**DEPARTMENT OF HORTICULTURE AND LANDSCAPE ARCHITECTURE**

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Professor Jessica Davis, Department Head

**Undergraduate Majors**

- Environmental Horticulture
  - Landscape Business Concentration
  - Nursery and Landscape Management Concentration
  - Turf Management Concentration
- Horticulture
  - Floriculture Concentration
  - Horticultural Business Management Concentration
  - Horticultural Food Crops Concentration
    - Production Option
    - Seed Science Option
  - Horticultural Science Concentration
  - Horticultural Therapy Concentration
  - Viticulture and Enology Concentration
- Landscape Architecture

**Minors**

A Horticulture or Environmental Horticulture minor will serve to broaden the academic background of students seeking employment in interdisciplinary job markets associated with plant sciences or the art and science of environmental horticulture. A minor will allow students a maximum breadth and depth in the field while utilizing a limited number of requirements.

- Environmental Horticulture
- Horticulture

**Graduate Programs in Horticulture**

The department offers graduate programs leading to Master of Science and Doctor of Philosophy degrees. Students interested in graduate work should refer to the Graduate and Professional Bulletin and the Department of Horticulture (http://hortla.agsci.colostate.edu).

**Master’s Programs**

Master of Science in Horticulture, Plan A*  
Master of Science in Horticulture, Plan B*  
Master of Landscape Architecture, Plan C (M.L.A.) (No new students are being accepted into this program.)

**Ph.D.**

Ph.D. in Horticulture*  
* Please see department for program of study.

**Courses**

Subjects in this department include: Horticulture (HORT) and Landscape Architecture (LAND).

**Horticulture (HORT)**

HORT 100  Horticultural Science  Credits: 4 (3-2-0)  
Course Description: Principles of plant science and related disciplines as the base and context for the introduction of horticultural practices.  
Prerequisite: None.  
Registration Information: Must register for lecture and laboratory. Required field trips. Sections may be offered: Online.  
Terms Offered: Fall, Spring, Summer.  
Grade Mode: Traditional.  
Special Course Fee: Yes.  
Additional Information: Biological & Physical Sciences 3A.

HORT 171  Environmental Issues in Agriculture (GT-SS3)  Credits: 3 (2-0-1)  
Also Offered As: SOCR 171.  
Course Description: Historical development of agriculture, environmental consequences of modern food production and other cultural approaches to agriculture.  
Prerequisite: None.  
Registration Information: Must register for lecture and recitation. Credit not allowed for both HORT 171 and SOCR 171.  
Term Offered: Fall.  
Grade Mode: Traditional.  
Special Course Fee: No.  
Additional Information: Global & Cultural Awareness 3E, Human Behavior, Culture, or Social Frameworks (GT-SS3).

HORT 221  Landscape Plants  Credits: 4 (2-4-0)  
Course Description: Identification, landscape features, cultural requirements, and landscape use of coniferous and deciduous trees and shrubs, vines, and evergreens.  
Prerequisite: None.  
Registration Information: Must register for lecture and laboratory. Required field trips.  
Terms Offered: Fall, Spring.  
Grade Modes: S/U within Student Option, Trad within Student Option.  
Special Course Fee: Yes.
HORT 231 Landscape Graphics Studio Credits: 4 (2-4-0)
Course Description: Mechanical and freehand graphic techniques for landscape design. Use of pencil, ink, and colored markers. Plan, sectional, and perspective views.
Prerequisite: None.
Registration Information: Must register for lecture and laboratory.
Term Offered: Fall.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

HORT 232 Principles of Landscape Design Credits: 4 (2-4-0)
Course Description: Basic concepts in the art and process of landscape design.
Prerequisite: HORT 231.
Registration Information: Must register for lecture and laboratory.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: Yes.

HORT 260 Plant Propagation Credits: 4 (3-2-0)
Course Description: Theories, principles, and techniques of sexual and asexual propagation.
Prerequisite: BZ 120, may be taken concurrently or HORT 100, may be taken concurrently or LIFE 103, may be taken concurrently.
Registration Information: Must register for lecture and laboratory.
Term Offered: Spring.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: Yes.

HORT 270 Fundamentals of Horticultural Therapy Credits: 2 (2-0-0)
Course Description: Theory and practice of horticultural therapy in health care and human services; applications, settings, and professional career topics.
Prerequisite: None.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

HORT 277 Introduction to Enology Credit: 1 (1-0-0)
Course Description: Methods/criteria to evaluate, compare, and describe aroma and flavor characteristics in sound commercial wines; identification of common wine defects.
Prerequisite: None.
Term Offered: Fall (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

HORT 310 Greenhouse Management Credits: 4 (3-2-0)
Course Description: Design and use of enclosed structures to manipulate controlled environments, effects on growth as applied to crops, production, and marketing costs.
Prerequisite: None.
Registration Information: Must register for lecture and laboratory. Sections may be offered: Online.
Terms Offered: Fall, Spring, Summer.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: Yes.

HORT 321 Nursery Production and Management Credits: 4 (3-2-0)
Course Description: Nursery industry organization, management, equipment, field and container production, storage, shipping, marketing, and business management practices.
Prerequisite: BZ 120 or HORT 100 or LIFE 103.
Registration Information: Must register for lecture and laboratory. Required field trips.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: Yes.

HORT 322 Herbaceous Plants Credits: 3 (2-2-0)
Course Description: Identification, landscape features, cultural requirements, and uses of ornamental annual, perennial, and bulb plants.
Prerequisite: None.
Registration Information: Must register for lecture and laboratory. Sections may be offered: Online. Required field trips.
Term Offered: Fall.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: Yes.

HORT 328 Interior Plantscaping Credits: 3 (2-2-0)
Course Description: Interior plant culture, plant identification, interiorscape design and concepts for running an interior plantscaping business.
Prerequisite: BZ 120 or HORT 100.
Registration Information: Must register for lecture and laboratory. Required field trips.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

HORT 330 Computers for Landscape Design Credits: 2 (1-2-0)
Course Description: Applications and techniques of computer software utilized in small-scale landscape design-build.
Prerequisite: None.
Registration Information: Must register for lecture and laboratory.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

HORT 331 Landscape Design Credits: 2 (2-0-0)
Course Description: Fundamentals of landscape design theory and plant composition as presented in simple problems.
Prerequisite: None.
Registration Information: For non-design majors only.
Term Offered: Spring.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

HORT 335 Landscape Structures Credits: 4 (2-4-0)
Course Description: Design and construction methods for structures commonly used in residential landscaping. Preparation of construction documents.
Prerequisite: CON 131 and HORT 232.
Registration Information: Must register for lecture and laboratory. Required field trips.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.
HORT 336 Landscape Grading and Drainage Studio  Credits: 4 (2-4-0)
Course Description: Basic design principles for grading, drainage, and earth forms for small-scale projects.
Prerequisite: (HORT 221 and HORT 322 and HORT 335) and (MATH 118).
Registration Information: Must register for lecture and laboratory.
Term Offered: Spring.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

HORT 341 Turfgrass Management Credits: 3 (2-2-0)
Course Description: Principles and practices of turfgrass propagation and maintenance.
Prerequisite: HORT 100, may be taken concurrently.
Registration Information: Must register for lecture and laboratory.
Required field trips.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

HORT 344 Organic Greenhouse Production Credit: 1 (1-0-0)
Course Description: Fundamentals of greenhouse production using organic production methods.
Prerequisite: HORT 310.
Term Offered: Spring (even years).
Grade Mode: Traditional.

HORT 345 Diagnosis and Treatment in Organic Fields Credits: 2 (0-4-0)
Also Offered As: SOCR 345.
Course Description: Field experience in diagnosis of pest and nutrient problems on organic farms and development of treatment recommendations.
Prerequisite: (BSPM 302 or BSPM 308 or BSPM 361) and (HORT 100 or SOCR 100) and (SOCR 240).
Registration Information: Credit not allowed for both HORT 345 and SOCR 345. Required field trips.
Term Offered: Summer (even years).
Grade Mode: Traditional.
Special Course Fee: Yes.

HORT 346 Landscape Irrigation Credits: 3 (2-2-0)
Course Description: Practical design of sprinkler and trickle irrigation systems for commercial and residential landscapes.
Prerequisite: None.
Registration Information: Must register for lecture and laboratory. Credit allowed for only one of the following: HORT 367, HORT 368, LAND 368.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

HORT 347 Landscape Irrigation and Water Conservation Credits: 3 (2-2-0)
Also Offered As: LAND 368.
Course Description: Practical approaches and methods of irrigation, water conservation, and water management in the designed landscape.
Prerequisite: HORT 100 or LAND 110.
Registration Information: Must register for lecture and laboratory. Credit allowed for only one of the following: HORT 367, HORT 368, LAND 368.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

HORT 370 Landscape Irrigation Credit: 1 (1-0-0)
Course Description: Necessary skills to design and manage irrigation systems used in the landscape industry.
Prerequisite: HORT 100, may be taken concurrently.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

HORT 377 Horticultural Methods for Therapy Programs Credit: 1 (1-0-0)
Course Description: Horticultural methods for health care and human service settings, including indoor and outdoor growing techniques, management and plant selection.
Prerequisite: HORT 100 or HORT 270.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

HORT 382 Origins of Agriculture in the Andes of Peru Credits: 3 (0-0-3)
Course Description: Study abroad experience focused on understanding the agricultural, biological, cultural, and geographical diversity of the Andes region of Peru.
Prerequisite: HORT 100 or BZ 120 or LIFE 103.
Term Offered: Summer.
Grade Mode: Traditional.

HORT 384 Supervised College Teaching Credits: Var[1-5] (0-0-0)
Course Description:
Prerequisite: None.
Registration Information: A maximum of 10 combined credits for all 384 and 484 courses are counted towards graduation requirements.
Terms Offered: Fall, Spring.
Grade Mode: Instructor Option.
Special Course Fee: No.

HORT 390 Medicinal and Value-Added Uses of Plants Credits: 3 (3-0-0)
Course Description: Chemical, biochemical and ethnobotanical perspective on the medicinal and value-added uses of plants.
Prerequisite: BZ 120 or HORT 100 or LIFE 103.
Registration Information: Sections may be offered: Online.
Term Offered: Fall.
Grade Mode: Traditional.

HORT 391 Postharvest Biology and Technology Credits: 3 (3-0-0)
Course Description: Storage and quality maintenance of harvested fruits and vegetables.
Prerequisite: (BZ 120 or HORT 100 or LIFE 103) and (BZ 440).
Registration Information: Offered as an online course. Credit not allowed for both HORT 410 and HORT 481A1.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

HORT 410 Floriculture Crops Credits: 4 (3-0-1)
Course Description: Commercial production and marketing of bedding plants, potted container crops, and cut flowers.
Prerequisite: None.
Registration Information: Must register for lecture and recitation.
Required field trips. Sections may be offered: Online.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.
HORT 421  Horticultural Therapy Techniques  Credits: 2 (2-0-0)
Course Description: Clinical skills in horticultural therapy; communication, safety, leadership, therapeutic relationships, adaptation of tools and activities.
Prerequisite: HORT 270.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

HORT 423  Horticultural Therapy Programming  Credits: 2 (2-0-0)
Course Description: Methods for individual treatment planning, intervention, documentation, and reporting within therapy, social, and vocational HT programs.
Prerequisite: HORT 421.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

HORT 424  Topics in Organic Agriculture  Credits: 3 (3-0-0)
Also Offered As: SOCR 424.
Course Description: Examination of issues specific to organic food production systems and marketing.
Prerequisite: (AREC 202 or ECON 202) and (SOCR 240 and AREC 328) and (HORT 100 or SOCR 100) and (HORT 171 or SOCR 171).
Registration Information: Credit not allowed for both HORT 424 and SOCR 424.
Term Offered: Spring (even years).
Grade Mode: Traditional.
Special Course Fee: No.

HORT 425  Horticultural Therapy Management  Credits: 3 (2-0-1)
Course Description: Horticultural therapy program and site design, proposals, funding, marketing, management, and evaluation.
Prerequisite: HORT 423.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

HORT 431  Planting Design Studio  Credits: 4 (2-4-0)
Course Description: Functional and aesthetic values of plant materials; their creative use in landscape design.
Prerequisite: HORT 221 and HORT 336 and HORT 322.
Registration Information: Must register for lecture and laboratory.
Term Offered: Fall.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

HORT 432  Intensive Landscape Design Studio  Credits: 5 (2-6-0)
Course Description: Site planning and design for landscape projects of a limited scale. Problems of increasing complexity. Emphasis on real sites and clients.
Prerequisite: HORT 487 and HORT 431.
Registration Information: Must register for lecture and laboratory. Required field trips.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

HORT 441  Turfgrass Science  Credits: 3 (3-0-0)
Course Description: Examination of turfgrass management practices from a scientific perspective; discussion of advanced turfgrass management technologies.
Prerequisite: BZ 120 or HORT 100 or SOCR 240.
Registration Information: Required field trips.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: Yes.

HORT 452  Viticulture-Grape Production  Credit: 1 (1-0-0)
Course Description: Grape production in temperate zone climates.
Prerequisite: BZ 120 or HORT 100 or LIFE 103 or SOCR 100.
Registration Information: Required field trips.
Term Offered: Fall (even years).
Grade Mode: Traditional.
Special Course Fee: Yes.

HORT 454  Horticulture Crop Production and Management  Credits: 2 (2-0-0)
Course Description: Production and management of horticulture crops.
Prerequisite: HORT 100.
Registration Information: Sections may be offered: Online.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.
HORT 460 Plant Breeding  Credits: 3 (2-0-1)
Also Offered As: SOCR 460.
Course Description: Theory and practice of plant breeding using principles of genetics and related sciences.
Prerequisite: BZ 350, may be taken concurrently or LIFE 201A, may be taken concurrently or SOCR 330, may be taken concurrently.
Registration Information: Must register for lecture and recitation. Credit not allowed for both HORT 460 and SOCR 460.
Term Offered: Fall (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

HORT 461 Plant Breeding Laboratory  Credit: 1 (0-2-0)
Also Offered As: SOCR 461.
Course Description: Techniques and procedures used in public and commercial plant breeding programs.
Prerequisite: HORT 460, may be taken concurrently or SOCR 460, may be taken concurrently.
Registration Information: Credit not allowed for both HORT 461 and SOCR 461.
Term Offered: Fall (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

HORT 462 Viticulture Practices in Grape Production  Credits: 3 (3-0-0)
Course Description: Biology of grape vines and cultural practices including planning, training, pest control, pruning, and harvesting; special emphasis on Colorado.
Prerequisite: None.
Term Offered: Fall (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

HORT 464A Arboriculture  Credits: 3 (2-2-0)
Course Description: Practices used by arborists and landscape managers to plant, appraise and maintain landscape trees.
Prerequisite: HORT 100 and HORT 465.
Registration Information: Sections may be offered: Online. Credit not allowed for both HORT 464A and HORT 464B. Required field trips.
Term Offered: Fall.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

HORT 465 Landscape Estimating  Credits: 3 (2-2-0)
Course Description: Landscape construction estimating and bidding, contract documentation and other business practices relevant to landscape design-build and contracting.
Prerequisite: (MATH 117) and (MATH 118) and (MATH 124 or MATH 125 or MATH 141 or MATH 155) and (HORT 221).
Registration Information: Must register for lecture and laboratory.
Term Offered: Fall.
Grade Modes: S/U within Student Option, Trad within Student Option.
Special Course Fee: No.

HORT 466 Urban and Community Forestry  Credits: 3 (3-0-0)
Also Offered As: F 466.
Course Description: Policies and management of publicly and privately owned community forests in urbanized areas.
Prerequisite: F 310 or RS 310 or HORT 221.
Registration Information: Credit not allowed for both HORT 466 and F 466.
Term Offered: Fall (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

HORT 476 Environmental Plant Stress Physiology  Credits: 3 (3-0-0)
Course Description: Plant growth, development and physiology, major sources of stress in plants, global issues in environment and plant stress.
Prerequisite: BZ 440.
Registration Information: Credit not allowed for both HORT 476 and HORT 576. Sections may be offered: Online.
Term Offered: Spring (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

HORT 477 Enology-History and Winemaking  Credits: 3 (3-0-0)
Course Description: History and development of the wine industry; mechanics of various processes and factors affecting wine quality and consumer acceptance.
Prerequisite: CHEM 107, may be taken concurrently and CHEM 108, may be taken concurrently or CHEM 111, may be taken concurrently and CHEM 112, may be taken concurrently.
Term Offered: Fall (even years).
Grade Mode: Traditional.
Special Course Fee: No.

HORT 479 Professional Landscape Practices  Credits: 2 (2-0-0)
Course Description: Business skills involved in a successful career in the green industry.
Prerequisite: HORT 100 and HORT 465.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

HORT 486A Practicum: Floriculture  Credits: 2 (0-4-0)
Course Description: Directed experience in applications of floriculture technique. Fall: pest, energy, and production. Spring: production and experimentation.
Prerequisite: HORT 310.
Terms Offered: Fall, Spring.
Grade Mode: Instructor Option.
Special Course Fee: No.

HORT 486B Practicum: General  Credits: Var[1-6] (0-0-0)
Course Description: Directed experiences in applications of horticulture techniques and procedures.
Prerequisite: None.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

HORT 487 Internship  Credits: Var[1-18] (0-0-0)
Course Description:
Prerequisite: None.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

HORT 495 Independent Study  Credits: Var[1-18] (0-0-0)
Course Description:
Prerequisite: None.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

HORT 496 Group Study  Credits: Var[1-18] (0-0-0)
Course Description:
Prerequisite: None.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.
HORT 511 Green Roof Culture Credits: 2 (2-0-0)
Course Description: Understand the relevance of green roofs in North America, especially the process, from concept to project completion and maintenance.
Prerequisite: HORT 100 to 199 - at least 3 credits.
Registration Information: Sections may be offered: Online.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

HORT 515 Urban Horticulture Credits: 3 (3-0-0)
Also Offered As: AGRI 515.
Course Description: Investigate and evaluate the techniques of incorporating food production systems in the urban and peri-urban environment.
Prerequisite: HORT 450A or HORT 450B or HORT 450C or HORT 450D.
Registration Information: Credit not allowed for both HORT 515 and AGRI 515. Offered only online.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

HORT 521 Horticulture and Human Health and Well-Being Credits: 3 (3-0-0)
Course Description: Impact of principles and practices of horticulture on human health and well-being.
Prerequisite: None.
Restriction: Must be a: Graduate.
Registration Information: Graduate standing. Bachelor's degree required. Sections may be offered: Online.
Term Offered: Fall (even years).
Grade Mode: Traditional.
Special Course Fee: No.

HORT 522 Horticulture and Human Health Issues Credits: 3 (3-0-0)
Course Description: Horticulture is an essential instrument of public health, but often professionals in these fields view themselves as opponents. Examine issues arising in the production of foods for human consumption that human health professionals often encounter. Overcome the barriers that divide horticulture and human health professionals.
Prerequisite: None.
Restriction: Must be a: Graduate.
Registration Information: Graduate standing. Sections may be offered: Online.
Term Offered: Spring (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

HORT 571 Soil-Plant-Water Relations/Water Stress Credits: 3 (3-0-0)
Course Description: Movement of water in the soil-plant-atmosphere continuum. Instrumentation for measuring plant-water relations. Plant responses to drought and salinity.
Prerequisite: BZ 440.
Term Offered: Spring (even years).
Grade Mode: Traditional.
Special Course Fee: No.

HORT 575 Plant Germplasm Conservation Credits: 2 (2-0-0)
Course Description: Principles, concepts, and methodology for collection, conservation, and utilization of plant genetic resources.
Prerequisite: HORT 460 or SOCR 460.
Term Offered: Fall (even years).
Grade Mode: Traditional.
Special Course Fee: No.

HORT 576 Advanced Environmental Plant Stress Physiology Credits: 4 (3-0-1)
Course Description: Advanced aspects of plant growth, development and physiology, major sources of stress in plants, global issues in environment and plant stress.
Prerequisite: BZ 440.
Registration Information: Must register for lecture and recitation. Credit not allowed for both HORT 576 and HORT 476.
Term Offered: Spring (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

HORT 578 Phytochemicals and Probiotics for Health Credits: 3 (2-0-1)
Also Offered As: FTEC 578.
Course Description: Examination of phytochemicals and probiotic organisms important in human health.
Prerequisite: BC 351.
Registration Information: Senior standing. Must register for lecture and recitation. Credit not allowed for both FTEC 578 and HORT 578.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

HORT 579 Metabolomics Methods and Analysis Credits: 2 (1-2-0)
Course Description: Experimental designs and workflows to generate, computationally process and analyze metabolite data. Methods to detect small molecules and proteins using mass spectrometry, and upper processing and interpretation of chemical data for metabolomics and proteomics studies. Course format includes lecture, computer lab, literature review, and student presentations.
Prerequisite: None.
Registration Information: Graduate standing. Must register for lecture and laboratory.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

HORT 588 Supervised Extension Practices Credits: Var[1-18] (0-0-0)
Course Description: Field experiences in extension practices in horticulture.
Prerequisite: None.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

HORT 601 Topics in Root and Rhizosphere Biology Credits: 2 (1-0-1)
Course Description: In-depth overview of the biology of roots and the rhizosphere processes related to roots.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: One course in plant physiology; one course in biochemistry. Must register for lecture and recitation.
Term Offered: Spring (odd years).
Grade Mode: Traditional.
Special Course Fee: No.

HORT 675 Plant Stress Physiology Credits: 3 (3-0-0)
Course Description: Research concepts based on physiological, biochemical, and molecular mechanisms controlling environmental stresses in plants.
Prerequisite: BZ 440.
Restriction: Must be a: Graduate, Professional.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.
HORT 698 Research Credits: Var[1-18] (0-0-0)
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

HORT 699 Thesis Credits: Var[1-18] (0-0-0)
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

HORT 784 Supervised College Teaching Credits: Var[1-18] (0-0-0)
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

HORT 792 Seminar Credit: 1 (0-0-1)
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring.
Grade Mode: Instructor Option.
Special Course Fee: No.

HORT 795 Independent Study Credits: Var[1-18] (0-0-0)
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

HORT 799 Dissertation Credits: Var[1-18] (0-0-0)
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

LAND 120 History of the Designed Landscape Credits: 3 (3-0-0)
Course Description: Major monuments and spaces from ancient Middle East through classical antiquity, the Renaissance, and Western tradition.
Prerequisite: None.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

LAND 200 Topics in Landscape Theory and Garden Design Credits: 3 (3-0-0)
Course Description: Landscape theory and design principles in garden design. Students will be engaged through online discussions and will record weekly exercises and course material with the development of a sketchbook and blog/website postings.
Prerequisite: None.
Registration Information: This is a partial semester course. Offered as an online course only.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

LAND 220 Fundamentals of Ecology (GT-SC2) Credits: 3 (3-0-0)
Also Offered As: LIFE 220.
Course Description: Interrelationships among organisms and their environments.
Prerequisite: (BIO 100 to 199 - at least 3 credits or BZ 100 to 199 - at least 3 credits or LIFE 100 to 199 - at least 3 credits or HORT 100) and (MATH 100 to 199 - at least 3 credits).
Registration Information: Credit allowed for only one of the following: LAND 220/LIFE 220, or LIFE 320. Sections may be offered: Online.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

LAND 230 Drawing the Landscape Credits: 4 (2-4-0)
Course Description: Visual communication techniques; exploration of symbology, model building, design development drawing, and construction documentation draughting.
Prerequisite: None.
Registration Information: Must register for lecture and laboratory.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

LAND 240 Fundamentals of Landscape Design Process Credits: 4 (1-4-1)
Course Description: Initiation of formal exploration of design elements, materials, and principles, and introduction of design process as a defensible methodology.
Prerequisite: LAND 230.
Registration Information: Must register for lecture, laboratory and recitation.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

LAND 220 Fundamentals of Ecology (GT-SC2) Credits: 3 (3-0-0)
Also Offered As: LIFE 220.
Course Description: Interrelationships among organisms and their environments.
Prerequisite: (BIO 100 to 199 - at least 3 credits or BZ 100 to 199 - at least 3 credits or LIFE 100 to 199 - at least 3 credits or HORT 100) and (MATH 100 to 199 - at least 3 credits).
Registration Information: Credit allowed for only one of the following: LAND 220/LIFE 220, or LIFE 320. Sections may be offered: Online.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

LAND 230 Drawing the Landscape Credits: 4 (2-4-0)
Course Description: Visual communication techniques; exploration of symbology, model building, design development drawing, and construction documentation draughting.
Prerequisite: None.
Registration Information: Must register for lecture and laboratory.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

LAND 240 Fundamentals of Landscape Design Process Credits: 4 (1-4-1)
Course Description: Initiation of formal exploration of design elements, materials, and principles, and introduction of design process as a defensible methodology.
Prerequisite: LAND 230.
Registration Information: Must register for lecture, laboratory and recitation.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

Landscape Architecture (LAND)

LAND 110 Introduction to Landscape Architecture Credits: 3 (1-2-1)
Course Description: Introductory theories, methods, and applications of landscape studies.
Prerequisite: None.
Registration Information: Must register for lecture, laboratory, and recitation.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.
Additional Information: Arts & Humanities 3B.
LAND 241 Environmental Analysis Credits: 3 (1-4-0)
Course Description: Exploration and understanding of natural and cultural landscapes through analytical simulation techniques.
Prerequisite: LAND 230.
Registration Information: Must have concurrent registration in LAND 240. Must register for lecture and laboratory.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

LAND 240 Environmental Analysis Credits: 3 (1-4-0)
Course Description: Understanding and documenting the built environment with emphasis on construction and surveying as integral parts of design process.
Prerequisite: LAND 240.
Registration Information: Must register for lecture and laboratory.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

LAND 230 Introduction to Horticulture Credits: 3 (2-2-0)
Course Description: Study of basic principles of botany, plant growth, and physiology.
Prerequisite: None.
Registration Information: None. Must register for lecture and laboratory.
Term Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

LAND 201 Urban and Community Design Credits: 3 (1-4-0)
Course Description: The design and management of urban environments in the context of cultural, ecological, and historical values.
Prerequisite: None.
Registration Information: None. Must register for lecture and laboratory.
Term Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

LAND 200 Introduction to Landscape Architecture Credits: 3 (1-4-0)
Course Description: An introduction to the field of landscape architecture, focusing on the principles and processes of design.
Prerequisite: None.
Registration Information: None. Must register for lecture and laboratory.
Term Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

LAND 357 Omnibus Field Studies Credits: 4 (0-8-0)
Course Description: Theories and methods for the analysis, design, and planning of garden and landscape scale environments.
Prerequisite: None.
Registration Information: Must register for lecture and laboratory.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

LAND 361 Digital Methods Credits: 3 (2-2-0)
Course Description: Landscape research, analysis, and design with ARCVIEW, AutoCAD, Microstation, and Photoshop.
Prerequisite: LAND 392. May be taken concurrently.
Registration Information: Must register for lecture and laboratory.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

LAND 363 Advanced Landscape Site Engineering Credits: 4 (2-4-0)
Course Description: Understanding and documenting the built environment with emphasis on construction and surveying as integral parts of design process.
Prerequisite: LAND 360.
Registration Information: Must register for lecture and laboratory.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

LAND 360 Basic Landscape Design and Construction Credits: 3 (0-6-0)
Course Description: Site programming analysis, design, and construction, including skill development in specifying earthwork, drainage, and vegetative composition.
Prerequisite: LAND 240.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

LAND 362 Form and Expression in Garden Design Credits: 3 (0-6-0)
Course Description: Formal decision making for site scale environments, including creative processes for form-giving, and generation of experimental solutions.
Prerequisite: LAND 360.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

LAND 376 Landscape Design Expression Credits: 4 (0-8-0)
Course Description: Idea, values, and process landscape form applied to landscape systems at the site and community scale; design competitions.
Prerequisite: LAND 365.
Registration Information: Must register for lecture and laboratory.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

LAND 366 Landscape Design Expression Credits: 4 (0-8-0)
Course Description: Understanding and documenting the built environment with emphasis on construction and surveying as integral parts of design process.
Prerequisite: LAND 365.
Registration Information: Must register for lecture and laboratory.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

LAND 365 Landscape Contract Drawing and Specifications Credits: 3 (2-2-0)
Course Description: Construction details, design development, and construction documentation emphasizing implementation of design projects.
Prerequisite: LAND 357.
Registration Information: Must register for lecture and laboratory.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

LAND 384 Supervised College Teaching Credits: Var[1-5] (0-0-0)
Course Description: Supervised teaching experience in a college setting.
Prerequisite: None.
Registration Information: A maximum of 10 combined credits for all 384 and 484 courses are counted towards graduation requirements.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Instructor Option.
Special Course Fee: No.

LAND 392 Seminar-Designed Landscapes-Theory and Criticism Credits: 2 (0-0-2)
Course Description: Readings, discussions, and writing in landscape architectural design theory; critical analysis of the designed and constructed landscape.
Prerequisite: LAND 365.
Term Offered: Fall.
Grade Mode: Instructor Option.
Special Course Fee: No.

LAND 368 Landscape Irrigation and Water Conservation Credits: 3 (2-2-0)
Also Offered As: HORT 368.
Course Description: Practical approaches and methods of irrigation, water conservation, and water management in the designed landscape.
Prerequisite: LAND 110 or HORT 100.
Registration Information: Must register for lecture and laboratory.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

LAND 367 Landscape Design and Visualization Credits: 4 (0-8-0)
Course Description: Precedents, ideas, values and processes of landscape form applied to landscape systems at the site and community scale; design competitions.
Prerequisite: LAND 362.
Registration Information: Must register for lecture and laboratory.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

LAND 377 Landscape Design and Visualization Credits: 4 (0-8-0)
Course Description: Precedents, ideas, values and processes of landscape form applied to landscape systems at the site and community scale; design competitions.
Prerequisite: LAND 362.
Registration Information: Must register for lecture and laboratory.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

LAND 369 Landscape Irrigation and Water Conservation Credits: 3 (2-2-0)
Also Offered As: HORT 369.
Course Description: Practical approaches and methods of irrigation, water conservation, and water management in the designed landscape.
Prerequisite: LAND 110 or HORT 100.
Registration Information: Must register for lecture and laboratory.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

LAND 376 Landscape Design and Visualization Credits: 4 (0-8-0)
Course Description: Precedents, ideas, values and processes of landscape form applied to landscape systems at the site and community scale; design competitions.
Prerequisite: LAND 362.
Registration Information: Must register for lecture and laboratory.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Title</th>
<th>Credits</th>
<th>Special Fee</th>
<th>Term Offered</th>
<th>Registration Information</th>
<th>Prerequisite</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LAND 444</strong></td>
<td>Ecology of Landscapes</td>
<td>3</td>
<td>No.</td>
<td>Spring</td>
<td>Must be a: Graduate, Professional</td>
<td>LAND 366.</td>
</tr>
<tr>
<td><strong>Course Description:</strong></td>
<td>Theories, methods, and practices for interpreting, describing, and representing natural and human modified landscapes.</td>
<td></td>
<td></td>
<td></td>
<td>Required field trips.</td>
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</tr>
<tr>
<td><strong>Prerequisite:</strong></td>
<td>LAND 220 or LIFE 220 or LIFE 320.</td>
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<tr>
<td><strong>Registration Information:</strong></td>
<td>Required field trips.</td>
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</tr>
<tr>
<td><strong>LAND 445</strong></td>
<td>Urban Design</td>
<td>4</td>
<td>Yes.</td>
<td>Spring</td>
<td>Must be a: Graduate, Professional</td>
<td>LAND 366.</td>
</tr>
<tr>
<td><strong>Course Description:</strong></td>
<td>Designing the urban landscape, including precedent exploration about overall image, materials, and structure of the city and its components.</td>
<td></td>
<td></td>
<td></td>
<td>Required field trips.</td>
<td>LAND 366.</td>
</tr>
<tr>
<td><strong>Prerequisite:</strong></td>
<td>LAND 366.</td>
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<td></td>
<td>LAND 366.</td>
</tr>
<tr>
<td><strong>Registration Information:</strong></td>
<td>Maximum of 8 credits allowed in course.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>LAND 366.</td>
</tr>
<tr>
<td><strong>LAND 446</strong></td>
<td>Comprehensive Landscape Design</td>
<td>4</td>
<td>Yes.</td>
<td>Spring</td>
<td>Must be a: Graduate, Professional</td>
<td>LAND 447.</td>
</tr>
<tr>
<td><strong>Course Description:</strong></td>
<td>Terminal studio; research, analysis, and synthesis for comprehensive project identified by student and approved in advance by faculty committee.</td>
<td></td>
<td></td>
<td></td>
<td>Required field trips.</td>
<td>LAND 447.</td>
</tr>
<tr>
<td><strong>Prerequisite:</strong></td>
<td>LAND 446.</td>
<td></td>
<td></td>
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<td>LAND 447.</td>
</tr>
<tr>
<td><strong>Registration Information:</strong></td>
<td>Must register for lecture and laboratory.</td>
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<td></td>
<td>LAND 447.</td>
</tr>
<tr>
<td><strong>LAND 447</strong></td>
<td>Professional Practice</td>
<td>1</td>
<td>Yes.</td>
<td>Spring</td>
<td>Must be a: Graduate, Professional</td>
<td>LAND 447.</td>
</tr>
<tr>
<td><strong>Course Description:</strong></td>
<td>Theory and skills of landscape architectural professional practice including functional, human, business, legal, and political aspects.</td>
<td></td>
<td></td>
<td></td>
<td>Required field trips.</td>
<td>LAND 447.</td>
</tr>
<tr>
<td><strong>Prerequisite:</strong></td>
<td>LAND 447.</td>
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<td></td>
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<td>LAND 447.</td>
</tr>
<tr>
<td><strong>Registration Information:</strong></td>
<td>Maximum of 8 credits allowed in course.</td>
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<td>LAND 447.</td>
</tr>
<tr>
<td><strong>LAND 448</strong></td>
<td>Landscape Field Studies</td>
<td>5</td>
<td>Yes.</td>
<td>Summer</td>
<td>Must be a: Graduate, Professional</td>
<td>LAND 241.</td>
</tr>
<tr>
<td><strong>Course Description:</strong></td>
<td>Field observation of spatial and temporal landscape patterns resulting from natural and cultural processes and interactions.</td>
<td></td>
<td></td>
<td></td>
<td>Required field trips.</td>
<td>LAND 366.</td>
</tr>
<tr>
<td><strong>Prerequisite:</strong></td>
<td>LAND 366.</td>
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<td>LAND 366.</td>
</tr>
<tr>
<td><strong>Registration Information:</strong></td>
<td>Must register for lecture and laboratory.</td>
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<td>LAND 366.</td>
</tr>
<tr>
<td><strong>LAND 449</strong></td>
<td>Travel Abroad-European Landscape Architecture</td>
<td>5</td>
<td>Yes.</td>
<td>Summer</td>
<td>Must be a: Graduate, Professional</td>
<td>LAND 366.</td>
</tr>
<tr>
<td><strong>Course Description:</strong></td>
<td>Exploration of major theoretical platforms in design through drawing, photographing, and measuring landscape architecture precedents in Europe.</td>
<td></td>
<td></td>
<td></td>
<td>Required field trips.</td>
<td>LAND 366.</td>
</tr>
<tr>
<td><strong>Prerequisite:</strong></td>
<td>LAND 362.</td>
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<td>LAND 366.</td>
</tr>
<tr>
<td><strong>Registration Information:</strong></td>
<td>Must register for lecture and laboratory.</td>
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<td>LAND 366.</td>
</tr>
<tr>
<td><strong>LAND 495A</strong></td>
<td>Independent Study: Design Projects</td>
<td>4</td>
<td>No.</td>
<td>Fall, Spring, Summer</td>
<td>Must be a: Graduate, Professional</td>
<td>LAND 241.</td>
</tr>
<tr>
<td><strong>Course Description:</strong></td>
<td>Ideas, values, and processes of landscape form applied to interactions of natural and cultural systems for park and recreation applications.</td>
<td></td>
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<td>Required field trips.</td>
<td>LAND 241.</td>
</tr>
<tr>
<td><strong>Prerequisite:</strong></td>
<td>LAND 241.</td>
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<td>LAND 241.</td>
</tr>
<tr>
<td><strong>Registration Information:</strong></td>
<td>Must be a: Graduate, Professional.</td>
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<td>LAND 241.</td>
</tr>
</tbody>
</table>

**Department of Horticulture and Landscape Architecture**
LAND 630  Topics in Urban Design  Credits: 4 (2-6-0)
Course Description: History and application of urban design principles, practices, and policies.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Graduate standing. Must register for lecture and laboratory.
Term Offered: Fall.
Grade Mode: Traditional.
Special Course Fee: No.

LAND 640  Major Landscape Change  Credits: 4 (2-6-0)
Course Description: Addresses social and ecological resilience of large-scale landscapes through theory and application.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Graduate standing. Must register for lecture and laboratory.
Term Offered: Spring.
Grade Mode: Traditional.
Special Course Fee: No.

LAND 670  Landscape Architecture Studio Option  Credits: 4 (1-6-1)
Course Description: Ideas, values, and processes of landscape architectural studio practice.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Graduate standing. Course may be taken up to 5 times for credit. Must register for lecture, laboratory, and recitation.
Terms Offered: Fall, Spring.
Grade Mode: Traditional.
Special Course Fee: No.

LAND 695A  Landscape Architectural Independent Study: Design Projects  Credits: Var[1-4] (0-0-0)
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Graduate standing.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

LAND 695B  Landscape Architectural Independent Study: Field Service  Credits: Var[1-4] (0-0-0)
Course Description:
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Graduate standing.
Terms Offered: Fall, Spring, Summer.
Grade Mode: Traditional.
Special Course Fee: No.

LAND 698  Research  Credits: Var[1-5] (0-0-0)
Course Description: Guided research experience in landscape architecture.
Prerequisite: None.
Restriction: Must be a: Graduate, Professional.
Registration Information: Graduate standing.
Terms Offered: Fall, Spring, Summer.
Grade Mode: S/U Sat/Unsat Only.
Special Course Fee: No.