

## HORTICULTURE

### Natural and Applied Sciences Division

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The horticulture program prepares students for entry level to management jobs and self-employment in diverse horticulture businesses. It also provides a foundation for students in Ornamental Horticulture and Landscape Architecture. It affords local horticulturists and working professionals the means to upgrade their skills and knowledge. Opportunities to obtain valuable experience are provided in the greenhouse/garden facility and by working to enhance campus landscapes.

### DEGREES AND CERTIFICATES

The college offers two A.S. Degrees, two Certificates of Achievement and seven Skills Certificates in Horticulture. Students may obtain an A.S. Degree in General and Crop Production or Landscape Horticulture. Students may earn only one A.S. Degree. Separate certificates may be obtained in both areas of concentration).

#### Learning Outcomes

1. Critically assess a soil test and make recommendations.  
(Communication, Critical Thinking)
2. Construct an Integrated Pest Management program for a chosen crop. (Communication, Global Awareness)
3. Analyze the cost of production of various crops under different production techniques. (Communication, Critical Thinking)

### General Horticulture & Crop Production A.S. Degree

#### A.S. General Education

21 Units

#### Core Courses (37 units)

HORT 1A	Basic Horticulture .....	4
HORT 1B	Basic Horticulture: Crop Production .....	4
HORT 2	Soil Science and Management.....	4
HORT 52	Greenhouse Design and Operation .....	3
HORT 54	Business Aspects of Horticulture.....	4
HORT 58	Irrigation Systems Design and Management .....	3
HORT 62	Fall Plant Materials and Design .....	3
and		
HORT 63	Spring Plant Materials and Design .....	3
and		
HORT 199C	Career Work Experience Education .....	1
or		
HORT 70	Organic Agriculture.....	3
and		
HORT 71	Organic Food Production 1 .....	4
and		
HORT 72	Organic Food Production 2 .....	1
HORT 100A	Plant Propagation.....	1 - 3
HORT 125	Hydroponic and Substrate Production.....	3
HORT 150	Pest Management .....	4

#### Approved Electives:

Units

Any Horticulture Course .....

2

**Total Units**

**60**

## General Horticulture and Crop Production Certificate of Achievement

### Learning Outcomes

1. Critically assess a soil test and make recommendations. (Communication, Critical Thinking)
2. Construct an Integrated Pest Management program for a chosen crop. (Communication, Global Awareness)
3. Analyze the cost of production of various crops under different production techniques. (Communication, Critical Thinking)

### Core Courses (35-37 units)

HORT 1A	Basic Horticulture .....	4
HORT 1B	Basic Horticulture: Crop Production .....	4
HORT 2	Soil Science and Management.....	4
HORT 52	Greenhouse Design and Operation .....	3
HORT 54	Business Aspects of Horticulture.....	4
HORT 58	Irrigation Systems Design and Management .....	3
HORT 62	Fall Plant Materials and Design .....	3
and		
HORT 63	Spring Plant Materials and Design .....	3
and		
HORT 199C	Career Work Experience Education .....	1
or		
HORT 70	Organic Agriculture.....	3
and		
HORT 71	Organic Food Production 1 .....	4
and		
HORT 72	Organic Food Production 2 .....	1
HORT 100A	Plant Propagation.....	1 - 3
HORT 125	Hydroponic and Substrate Production.....	3
HORT 150	Pest Management .....	4

### Other Required Courses (3 Units)

### Units

ENGL 100	Elements of Writing.....	3
or		
ESL 100	High Advanced Academic ESL .....	4-6
or		
ENGL 1A/1AH/1AMC/1AMCH	.....	3
or		
CABT 157	Business and Technical Writing .....	3

### Total Units

**41-42**

## Landscape Horticulture A.S. Degree

### Learning Outcomes

1. Critically assess a soil test and make recommendations. (Communication, Critical Thinking)
2. Construct an Integrated Pest Management program for a chosen crop. (Communication, Global Awareness)
3. Design novel landscapes for the Central California Coast. (Problem Solving, Global Awareness, Professional Development)

### A.S. General Education

**21 Units**

### Core Courses (39 units)

HORT 1A	Basic Horticulture .....	4
HORT 2	Soil Science and Management.....	4
HORT 54	Business Aspects of Horticulture.....	4
HORT 58	Irrigation Systems Design and Management .....	3
HORT 62	Fall Plant Materials and Design .....	3
HORT 63	Spring Plant Materials and Design .....	3

