

474. Aesthetic Theory and Modernism
Fall. 4(4-0) Interdepartmental with Philosophy, English, Linguistics and Languages, Music, and Romance Languages. Administered by Philosophy.
R: Not open to freshmen and sophomores.
Problems, assumptions, and arguments of modern aesthetic theory examined in the context of debates over modernity and modernist artistic practice.

481. Women in Art
Fall of odd-numbered years. 3(3-0)
P: HA 202 or approval of department. R: Not open to freshmen and sophomores.
Selected European, North American, and Asian or African women artists, architects, and critics active since the late nineteenth century: their oeuvres and their changing relationships to mainstream artistic and critical developments.

483. Historic Preservation and Preservation Planning in the U.S.
Fall. 4(4-0) Interdepartmental with Urban Planning and Landscape Architecture. Administered by Urban Planning.
R: Not open to freshmen and sophomores. Approval of department.
History and philosophy of the preservation of buildings, structures, and objects significant to the heritage of this nation. Preservation as a planning tool for local governments.

484. History of Prints
Spring of odd-numbered years. 3(3-0)
P: HA 202, HA 203. R: Not open to freshmen and sophomores.
Printmaking to the present. Woodcuts, engraving, etching and lithography by such artists as Durer, Rembrandt, Goya and Picasso.

485. Museum Studies
Fall of even-numbered years. 3(3-0) Interdepartmental with Arts and Letters. Administered by Arts and Letters.
R: Not open to freshmen and sophomores.
Activities, functions and organization of museums; the changing role of museums as cultural institutions.

486. History of Western Design
Spring. 4(4-0)
R: Not open to freshmen and sophomores.
History of design from the Victorian Age to the present. Relationship to materials and technology, to the influence of the fine arts and to socio-political movements.

489. Methods and Approaches in History of Art
Fall. 3(3-0)
R: Approval of department.
Techniques and reference materials used in art-historical research. History of scholarship in the field, with emphasis on changes in approach in the 19th and 20th centuries. Extensive writing.

490. Independent Study
Fall, Spring. 1 to 3 credits. A student may earn a maximum of 3 credits in all enrollments for this course.
R: Not open to freshmen and sophomores. Approval of department.
Special projects arranged by an individual student and a faculty member in areas supplementing regular course offerings.

491. Special Topics in History of Art
Fall, Spring. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course.
R: Approval of department.
Special topics supplementing regular course offerings proposed by faculty on a group study basis.

493C. Museum Internship
Fall, Spring, Summer. 2 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course. Interdepartmental with Arts and Letters. Administered by Arts and Letters.
R: Not open to freshmen and sophomores. Approval of college.
Activities, functions and organization of a university art museum.

800. Seminar in Ancient Art
Fall of even-numbered years. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course.
R: Approval of department.
Intensive investigation of a topic in the history of ancient painting, sculpture, or architecture.

810. Seminar in Medieval Art
Spring of odd-numbered years. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course.
R: Approval of department.
Intensive investigation of a topic in Early Christian, Byzantine, or Medieval art.

820. Seminar in Italian Renaissance Art
Spring of even-numbered years. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course.
R: Approval of department.
Intensive investigation of a topic in Italian art of the 14th, 15th, or 16th centuries.

840. Seminar in 19th Century Art
Spring of even-numbered years. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course.
R: Approval of department.
Intensive investigation of a topic in the history of 19th-century painting, sculpture, or architecture.

850. Seminar in 20th Century Art
Fall of odd-numbered years. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course.
R: Approval of department.
Investigation of a topic in the history of 20th-century painting, sculpture, or architecture.

870. Seminar in African Art
Spring of odd-numbered years. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course.
R: Approval of department.
Intensive investigation of a topic in the history of African painting, sculpture, or architecture.

890. Independent Study
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course.
R: Approval of department.
Special project, directed reading, and research arranged by an individual graduate student and a faculty member in areas supplementing regular course offerings.

891. Special Topics in History of Art
Fall, Spring, Summer. 3(3-0) A student may earn a maximum of 6 credits in all enrollments for this course.
R: Approval of department.
Special topics supplementing regular course offerings proposed by faculty on a group study basis for graduate students.

899. Master's Thesis Research
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course.
R: Approval of department.
Directed research leading to a master's thesis, used in partial fulfillment of Plan A master's degree requirements.

