

MICHIGAN STATE
UNIVERSITY

March 8, 2010

MEMORANDUM

TO: Dr. Douglas Estry, Associate Provost for Undergraduate Education
and Dean of Undergraduate Studies

FROM: Dr. Linda O. Stanford, Associate Provost for Academic Services

RE: Request for a New Minor in Horticulture
For Transmittal to the University Committee on Academic Policy (UCAP)

The request referenced above is being sent to the University Committee on Academic Policy (UCAP) in accordance with the *Bylaws for Academic Governance*, 4.4.

UCAP Response Requested:

Please ask the UCAP to consider the request referenced above and provide consultative commentary. Please mail the related materials referenced under the heading Attachments at the end of this memorandum to the UCAP members.

After receiving UCAP's consultative response, the Provost will make a determination to forward or not to forward the request to the University Committee on Curriculum for its approval of curriculum and degree requirements.

If you have any questions, please call Joy Speas, University Curriculum Administrator, at 5-8420.

Thank you.

Attachments:

1. Request to Establish a New Academic Program form dated January 22, 2010; Minor in Horticulture and attachments.



**UNIVERSITY
CURRICULUM
and CATALOG**

Michigan State University
176 Administration Building
East Lansing, Michigan
48824-1046

PH: 517/355-8420
FAX: 517/353-1935

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View a Program		Main Menu
Joy Speas, RO	Friday, 1/22/2010	
Program Name: Horticulture Minor Degree: MNUN Sequence Number: 1	Program Request ID: 1537	
Effective Dates: Summer 2010 - Open Status: Interim Initial Action: New		
Requested Date: 9/25/2009 10:58:18 AM		
<p>1. Department/School/College: 02410 Department of Horticulture</p> <p>2. Name of Program: Horticulture Minor</p> <p>3. Name of Degree: MNUN</p> <p>4. Type of Program: Minor</p> <p>5. Effective Start Semester: Summer 2010</p> <p>6. Target student audience for the program: All undergraduate students at MSU</p> <p>7. Enrollment: What is the expected enrollment per year: 20 What is the minimum enrollment acceptable: 0</p> <p>8. Source of budget for the program: To align academic planning and curricular change, ALL requests for NEW funds must be included in the College's annual planning letter. Provost approval of new funds and the effective date for the new program must align. If funding is not approved, then the program request will not be forwarded to Academic Council. Internal reallocation If new funds, was this request included in the College's annual planning letter? Indicate yes or no. If no, then this is a department or college fund reallocation (If the program is implemented, no additional resources are required.).</p> <p>9. Projected Costs as compared to other programs in unit: Same</p> <p>10. Staff requirement: How many additional staff will be required: 0 Who will provide the primary instruction. Describe any external linkages(industry, government, etc.):</p>		

Faculty currently teaching courses

11. Will additional equipment be required:

Approximate cost: 0

Source of funding:

12. Will additional library materials be required:

Approximate cost: 0

Source of funding: NA

13. Will additional space be required:

Type:

Approximate amount:

14. If the program requirements contain a named concentration, do you wish for the concentration to be noted on the student's transcript?:

No

15. Detailed Description:

15 a. Many MSU students will have careers that involve knowledge of horticulture or they wish to learn more about the subject for personal enjoyment. The minor serves the needs and interests of these students. For example, many students majoring in Landscape Architecture and Turfgrass Management would benefit professionally with additional training in ornamental plants. Students in Ag Business Management may be managing a business where horticulture crops such as tree fruits, vegetable, or ornamentals are grown and marketed. Approximately half of the current students enrolled in our introductory horticulture class (HRT 203) are non-majors from numerous different majors. A minor in Horticulture may give them an incentive to enroll in additional horticulture courses.

15 b. The expertise, faculty, and courses are already in place.

15 c. Courses in the Horticulture Minor are taught by faculty in the Department of Horticulture.

