set of landscape plans, and prepare a construction estimate and/or bid.
SLO 4: Demonstrate a fundamental understanding of state contractor licensing, supplemental certification, and business and professional standards in the landscape industry.

- Analyze landscape professions and identify and explain licensing requirements.
- Recognize and explain the requirements and procedures for procuring a C-27 landscape contracting license.
- Recognize and explain the benefits of additional/supplemental licensing and certification through state agencies and professional associations.
- Examine and explain the California state contracting laws and regulations, and the California State License Board rules governing the C-27 landscape contractor’s specialty license.
- Validate and demonstrate the importance of professionalism in the landscape industry, and described the professional industry associations and certification programs.
- Recognize and explain the standard practices of various types of landscape construction/maintenance businesses, including estimating and bidding procedures, business practices, and working with state agencies.

HORT 324 Sustainable Landscape Maintenance

<table>
<thead>
<tr>
<th>Units:</th>
<th>3</th>
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<tbody>
<tr>
<td>Hours:</td>
<td>36 hours LEC; 54 hours LAB</td>
</tr>
<tr>
<td>Prerequisite:</td>
<td>None.</td>
</tr>
<tr>
<td>Advisory:</td>
<td>HORT 300 with a grade of &quot;C&quot; or better</td>
</tr>
<tr>
<td>Transferable:</td>
<td>CSU</td>
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<td>Catalog Date:</td>
<td>June 1, 2020</td>
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This course is a study of sustainable landscape maintenance and management of exterior and interior residential and commercial landscapes, parks, highways, and public buildings. Topics include planting and transplanting, pruning, water conservation and use, sustainable plant nutrition and soils management, integrated pest management, and the safe operation and maintenance of power equipment for the trade. Field trips may be required.

Student Learning Outcomes

- SLO 1: Demonstrate independent learning and effective communication skills.
- Utilize time management effectively and prioritize tasks to meet deadlines.
- Demonstrate effective oral and written communication.
- SLO 2: Demonstrate a fundamental understanding of jobsite safety and effective and efficient work habits.
- Validate and demonstrate safety consciousness in work dress/apparel, tool use, jobsite demeanor, and personal protective equipment use.
- Assess jobsite hazards, reduce work related risks, and influence others to work in a safe and efficient manner.
- Select appropriate hand and/or power tools for a variety of landscape maintenance activities.
- Demonstrate the safe and efficient use of gas/fuel powered landscape equipment.
- SLO 3: Assess, evaluate, and implement the principles and practices of sustainable landscape maintenance.
- Select appropriate soil preparation methods for various soil conditions.
- Analyze soil conditions and formulate a sustainable program of soil maintenance and improvement through the use of organic amendments.
- Recognize and demonstrate the appropriate management strategies, including mowing, fertilizing, watering, and pest management for a given turf species.
- Evaluate and discuss the steps required in the renovation and repair of a given turf planting.
- Evaluate and describe basic pruning systems applied to shade trees, shrubs, vines, perennials, roses, and fruit trees.
- Utilize irrigation and water auditing techniques and select equipment to correctly irrigate, schedule, and conserve water in the landscape.
- Recognize inappropriate irrigation equipment and/or faulty irrigation components and make basic repairs, replacements, and/or adjustments to a system.
- Design a water efficient irrigation schedule based on landscape environments and microclimates.
- Demonstrate the ability to program a variety of commonly used irrigation controllers.
- Discuss and demonstrate the proper steps and planting various container grown, balled and burlapped, bare-root, groundcover, and bedding plants.
- Analyze landscape plantings and select appropriate staking/guying systems.
- Evaluate plant health, and identify symptoms of plant damage by common pests, diseases, and abiotic factors.
- Analyze and discuss integrated pest management strategies for controlling selected weeds, insect pests, and diseases.
- Identify common landscape weeds, insect pests, and diseases, and propose an integrated pest management plan.
- Select, mix, and safely apply pesticides according to label directions, and in accordance with state and federal laws and regulations, through properly calibrated application equipment.
- Utilize a complete set of landscape plans to estimate required maintenance activities, material, supply, and labor costs, and create an annual maintenance calendar of operations for a selected landscape.
- Analyze a complete set of landscape plans or an actual landscape site, and prepare a maintenance estimate and/or bid.
- SLO 4: Demonstrate a fundamental understanding of licensing and/or certification, and business and professional standards in the landscape industry.
- Analyze landscape maintenance professions and identify and explain requirements for employment and/or licensing or certification.
- Recognize and explain the benefits of additional/supplemental licensing and certification through state agencies and professional associations.
- Examine and explain the California state Department of Pesticide Regulation laws and regulations, and the CDPR rules governing the Qualified Applicator’s Certificate and Landscape Maintenance Gardener’s pesticide license.
- Validate and demonstrate the importance of professionalism in the landscape industry, and described the professional industry associations and certification programs.
- Recognize and explain the standard practices of various types of landscape construction/maintenance businesses, including estimating and bidding procedures, business practices, and working with state agencies.
This course is the study of technical drafting skills and freehand graphics, including line quality, lettering, and organization of the design space as it relates to landscape and irrigation design. It includes ‘hand drafting techniques’, plant database software, introduction to Computer-Aided Drafting and Design (CADD) for landscape, and the use of a variety of graphics skills and media. Irrigation design for landscapes studies water hydraulics, irrigation equipment, including irrigation heads, pipes, pumps, controllers and valves, and water conservation. The course includes preparing landscape and irrigation plans, plan presentation, and reprographics. Field trips may be required.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Demonstrate independent learning and effective communication skills.
- Operate independently by attending class regularly.
- Utilize time management effectively and prioritize tasks to meet deadlines.
- Demonstrate effective oral, written, and graphic communication.
- SLO 2: Assess, evaluate, and implement the principles and practices of water efficient landscape design through graphic presentation.
- Assess and apply the use of drafting equipment and techniques as related to landscape design and landscape architecture.
- Assess and evaluate plant data software, plant materials web sites, and landscape CADD programs.
- Demonstrate a basic understanding of local architectural requirements and covenants, codes, and restrictions, and assess the needs of the client.
- Produce graphic representations of various landscape elements and systems to scale.
- Analyze the existing landscape through systematic site and environmental data collection.
- Appraise the landscape design potential of a site utilizing site inventory and analysis data.
- Employ the basic principles of irrigation design
- Identify and correctly apply sprinkler components for a landscape irrigation design.
- Produce an irrigation design that complies with water conservation regulations for our industry.
- Create landscape design concepts utilizing the principles of water efficient landscape design.
- Develop the components included in a set of landscape plans and construction drawings.
- Create an elevation view of a landscape design.
- Create and present a full set of landscape drawings based on a client’s criteria, needs and budget.
- Create a portfolio of design work.