HORTICULTURE HRT

Department of Horticulture College of Agriculture and Natural Resources

100. Horticulture: Plants and People
Spring. 3(2-2)
R: Not open to junior or senior Horticulture majors.
Functional uses of plants: aesthetics, food, industry, recreation. Growing and using horticultural plants. Consumer and environmental issues related to horticulture in daily living.

203. Principles of Horticulture I
Fall. 2(3-0)
P: BOT 105 or BS 110 or BS 111 or concurrently.
Contributions of horticulture to society. Cultivar development, crop geography, environmental factors, vegetative and reproductive development, and crop management. Field trip required.
SA: HRT 201

203L. Principles of Horticulture I Laboratory
Fall. 1(0-3)
P: HRT 203 or concurrently.
Growing, handling, and identifying plants. Irrigation, fertilization, and media for plant production. Pruning and control of flowering and growth. Measuring environmental factors. Sources of cultural information.
SA: HRT 201L

204. Principles of Horticulture II
Spring. 2(3-0)
P: HRT 203.
Asexual and sexual propagation. Plant population effects, pest management, harvesting, and postharvest handling and marketing of horticultural crops. Field trip required.
SA: HRT 202

204L. Principles of Horticulture II Laboratory
Spring. 1(0-3)
P: HRT 204 or concurrently.
Growing, handling, and identifying plants. Asexual propagation from cuttings. Micropropagation. Bulbs, tubers, and corms. Grafting. Seed germination on perennial and annual crops. Storage of fruit.
SA: HRT 202L

211. Ornamental Trees and Narrow-Leaved Evergreens
Fall. 3(2-3)
Identification, adaptation, evaluation, management, and landscape uses of trees, deciduous shrubs, narrow-leaved evergreens, and woody vines.

212. Ornamental Flowering Shrubs and Broad-Leaved Evergreens
Spring. 3(2-3)
Identification, adaptation, evaluation, management, and landscape uses of flowering trees, deciduous shrubs, broad-leaved evergreens, woody vines and ground covers.

Descriptions — Horticulture of Courses

221. Greenhouse Structures and Management Fall. 3(3-0)

Planning and operation of a commercial greenhouse. Structures, coverings, heating, cooling, ventilation, irrigation, fertilization, root media, and pest control. Field trips required.

225A. Basic Floral Design Spring. 2(1-2)

Principles and mechanics of floral design. Line and mass designs, symmetrical and asymmetrical designs. Contemporary techniques. Flower identification. Retail pricing. Laboratory fee required. First half of semester.

225B. Advanced Floral Design Spring. 2(1-2)

P: HRT 225A or concurrently.

Marketing, selling, and designing flowers for weddings, funerals, and other special events. Identification, handling, and design use of fresh flowers and other materials. Laboratory fee required. Second half of semester.

310. Nursery Management Fall. 3(2-3)

P: HRT 204. R: Not open to freshmen and sophomores. Management practices applied to wholesale and retail nursery production and marketing. Field trip required.

311. Landscape Design and Management Specifications Spring. 4(3-2) Interdepartmental with Landscape Architecture.

P: HRT 211; HRT 212 or concurrently.

Landscape design techniques, spatial organization, plant selection, plant and site interaction. Relationship between design, construction and maintenance. Preparation of planting and maintenance specifications.

322. Greenhouse Production I: Potted Plants Fall. 3(1-4)

P: HRT 204; HRT 221 or concurrently.

Commercial production of floriculture greenhouse crops with emphasis on flowering and potted foliage plants and on seed germination. Field trips required.

323. Greenhouse Production II: Cut Flowers and Bedding Plants Spring. 3(1-4)

P: HRT 204, HRT 221.

Commercial production of bedding plants and cut flowers. Finishing procedures for selected potted plant crops. Field trips required.

325. Floral Distribution and Marketing Spring. 3(2-2)

P: HRT 204 or concurrently.

Business operations of wholesale and retail floral outlets. Identification, care, and handling of commercial cut flowers and foliage. Field trips required.

331. Tree and Small Fruit Production and Management Fall. 3(2-3)

P: HRT 204.

Commercial aspects of tree and small fruit production. Procedures used in production of major fruit crops grown in Michigan: apples, cherries, peaches, grapes, blueberries, brambles, and strawberries. Field trips required.