15 d. To provide an opportunity for non-majors to expand their knowledge of horticulture; to gain a fundamental understanding of the science of horticulture; and to tailor their studies to food production, greenhouse and nursery crops, landscape design and management, or plant breeding and genetics based on their interests.

15 e. Faculty involved in developing the program were the HRT Undergraduate Programs Committee with approval of the HRT faculty. Implementation of the program will be by the HRT Chairperson or his/her delegate, who will communicate with undergraduate student advisors in all departments in CANR and be the program contact for interested students outside of CANR.

15 f.

Michigan State University
Assessing Student Outcomes

College: CANR
 Department: Horticulture 02410
 Program or Major: Horticulture Minor
 Program Level: BS
 Contact Person: Brad Rowe, Terrie Hayes

Inventory of Written Statements and Plans

1. Do you have a written mission statement or statement of purpose? **yes** **no**
If yes, please attach a copy or reference where this can be found:

The mission of the Horticulture Department at Michigan State University is to build and sustain world class teaching, research, extension and outreach programs to advance, apply, and disseminate knowledge of horticultural science and related areas of basic plant biology in order to: prepare students for careers in horticulture; improve production and management of horticultural crops and species; improve the environment; and promote human health and personal enrichment.

2. Do you have a written statement of intended educational outcomes describing what a student should know or be able to do when they have completed this program? **yes** **no**
3. Do you have a written method of assessment for measuring student outcomes? **yes** **no**
4. Does your program have a separate accreditation process? **yes** **no**
If yes, please list all accrediting agencies below:

Assessment Methodologies

It is likely that some assessment measures are already in place in this program even if they are not identified as being part of a formal assessment plan. Listed below are some of the assessment methodologies you may be using. Indicate "A" if the method is currently being used; "B" if it is **not** being used but you are interested in using it; and "C" if the method of assessment does not apply to your program.

Direct Methods of Assessment

1. C Comprehensive Examinations
2. C Writing proficiency Examinations
3. C National Examinations assessing subject matter knowledge
4. C Graduate Record Exam General Test
5. C Graduate Record Exam Subject Test
6. C Certification Examinations
7. C Licensure Examinations
8. C Locally developed pre-test or post-test for subject matter knowledge
9. C Senior thesis or major project
10. A Portfolio evaluation of student work
11. C Capstone courses
12. C Audio or Video tape evaluations

Indirect Methods of Assessment

1. A Comparison or benchmarking with peer institutions
2. A Job placement of graduates
3. A Employer surveys
4. A Advisory groups from your profession

5. C Graduate school acceptance rates
6. A Student graduation/retention rates
7. C Exit interviews with students graduating or leaving the program
8. A Student satisfaction surveys
9. A Student course evaluations
- 10.C Focus group discussions
- 11.C Alumni surveys
- 12.C Alumni honors, awards, achievements
- 13.C Analysis of grade distributions
- 14.A Peer review of courses
- 15.A Peer review of program
- 16.A Curriculum/syllabus analysis
- 17.A Community service/volunteerism participation
- 18.A Other: National student competitions against other schools and programs through PLANET (Professional Landcare Network) and MACHS (Mid-America Collegiate Horticulture Society). Some non-majors have been involved in these events and would likely minor in horticulture.

Does your program have an experiential learning component? **yes** **no**
 If yes, how do you assess the student learning outcomes from that experience?

1. A Participate in a class designed to complement the experience
2. A Student journals
3. A Formal evaluation procedures from field-based supervisor
4. A Formal meetings between supervisor, student, and faculty
5. A Formal test of practical skills
6. A Other: Numerous student jobs in the field, greenhouses, and gardens.

Implementation Plans

1. How has your department used any of the indicators above to improve services and programs for students?

Results of S.I.R.S. (Student Instructional Rating System) and S.O.C.T. (Student Opinion of Courses and Teaching) are discussed between the Department Chair and each individual teaching faculty member during an annual evaluation. Exit evaluations are conducted semi-annually with upper division students and results are discussed with faculty directly involved in the teaching of a specific class and with members of the Undergraduate Programs Committee. Positive and negative scores and/or comments are discussed with individual faculty with an emphasis on strengthening classroom material and student involvement in the learning process. These exercises increase the effectiveness of teaching and learning within the Horticulture department.