HORT 65	Landscape CADD and Surveying .....	2
HORT 66	Landscape Design .....	3
HORT 150	Pest Management .....	4
HORT 164	California Native Plants & Plant Communities .....	2
HORT 172	Arboriculture .....	3
or		
HORT 160B	Edible Landscaping.....	3
or		
HORT 176	Permaculture Design.....	3
HORT 175	Sustainable Landscaping.....	4

### Total Units

**60**

## Landscape Horticulture Certificate of Achievement

### Learning Outcomes

1. Critically assess a soil test and make recommendations. (Communication, Critical Thinking)
2. Construct an Integrated Pest Management program for a chosen crop. (Communication, Global Awareness)
3. Design novel landscapes for the Central California Coast. (Problem Solving, Global Awareness, Professional Development)

### Core Courses (39 units)

HORT 1A	Basic Horticulture .....	4
HORT 2	Soil Science and Management.....	4
HORT 54	Business Aspects of Horticulture.....	4
HORT 58	Irrigation Systems Design and Management .....	3
HORT 62	Fall Plant Materials and Design .....	3
HORT 63	Spring Plant Materials and Design .....	3
HORT 65	Landscape CADD and Surveying .....	2
HORT 66	Landscape Design .....	3
HORT 150	Pest Management .....	4
HORT 164	California Native Plants & Plant Communities .....	2
HORT 172	Arboriculture .....	3
or		
HORT 160B	Edible Landscaping.....	3
or		
HORT 176	Permaculture Design.....	3
HORT 175	Sustainable Landscaping.....	4

### Other Required Courses (3 Units)

### Units

ENGL 100	Elements of Writing.....	3
or		
ESL 100	High Advanced Academic ESL .....	4-6
or		
ENGL 1A/1AH/1AMC/1AMCH	.....	3
or		
CABT 157	Business and Technical Writing .....	3

### Total Units

**42-45**

## Arboriculture Skills Certificate

### Learning Outcomes

1. Identify trees found on the ISA exam. (Critical Thinking, Professional Development)

### Required Course

### Units

HORT 62	Fall Plant Materials and Design .....	3
HORT 63	Spring Plant Materials and Design .....	3
HORT 150	Pest Management .....	4

HORT 172	Arboriculture .....	3
HORT 173	Landscape Pruning .....	1
HORT 199C	Career Work Experience Education .....	1
<b>Total Units</b>		<b>15</b>

## General Horticulture Skills Certificate

### Learning Outcomes

1. Critically assess a soil test and make recommendations. (Communication, Critical Thinking)

Required Courses	Units	
HORT 1A	Basic Horticulture .....	4
HORT 1B	Basic Horticulture: Crop Production .....	4
HORT 2	Soil Science and Management.....	4
HORT 150	Pest Management .....	4
HORT 199C	Career Work Experience Education .....	1

**Total Units** **17**

## Greenhouse and Nursery Management Skills Certificate

### Learning Outcomes

1. Analyze the cost of production of various crops under different production techniques. (Communication, Critical Thinking Problem Solving)
2. Justify propagation techniques used for specific nursery crops. (Communication, Problem Solving)

Required Courses	Units	
HORT 1A	Basic Horticulture .....	4
HORT 1B	Basic Horticulture: Crop Production .....	4
HORT 52	Greenhouse Design and Operation .....	3
HORT 100A	Plant Propagation.....	1 - 3
HORT 150	Pest Management .....	4

**Total Units** **16 - 18**

## Landscape Design Skills Certificate

### Learning Outcomes

1. Assess components of a sustainable landscape. (Global Awareness, Professional Development)

Required Courses	Units	
HORT 62	Fall Plant Materials and Design .....	3
HORT 63	Spring Plant Materials and Design .....	3
HORT 65	Landscape CADD and Surveying .....	2
HORT 66	Landscape Design .....	3
HORT 175	Sustainable Landscaping.....	4
HORT 199C	Career Work Experience Education .....	1

**Total Units** **16**

## Landscaping Skills Certificate

### Learning Outcomes

1. Critically assess a soil test and make recommendations. (Communication, Critical Thinking)
2. Identify and analyze plants showing their best use and identification characteristics using the scientific name and common names. (Critical Thinking, Professional Development)

Required Courses	Units	
HORT 2	Soil Science and Management.....	4
HORT 58	Irrigation Systems Design and Management .....	3
HORT 62	Fall Plant Materials and Design .....	3
or		
HORT 63	Spring Plant Materials and Design .....	3
HORT 65	Landscape CADD and Surveying .....	2
HORT 175	Sustainable Landscaping.....	4

**Total Units** **16**

## Permaculture Skills Certificate

### Learning Outcomes

1. Analyze a site to determine its resources and constraints.
2. Create a design for local commons and public access sites.

