



## Undergraduate Course Descriptions

Department of Horticulture  
Plant & Soil Sciences Building  
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### FALL 2009 - SPRING 2010

#### **100 Horticulture: Plants and People**

3(2-2) Spring

Not open to jrs or srs in the Dept of Hort. Functional uses of plants: aesthetics, food, industry, recreation. Growing and using horticultural plants. Consumer and environmental issues related to horticulture in daily living.

#### **109 Intro to Applied Plant Science**

2(2-0) Fall

Open only to students in Agr Technology. Plant growth and development. Interrelationship 741/0 between cultural practice and plant performance. Plant classification, physiology and metabolism.

#### **111 Landscape Design**

3(3-3) Spring (first 10 weeks of sem)

Not open if you have cr in HRT 072 or 311. Functional uses of the landscape, landscape design process, drafting and graphic representation, plant selection and use, planting design principles, construction materials and specifications.

#### **135 Crop Scouting and Investigation**

2(3-0) Spring (first 10 weeks of sem)

Prerequisite: CSS 101 or HRT 203  
Interdepartmental - enroll in CSS 135. Crop production, pest scouting and other production problems, and field diagnoses. Interaction with agriculture clientele.

#### **203 Principles of Horticulture**

3(2-2) Fall

Basics of horticulture. Plant growth including crop selection and management, cultivar development, crop geography, environmental factors affecting plant growth and development, and reproductive development. Field trip required.

#### **204 Plant Propagation**

2(2-3) Spring (first 10 wks of sem)

Asexual propagation including rooting of cuttings, micropropagation, grafting, layering, and underground structures. Sexual propagation including seed germination, storage, and production.

#### **205 Plant Mineral Nutrition**

1(3-0) Spring (first 5 weeks of sem)

Prerequisite: CSS 210  
Mineral elements required by plants. Essential elements, affect of soil and potting media on nutrient availability, absorption and function in plant physiology, and nutrient

deficiency and toxicity symptoms. Methods of monitoring and managing plant nutrient levels.

#### **206 Training and Pruning Plants**

1(2-2) Spring (last 5 weeks of sem)

Principles and techniques of pruning for landscape and nursery ornamentals, Christmas tree production, tree fruits, and small fruits. Pruning practices, equipment, and basic large tree care techniques.

#### **207 Horticulture Career Development**

1(1-0) Fall

Internship preparation and identification of employment opportunities. Career goal establishment, resume construction, correspondence development, personal budgeting, interview skills and strategies.

#### **208 Pruning and Training Systems in Horticulture**

3(2-2) Spring odd years. Traverse City.

Open only to Applied Plant Science major. Principles and practices of plant growth management. Plant biology. Crown and canopy development. Crop specific training systems. Pruning techniques.

#### **210 Nursery Management**

3(2-3) Fall

Prerequisite: HRT 203 (or concurrently) and HRT 204

Management of field and container grown nursery operations. Site selection and development, financing, legal restrictions, production practices, nutrition, irrigation, weed and pest control, modification of plant growth, storage, shipping, and marketing.

#### **211 Landscape Plants I**

3(2-3) Fall

Identification, adaptation, and evaluation of shade trees, narrow-leaved evergreens, shrubs, woody vines, herbs, ornamental grasses, and herbaceous perennials.

#### **212 Landscape Plant II**

3(2-3) Fall, Spring

Identification, adaptation, and evaluation of flowering trees and shrubs, broad-leaved evergreens, herbaceous vines, ground covers, bulbs, wildflowers, ferns, and aquatic plants.

#### **213 Landscape Maintenance**

2(2-0) Fall

Open only to students in Agr Technology. Ornamental plant mngt Plant growth and development related to pruning, fertilization, irrigation, weed control, transplanting; development of landscape management specifications; integrated plant management and plant health care programs.

#### **213L Landscape Maintenance Field Lab**

1(0-2) Fall

Prerequisite: HRT 213 or concurrently  
Open only to students in Agr Technology. Landscape maintenance. Site analysis. Pruning woody plants, transplanting by hand and mechanical tree spade, and planting techniques for ornamentals. Herbaceous perennial care, cutting back, dividing. Scouting as a component of integrated pest management and plant health care programs.

#### **214 Landscape & Turfgrass Business Operations**

2(3-0) Spring (first 10 weeks of sem)

Open only to students in Agr Technology. Organizing, marketing, and directing a business enterprise within the turf and landscape industry. Project estimating, bidding, payroll, equipment, and accounting.