HORT 350 Landscape Irrigation

Units: 3
Hours: 36 hours LEC, 54 hours LAB
Prerequisite: None.
Advisory: HORT 300 and 340; Hort 322 from ARC with a grade of "C" or better satisfies the Hort 340 advisory.
Transferable: CSU
Catalog Date: June 1, 2020

This course prepares students to design, install and maintain water efficient landscape irrigation systems. Topics include current California State water use regulations and ordinances, water supply, basic hydraulics, component identification and terminology, system layout, pipe sizing, water application devices, valves, and controllers. Students can earn QWEL (Qualified Water Efficient Landscaper) certification by achieving a passing score on the final exam. (Minimum passing score will be announced in class). Field trips may be required.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO 1: Demonstrate independent learning and effective communication skills.
- Operate independently by attending and / or logging into class regularly when the course is offered online or an online component is utilized as part of the course.
- Utilize time management effectively and prioritize tasks to meet deadlines.
- Demonstrate effective oral and written communication.
- Demonstrate the ability to read and interpret irrigation plans.
- Utilize appropriate graphic irrigation symbols and terminology in irrigation design.
- SLO 2: Demonstrate a fundamental understanding of water sources, delivery systems, and how water is utilized in the landscape.
- Explain and analyze California's water storage and delivery system.
- Evaluate the percent of the state's developed water supply used for landscape irrigation.
- Explain how irrigation water is made available to plants through the soil.
- Identify professional organizations and certification pertaining to landscape irrigation.
- SLO 3: Demonstrate a fundamental understanding of landscape irrigation system components and hydraulics.
- Identify system components on an irrigation plan.
- Explain the basic concepts of water pressure, flow, velocity, and friction loss.
- Calculate static and dynamic water pressure and flow at key points in a system.
- Explain the function of backflow prevention devices and assess the proper application for each device.
- Appraise the major types of sprinkler heads, valves, and controllers.
- SLO 4: Demonstrate a fundamental understanding of irrigation design, installation, and troubleshooting.
- Select the proper irrigation equipment for a given application.
- Calculate sprinkler head spacing for uniform application and precipitation rates.
- Arrange irrigation laterals and calculate pipe size based on application, water pressure, and flow velocity.
- Identify and select pipe fittings.
- Design and construct an irrigation system utilizing industry approved equipment and techniques.
- Devise a water-efficient program and manage controller system operation.
- Evaluate the need for pumping/filtering irrigation water from city mains and private wells.
- Measure irrigation system efficiency.
Diagnose and solve irrigation system problems.
Prepare and present a cost estimate for an irrigation system.