Required Courses	Units	
HORT 2	Soil Science and Management.....	4
HORT 58	Irrigation Systems Design and Management .....	3
HORT 160B	Edible Landscaping.....	3
HORT 175	Sustainable Landscaping.....	4
HORT 176	Permaculture Design.....	3

**Total Units** **17**

## Sustainable and Organic Food Production Skills Certificate

### Learning Outcomes

1. Analyze current organic production techniques and justify which system is recommended for specific crops grown organically in the Monterey Bay area. (Global Awareness, Critical Thinking, Professional Development)
2. Critically assess crop nutritional needs. (Critical Thinking, Professional Development)

Required Courses	Units	
HORT 2	Soil Science and Management.....	4
HORT 70	Organic Agriculture.....	3
HORT 71	Organic Food Production 1 .....	4
HORT 72	Organic Food Production 2 .....	1
HORT 125	Hydroponic and Substrate Production.....	3
HORT 199C	Career Work Experience Education .....	1

**Total Units** **16**

## Horticulture Courses

### HORT 1A Basic Horticulture

4 units; 3 hours Lecture, 3 hours Laboratory  
Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100; Eligibility for MATH 154.

Repeatability: May be taken a total of 1 time.

Introduces plant science including structure, growth process, physiology, soils, propagation, history, and plant adaptations for survival in a Mediterranean climate.

*Transfer Credit:* Transfers to CSU; UC.

**HORT 1B Basic Horticulture: Crop Production**

4 units; 3 hours Lecture, 3 hours Laboratory

Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100; Eligibility for MATH 154.

Repeatability: May be taken a total of 1 time.

Surveys the production of ornamental and landscape plants to gain a working knowledge of how light, temperature, water, fertilizers, and soilless media interact in a controlled environment. Also covers pest management and propagation of selected ornamentals.

*Transfer Credit:* Transfers to CSU.

**HORT 2 Soil Science and Management**

4 units; 3 hours Lecture, 3 hours Laboratory

Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100; Eligibility for MATH 154.

Repeatability: May be taken a total of 1 time.

Examines physical, chemical, and biological composition of soils, local soil formations, methods of soil sampling and testing, fertilizer and liming techniques, production and use of organic and chemical fertilizers, green manures, and relationship between soils and human culture. Includes the use and testing of soils for production plus septic and gray water systems.

*Transfer Credit:* Transfers to CSU; UC. C-ID: AG-PS 128L

**HORT 52 Greenhouse Design and Operation**

3 units; 3 hours Lecture

Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100; Eligibility for MATH 154.

Repeatability: May be taken a total of 1 time.

Presents the design and management of commercial and residential greenhouses including site analysis, greenhouse styles, glazing, circulation, cooling, venting, heating systems, and control systems. This class also covers general growing conditions of plants in a controlled environment. The business of nurseries and greenhouses is also covered briefly.

*Transfer Credit:* Transfers to CSU.

**HORT 54 Business Aspects of Horticulture**

4 units; 3 hours Lecture, 3 hours Laboratory

Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100; Eligibility for MATH 154.

Repeatability: May be taken a total of 1 time.

Focuses on starting and managing horticultural businesses, including licenses required, developing a business plan, sales, marketing, computer invoicing, and record keeping and legal requirements of employers. Discusses myriad of employment opportunities, especially niche markets. Labs include field trips and retail/inventory training for departmental plant sales.

*Transfer Credit:* Transfers to CSU.

**HORT 57 Landscape Construction**

3 units; 2 hours Lecture, 3 hours Laboratory

Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100; Eligibility for MATH 154.

Repeatability: May be taken a total of 1 time.

Presents an overview of the landscape contracting industry and provides hands-on experience with landscape construction techniques including site layout and preparation, planting, interlocking pavers, retaining walls, wood construction, and water features as well as bidding and estimating projects.

*Transfer Credit:* Transfers to CSU.