#### **215 Landscape Industries Seminar**

1(0-2) Fall

Open only to students in Agr Technology. Not open to students with credit in HRT 207 or HRT 064.

Landscape, nursery and related green industry firms. Career opportunities. Horticulture operations, products, services and marketing practices. Personal and professional development.

#### **216 Landscape Construction**

3(2-2) Fall

Open only to students in Agr Technology. Not open to students with credit in HRT 076. Construction installation techniques encountered in landscape development. Field installation of patios, retaining walls, ponds, and plant materials. Construction estimating and bidding procedures. Field trip required.

#### **218 Landscape Irrigation**

3(3-3) Spring (first 10 weeks of sem)

Not open to students with credit in HRT 078.  
Design, installation and maintenance of

irrigation systems for turfgrass and landscape plants. Design hydraulics, equipment selection, pump stations, water features, water quality and conservation.

**219 Landscape Computer Aided Design**  
2(0-4) Spring  
Computer Aided Design (CAD) for landscape design. Calculations, take offs, perspective drawings, AutoCAD and LandCADD software.

**221 Greenhouse Structures and Management**  
3(3-0) Fall  
Planning and operation of a commercial greenhouse. Structures, coverings, heating, cooling, ventilation, irrigation, fertilization, root media, and pest control. Field trips required.

**222 Ornamental Grasses**  
1(3-0) Fall even yrs (first 5 weeks of sem)  
Selection, propagation, production, garden design, and maintenance of ornamental grasses for landscape use. Invasive issues and responsible use of ornamental grasses in the landscape.

**242 Passive Solar Greenhouses for Protected Cultivation**  
1(1-0) Fall, Spring  
Season extension and year-round vegetable, herb, flower and fruit production in unheated, low cost passive solar greenhouses. Marketing options, site selection, site preparation, structures, and organic crop management methods. Field trip required.

**243 Organic Transplant Production**  
1(1-0) Spring  
Seed ordering. Seed storage and seed germination. Vegetative propagation. Growing containers. Organic root media. Fertility, light, and temperature. Plant health. Hardening off. Considerations for organic certification. Field trip required.

**244 Culinary and Medicinal Herbs**  
1(1-0) Summer  
Field and greenhouse species and variety selection. Planting, organic production, and harvesting methods and schedules. Postharvest storage and maintenance of quality. Herbal teas, salves, oils, and tinctures. Field trip required.

**245 Specialty Cut Flowers**  
1(1-0) Summer  
Field and greenhouse cut flower species and variety selection. Planting, organic production methods, and harvesting and scheduling. Bouquet assembly. Postharvest handling and marketing. Value for biological diversity and farm scaping. Field trip required.

**251 Organic Farming Principles and Practices**  
3(3-0) Spring  
History and principles of organic farming. Farms as ecological systems. Certification process and agencies. Organic matter management, the soil food web, and nutrient availability. Biodiversity, crop rotations, plant competition, ground cover, and plant health. Integrating crops and animals. Organic animal husbandry. Field trip required.

**252 Organic Certification and Farm Plans**  
1(1-0) Fall  
Prerequisite: HRT 251  
Organic certification requirements as specified by the USDA National Organic Program and implemented by certifying agencies. Methods of record keeping and farm plans for specialty crop, field crop, perennial fruit, and livestock farms. Organic processing and marketing.

**253 Compost Production and Use**  
1(1-0) Summer  
Process and methods of composting, maturity and quality analysis, use of compost products at home and farm scale. Field trip required.

**256 Organic Produce Direct Marketing**  
1(1-0) Fall  
Food chain and produce marketing; values added versus value added. Community supported agriculture (CSA). Multi-farm CSA, farmer's markets, roadside markets, u-pick, restaurants. Crop scheduling and rotation strategies. Estimating cost, income, profit, yield. Field trip required.

**257 Organic Produce Wholesale Marketing**  
1(1-0) Fall  
Marketing options for high volume sales of organic produce. Farmer cooperatives. Produce suppliers handling organic produce; retailers handling exclusively organic. Retailers diversifying into organic. Requirements for storing, handling and displaying organic produce. Organic labeling requirements. Field trip required.

**258 Study a Farm**  
3(1-2) Summer  
Prerequisite: HRT 251  
Field trips to visit MI organic farms, farmers' markets, food distributors and retailers to observe farming and marketing methods and learn from farmers. Field trips required.