SA: HRT 330

341. Vegetable Production and Management Spring. 3(2-3)

P: HRT 204.

Field production of vegetable crops. Marketing systems, tillage practices, field establishment, cultural management, pest management, harvesting, and post-harvest handling and storage. Field trip required.

SA: HRT 440, HRT 442

394A. Retail Florist Practicum

Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course.

P: HRT 204. R: Open only to juniors and seniors. Approval of department and application required. Maximum of 8 credits may be earned in HRT 394A and HRT 490.

Customer relations. Floral design, flower buying, holiday planning. Advertising, display. Financial record-keeping. Flower care and handling.

401. Physiology and Management of Herbaceous Plants Spring. 3(3-0)

P: HRT 221, BOT 301. R: Not open to freshmen and sophomores

Physiological and flowering responses of herbaceous plants to light, temperature, nutrients, and gases. Management of these factors for optimum production.

403. Handling and Storage of Horticultural Crops Fall. 3(2-3)

P: BOT 105 or BS 110. R: Not open to freshmen and sophomores.

Biological principles involved in quality maintenance of horticultural products. Control of deterioration during harvesting, handling, transport, and storage. Field trip required.

SA: HRT 482

404. Horticultural Management Spring. 3(2-2)

P: EC 201 or EC 202; HRT 204 or CSS 370 or FOR 404.

R: Open only to seniors in the College of Agriculture and Natural Resources.

Integration of physiological, genetic, economic, and production principles to develop a horticultural business plan. Management techniques. Environmental impacts of business and production practices.

SA: HRT 488

411. Landscape Contract Management Fall. 3(2-2)

P: HRT 311.

Management of landscape construction and maintenance operations. Working drawings, construction specifications, labor and equipment standards, and bid procedures. Case studies.

431. Reproductive Physiology of Tree Fruits Spring of odd-numbered years. 2(2-0)

P: HRT 331 or concurrently. R: Not open to freshmen and sophomores.

Physiology of flowering and fruiting in tree fruits: manipulation by cultural practices and growth regulators.

441. Plant Breeding and Biotechnology

Spring. 4(3-2) Interdepartmental with Crop and Soil Sciences, and Forestry. Administered by Crop and Soil Sciences.

P: CSS 350.

Plant improvement by genetic manipulation. Genetic variability in plants. Traditional and biotechnological means of creating and disseminating recombinant genotypes and cultivars.

451. Cellular and Molecular Principles and Techniques for Plant Sciences

Spring. 4(2-6) Interdepartmental with Crop and Soil Sciences, and Forestry. Administered by Crop and Soil Sciences.

P: CSS 350 or ZOL 341.

Principles, concepts, and techniques of agricultural plant biotechnology. Recombinant DNA technology, plant molecular biology, transformation, cell tissue, and organ culture in relation to plant improvement.

461. World Fruits and Vegetables

Spring of odd-numbered years. 2(2-0)

P: BS 110 or BOT 105 or HRT 204. R: Open only to juniors, seniors, and graduate students.

Importance of fruits and vegetables in human nutrition, income generation, and international development. Unique cultural and climatic requirements for production and marketing.

SA: HRT 460, HRT 462

477. Pest Management I: Pesticides in Management Systems

Fall. 3(3-0) Interdepartmental with Entomology, Crop and Soil Sciences, and Fisheries and Wildlife. Administered by Entomology.

P: CEM 143; BOT 405 or CSS 402, ENT 404 or ENT 470 or FW 328.

Chemistry, efficient use, environmental fate, and legal aspects of pesticides.

478. Pest Management II: Biological Components of Management Systems

Spring. 3(2-3) Interdepartmental with Entomology, Crop and Soil Sciences, Fisheries and Wildlife, and Forestry. Administered by Entomology.

P: ENT 404 or ENT 470 or BOT 405 or CSS 402 or FW 328.

Principles of host plant resistance and biological control and their relationship to the design of agroecosystems. Classification of insect biological control agents.

480. Woody Plant Physiology

Spring. 3(3-0) Interdepartmental with Forestry.

P: BOT 301. R: Not open to freshmen and sophomores.

Physiology of carbon utilization. Effects of water, temperature, nutrition, and light on apical, vegetative, and reproductive growth of woody plants.