**HORT 58 Irrigation Systems Design and Management**

3 units; 3 hours Lecture, 1 hour Laboratory

Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100; Eligibility for MATH 154.

Repeatability: May be taken a total of 1 time.

Introduces the fundamentals of agricultural, residential, and commercial landscape irrigation systems design, installation, and maintenance with an emphasis on the efficient use of irrigation water in the semi-arid Central Coast climate.

*Transfer Credit:* Transfers to CSU.

**HORT 62 Fall Plant Materials and Design**

3 units; 2 hours Lecture, 3 hours Laboratory

Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100; Eligibility for MATH 154.

Repeatability: May be taken a total of 1 time.

Covers the identification of the common plants used in local landscapes including native and introduced trees, shrubs, groundcovers, and vines. Also covers the uses of plants in the landscape, California natives firescaping, history of gardens, selecting groundcovers, plant selection software, and planting design.

*Transfer Credit:* Transfers to CSU. C-ID: AG-EH 108L

**HORT 63 Spring Plant Materials and Design**

3 units; 2 hours Lecture, 3 hours Laboratory

Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100; Eligibility for MATH 154.

Repeatability: May be taken a total of 1 time.

Covers the identification of the plants used in California landscapes including ornamental grasses, perennials, trees, and shrubs. Also covers selecting proper plants for landscape needs including flowering trees, and plants for hedges, screens and espaliers.

*Transfer Credit:* Transfers to CSU.

**HORT 65 Landscape CADD and Surveying**

2 units; 1 hour Lecture, 3 hours Laboratory

Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100; Eligibility for MATH 154.

Repeatability: May be taken a total of 1 time.

Introduces Landscape Computer-Aided Design-and-Drafting software as well as measures and surveying fundamentals. Prepares for entry-level skills in the field of landscape design.

*Transfer Credit:* Transfers to CSU.

**HORT 66 Landscape Design**

3 units; 2 hours Lecture, 3 hours Laboratory

Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100; Eligibility for MATH 154.

Repeatability: May be taken a total of 1 time.

Presents principles of landscape design theory; analysis and functional diagrams, form and spatial composition; creative problem solving; and in-depth study of hardscape materials. Meet and work with an actual client while designing a typical residential landscape.

*Transfer Credit:* Transfers to CSU.

**HORT 70      Organic Agriculture**

3 units; 3 hours Lecture, 1 hour Laboratory

Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100; Eligibility for MATH 154.

Repeatability: May be taken a total of 1 time.

Introduces organic agriculture with an emphasis on organic food production and a practical understanding of the philosophy, principles, and practices of organic crops.

*Transfer Credit:* Transfers to CSU.

**HORT 71      Organic Food Production 1**

4 units; 3 hours Lecture, 3 hours Laboratory

Prerequisite: HORT 70 or equivalent experience.

Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100; Eligibility for MATH 154.

Repeatability: May be taken a total of 1 time.

Continues the theory and practices of good management begun in HORT 70 emphasizing springtime, commercial scale, local area, organic vegetable, fruit, and flower crops. Emphasizes the scientific, economic, and social basis for good management practices. Designed primarily for students planning a management career in organic horticulture. Includes instruction for obtaining the IOIA Certificate: USDA NOP Organic Crop Standards Training.

*Transfer Credit:* Transfers to CSU; UC.

**HORT 72      Organic Food Production 2**

1 unit; 0.5 hour Lecture, 1.5 hours Laboratory

Prerequisite: HORT 71 or equivalent experience.

Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100; Eligibility for MATH 154.

Repeatability: May be taken a total of 1 time.

Continues the theory and practices of good management agriculture begun in HORT 71 emphasizing summertime, commercial scale, local area, organic vegetable, fruit, and flower crops. Emphasizes the scientific, economic, and social basis for good management practices. Explores organic farming and farm business, and is designed primarily for students planning a management career in organic horticulture.

*Transfer Credit:* Transfers to CSU.

**HORT 100A    Plant Propagation**

1 – 3 units; 3 – 9 hours Laboratory

Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100; Eligibility for MATH 154.

Repeatability: May be taken a total of 1 time.

Presents techniques in plant propagation including seed collection, handling, and sowing as well as producing plants from cuttings, layering, leaf pieces, division, and grafting. Includes equipment and facilities commonly used in nursery and greenhouse production, appropriate chemicals and hormones, growing mediums and fertilizers appropriate for propagation, sanitation procedures, propagation scheduling, lining out and potting up.

*Transfer Credit:* Non-transferable.

**HORT 125      Hydroponic and Substrate Production**

3 units; 2 hours Lecture, 3 hours Laboratory

Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100; Eligibility for MATH 154.

Repeatability: May be taken a total of 1 time.

Introduces concepts and practices of growing crops hydroponically and with substrates including set up, nutrient solution preparation, lighting needs, and pest control.

*Transfer Credit:* Non-transferable.

**HORT 150      Pest Management**

4 units; 3 hours Lecture, 3 hours Laboratory

Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100; Eligibility for MATH 154.

Repeatability: May be taken a total of 1 time.

Introduces the concepts and practices of integrated pest management emphasizing identification of insects, vertebrates, diseases and weeds in managed landscapes, crops, nurseries and greenhouses on the Central Coast. Covers pesticide use and safety and the techniques of integrated pest management including: biological control, resistant varieties, cultural controls and mixed cropping.

*Transfer Credit:* Non-transferable.

**HORT 160B    Edible Landscaping**

3 units; 3 hours Lecture

Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100; Eligibility for MATH 154.

Repeatability: May be taken a total of 1 time.

Provides an introduction to designing, growing, and harvesting edible plants in the landscape with a focus on fruits and vegetables as well as food issues highlighting the value of whole food diets using documentary films.

*Transfer Credit:* Non-transferable.

**HORT 162A-Z    Current Topics in Horticulture**

0.5 – 4 units; 0.5 – 4 hours Lecture or 1.5 – 12 hours Laboratory

Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100; Eligibility for MATH 154.

Repeatability: May be taken a total of 1 time.

Presents selected topics in horticulture not covered by regular catalog offerings. Each special topic course will be announced, described, and given its own title and letter designation in the Schedule of Classes. The structure and format of each class will vary depending on the subject matter and may consist of lecture, lab, or both.

*Transfer Credit:* Non-transferable.

**HORT 164      California Native Plants & Plant Communities**

2 units; 1 hour Lecture, 3 hours Laboratory

Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100; Eligibility for MATH 154.

Repeatability: May be taken a total of 1 time.

Covers the identification of native plants and their best uses in the developed landscape, and includes discussion of the diverse native plant communities of California.

*Transfer Credit:* Non-transferable.

### **HORT 172 Arboriculture**

3 units; 2 hours Lecture, 3 hours Laboratory

Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100; Eligibility for MATH 154.

Repeatability: May be taken a total of 1 time.

Introduces the care and management of trees in the landscape providing preparation for the International Society of Arboriculture (ISA) certification exam and covers the selection, training, protecting, fertilizing, and the basics of pruning. Soil, water and nutrient management, and plant biology will be discussed as well as the operation of a tree maintenance business. Trees common to the ISA exam will be covered.

*Transfer Credit:* Non-transferable.

### **HORT 173 Landscape Pruning**

1 unit; 0.75 hours Lecture, 1.5 hours Laboratory

Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100; Eligibility for MATH 154.

Repeatability: May be taken a total of 1 time.

Provides hands-on experience using pruning equipment and presents general and specific pruning techniques of common plants in the landscape including ornamental trees, shrubs and vines, roses, and fruit trees. Discusses the advantages and disadvantages of winter versus summer pruning and the selection of plants for special pruning techniques such as topiary, hedging, winter interest and blooming.

*Transfer Credit:* Non-transferable.

### **HORT 175 Sustainable Landscaping**

4 units; 3 hours Lecture, 3 hours Laboratory

Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100; Eligibility for MATH 154.

Repeatability: May be taken a total of 1 time.

Encompasses sustainable landscaping theories and practices including designing, installing and maintaining ecologically sound landscapes through renovating existing gardens with living walls, green roofs, permeable hardscapes and rain water catchment systems, appropriate plant selection, and water conservation and irrigation.

*Transfer Credit:* Non-transferable.

### **HORT 176 Permaculture Design**

3 units; 2 hours Lecture, 3 hours Laboratory

Repeatability: May be taken a total of 1 time.

Recommended Preparation: Eligibility for ENGL 100 or ESL 100 and READ 100; Eligibility for MATH 154.

Introduces principles and practices of permaculture design through collaboration on real-world projects with a focus towards repairing, restoring, and regenerating human ecosystems.

*Transfer Credit:* Non-transferable.