**259 Student Organic Farm Practicum**  
2-4 Fall, Spring, Summer (10 cr maximum)  
Open to students in Agr Technology. Year-round intensive organic vegetable, fruit, herb, and flower farming by direct involvement in the weekly activities and operation of the MSU Student Organic Farm. Planning, scheduling, planting, growing, irrigation, fertility, use of tools and equipment, harvesting, storage, CSA and farm stand marketing, record keeping, and organic certification.

**290 Independent Study Ornamental Hort**  
1-4 Fall, Spring, Summer (6 cr maximum)  
Open only to students in Agr Technology. Not open to students with credit in HRT 075. A planned learning experience developed by the student with a faculty member.

**311 Landscape Design and Management Specifications**  
4(3-2) Spring  
Prerequisite: HRT 211 and (HRT 212 or concurrently)  
Landscape design techniques, spatial organization, plant selection, plant and site interaction. Relationship between design, construction and maintenance. Preparation planting and maintenance specifications.

**323 Floriculture Production: Herbaceous Perennials and Annuals**  
3(1-4) Spring

Prerequisite: HRT 203 and (HRT 204 or concurrently) and HRT 221  
Commercial greenhouse and outdoor production of herbaceous perennials, annuals, and other plants typically sold in retail nurseries for outdoor gardens. Plant ID, propagation, production, scheduling, and finishing procedures based on specific plant growth requirements. Plant selection, marketing and retailing issues.

**332 Tree Fruit Production and Mngt**  
2(2-1) Fall  
Prerequisite: HRT 203 or HRT 251  
Commercial apple, cherry, peach, and pear production. Cultural practices to manipulate growth and development and optimize fruit yields and quality. Field trips required.

**335 Berry Crop Production and Management**  
1(2-1) Spring  
Prerequisite: HRT 203 or HRT 251  
Commercial production of blueberries, strawberries, raspberries, blackberries, cranberries, and minor fruit. Physiology, growth, and development of these species, how cultural practices used to optimize fruit yields and quality. Field trip required.

**341 Vegetable Production and Management**  
3(2-3) Spring  
Prerequisite: HRT 203 or HRT 251 (or concurrently)  
Field production of vegetable crops. Marketing systems, tillage practices, field establishment, cultural management, pest management, harvesting, and postharvest handling and storage.

**361 Applied Plant Physiology**  
3(3-0) Fall  
Prerequisite: PLB 105 and PLB 106 (or concurrently)  
Whole plant physiological and growth responses of plants to light, temperature, and gases during commercial plant production. Coordination and management of growth for optimum production and quality.

**362 Applied Crop Improvement**  
1(3-0) Spring (weeks 6-10 of sem)  
Prerequisite: HRT 203 and PLB 105  
History of plant improvement. Basic genetic principles of crop breeding and biotechnology.

**382 Turfgrass Physiology**  
2(3-0) Spring (first 10 weeks of sem)  
Prerequisite: (CSS 232) Completion of Tier I writing requirement. Not open to students with credit in CSS 332.  
Interdepartmental-enroll in CSS 382.  
Physiological principles of turfgrass growth and development. Water relations, light, temperature, respiration, photosynthesis, mineral nutrition, and hormone action. Impact of mowing, cultivation, and traffic on turfgrass growth.

**391 Special Topics**  
1-2 Fall, Spring (9 cr maximum)  
Offered half of semester.  
Specific topics in horticulture of current interest and importance. Possible field trips.

**401 Physiology and Management of Herbaceous Plants**

3(3-0) Fall  
Prerequisite: HRT 361 or PLB 301  
Not open to freshmen or sophomores.  
Physiological and flowering responses of herbaceous plants to light, temperature, nutrients, and gases. Management of factors for optimum production.

#### **403 Handling and Storage of Horticultural Crops**

3(2-3) Fall  
Prerequisite: PLB 105 or BS 110  
Not open to freshmen or sophomores. Biological principles involved in quality maintenance of horticultural products. Control of deterioration during harvesting, handling, transport, and storage. Field trip required.

#### **404 Horticultural Management (W)**

3(2-2) Spring  
Prerequisite: Completion of Tier I writing requirement -open only to seniors in ANR. Integration of management, economic, marketing, and horticultural production principles to develop personnel, financial, and resource strategies. Business plan development in a team situation. Effects of business decisions on people/profits.

#### **407 Horticulture Marketing**

3(2-2) Fall  
Demographic and purchase trends of perishable horticultural commodities, including landscape and floral crops, and fruits and vegetables. Market segmentation and product targeting, distribution, branding and packaging, and advertising and promotion. Services as a critical component of strategic business planning.

