

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 credit.
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 credit.
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.

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 foliages. 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 postharvest 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 (W)
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. Completion of Tier I writing requirement.
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.

**Descriptions — Horticulture
of
Courses**

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, and environmental fate of pesticides. Legal and social aspects of pesticide use.

478. Pest Management II: Biological Components of Management Systems

(W)

Spring of odd-numbered years. 3 credits. 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. R: Completion of Tier I writing requirement.

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.

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 credits. 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 credit. 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 to 4 credits. A student may earn a maximum of 4 credits in all enrollments for this course.

Experience in review, organization, oral presentation and analysis of research.

895. 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.

HOSPITALITY BUSINESS HB

School of Hospitality Business 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: HB 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: HB 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 101; HB 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: MSC 300, MGT 302; HB 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: HB 237, CPS 101.
Technology for gathering, analyzing, storing and communicating information within the hospitality industry.

345. Quantity Food Production Systems
Fall, Spring. 3(1-4)
P: HB 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.

353. Professional Work Experience I (W)
Fall, Spring, Summer. 1(1-0)
P: HB 200. R: Completion of Tier I writing requirement.
Work and training in hospitality management and supervision. Written report detailing work experience.

454. Professional Work Experience II (W)
Fall, Spring, Summer. 1(1-0)
P: HB 353. R: Open only to juniors and seniors. Completion of Tier I writing requirement.
Professional workplace experience involving planning, controlling, staffing, and organizing. Professionally written reports detailing experiences required.

473. Hospitality Industry Research
Fall, Spring. 3(3-0)
P: HB 337, STT 315. R: Open only to seniors. Not open to students with credit in MSC 317.
Strategies and techniques for obtaining, analyzing, evaluating, and reporting relevant research data.

475. Innovations in Hospitality Marketing
Fall, Spring. 3(3-0)
P: MSC 300, HB 307; HB 473 or concurrently. R: Open only to seniors.
Marketing of hospitality industry products and concepts, amid global competition and culturally diverse markets and workforces.

482. Hospitality Managerial Finance
Fall, Spring, Summer. 3(3-0)
P: FI 311. R: Open only to seniors.
Cash flow determination and management. Strategies for financing hospitality ventures and expansion. Determining financial viability of proposed and existing operations.

485. Advanced Foodservice Management
Fall, Spring, Summer. 3(1-4)
P: HB 302, HB 307, HB 345. R: Open only to seniors in Hospitality Business.
Beverage management and dining room service. Guest relations and current management topics. Emphasis on foodservice team projects.

489. Policy Issues in Hospitality Management
Fall, Spring. 3(3-0)
P: HB 482, HB 454. R: Open only to seniors in Hospitality Business. Not open to students with credit in MGT 409.
Management problems and issues in the hospitality industry. Focus on decision-making models. Case study analysis, discussion and written reports.

490. Independent Study
Fall, Spring, Summer. 1 to 3 credits.
Supervised research in hospitality management and operations.

491. Current Topics in Hospitality Industry
Spring. 3(3-0)
P: HB 307. R: Open only to seniors.
Emerging topics or issues confronting the hospitality service industry.

807. Workforce Management in the Hospitality Industry
Fall. 3(3-0)
R: Open only to graduate students in Business.
Identifying and solving hospitality workforce problems. Topics include leadership styles, interpersonal and organization communication.

837. Hospitality Computer Information Systems
Spring. 3(3-0)
R: Open only to graduate students in College of Business.
Overview of computer systems and networks designed for the hospitality industry.

875. Marketing in the Hospitality Industry
Spring. 3(3-0)
R: Not open to first-year graduate students. Open only to MBA students.
A framework for understanding hospitality marketing in a global business environment. Emphasis on industry responses to changing consumer trends, and applying marketing principles to case studies.

882. Financial Management in the Hospitality Industry
Spring. 3(3-0)
P: ACC 840, FI 889. R: Not open to first-year graduate students. Open only to MBA students.
Interpretation and analysis of financial statements. Budget preparation and analysis. Leasing, franchising, and management contracts.

885. Seminar in Food and Beverage Systems Management
Fall. 3(3-0)
R: Open only to graduate students in Business. Not open to students with credit in HB 485.
Management principles and practices in quality food and beverage operations. Emphasis on product, sales, income, and human resource strategies.

890. Independent Study
Fall, Spring. 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 the College of Business. Approval of school.
Faculty-supervised independent study.

HUMAN ECOLOGY HEC

College of Human Ecology

201. The Human Ecological Perspective
Fall, Spring. 3(3-0)
R: Not open to freshmen.
Human ecological perspective and philosophy. Holistic, futuristic problem solving.

290. Independent Study
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 6 credits in all enrollments for this course.
R: Open only to students in the College of Human Ecology.
Individual study of interdisciplinary topics related to the human ecology perspective under the guidance of a faculty member.