**HORT 351 Drip and Subsurface Irrigation**

**Units:** 2
**Hours:** 27 hours LEC, 27 hours LAB
**Prerequisite:** None.
**Advisory:** HORT 300, 340, and 350
**Transferable:** CSU
**Catalog Date:** June 1, 2020

This course prepares students to design, install and maintain water efficient, surface and subsurface drip irrigation systems. Topics include component identification and terminology, system layout, pipe sizing, water application equipment. Field trips may be required.

**Student Learning Outcomes**

Upon completion of this course, the student will be able to:

- SLO 1: Demonstrate independent learning and effective communication skills.
- Operate independently by attending and/or logging into class regularly when the course is offered online or an online component is utilized as part of the course.
- Utilize time management effectively and prioritize tasks to meet deadlines.
- Demonstrate effective oral and written communication.
- Utilize appropriate graphic irrigation symbols and terminology in irrigation design.
- SLO 2: Demonstrate a fundamental understanding of surface and subsurface micro-irrigation (drip) system components and hydraulics.
- Identify system components on an irrigation plan.
- Explain the basic concepts of water pressure, flow, velocity, and friction loss in drip systems.
- Calculate static and dynamic water pressure and flow at key points in a system.
- Explain the function of backflow prevention devices and assess the proper application for each device.
- Appraise the major types of drip tubing, emitters, and other micro-irrigation application devices.
- SLO 4: Demonstrate a fundamental understanding of surface and subsurface micro-irrigation (drip) system components and hydraulics.
- Select the proper micro-irrigation equipment for a given application.
- Calculate emitter spacing for uniform application and precipitation rates.
- Arrange irrigation laterals and calculate pipe size based on application, water pressure, and flow velocity.
- Identify and select drip fittings.
- Design and construct a micro-irrigation system utilizing industry approved equipment and techniques.
- Devise a water-efficient program and manage controller system operation.
- Evaluate the need for pressure regulation and filtering of irrigation water from city mains and private wells.
- Measure micro-irrigation system efficiency.
- Diagnose and solve micro-irrigation system problems.
- Prepare and present a cost estimate for a micro-irrigation system.

**HORT 353 Sustainable Water Management**

**Units:** 3
**Hours:** 36 hours LEC; 54 hours LAB
**Prerequisite:** HORT 350 with a grade of "C" or better; HORT 105 from ARC with a grade of "C" or better satisfies the Hort 350 prerequisite.
**Advisory:** HORT 300
**Transferable:** CSU
**Catalog Date:** June 1, 2020

This course prepares students to maintain and manage water efficient landscape irrigation systems utilizing the latest irrigation technology including water efficient application equipment, traditional and smart controllers, and environmental sensors. Topics include the review of the current California State Model Water Efficient Landscape Ordinance, inspection and performance assessment of irrigation systems, determining sprinkler precipitation and consumption rates, calculating water budgets, assessing soil/water relationships of the landscape, installing smart controllers and environmental sensors, controller programming, developing water schedules, and irrigation system management for efficient water use. Students can earn QWEL (Qualified Water Efficient Landscaper) certification by achieving a passing score on the final exam. (Minimum passing score will be announced in class). Field trips may be required.

**Student Learning Outcomes**

Upon completion of this course, the student will be able to:

- SLO 1: Demonstrate independent learning and effective communication skills.
- Operate independently by attending and/or logging into class regularly if an online component is utilized as part of the course.
- Utilize time management effectively and prioritize tasks to meet deadlines.
- Demonstrate effective oral and written communication.
- Demonstrate the ability to read and interpret irrigation plans and equipment manuals.
- Utilize appropriate graphic irrigation symbols and terminology used in irrigation design.
- SLO 2: Demonstrate a fundamental understanding of current model water efficient landscape standards.
- Analyze and explain the current California State Model Water Efficient Landscape Ordinance.
- Analyze and explain current local ordinances regulating the use of water in the landscape.
- Identify professional organizations and certification pertaining to efficient landscape irrigation.
- SLO 3: Demonstrate a fundamental understanding of landscape irrigation system performance and factors that affect performance.
- Evaluate and assess irrigation system water demand, precipitation rate, and coverage.
Calculate landscape irrigation coefficients and landscape evapotranspiration.
Calculate a water budget.
Evaluate the soil/water relationships for a landscape and determine water infiltration and percolation rates.
Assess methods of water capture.
SLO 4: Demonstrate a fundamental understanding of the use, installation, programming, and management of water efficient landscape irrigation equipment.
Evaluate and assess the latest models of water efficient sprinkler heads and micro-irrigation application devices.
Select the proper water application devices for a given landscape site.
Evaluate and assess the latest models of water efficient controllers and environmental sensors.
Demonstrate the ability to install various models of water efficient controllers and environmental sensors.
Demonstrate the ability to program various models of water efficient controllers and sensor input devices.
Demonstrate the ability to program various models of traditional controllers for water efficient operation.
Evaluate soil moisture content and perform system adjustments as required to maintain system efficiency.
Evaluate real-time evapotranspiration data and perform system adjustments as required to maintain system efficiency.
Analyze system flow rates and calculate water usage.

**HORT 360 Introduction to Tree Care and Urban Forestry**

**Units:** 3
**Hours:** 36 hours LEC, 54 hours LAB
**Prerequisite:** None.
**Advisory:** HORT 300 with a grade of "C" or better
**Transferable:** CSU
**Catalog Date:** June 1, 2020

This course is an introductory study and application of the principles and practices of tree care and urban forestry. This course will focus on tree biology, tree identification, plant health care, soils, plant nutrition, planting, worker safety, climbing, pruning, and the safe and effective use of tree-care tools and equipment. This course prepares the student to obtain a Certified Arborist designation through the International Society of Arboriculture. Field trips may be required.

**Student Learning Outcomes**

Upon completion of this course, the student will be able to:

- SLO 4: Demonstrate a fundamental understanding of the use, installation, programming, and management of water efficient landscape irrigation equipment.
- Assess methods of water capture.
- Evaluate the soil/water relationships for a landscape and determine water infiltration and percolation rates.
- Calculate landscape irrigation coefficients and landscape evapotranspiration.
- Analyze system flow rates and calculate water usage.
- Demonstrate the ability to install various models of water efficient controllers and environmental sensors.
- Demonstrate the ability to program various models of water efficient controllers and environmental sensors.
- Demonstrate the ability to program various models of traditional controllers for water efficient operation.
- Evaluate soil moisture content and perform system adjustments as required to maintain system efficiency.
- Evaluate real-time evapotranspiration data and perform system adjustments as required to maintain system efficiency.
- Formulate criteria for selecting healthy, vigorous planting stock.
- Validate how using proper planting techniques can improve tree survival and accelerate establishment.
- Demonstrate and explain the techniques and procedures used to plant and transplant trees.
- Assess the procedures and techniques used in tree pruning.
- Explain how trees respond to pruning and describe the effects of severe or improper pruning.
- Identify and discuss various tree hazards.
- Distinguish when a tree might be helped by the installation of cables, guys, bracing rods, and/or props.
- Describe the various physiological disorders and injuries that can affect trees.
- Recognize symptoms and signs of plant diseases and identify the cause of plant damage.
- Classify treatments that are appropriate for common tree disorders and injuries.
- Explain the concept of Compartmentalization of Decay in Trees (CODIT).
- Explain the philosophy of Plant Health Care (PHC) and describe its relationship with Integrated Pest Management (IPM).

- SLO 5: Demonstrate a fundamental understanding of common tree care practices.
- Investigate plant growth requirements.
- Explain how water, minerals, and nutrients are necessary for tree health and growth.
- Describe the basic composition of a tree's vascular system and explain how water, minerals, carbohydrates, and plant growth regulators are transported within this system.
- Describe how all plants are classified and how scientific names are based on the classification system.
- Explain how plant characteristics such as growth habit, texture, and color can be used in tree identification.
- Demonstrate the ability to identify trees based on a tree's physical characteristics.
- Explain how trees respond to pruning and describe the effects of severe or improper pruning.
- Identify and discuss various tree hazards.
- Distinguish when a tree might be helped by the installation of cables, guys, bracing rods, and/or props.
- Describe the various physiological disorders and injuries that can affect trees.
- Recognize symptoms and signs of plant diseases and identify the cause of plant damage.
- Classify treatments that are appropriate for common tree disorders and injuries.
- Explain the concept of Compartmentalization of Decay in Trees (CODIT).
- Explain the philosophy of Plant Health Care (PHC) and describe its relationship with Integrated Pest Management (IPM).
HORT 495 Independent Studies in Horticulture