#### **408 Agricultural Services Marketing**

1(3-0) Spring even years (first 5 weeks sem)  
Prerequisite: HRT 203. Not open to Fr.  
Products and services for horticultural marketing. Marketing agricultural services to a diverse customer base.

#### **411 Landscape Contract Management**

3(2-2) Fall  
Management of landscape construction and maintenance operations. Working drawing, contracts, bonds, and insurance. Estimating and bidding procedures. Installation techniques for hardscapes and plant material.

#### **413 Sustainable Landscape Practices**

1(3-0) Spring even years (last 5 weeks of semester)  
Prerequisite: HRT 203 and HRT 211 or HRT 212  
Landscape construction and maintenance to minimize adverse environmental effects. Site protection, restoration, plant selection, bioengineering, green roofs, water issues, and maintenance practices.

#### **414 Ornamental Conifers**

1(3-0) Fall odd years (first 5 weeks of sem)  
Prerequisite: HRT 211 or HRT 212 or FOR 204  
Taxonomy, ecology, and production of important conifers for landscape and Christmas trees.

#### **415 Natural Landscapes, Native Plants and Landscape Restoration**

2(2-0) Fall

Natural landscapes, native plants and landscape restoration options for the natural and built environment. Planning and design approaches, site engineering, construction practices, and management guidelines. Case studies, regulatory policies, contract services, resources and issues of concern will be discussed.

#### **419 Landscape Design Practicum**

2-4 Fall, Spring (6 cr maximum)  
Prerequisite: HRT 111 or HRT 311  
Approval of dept; application required.  
Application of landscape design theory and practice to landscape development projects. Client interaction, site visits and design, plan development, and construction and management specifications. Residential, commercial and public landscape projects.

#### **430 Exploring Wines and Vines**

3(3-0) Spring  
Study of wine, its history, production methods, climactic, social and cultural impacts, and economic impact of wine industry as part of modern agriculture. Sensory evaluations of wine are conducted in relationship to food pairings.

#### **441 Plant Breeding and Biotechnology**

3(3-0) Spring even years  
Prerequisite: CSS 101  
Interdepartmental-enroll in CSS 441.  
Plant improvement by genetic manipulation. Genetic variability in plants. Traditional and biotechnological means of creating and disseminating recombinant genotypes and cultivars. Importance of plant breeding to our food system, economy, and environment.

#### **451 Biotechnology Applications for Plant Breeding and Genetics**

3(2-2) Spring  
Interdepartmental-enroll in CSS 451.  
Principles, concepts, and techniques of agricultural plant biotechnology. Recombinant DNA technology, plant molecular biology and transformation in relation to plant improvement.

#### **475 International Studies in Horticulture**

1-6 Spring odd years, summer every year (6 cr maximum)  
Approval of dept, application required.  
Summer Study and travel experience emphasizing contemporary problems, issues, and trends in horticulture.

#### **477 Pest Management I: Pesticides in Management Systems**

3(3-0) Fall even years  
Open to jrs or srs or grad students.  
Interdepartmental - enroll in ENT 477.  
Chemistry, modes of action, and environmental fate of pesticides. Product development and regulation. Social aspects of pesticide use.

#### **478 Pest Management II: Biological Components of Management Systems (W)**

3(2-3) Spring even years  
Prerequisite: ENT 404 or ENT 470 or PLP 405 or CSS 402) and completion of Tier I writing requirement  
Interdepartmental-enroll in ENT 478.  
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**

3(3-0) Spring  
Prerequisite: PLB 105 or BS 110  
Not open to freshmen or 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**

3(3-0) Fall even years  
Prerequisite: BOT 105 or BS 111  
Not open to freshmen or sophomores.  
Current and future roles of biotechnology in agriculture: scientific basis, applications. Environmental, social, and ethical concerns.

#### **490 Independent Study: Horticulture**

1-2 Fall, Spring, Summer (6 cr maximum)  
Prerequisite: HRT 203 and HRT 203L, and HRT 204  
Approval of dept; 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**

1-3 Fall, Spring (6 cr maximum)  
Selected topics in horticulture of current interest and importance.

#### **493 Professional Internship in Horticulture**

3(0-0) Fall, Spring, Summer (6 cr maximum)  
Prerequisite: HRT 203 and HRT 203L, and HRT 204  
Open only to juniors and seniors in ANR.  
Professional career related work experience supervised by a professional horticulturist. Requires 40 hours per week for 12 weeks. Must enroll semester you plan to complete internship.

#### **\*NOTE:**

See MSU Description of Courses Catalog for prerequisites, restrictions, and changes after 1/6/09.