486. Biotechnology in Agriculture: Applications and Ethical Issues

Spring of even-numbered years. 3(3-0) Interdepartmental with Philosophy, Crop and Soil Sciences, and Forestry.

P: BS 111 or BOT 105. R: Not open to freshmen and sophomores.

Current and future roles of biotechnology in agriculture: scientific basis, applications. Environmental, social, and ethical concerns.

488. Horticultural Management Spring. 3(2-2)

P: HRT 202; EC 201 or EC 202; one 300 or 400 level HRT course. R: Open only to seniors in Horticulture.

Integration of physiological, genetic, economic and production principles to develop a horticultural business plan. Management techniques. Environmental impacts of business and production practices.

490. Independent Study in Horticulture

Fall, Spring, Summer. 1 to 2 credits. A student may earn a maximum of 6 credits in all enrollments for this course.

P: HRT 202. R: Approval of department; application required.

Independent study of horticulture on a field, laboratory or library research program of special interest to the student.

491. Selected Topics in Horticulture

Fall, Spring. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course.

P: HRT 202. R: Not open to freshmen and sophomores. Selected topics in horticulture of current interest and importance.

- 801. Research Procedures in Plant Science**
Spring, 3(2-2)
P: STT 422.
Applications of epistemology and logic in plant science research. Classical research methods. Hypotheses. Analysis of laboratory, storage, greenhouse, and field experiments.
- 802. Growth and Development of Horticultural Crops**
Spring of even-numbered years. 3(2-2)
Physiology of grafting, juvenility, flowering, fruiting, senescence, bud and seed dormancy, apical dominance of horticultural crops.
- 803. Postharvest Physiology**
Spring of odd-numbered years. 3(2-2)
Physiology, biochemistry and molecular biology of maturation, ripening and senescence of harvested horticultural crops.
- 819. Advanced Plant Breeding**
Fall, 3(3-0) Interdepartmental with Crop and Soil Sciences, and Forestry.
P: CSS 450, STT 422.
Genetic expectations resulting from breeding strategies with cross- and self-pollinated crop plants. Germplasm collections, mapping populations, and modifications of reproductive biology useful for crop improvement.
- 823. Methods in Genetic Engineering of Plants**
Fall of even-numbered years. 4(0-8) Interdepartmental with Crop and Soil Sciences, and Forestry. Administered by Crop and Soil Sciences.
Bacterial transformation. Plant transformation via Ti-plasmid, protoplast/PEG, and electroporation methods. Detection of foreign gene integration and expression.
- 827. Techniques in Cytogenetics**
Fall of odd-numbered years. 1(0-3) Interdepartmental with Crop and Soil Sciences, and Forestry. Administered by Crop and Soil Sciences.
Preparation of chromosomes from commercially important plants for cytogenetic analysis.
- 836. Plant Evolution and the Origin of Crop Species**
Fall of even-numbered years. 3(3-0) Interdepartmental with Crop and Soil Sciences, and Forestry.
P: CSS 350.
Cultural and biological aspects of the evolution of domestic plants. Origin and diversity of cultivated plants.
- 853. Plant Mineral Nutrition**
Fall of odd-numbered years. 3(3-0) Interdepartmental with Crop and Soil Sciences. Administered by Crop and Soil Sciences.
P: BOT 301.
Inorganic ion transport in plant cells and tissues. Physiological responses and adaptation to problem soils. Genetic diversity in nutrient uptake and use by plants. Physiological roles of elemental nutrients in crop growth.
- 863. Environmental Plant Physiology**
Spring of odd-numbered years. 3(3-0) Interdepartmental with Botany and Plant Pathology. Administered by Botany and Plant Pathology.
P: BOT 301 or BOT 414 or BOT 415.
Interaction of plant and environment. Photobiology, thermophysiology, and plant-water relations.
- 890. Independent Study**
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 6 credits in all enrollments for this course.
R: Approval of department.
Individual study of problems of special interest.
- 891A. Selected Topics in Horticulture**
Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course.
R: Open only to graduate students in Horticulture. Approval of department.
Selected topics in horticultural science of current interest and importance.
- 891B. Selected Topics in Plant Breeding and Genetics**
Fall, Spring, Summer. 1 to 2 credits. A student may earn a maximum of 6 credits in all enrollments for this course. Interdepartmental with Crop and Soil Sciences, and Forestry.
R: Open only to graduate students in Plant Breeding and Genetics or Genetics. Approval of department.
Selected topics in plant breeding.
- 892. Plant Breeding and Genetics Seminar**
Fall, Spring, Summer. 1(1-0) A student may earn a maximum of 8 credits in all enrollments for this course. Interdepartmental with Crop and Soil Sciences, and Forestry.
Experience in review, organization, oral presentation, and analysis of research.
- 894. Horticulture Seminar**
Fall, Spring. 1(1-0)
Experience in review, organization, oral presentation and analysis of research.
- 898. Master's Research**
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course.
R: Approval of department.
Master's degree Plan B project.
- 899. Master's Thesis Research**
Fall, Spring, Summer. 1 to 10 credits. A student may earn a maximum of 99 credits in all enrollments for this course.
R: Open only to graduate students in Horticulture.
- 930. Advanced Forest Genetics**
Fall of odd-numbered years. 2(1-2) Interdepartmental with Forestry, and Crop and Soil Sciences. Administered by Forestry.
P: HRT 819 or HRT 836.
Applications of genetics, plant breeding, and biotechnology to the improvement, and preservation of diversity, of tree species.
- 941. Quantitative Genetics in Plant Breeding**
Spring of even-numbered years. 3(3-0) Interdepartmental with Crop and Soil Sciences, and Forestry. Administered by Crop and Soil Sciences.
P: CSS 450, STT 422.
Theoretical genetic basis of plant breeding with emphasis on traits exhibiting continuous variation. Classical and contemporary approaches to the study and manipulation of quantitative trait loci.
- 943. Techniques of Analyzing Unbalanced Research Data**
Spring. 4(4-0) Interdepartmental with Animal Science, Forestry, Crop and Soil Sciences, and Fisheries and Wildlife. Administered by Animal Science.
P: STT 464. R: Open only to graduate students in the College of Agriculture and Natural Resources.
Linear model techniques to analyze research data characterized by missing and unequal number of observations in classes. Simultaneous consideration of multiple factors. Estimable comparisons. Hypothesis testing. Computational strategies. Variance and covariance components. Breeding values.
- 999. Doctoral Dissertation Research**
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 99 credits in all enrollments for this course.
R: Open only to Ph.D. students in Horticulture.

HOTEL, RESTAURANT AND INSTITUTIONAL MANAGEMENT HRI

**School of Hotel, Restaurant and Institutional Management
The Eli Broad College of Business
and The Eli Broad Graduate School of Management**

200. Introduction to the Hospitality Industry *Fall. 3(3-0)*

R: Open only to freshmen and sophomores.
Survey of all sectors, segments and disciplines of the hospitality and tourism industries. Topics include impact of travel and tourism, hospitality trends, and overview of accounting, marketing, and sales.

237. Management of Lodging Facilities *Spring. 3(3-0)*

P: HRI 200, one ISP course. R: Open only to freshmen, sophomores and juniors.
Operational departments and logical functions in the operation of various types of lodging properties. Planning and control of physical, mechanical, and electrical systems.

265. Quality Food Management *Spring. 3(3-0)*

P: HRI 200, one ISB course. R: Open only to sophomores and juniors.
Standards of microbiology, sanitation, nutrition, and other quality issues in food management. Chemical, health, and workplace standards. Management of product quality and costs.

302. Hospitality Managerial Accounting *Fall, Spring. 3(3-0)*

P: ACC 201; CPS 100 or CPS 130; HRI 200; STT 315 or concurrently. R: Open only to juniors and seniors.
Principles of managerial accounting applied to hospitality enterprises. Topics include financial statements, forecasting methods, internal control, and accounting ethics.

307. Organizational Behavior in the Hospitality Industry *Spring. 3(3-0)*

P: ML 300, MGT 302; HRI 237. R: Open only to juniors and seniors.
Human resource management and interpersonal skills in the hospitality industry. Focus on managing in a culturally diverse workplace.

337. Hospitality Information Systems *Fall. 3(3-0)*

P: HRI 237; CPS 100 or CPS 130.
Technology for gathering, analyzing, storing and communicating information within the hospitality industry.

345. Quality Food Production Systems *Fall, Spring. 3(1-4)*

P: HRI 265. R: Open only to juniors and seniors.
Organization of food and beverage operations. Product knowledge, especially purchasing, storing, preparing and production in food service operations. Menu development and recipe management.