Units: 1 - 3
Hours: 54 - 162 hours LAB
Prerequisite: None
Transferable: CSU
Catalog Date: June 1, 2020

An independent studies project involves an individual student or small group of students in study, research, or activities beyond the scope of regularly offered courses. See the current catalog section of "Special Studies" for full details of Independent Studies.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- SLO #1: Actively engage in intellectual inquiry beyond that required in order to pass a course of study (College Wide Learning Outcome – Area 4).
- Discuss and outline a proposal of study (that can be accomplished within one semester term) with a supervising instructor qualified within the discipline.
- Design an independent study (to be completed individually or by collaboration of a small group) to foster special knowledge, skills, and experience that are not available in any one regularly scheduled course.
- Use information resources to gather discipline-specific information.
- SLO #2: Utilize modes of analysis and critical thinking to apply theoretical perspectives and/or concepts in the major discipline of study to significant problems and/or educational activities (College Wide Learning Outcome – Area 3).
- Analyze and apply the knowledge, skills and experience that are involved in the independent study to theoretical perspectives and/or concepts in the major discipline of study.
- Explain the importance of the major discipline of study in the broader picture of society.
- SLO #3: Communicate a complex understanding of content matter of the major discipline of study (College Wide Outcome – Area 3).
- Demonstrate competence in the skills essential to mastery of the major discipline of study that are necessary to accomplish the independent study.
- SLO #4: Identify personal goals and pursue these goals effectively (College Wide Outcome – Area 4).
- Utilize skills from the "academic tool kit" including time management, study skills, etc., to accomplish the independent study within one semester term.

HORT 498 Work Experience in Horticulture

Units: 1 - 4
Hours: 60 - 300 hours LAB
Prerequisite: None
Enrollment Limitation: Students must be in a paid or unpaid internship, volunteer position or job related to career goals in Horticulture.
Transferable: CSU
General Education: AA/AS Area III(b)
Catalog Date: June 1, 2020

This course provides students with opportunities to develop marketable skills in preparation for employment in their major field of study or advancement within their career. It is designed for students interested in work experience and/or internships in transfer level degree occupational programs. Course content includes understanding the application of education to the workforce; completion of required forms which document the student's progress and hours spent at the work site; and developing workplace skills and competencies. Appropriate level learning objectives are established by the student and the employer. During the semester, the student is required to participate in a weekly orientation and 75 hours of related paid work experience, or 60 hours of unpaid work experience for one unit. An additional 75 or 60 hours of related work experience is required for each additional unit. Work Experience may be taken for a total of 16 units when there are new or expanded learning objectives. Only one Work Experience course may be taken per semester.

Student Learning Outcomes

Upon completion of this course, the student will be able to:

- DEMONSTRATE AN UNDERSTANDING AND APPLICATION OF PROFESSIONAL WORKPLACE BEHAVIOR IN A FIELD OF STUDY RELATED ONE'S CAREER.(SLO 1)
- Understand the effects time, stress, and organizational management have on performance.
- Demonstrate an understanding of consistently practicing ethics and confidentiality in a workplace.
- Examine the career/life planning process and relate its relevancy to the student.
- Demonstrate an understanding of basic communication tools and their appropriate use.
- Demonstrate an understanding of workplace etiquette.
- DESCRIBE THE CAREER/LIFE PLANNING PROCESS AND RELATE ITS RELEVANCY TO ONE'S CAREER.(SLO 2)
- Link personal goals to long term achievement.
- Display an understanding of creating a professional first impression.
- Understand how networking is a powerful job search tool.
- Understand necessary elements of a résumé.
- Understand the importance of interview preparation.
- Identify how continual learning increases career success.
- DEMONSTRATE APPLICATION OF INDUSTRY KNOWLEDGE AND THEORETICAL CONCEPTS AS WRITTEN IN LEARNING OBJECTIVES IN PARTNERSHIP WITH THE EMPLOYER WORK SITE SUPERVISOR. (SLO 3)
HORT 499 Experimental Offering in Horticulture

Units: 0.5 - 4
Prerequisite: None.
Transferable: CSU
Catalog Date: June 1, 2020

Dave Andrews
Horticulture Professor

Office: CRC Main, NTB, 109
Email: andrewd@crc.losrios.edu
Phone: (916) 691-7551
Web: Dave Andrews's Profile Page /about-us/contact-us/faculty-and-staff-directory/dave-andrews

andrewd@crc.losrios.edu
(916) 691-7551
Web: