

HORTICULTURE (HORT)

Courses primarily for undergraduates:

HORT 1100: Professional and Educational Development in Horticulture

Credits: 1. Contact Hours: Lecture 1.

Intended for first-year students and others new to the horticulture curriculum. Introduction to professional and educational development within horticulture. Focus is on university and career acclimation.

Assessed service-learning component. (Typically Offered: Fall)

HORT 1210: Home Horticulture

Credits: 3. Contact Hours: Discussion 1, Lecture 2.

Growing plants in and around the home including requirements for growing indoor plants, plant propagation, landscape design, and maintaining trees, lawns, flower, fruit, and vegetable gardens. Recitation includes demonstrations and hands-on activities that illustrate principles of designing, growing and maintaining plants for both indoor and outdoor gardens. (Typically Offered: Fall, Spring)

HORT 1310: Floral Design

Credits: 2. Contact Hours: Lecture 1, Laboratory 2.

Introduces basic geometric design of fresh arrangements, corsages, and holiday arrangements. Includes use of tools and supplies. (Typically Offered: Fall, Spring)

HORT 1320: Wedding and Event Floral Design

Credits: 2. Contact Hours: Lecture 1, Laboratory 2.

Prereq: HORT 1310

Principles of design and proper mechanics for ceremony flowers, reception flowers, personal flowers, bridal bouquets, and event florals. Flower and plant materials that are commonly used in the event industry. Plan, design, cost, order, and create florals for a wedding, then present as the final project for implementation. (Typically Offered: Fall, Spring)

HORT 1930A: Topics in Horticulture: Greenhouse Crops

Credits: 1-30. Contact Hours: Lecture 30.

Repeatable.

Practical courses in the field of horticulture. Graduation Restriction: A maximum of 6 credits of HORT 1930 may be used toward the total of 128 credits required for graduation. (Typically Offered: Fall, Spring, Summer)

HORT 1930B: Topics in Horticulture: Nursery Crops

Credits: 1-30. Contact Hours: Lecture 30.

Repeatable.

Practical courses in the field of horticulture. Graduation Restriction: A maximum of 6 credits of HORT 1930 may be used toward the total of 128 credits required for graduation. (Typically Offered: Fall, Spring, Summer)

HORT 1930C: Topics in Horticulture: Turfgrass

Credits: 1-30. Contact Hours: Lecture 30.

Repeatable.

Practical courses in the field of horticulture. Graduation Restriction: A maximum of 6 credits of HORT 1930 may be used toward the total of 128 credits required for graduation. (Typically Offered: Fall, Spring, Summer)

HORT 1930D: Topics in Horticulture: Fruit Crops

Credits: 1-30. Contact Hours: Lecture 30.

Repeatable.

Practical courses in the field of horticulture. Graduation Restriction: A maximum of 6 credits of HORT 1930 may be used toward the total of 128 credits required for graduation. (Typically Offered: Fall, Spring, Summer)

HORT 1930E: Topics in Horticulture: Vegetable Crops

Credits: 1-30. Contact Hours: Lecture 30.

Repeatable.

Practical courses in the field of horticulture. Graduation Restriction: A maximum of 6 credits of HORT 1930 may be used toward the total of 128 credits required for graduation. (Typically Offered: Fall, Spring, Summer)

HORT 1930F: Topics in Horticulture: Cross-Commodity

Credits: 1-30. Contact Hours: Lecture 30.

Repeatable.

Practical courses in the field of horticulture. Graduation Restriction: A maximum of 6 credits of HORT 1930 may be used toward the total of 128 credits required for graduation. (Typically Offered: Fall, Spring, Summer)

HORT 1930G: Topics in Horticulture: Landscape Horticulture

Credits: 1-30. Contact Hours: Lecture 30.

Repeatable, maximum of 6 credits.

Practical courses in the field of horticulture. Graduation Restriction: A maximum of 6 credits of HORT 1930 may be used toward the total of 128 credits required for graduation. (Typically Offered: Fall, Spring, Summer)

HORT 2210: Principles of Horticulture Science

Credits: 3. Contact Hours: Lecture 2, Laboratory 2.

Prereq: Credit or enrollment in BIOL 2110

Biological principles of growing horticultural crops including anatomy, reproduction, light, temperature, water, nutrition, and growth and development. Laboratory exercises emphasize environmental factors and permit detailed observation of plant growth. (Typically Offered: Fall, Spring)

HORT 2330: House Plants and Interiorscaping

Credits: 2. Contact Hours: Lecture 1, Laboratory 2.

Basic introduction to indoor houseplants and interiorscapes. Understand plant selection, identification, maintenance, and problem solving.

Learn current houseplant trends, commercial interior plant design, and installation. A beneficial course for students with an interest in house plants, retail plant sales, Interiorscaping, event design, or gardening.

(Typically Offered: Fall, Spring)

HORT 2400: Trees, Shrubs, and Woody Vines for Landscaping

Credits: 3. Contact Hours: Lecture 2, Laboratory 2.

Identification of trees, shrubs, and woody vines. Factors influencing the horticultural use of woody plants. Field trips outside of regular class time may be required. (Typically Offered: Fall)

HORT 2760: Understanding Grape and Wine Science

(Cross-listed with FSHN 2760).

Credits: 3. Contact Hours: Lecture 2, Laboratory 2.

A scientific introduction to viticulture (grape-growing) and enology (wine-making) and grape and wine chemistry. Topics include grape biology and cultivars, vineyard management, geography of wine, wine production, wine classification, grape and wine chemistry, wine sensory. No wine tasting. (Typically Offered: Spring)

HORT 2810: Landscape Graphics

Credits: 2. Contact Hours: Studio 4.

Introduction to computer and hand rendering techniques of landscape graphics. Students will gain proficiency in plan view and elevation graphics. Intensive studio and computer based instruction. (Typically Offered: Fall)

HORT 2830: Pesticide Application Certification

(Cross-listed with AGRON 2830/ FOR 2830/ ENT 2830).

Credits: 2. Contact Hours: Lecture 2.

Core background and specialty topics in agricultural, and horticultural pesticide applicator certification. Students can select certification categories and have the opportunity to obtain pesticide applicator certification at the completion of the course. Commercial pesticide applicator certification is emphasized. (Typically Offered: Spring)

HORT 2910A: Horticulture Professional Development: Turfgrass Competition

Credits: 1. Contact Hours: Laboratory 2.

Repeatable, maximum of 4 credits.

Prereq: Instructor Permission for Course

Intensive training in preparation for intercollegiate competition in turfgrass, planting, design, plant identification, installation, cost estimating, and other skills at national contests in horticulture. Students must compete in related national competition to earn credit. Graduation Restriction: Only one credit of HORT 2910A, 2910B, or 2910C may count toward Horticulture credits for graduation. A maximum of four credits of any combination of HORT 2910A, 2910B, and 2910C may count toward credits for graduation. Offered on a satisfactory-fail basis only. (Typically Offered: Fall)

HORT 2910B: Horticulture Professional Development: Landscape Competition

Credits: 1. Contact Hours: Lecture 1.

Repeatable, maximum of 4 credits.

Prereq: Instructor Permission for Course

Intensive training in preparation for intercollegiate competition in planting, design, plant identification, installation, cost estimating, and other skills at national contests in horticulture. Students must compete in related national competition to earn credit. Graduation Restriction: Only one credit of HORT 2910A, 2910B, or 2910C may count toward Horticulture credits for graduation. A maximum of four credits of any combination of HORT 2910A, 2910B, and 2910C may count toward credits for graduation. Offered on a satisfactory-fail basis only. (Typically Offered: Spring)

HORT 2910C: Horticulture Professional Development: Cross-Commodity

Credits: 1. Contact Hours: Laboratory 2.

Repeatable, maximum of 4 credits.

Prereq: Instructor Permission for Course

Intensive training in preparation for intercollegiate competition in planting, plant identification and other skills at national contests in horticulture. Students must compete in related national competition to earn credit. Graduation Restriction: Only one credit of HORT 2910A, 2910B, or 2910C may count toward Horticulture credits for graduation. A maximum of four credits of any combination of HORT 2910A, 2910B, and 2910C may count toward credits for graduation. Offered on a satisfactory-fail basis only. (Typically Offered: Fall, Spring)

HORT 3210: Horticulture Physiology

Credits: 3. Contact Hours: Lecture 3.

Prereq: HORT 2210 or BIOL 2110

Principles of plant physiology relating to growth and development of horticultural plants including plant water relations, membrane transport, photosynthesis, photomorphogenesis, respiration, and phytohormones. Emphasis on plant's responses to environmental factors (temperature, water, and light) including cellular and whole-plant physiology under stressful environments. (Typically Offered: Fall)

HORT 3220: Plant Propagation

Credits: 3. Contact Hours: Lecture 2, Laboratory 2.

Prereq: HORT 2210 or BIOL 2110

Fundamental principles underlying sexual and asexual propagation of plants; practice in reproducing plants by use of seeds, cuttings, layering, grafting and budding and tissue culture. (Typically Offered: Spring)

HORT 3300: Herbaceous Ornamental Plants

Credits: 3. Contact Hours: Lecture 2, Laboratory 2.

Prereq: HORT 2210 or *Permission of Instructor*

Identification, botanical characteristics, origins, propagation, uses and general culture of herbaceous annual and perennial plants for Midwestern gardens and landscapes. (Typically Offered: Fall)

HORT 3310: Hydroponic Crop Production

Credits: 2. Contact Hours: Lecture 2.

Prereq: AGRON 1810 or HORT 2210 or 3 credits in *Biological Sciences*

Principles and practices of hydroponic systems, crop production and culture, aquaponic systems, and new food and medicinal crops for hydroponic systems. Offered odd-numbered years. (Typically Offered: Fall)

HORT 3320: Greenhouse and Nursery Operations and Management

Credits: 4. Contact Hours: Lecture 3, Laboratory 3.

Prereq: HORT 2210

Operation and management of greenhouses, nurseries, and other controlled environment agriculture structures and facilities. Principle of site selection, facility design and methods of monitoring and manipulating environmental, cultural, and management factors such as light, temperature, fertility, substrate, etc., to maximize production efficiency. Emphasis placed on the principles of production of both ornamental and food crops. Greenhouse analysis project required. (Typically Offered: Spring)

HORT 3380: Seed Science and Technology

(Cross-listed with AGRON 3380).

Credits: 3. Contact Hours: Lecture 2, Laboratory 3.

Prereq: (AGRON 1810 or HORT 2210); 3 credits of *BIOL*

Seed production, maturation, dormancy, vigor, deterioration, and related aspects of enhancement, conditioning, storage, and quality evaluation. Aspects of the seed industry and regulation of seed marketing. (Typically Offered: Fall)

HORT 3410: Woody Plant Cultivars: Shade Trees, Ornamental Trees and Woody Shrubs

Credits: 2. Contact Hours: Lecture 2.

Prereq: HORT 2400 or LA 2210 or LA 2220

Cultivars of the most prevalent and economically important woody landscape plants will be taught. The importance of cultivars to the nursery and landscaping professions and suggestions for their proper usage will be discussed. (Typically Offered: Spring)

HORT 3420: Landscape Plant Installation, Establishment, and Management

Credits: 3. Contact Hours: Lecture 2, Laboratory 3.

Prereq: HORT 2400 or LA 2210 or LA 2220

Principles and practices involved with the establishment and management of landscapes. Laboratory work involves site evaluation, installation techniques, postplant care, and management of established landscape plants. (Typically Offered: Spring)

HORT 3510: Turfgrass Establishment and Management

(Cross-listed with AGRON 3510).

Credits: 3. Contact Hours: Lecture 3.

Prereq: HORT 2210 or AGRON 1810 or BIOL 2110

Principles and practices of turfgrass propagation, establishment, and management. Specialized practices relative to professional lawn care, golf courses, athletic fields, highway roadsides, and seed and sod production. The biology and control of turfgrass pests. (Typically Offered: Fall)

HORT 3510L: Turfgrass Establishment and Management Laboratory

(Cross-listed with AGRON 3510L).

Credits: 1. Contact Hours: Laboratory 3.

Prereq: *Credit or enrollment in HORT 3510*

Those enrolled in the horticulture curriculum are required to take 3510L in conjunction with 3510 except by permission of the instructor. (Typically Offered: Fall)

HORT 3540: Soils and Plant Growth

(Cross-listed with AGRON 3540).

Credits: 3. Contact Hours: Lecture 3.

Prereq: AGRON 1820; 3 credits of BIOL

Effects of chemical, physical, and biological properties of soils on plant growth, with emphasis on nutritive elements, pH, organic matter maintenance, and rooting development. (Typically Offered: Fall, Spring)

HORT 3540L: Soils and Plant Growth Laboratory

(Cross-listed with AGRON 3540L).

Credits: 1. Contact Hours: Laboratory 3.

Prereq: AGRON or HORT major with Credit or concurrent enrollment in AGRON 3540

Laboratory exercises in soil testing that assess a soil's ability to support nutritive requirements for plant growth. (Typically Offered: Fall, Spring)

HORT 3760: Fundamentals of Field Production of Horticultural Food Crops

Credits: 3. Contact Hours: Lecture 3.

Prereq: AGRON 1810 or HORT 2210

An introduction to field production of fruit and vegetable crops and the theoretical and practical knowledge required for successfully producing them. Topics will include basic principles and practices of fruit and vegetable production, site selection, soil techniques, irrigation management, equipment and tools, integrated pest management, season extension strategies, postharvest handling and food safety, marketing, and basic business planning for fruit and vegetable enterprises. Additionally, this course will prepare students for HORT 4610 and HORT 4710, that are advanced level courses focusing on fruit and vegetable production. (Typically Offered: Fall)

HORT 3800: Principles of Garden Composition

Credits: 2. Contact Hours: Lecture 2.

Functional and aesthetic aspects of landscape planning as a basis for design decisions; emphasis on spatial design and plant selection. Includes site analysis, design process, and design principles. (Typically Offered: Spring)

HORT 3810: Beginning Garden Composition Studio

Credits: 2. Contact Hours: Studio 4.

Prereq: HORT 2810; (HORT 2400 or HORT 3300); concurrent enrollment in HORT 3800

Introduction to landscape design process. Intensive studio-based projects implementing principles of landscape design, concept development, and graphic communication. (Typically Offered: Spring)

HORT 3910: Horticultural Management Experience

Credits: 1. Repeatable.

Prereq: HORT 2210; Department Permission

A structured work experience for the student to gain insight into management operations associated with production and management of horticultural crops. A report of 10 or more pages describing the student's experience is required. One credit is given for each term the student is enrolled in the course. Graduation Restriction: A maximum of two credits may be used toward the horticultural sciences course requirements, and two additional credits may be used toward the 128 credits required for graduation. (Typically Offered: Fall, Spring, Summer)

HORT 3980: Cooperative Education

Credits: Required. Repeatable.

Prereq: Department Permission for Course

Students must register for this course before commencing each work period. Offered on a satisfactory-fail basis only. (Typically Offered: Fall, Spring, Summer)

HORT 4210: Introduction to Plant Breeding

(Cross-listed with AGRON 4210).

Credits: 3. Contact Hours: Lecture 3.

Prereq: GEN 3200 or BIOL 3130

Fundamental principles of plant breeding and cultivar development, breeding methods for self-pollinated, cross-pollinated and clonal crops. (Typically Offered: Fall)

HORT 4240: Sustainable and Environmental Horticulture Systems

(Dual-listed with HORT 5240). (Cross-listed with ENVS 4240).

Credits: 3. Contact Hours: Lecture 3.

Inquiry into ethical issues and environmental consequences of horticultural cropping systems, production practices and managed landscapes. Emphasis on systems that are resource efficient, environmentally sound, socially acceptable, and profitable. Offered odd-numbered years. (Typically Offered: Spring)

HORT 4340: Floriculture Crop Production

Credits: 3. Contact Hours: Lecture 2, Laboratory 3.

Prereq: HORT 3320

Principles and practices of flowering and ornamental greenhouse crop production. Emphasis is placed on production of flowering potted plants, cut flowers, and foliage crops produced in greenhouses and other controlled environments. An overnight class field trip outside scheduled class time is required. Offered odd-numbered years. (Typically Offered: Fall)

HORT 4350: Landscape Plant Production

Credits: 3. Contact Hours: Lecture 2, Laboratory 3.

Prereq: HORT 3320

Principles and practices of producing herbaceous and woody landscape plants for gardens, landscapes, restoration and other outdoor uses.

Emphasis is placed on the production of: seedling plugs and rooted cuttings; container grown herbaceous annual and perennials; tree, shrubs, and vines; and native plants. An overnight class field trip outside scheduled class time is required. Offered odd-numbered years. (Typically Offered: Spring)

HORT 4440: Landscape Construction Management

Credits: 3. Contact Hours: Lecture 2, Laboratory 3.

Principles and practices of residential landscape construction.

Encompasses project management, landscape estimating and overview of common landscape materials. Laboratory work involves field trips and project installation. (Typically Offered: Fall)

HORT 4510: Professional Turfgrass Management

Credits: 2. Contact Hours: Lecture 2.

Prereq: HORT 3510

Turfgrass science including the study of (1) specific information on soil chemistry and soil modification as they relate to the development and maintenance of turfgrass areas, (2) specialized management practices used in athletic field care, professional lawn care, and golf course industries, and (3) construction methods for golf courses and sports fields. Offered odd-numbered years. (Typically Offered: Spring)

HORT 4520: Integrated Management of Diseases and Insect Pests of Turfgrasses

(Dual-listed with PLP 5520/ ENT 5520/ HORT 5520). (Cross-listed with ENT 4520/ PLP 4520).

Credits: 3. Contact Hours: Lecture 3.

Prereq: HORT 3510

Identification and biology of important diseases and insect pests of turfgrasses. Development of integrated pest management programs in various turfgrass environments. Offered even-numbered years. (Typically Offered: Spring)

HORT 4530: Sports Turf Management

Credits: 3. Contact Hours: Lecture 3.

Prereq: HORT 3510

Management techniques for today's specialized athletic fields. The horticultural and budgetary aspects of football, soccer, baseball, and softball fields will be presented. Field trips and laboratory exercises will develop a practical understanding of actual principles in field development, construction, and management. Offered even-numbered years. (Typically Offered: Fall)

HORT 4540: Turf & Landscape Irrigation

Credits: 3. Contact Hours: Lecture 3.

Irrigation systems and principles for turf and landscape environments. Topics include design, installation, equipment, management, and troubleshooting of irrigation systems for golf, athletic fields, residential lawns and landscapes. Participation in practical exercises and local field trips to irrigation sites is required. Offered odd-numbered years. (Typically Offered: Fall)

HORT 4610: Fruit Crop Production and Management

Credits: 3. Contact Hours: Lecture 2, Laboratory 2.

Prereq: HORT 2210

Principles and practices of small fruit; tree fruit, and nut culture and production. Morphology, physiology of growth and development, plant establishment, pest management, pruning, training, harvesting, storage, and marketing of commercial temperate fruit and nut crops. Emphasis on sustainable practices. Participation in practical exercises and local field trips is required. Offered odd-numbered years. (Typically Offered: Spring)

HORT 4710: Vegetable Production and Management

(Dual-listed with HORT 5710).

Credits: 2. Contact Hours: Lecture 2.

Prereq: HORT 2210

Principles of vegetable production with emphasis on sustainable production practices, market outlets, business aspects, and risk management. Topics will include crop classification and rotation; planting methods; crop climatic conditions, physiological growth & development; soil, water, and pest management; cover cropping; season extension strategies; harvest and postharvest management and marketing. Involves visits to growers fields to observe/experience their production enterprise. Offered even-numbered years. (Typically Offered: Spring)

HORT 4710L: Vegetable Production and Management Lab

(Dual-listed with HORT 5710L).

Credits: 1. Contact Hours: Laboratory 3.

Prereq: Junior or Senior classification; concurrent enrollment in HORT 4710
Hands-on training in the area of vegetable crop production. Opportunity to grow a variety of vegetables in a heated greenhouse and also conduct greenhouse and lab experiments. The lab also involves visits to vegetable production sites in Iowa to observe/experience and learn from growers and other agricultural professionals. Offered even-numbered years. (Typically Offered: Spring)

HORT 4750: Urban Forestry

(Cross-listed with FOR 4750).

Credits: 3. Contact Hours: Lecture 2, Laboratory 3.

Prereq: Junior or senior classification, 3 credits in BIOL

Discussion of establishment and management of woody perennials in community-owned urban greenspaces, consideration of urban site and soil characteristics, plant physiology, plant culture, urban forest valuation, inventory methods, species selection, and urban forest maintenance (health care and pest management). (Typically Offered: Fall)

HORT 4760: Horticultural Postharvest Technology

(Dual-listed with HORT 5760).

Credits: 3. Contact Hours: Lecture 2, Laboratory 3.

Prereq: HORT 2210

Study of pre- and post-harvest factors, procedures, and challenges that affect market quality of horticultural commodities. Emphasis on storage and handling technologies to preserve quality and extend storage life of edible and ornamental horticultural crops. Field trips outside scheduled class time required. Offered odd-numbered years. (Typically Offered: Fall)

HORT 4810: Advanced Garden Composition

Credits: 2. Contact Hours: Studio 4.

Prereq: HORT 2400 and HORT 3300 and HORT 3800 and HORT 3810

Priority given to Landscape Design Installation and Management option students. Development of residential landscapes using design principles and the design process. Projects encompass site analysis, concept development, preliminary design, final design, and graphic presentation techniques. Techniques will include hand and computer rendering. (Typically Offered: Fall)

HORT 4840: Organic Agricultural Theory and Practice

(Dual-listed with AGRON 5840/ HORT 5840/ SUSAG 5840). (Cross-listed with AGRON 4840).

Credits: 3. Contact Hours: Lecture 3.

Prereq: 9 credits in biological or physical sciences

Understanding of the historical origins and ecological theories underpinning the practices involved in organic agriculture. Interdisciplinary examination of crop and livestock production and socio-economic processes and policies in organic agriculture from researcher and producer perspectives. Offered odd-numbered years. (Typically Offered: Spring)

HORT 4900A: Independent Study: Greenhouse Crops

Credits: 1-30. Repeatable, maximum of 4 credits.

Prereq: Junior or Senior classification in HORT; Permission of Instructor

Investigation of topic holding special interest to the student.

Comprehensive report required. Election of course and topic must be approved by department head. Graduation Restriction: A maximum of 4 credits of HORT 4900 and an additional 2 credits of 4900 from outside Horticulture may be used toward the total of 129 credits required for graduation.

HORT 4900B: Independent Study: Nursery Crops

Credits: 1-30. Repeatable, maximum of 4 credits.

Prereq: Junior or Senior classification in HORT; Permission of Instructor

Investigation of topic holding special interest to the student.

Comprehensive report required. Election of course and topic must be approved by department head. Graduation Restriction: A maximum of 4 credits of HORT 4900 and an additional 2 credits of 4900 from outside Horticulture may be used toward the total of 129 credits required for graduation.

HORT 4900C: Independent Study: Turfgrass

Credits: 1-30. Repeatable, maximum of 4 credits.

Prereq: Junior or Senior classification in HORT; Permission of Instructor

Investigation of topic holding special interest to the student.

Comprehensive report required. Election of course and topic must be approved by department head. Graduation Restriction: A maximum of 4 credits of HORT 4900 and an additional 2 credits of 4900 from outside Horticulture may be used toward the total of 129 credits required for graduation.

HORT 4900D: Independent Study: Fruit Crops

Credits: 1-30. Repeatable, maximum of 4 credits.

Prereq: Junior or Senior classification in HORT; Permission of Instructor

Investigation of topic holding special interest to the student.

Comprehensive report required. Election of course and topic must be approved by department head. Graduation Restriction: A maximum of 4 credits of HORT 4900 and an additional 2 credits of 4900 from outside Horticulture may be used toward the total of 129 credits required for graduation.

HORT 4900E: Independent Study: Vegetable Crops

Credits: 1-30. Repeatable, maximum of 4 credits.

Prereq: Junior or Senior classification in HORT; Permission of Instructor

Investigation of topic holding special interest to the student.

Comprehensive report required. Election of course and topic must be approved by department head. Graduation Restriction: A maximum of 4 credits of HORT 4900 and an additional 2 credits of 4900 from outside Horticulture may be used toward the total of 129 credits required for graduation.

HORT 4900F: Independent Study: Cross-Commodity

Credits: 1-30. Repeatable, maximum of 4 credits.

Prereq: Junior or Senior classification in HORT; Permission of Instructor

Investigation of topic holding special interest to the student.

Comprehensive report required. Election of course and topic must be approved by department head. Graduation Restriction: A maximum of 4 credits of HORT 4900 and an additional 2 credits of 4900 from outside Horticulture may be used toward the total of 129 credits required for graduation.

HORT 4900G: Independent Study: Landscape Horticulture

Credits: 1-30. Repeatable, maximum of 4 credits.

Prereq: Junior or Senior classification in HORT; Permission of Instructor

Investigation of topic holding special interest to the student.

Comprehensive report required. Election of course and topic must be approved by department head. Graduation Restriction: A maximum of 4 credits of HORT 4900 and an additional 2 credits of 4900 from outside Horticulture may be used toward the total of 129 credits required for graduation.

HORT 4900H: Independent Study: Honors

Credits: 1-30. Repeatable, maximum of 4 credits.

Prereq: Junior or Senior classification in HORT; Permission of Instructor

Investigation of topic holding special interest to the student.

Comprehensive report required. Election of course and topic must be approved by department head. Graduation Restriction: A maximum of 4 credits of HORT 4900 and an additional 2 credits of 4900 from outside Horticulture may be used toward the total of 129 credits required for graduation.

HORT 4900I: Independent Study: International Study

Credits: 1-30. Repeatable, maximum of 4 credits.

Prereq: Junior or Senior classification in HORT; Permission of Instructor

Investigation of topic holding special interest to the student.

Comprehensive report required. Election of course and topic must be approved by department head. Graduation Restriction: A maximum of 4 credits of HORT 4900 and an additional 2 credits of 4900 from outside Horticulture may be used toward the total of 129 credits required for graduation.

HORT 4900J: Independent Study: Entrepreneurship

Credits: 1-30. Repeatable, maximum of 4 credits.

Prereq: Junior or Senior classification in HORT; Permission of Instructor

Investigation of topic holding special interest to the student.

Comprehensive report required. Election of course and topic must be approved by department head. Graduation Restriction: A maximum of 4 credits of HORT 4900 and an additional 2 credits of 4900 from outside Horticulture may be used toward the total of 129 credits required for graduation.

HORT 4910: Seed Science Internship Experience

(Cross-listed with AGRON 4910).

Credits: 1-2. Repeatable, maximum of 2 credits.

Prereq: AGRON 3380; Permission of Instructor

A professional work experience and creative project for seed science secondary majors. The project requires the prior approval and participation of the employer and instructor. The student must submit a written report. Advanced approval and participation of employer and instructor required. (Typically Offered: Fall, Spring, Summer)

HORT 4930: Workshop in Horticulture

Credits: 1-30. Repeatable.

Off campus. Offered as demand warrants. Workshops in horticulture.

HORT 4940A: Service Learning: International

Credits: 1-30. Repeatable, maximum of 12 credits.

Prereq: Instructor Permission for Course

Selected projects that result in outcomes benefiting a non-Iowa State University entity while instilling professional ethics and accomplishing student learning goals. Course expenses paid by student. Assessed service-learning component. Graduation Restriction: A maximum of 4 credits of HORT 4940 may be used toward the Horticulture credits required for graduation. (Typically Offered: Fall, Spring, Summer)

HORT 4940B: Service Learning: Domestic

Credits: 1-30. Repeatable, maximum of 12 credits.

Prereq: Instructor Permission for Course

Selected projects that result in outcomes benefiting a non-Iowa State University entity while instilling professional ethics and accomplishing student learning goals. Course expenses paid by student. Assessed service-learning component. Graduation Restriction: A maximum of 4 credits of HORT 4940 may be used toward the Horticulture credits required for graduation. (Typically Offered: Fall, Spring, Summer)

HORT 4950: Horticulture Travel Course Preparation

Credits: Required. Contact Hours: Lecture 1.

Repeatable.

Prereq: Instructor Permission for Course

Limited enrollment. Students enrolled in this course also intend to register for Hort 496 the following term. Topics include preparation for safe international travel, the horticultural/agricultural industries, climate, crops, economics, geography, history, marketing, soils, culture, traditions, and horticultural/agricultural development of the country to be visited. Students enroll in this course the term immediately before travel to the foreign country. (Typically Offered: Fall, Spring, Summer)

HORT 4960: Horticulture Travel Course

Credits: 1-4. Repeatable.

Prereq: Instructor Permission for Course

Limited enrollment. Study and tour of production methods in major horticultural regions of the world. Influence of climate, economics, geography, soils, landscapes, markets, cultures, and history of horticultural crops. Location and duration of tours will vary. Tour expenses paid by students. Meets International Perspectives Requirement. (Typically Offered: Fall, Spring, Summer)

HORT 4970X: Domestic Horticulture Travel Course

Credits: 1-4. Contact Hours: Lecture 4.

Repeatable.

Study and tour of production methods in major horticultural regions of the US. Influence of climate, economics, geography, soils, landscapes, markets, cultures, and history of horticultural crops. Location and duration of tours will vary. Tour expenses paid by students. Limited enrollment. (Typically Offered: Fall, Spring, Summer)

Courses primarily for graduate students, open to qualified undergraduates:

HORT 5060: Crop Genetics

(Cross-listed with AGRON 5060).

Credits: 3. Contact Hours: Lecture 3.

Introduction to plant reproductive systems, gene segregation and linkage analysis, molecular nature of genes and how genes confer phenotypes, mutation and biotechnology, quantitative inheritance and population genetics to prepare students for subsequent courses in crop improvement. Enrollment is restricted to off-campus MS in Plant Breeding students. (Typically Offered: Fall)

HORT 5110: Integrated Management of Tropical Crops

(Cross-listed with ENT 5110/ PLP 5110).

Credits: 3. Contact Hours: Lecture 3.

Prereq: (ENT 3700 or ENT 3760 or HORT 2210 or PLP 4080 or PLP 4160) or Graduate Classification

Applications of Integrated Crop management principles (including plant pathology, entomology, and horticulture) to tropical cropping systems. Familiarization with a variety of tropical agroecosystems and Costa Rican culture is followed by a 10-day tour of Costa Rican agriculture during spring break, then writeup of individual projects. Offered odd-numbered years. Meets International Perspectives Requirement. (Typically Offered: Spring)

HORT 5240: Sustainable and Environmental Horticulture Systems

(Dual-listed with ENVS 4240/ HORT 4240).

Credits: 3. Contact Hours: Lecture 3.

Inquiry into ethical issues and environmental consequences of horticultural cropping systems, production practices and managed landscapes. Emphasis on systems that are resource efficient, environmentally sound, socially acceptable and profitable. Offered odd-numbered years. (Typically Offered: Spring)

HORT 5300: Research Orientation

Credits: 2. Contact Hours: Lecture 2.

Instruction in scientific methods and communication skills. (Typically Offered: Fall)

HORT 5380: Seed Physiology and the Environment

(Cross-listed with AGRON 5380).

Credits: 2. Contact Hours: Lecture 2.

Prereq: AGRON 3160; CHEM 2310 or CHEM 3310 or graduate standing
Physiological aspects of seed development, maturation, longevity, dormancy, and germination of agronomic and horticultural crops and their interactions with field and storage environments. Emphasis on current literature and advanced methodology. Offered even-numbered years. (Typically Offered: Fall)

HORT 5420A: Introduction to Molecular Biology Techniques: DNA Techniques

(Cross-listed with BMS 5420A/ EEOB 5420A/ FSHN 5420A/ GDCB 5420A/ BBMB 5420A/ NREM 5420A/ NUTRS 5420A/ VDPAM 5420A/ VMPM 5420A).

Credits: 1. Contact Hours: Lecture 0.5, Laboratory 1.

Repeatable.

Includes genetic engineering procedures, sequencing, PCR, and genotyping. Offered on a satisfactory-fail basis only. (Typically Offered: Fall, Spring)

HORT 5420B: Introduction to Molecular Biology Techniques: Protein

(Cross-listed with BMS 5420B/ EEOB 5420B/ FSHN 5420B/ GDCB 5420B/ BBMB 5420B/ NREM 5420B/ NUTRS 5420B/ VDPAM 5420B).

Credits: 1. Repeatable.

Includes: immunophenotyping, ELISA, flow cytometry, microscopic techniques, image analysis, confocal, multiphoton and laser capture microdissection. Offered on a satisfactory-fail basis only. (Typically Offered: Spring, Summer)

HORT 5420C: Introduction to Molecular Biology Techniques: Cell Techniques

(Cross-listed with BMS 5420C/ EEOB 5420C/ FSHN 5420C/ GDCB 5420C/ BBMB 5420C/ NREM 5420C/ NUTRS 5420C/ VMPPM 5420C/ VDPAM 5420C).

Credits: 1. Contact Hours: Laboratory 2.

Repeatable.

Includes: immunophenotyping, ELISA, flow cytometry, microscopic techniques, image analysis, confocal, multiphoton and laser capture microdissection. ular biology techniques and related procedures. Offered on a satisfactory-fail basis only. (Typically Offered: Fall, Spring)

HORT 5420D: Introduction to Molecular Biology Techniques: Plant Transformation

(Cross-listed with BMS 5420D/ EEOB 5420D/ FSHN 5420D/ GDCB 5420D/ BBMB 5420D/ NREM 5420D/ NUTRS 5420D/ VMPPM 5420D/ VDPAM 5420D).

Credits: 1. Contact Hours: Lecture 0.5, Laboratory 1.

Repeatable.

Includes: Agrobacterium and particle gun-mediated transformation of tobacco, Arabidopsis, and maize, and analysis of transformants. Offered on a satisfactory-fail basis only. (Typically Offered: Spring)

HORT 5420E: Introduction to Molecular Biology Techniques: Proteomics

(Cross-listed with BMS 5420E/ EEOB 5420E/ FSHN 5420E/ GDCB 5420E/ BBMB 5420E/ NREM 5420E/ NUTRS 5420E/ VMPPM 5420E/ VDPAM 5420E).

Credits: 1. Contact Hours: Lecture 0.5, Laboratory 1.

Repeatable.

Includes: two-dimensional electrophoresis, laser scanning, mass spectrometry, and database searching. Offered on a satisfactory-fail basis only. (Typically Offered: Fall)

HORT 5420F: Introduction to Molecular Biology Techniques: Metabolomics

(Cross-listed with BMS 5420F/ EEOB 5420F/ FSHN 5420F/ GDCB 5420F/ BBMB 5420F/ NREM 5420F/ NUTRS 5420F/ VMPPM 5420F/ VDPAM 5420F).

Credits: 1. Contact Hours: Lecture 0.5, Laboratory 1.

Repeatable.

Includes: metabolomics and the techniques involved in metabolite profiling. For non-chemistry majoring students who are seeking analytical aspects into their biological research projects. Offered on a satisfactory-fail basis only. (Typically Offered: Fall)

HORT 5420G: Introduction to Molecular Biology Techniques: Genomic

(Cross-listed with BMS 5420G/ EEOB 5420G/ FSHN 5420G/ GDCB 5420G/ BBMB 5420G/ NREM 5420G/ NUTRS 5420G/ VMPPM 5420G/ VDPAM 5420G).

Credits: 1. Contact Hours: Lecture 0.5, Laboratory 1.

Repeatable.

Sessions in basic molecular biology techniques and related procedures. Offered on a satisfactory-fail basis only. (Typically Offered: Spring)

HORT 5430: Seed Physiology

(Cross-listed with STB 5430).

Credits: 2. Contact Hours: Lecture 2.

Brief introduction to plant physiology. Physiological aspects of seed development, maturation, longevity, dormancy and germination. Links between physiology and seed quality. Offered even-numbered years. (Typically Offered: Fall)

HORT 5460: Strategies for Diversified Food and Farming Systems

(Cross-listed with AGRON 5460/ SUSAG 5460).

Credits: 3. Contact Hours: Lecture 3.

Project-focused engagement in food and farming systems using tools and perspectives drawn from multiple disciplines. Includes a field component. Offered odd-numbered years. (Typically Offered: Spring)

HORT 5510: Growth and Development of Perennial Grasses

(Cross-listed with AGRON 5510).

Credits: 2. Contact Hours: Lecture 2.

Selected topics onatomy, morphology, and physiology relative to growth and development of perennial grasses. Emphasis on growth and development characteristics peculiar to grasses and variations of such characteristics under natural and managed conditions. Offered even-numbered years. (Typically Offered: Spring)

HORT 5520: Integrated Management of Diseases and Insect Pests of Turfgrasses

(Dual-listed with PLP 4520/ ENT 4520/ HORT 4520). (Cross-listed with ENT 5520/ PLP 5520).

Credits: 3. Contact Hours: Lecture 3.

Prereq: HORT 3510 or Graduate Classification

Identification and biology of important diseases and insect pests of turfgrasses. Development of integrated pest management programs in various turfgrass environments. Offered even-numbered years. (Typically Offered: Spring)

HORT 5710: Vegetable Production and Management

(Dual-listed with HORT 4710).

Credits: 2. Contact Hours: Lecture 2.

Prereq: HORT 221 or Graduate Classification

Principles of vegetable production with emphasis on sustainable production practices, market outlets, business aspects, and risk management. Topics will include crop classification and rotation; planting methods; crop climatic conditions, physiological growth & development; soil, water, and pest management; cover cropping; season extension strategies; harvest and postharvest management and marketing. Involves visits to growers fields to observe/experience their production enterprise. Offered even-numbered years. (Typically Offered: Spring)

HORT 5710L: Vegetable Production and Management Lab

(Dual-listed with HORT 4710L).

Credits: 1. Contact Hours: Laboratory 3.

Hands-on training in the area of vegetable crop production. Opportunity to grow a variety of vegetables in a heated greenhouse and also conduct greenhouse and lab experiments. The lab also involves visits to vegetable production sites in Iowa to observe/experience and learn from growers and other agricultural professionals. Offered even-numbered years. (Typically Offered: Spring)

HORT 5760: Horticultural Postharvest Technology

(Dual-listed with HORT 4760).

Credits: 3. Contact Hours: Lecture 2, Laboratory 3.

Prereq: HORT 2210

Study of pre- and post-harvest factors, procedures, and challenges that affect market quality of horticultural commodities. Emphasis on storage and handling technologies to preserve quality and extend storage life of edible and ornamental horticultural crops. Field trips outside scheduled class time required. Offered odd-numbered years. (Typically Offered: Fall)

HORT 5810: Experience in Plant Science Extension and Outreach

(Cross-listed with AGRON 5810/ ENT 5810/ PLP 5810).

Credits: 1.

A supervised learning experience in several extension delivery methods used in the plant sciences. Participation in Iowa State University-based extension programs that may include field crops horticulture, or Master Gardener programming. Offered odd-numbered years. (Typically Offered: Summer)

HORT 5840: Organic Agricultural Theory and Practice

(Dual-listed with AGRON 4840/ HORT 4840/ SUSAG 4840). (Cross-listed with AGRON 5840/ SUSAG 5840).

Credits: 3. Contact Hours: Lecture 3.

Understanding of the historical origins and ecological theories underpinning the practices involved in organic agriculture. Interdisciplinary examination of crop and livestock production and socio-economic processes and policies in organic agriculture from researcher and producer perspectives. Offered odd-numbered years. (Typically Offered: Spring)

HORT 5900: Special Topics

Credits: 1-30. Repeatable.

Prereq: Instructor Permission for Course

HORT 5930A: Workshop in Horticulture: Greenhouse Crops

Credits: 1-30. Contact Hours: Lecture 30.

Repeatable.

Workshops in horticulture, with emphasis on off-campus instruction.

HORT 5930B: Workshop in Horticulture: Nursery Crops

Credits: 1-30. Contact Hours: Lecture 30.

Repeatable.

Workshops in horticulture, with emphasis on off-campus instruction.

HORT 5930C: Workshop in Horticulture: Turfgrass

Credits: 1-30. Contact Hours: Lecture 30.

Repeatable.

Workshops in horticulture, with emphasis on off-campus instruction.

HORT 5930D: Workshop in Horticulture: Fruit Crops

Credits: 1-30. Contact Hours: Lecture 30.

Repeatable.

Workshops in horticulture, with emphasis on off-campus instruction.

HORT 5930E: Workshop in Horticulture: Vegetable Crops

Credits: 1-30. Contact Hours: Lecture 30.

Repeatable.

Workshops in horticulture, with emphasis on off-campus instruction.

HORT 5930F: Workshop in Horticulture: Cross-Commodity

Credits: 1-30. Contact Hours: Lecture 30.

Repeatable.

Workshops in horticulture, with emphasis on off-campus instruction.

HORT 5930G: Workshop in Horticulture: Landscape Horticulture

Credits: 1-30. Contact Hours: Lecture 30.

Repeatable.

Workshops in horticulture, with emphasis on off-campus instruction.

HORT 5990: Creative Component

Credits: 1-30. Repeatable.

*Prereq: Instructor Permission for Course***Courses for graduate students:****HORT 6100: Graduate Seminar**

Credits: 1. Contact Hours: Lecture 1.

Repeatable.

Offered on a satisfactory-fail basis only. (Typically Offered: Fall, Spring)

HORT 6900: Advanced Topics

Credits: 1-30. Repeatable.

HORT 6960: Research Seminar

(Cross-listed with AGRON 6960/ BBMB 6960/ FOR 6960/ GDCB 6960/ PLBIO 6960).

Credits: 1. Contact Hours: Lecture 1.

Repeatable.

Research seminars by faculty and graduate students. Offered on a satisfactory-fail basis only. (Typically Offered: Fall, Spring)

HORT 6980: Horticulture Teaching Practicum

Credits: 1. Contact Hours: Lecture 1.

Discussions are intended to foster the development of graduate students as teaching assistants and future horticulture/plant science teachers.

Topics include establishing a classroom presence, improving lectures, motivating students, dealing with difficult or disruptive students, and developing a teaching philosophy. Offered on a satisfactory-fail basis only. (Typically Offered: Spring)

HORT 6990A: Thesis and Dissertation Research: Greenhouse Crops

Credits: 1-30. Repeatable.

*Prereq: Instructor Permission for Course***HORT 6990B: Thesis and Dissertation Research: Nursery Crops**

Credits: 1-30. Repeatable.

*Prereq: Instructor Permission for Course***HORT 6990C: Thesis and Dissertation Research: Turfgrass**

Credits: 1-30. Repeatable.

*Prereq: Instructor Permission for Course***HORT 6990D: Thesis and Dissertation Research: Fruit Crops**

Credits: 1-30. Repeatable.

*Prereq: Instructor Permission for Course***HORT 6990E: Thesis and Dissertation Research: Vegetable Crops**

Credits: 1-30. Repeatable.

*Prereq: Instructor Permission for Course***HORT 6990F: Thesis and Dissertation Research: Cross-Commodity**

Credits: 1-30. Repeatable.

*Prereq: Instructor Permission for Course***HORT 6990G: Thesis and Dissertation Research: Landscape Horticulture**

Credits: 1-30. Repeatable.

*Prereq: Instructor Permission for Course***HORT 6990I: Thesis and Dissertation Research: Biotechnology**

Credits: 1-30. Repeatable.