Undergraduate students have been polled by the Undergraduate Program Committee (UPC) concerning their interest in the concept of multiple one-credit and new topics they would envision being developed. Based on the evaluation of current course offerings, the expertise and interest of faculty, and industry needs, some classes were developed as one- or two-credit modules beginning in fall 2004. A few examples of module courses are Plant Mineral Nutrition (HRT 205), Tree Fruit Production (HRT 332), Berry Crop Production (HRT 335), Applied Crop Improvement (HRT 362), and Sustainable Landscape Practices (HRT 413). Students in each of the classes were surveyed and results were reported to individual instructors and to the UPC.

Oral surveys of the Horticulture Industry Advisory Committee and the Department Alumni Association are compared with input from the Horticulture Organization of Graduate Students, Horticulture Club, and exit interviews of graduating seniors conducted by the Department Chair. Special concentration is given to how the mission of the department

meets the needs of students and industry. Students have given specific feedback on coursework in the areas of increasing the information on sustainable horticulture systems in order to better prepare them for the need to be better environmental stewardship with in the horticulture industry. Many of the one-credit module courses are addressing this issue.

2. When you think about developing and implementing an assessment plan, what concerns do you have?

Time and money involved to assess practical skills. For example, it takes a lot of time to set up and test individual students on their ability to install an irrigation system. The equipment and materials must be available.

15 g. **MINOR IN HORTICULTURE**

This minor is available as an elective to students who are enrolled in bachelor's degree programs at Michigan State University and is designed to serve students with majors in fields other than horticulture who are interested in plants. The minor will provide an opportunity for students to gain a fundamental understanding of the science of horticulture and tailor their studies to food production, greenhouse and nursery crops, landscape design and management, or plant breeding and genetics.

Requirements for the Minor in Horticulture

The student's program of study for the minor must be approved by the Department of Horticulture in advance and in writing. Students who plan to complete the minor must consult with an undergraduate adviser in the Department of Horticulture. With the approval of the department that administers the student's degree program, courses that are used to satisfy the requirements for the minor may also be used to satisfy the requirements for the bachelor's degree. At least 12 credits counted towards the requirements for a student's minor must not be used to fulfill the requirements for that student's major. The student must meet the requirements specified below:

1. All of the following (5 credits):

HRT 203 Principles of Horticulture	3 cr
HRT 204 Plant Propagation	2 cr

2. Select at least 12 credits from the following:

HRT 205 Plant Mineral Nutrition	1 cr
HRT 206 Training and Pruning Plants	1 cr
HRT 211 Landscape Plants I	3 cr
HRT 212 Landscape Plants II	3 cr
*HRT 213 Landscape Maintenance	2 cr
*HRT 213L Landscape Maintenance Field Lab	1 cr
HRT 218 Landscape Irrigation	3 cr
HRT 219 Landscape CAD <i>Computer Aided Design</i>	2 cr
HRT 221 Greenhouse Structures and Management	3 cr
HRT 222 Ornamental Grasses	1 cr
HRT 242 Passive Solar Greenhouses for Protected Cultivation	1 cr
HRT 243 Organic Transplant Production	1 cr
HRT 244 Culinary and Medicinal Herbs	1 cr
HRT 251 Organic Farming Principles and Practices	3 cr

HRT 253 Compost Production and Use	1 cr
HRT 310 Nursery Management	3 cr
HRT 311 Landscape Design and Management Specifications	4 cr
HRT 323 Floriculture Production <i>Horticulture's Pleasants and Animals</i>	3 cr
HRT 332 Tree Fruit Production <i>and Management</i>	1 cr
HRT 335 Berry Crop Production <i>and Management</i>	1 cr
HRT 341 Vegetable Production and Management	3 cr
HRT 361 Applied Plant Physiology	3 cr
HRT 362 Applied Crop Improvement	1 cr
HRT 403 Handling and Storage of Hort Crops	3 cr
HRT 407 Horticulture Marketing	3 cr
HRT 411 Landscape Contract Management	3 cr
HRT 415 Natural Landsc, Native Plants, and Landsc Restoration	2 cr
HRT 417 Sustainable Sites and Environ. Landscape Practices	3 cr
**HRT 475 Study Abroad	3 cr

*HRT 213 and 213L must be taken concurrently.

** Only 3 credits of HRT 475 can be applied to the minor.

Upon completion of the requirements for the Minor in Horticulture, the student should contact the Chairperson of the Department of Horticulture and request certification for the completion of the minor. After the certification is approved by the Chairperson of the Department of Horticulture and the Director of Academic Affairs of the College of Agriculture and Natural Resources, the Office of the Registrar will enter on the student's academic record the name of the minor and the date that it was completed. This certification will appear on the student's transcript.

15 h. Main campus.

15 i. No

15 j. None

16. Are there admissions requirements for this program?:

Grade or grade-point average requirements and if so in which course(s), portfolio requirement, audition, essay, etc. If there are not admission requirements other than those required by the University policy indicate "none".

16. Admissions requirements for the department. 16 a. No grade requirement. 16 b. Open to any undergraduate student meeting university GPA requirements. 16 c. NA 16 d. No 16 e. Undergraduate adviser will notify advisers in other departments. 16 f. If students have qualified for admission to MSU and have maintained the minimum GPA, then they are eligible to enroll in HRT courses assuming they have fulfilled the prerequisites for the specific course. 16 g. See 16 f. 16 h. If a student takes more than the required number of credits to obtain the minor then it may take the student longer to graduate. 16 i. Only those students that now have the opportunity to earn a minor in horticulture. 16 j. Academic advisers in other departments will be notified. Current students will be affected if they choose to pursue a minor in horticulture. 16 k. NA 16 l. Information on the minor will be included in department information for prospective students.

DEPARTMENT LEVEL APPROVAL STATUS

Approved: Department of Horticulture
11/30/2009 8:16:16 PM by William Baird for Randy Beaudry, Acting Chairperson

COLLEGE LEVEL APPROVAL STATUS

Approved: College of Agriculture and Natural Resources
1/22/2010 1:20:51 PM by Eunice Foster for Eunice F. Foster, Associate Dean

COLLEGE OF AGRICULTURE AND NATURAL RESOURCES

1. Request to establish a **Minor in Horticulture** in the Department of Horticulture. The University Committee on Academic Policy (UCAP) will consider this request.

a. **Background Information:**

Many Michigan State University students will have careers that involve knowledge of horticulture or they wish to learn more about the discipline for personal enjoyment. The minor will provide an opportunity for non-majors to expand their knowledge of horticulture; to gain a fundamental understanding of the science of horticulture; and to tailor their studies to food production, greenhouse and nursery crops, landscape design and management, or plant breeding and genetics based on their interests.

b. **Academic Programs Catalog Text:**

The Minor in Horticulture, which is administered by the Department of Horticulture, is designed to provide an opportunity for students to gain a fundamental understanding of the science of horticulture and tailor their studies to food production, greenhouse and nursery crops, landscape design and management, or plant breeding and genetics.

The minor is available as an elective to students who are enrolled in bachelor's degree programs at Michigan State University other than the Bachelor of Science Degree in Horticulture. With the approval of the department and college that administers the student's degree program, the courses that are used to satisfy the minor may also be used to satisfy the requirements for the bachelor's degree. At least 12 unique credits counted towards the requirements for a student's minor must not be used to fulfill the requirements for that student's major.

Students who plan to complete the requirements for the minor should consult an undergraduate adviser in Horticulture.

Requirements for the Minor in Horticulture

			CREDITS
Complete 17 credits from the following:			
1.	Both of the following courses (5 credits):		
	HRT 203	Principles of Horticulture	3
	HRT 204	Plant Propagation	2
2.	Complete 12 credits from the following:		
	HRT 205	Plant Mineral Nutrition	1
	HRT 206	Training and Pruning Plants	1
	HRT 211	Landscape Plants I	3
	HRT 212	Landscape Plants II	3
	HRT 213	Landscape Maintenance	2
	HRT 213L	Landscape Maintenance Field Laboratory	1
	HRT 218	Landscape Irrigation	3
	HRT 219	Landscape Computer Aided Design	2
	HRT 221	Greenhouse Structures and Management	3
	HRT 222	Ornamental Grasses	1
	HRT 242	Passive Solar Greenhouses for Protected Cultivation	1
	HRT 243	Organic Transplant Production	1
	HRT 244	Culinary and Medicinal Herbs	1
	HRT 251	Organic Farming Principles and Practices	3
	HRT 253	Compost Production and Use	1
	HRT 310	Nursery Management	3
	HRT 311	Landscape Design and Management Specifications	4
	HRT 323	Floriculture Production: Herbaceous Perennials and Annuals	3
	HRT 332	Tree Fruit Production and Management	2
	HRT 335	Berry Crop Production and Management	1

HRT	341	Vegetable Production and Management	3
HRT	361	Applied Plant Physiology	3
HRT	362	Applied Crop Improvement	1
HRT	403	Handling and Storage of Horticultural Crops	3
HRT	407	Horticulture Marketing	3
HRT	411	Landscape Contract Management	3
HRT	415	Natural Landscape, Native Plants, and Landscape Restoration	2
HRT	417	Sustainable Sites and Environmental Landscape Practices	3

Effective Summer 2010.

DEPARTMENT of HORTICULTURE

William Vance Baird, Chairperson

The subject of horticulture was first taught at the Agricultural College of the State of Michigan in a combined Department of Botany and Horticulture in 1858. The Department of Horticulture at Michigan State University, the first such department at an institution in the United States, began as an independent department with its first chairperson, Liberty Hyde Bailey in 1883. The department is administered by the College of Agriculture and Natural Resources.

Horticulture is a complex and integrative discipline encompassing the biological, physical, and management sciences and the arts to improve plant production and management, enhance human health, provide personal enrichment, and improve the environment. Horticulture includes floriculture, landscape horticulture, olericulture (vegetables), pomology (fruits), and other plant species. Horticultural crops and their uses connect agricultural producers, consumers, society, and the environment. With over 130 majors in our four-year program and nearly 100 students in our two-year Institute for Agricultural Technology, we have one of the largest undergraduate horticulture programs in the US. We offer two areas of concentration for our four-year students: horticultural science and landscape design, construction and management. Additionally, two on-campus certificate programs administered by the Institute of Agricultural Technology are offered in landscape and nursery management, and organic farming. A landscape and lawn management certificate program is offered in conjunction with Grand Rapids Community College and a landscape and nursery certificate program is offered with Northwestern Michigan College. All of our programs require an internship experience. Our undergraduate curriculum is continuously reviewed and evaluated for opportunities to introduce new concepts, practices, and technologies, and to ensure that the curriculum is well-integrated with practical and hands-on experiences and internships to help students develop problem solving skills in management, design, science, and technology.

Students will have opportunities to enroll in courses online, courses which are integrated with outreach/extension programs (on and off campus) and 1- and 2-credit-module courses offered in 5- and 10- week periods. Students are extensively involved in professional and social activities beyond the classroom: working in research laboratories; assisting in landscape, greenhouse, garden, and nursery operations; running the Horticulture Club's very popular annual spring garden show; and participating in academic and field events associated with the Professional Landcare Network (PLANET) and the Mid-American Collegiate Horticultural Society.

Our classrooms, computer access, and laboratory facilities are housed in a state-of-the-art Plant and Soil Sciences Building. Other facilities include the award-winning Horticultural Demonstration Gardens, the nationally recognized 4-H Children's Gardens, the Lewis Arboretum and the Horticulture Teaching and Research Center (HTRC) on south campus. Our newly established student organic farm is located at the HTRC where ten acres are devoted to a Community Supported Ag (CSA) farm for students to gain practical experience and produce food for CSA members.

UNDERGRADUATE PROGRAM

Horticulture is the science and art concerned with the culture, marketing, and utilization of high-value intensively cultivated plants. Horticultural crops are diverse, including both annual and perennial species, both food and ornamental plants, and plants grown both outdoors and in controlled environments. Horticultural foods and food products, flowers, and landscapes sustain and enrich our lives. The primary horticulture discipline areas include floriculture, landscape horticulture, olericulture (vegetables), and pomology (fruits).

Graduates with a major in horticulture may enter a broad range of challenging and rewarding professional careers in production, management, marketing, education, consulting and service industries, or research. In addition, graduates frequently become entrepreneurs or obtain employment in horticultural business enterprises (e.g., commercial production operations, landscape design/build and maintenance companies, nurseries, retail flower shops, or fruit and vegetable markets). Graduates may also pursue careers in nontraditional areas that require a knowledge of horticulture such as secondary education, the publication industry, or international development.

The academic study of horticulture is by its nature highly integrative. The undergraduate program combines scientific knowledge, knowledge of technology, and problem-solving skills for application in various professions related to horticulture. Students in horticulture study such diverse fundamental disciplines as physical science (chemistry), biological sciences (botany, genetics, plant physiology, entomology, and plant pathology), environmental science (soil science), and business (economics, management, and marketing). Communication and computer skills are also cultivated within the horticulture curriculum. Students complete either the Horticultural Science concentration or the Horticulture Landscape Design, Construction, and Management concentration. In both concentrations, students obtain hands-on experiences through laboratory exercises in the greenhouses, in the horticulture gardens, or at the Horticulture Teaching and Research Center. Field trips expose students to successful horticultural businesses, industries, and support services within Michigan. Students may gain professional work experience through internships, independent study, and part-time employment in research and extension programs within the Department of Horticulture.

Students who are enrolled in the Bachelor of Science degree program with a major in horticulture may elect a Specialization in Agricultural and Natural Resources Biotechnology. For additional information, refer to the *Specialization in Agricultural and Natural Resources Biotechnology* statement.

Requirements for the Bachelor of Science Degree in Horticulture

1. The University requirements for bachelor's degrees as described in the *Undergraduate Education* section of this catalog; 120 credits, including general elective credits, are required for the Bachelor of Science degree in Horticulture.

The University's Tier II writing requirement for the Horticulture major is met by completing Horticulture 404. That course is referenced in item 3. a. below.

Students who are enrolled in the Horticulture major leading to the Bachelor of Science degree in the Department of Horticulture may complete an alternative track to Integrative Studies in Biological and Physical Sciences that consists of the following courses: Plant Biology 105 and 106 and Chemistry 141, 143, and 161. The completion of Plant Biology 106 and Chemistry 161 satisfies the laboratory requirement. Plant Biology 105 and 106 and Chemistry 141, 143, and 161 may be counted toward both the alternative track and the requirements for the major referenced in item 3. below.

The completion of Mathematics 116 or its equivalent in fulfillment of the College of Agriculture and Natural Resources mathematics requirement which also may satisfy the University mathematics requirement.

2. The requirements of the College of Agriculture and Natural Resources for the Bachelor of Science degree.
Certain courses referenced in requirement 3. below may be counted toward College requirements as appropriate.
3. The following requirements for the major:

CREDITS

- a. All of the following courses: 34

CEM 141	General Chemistry	4
CEM 143	Survey of Organic Chemistry	4
CEM 161	Chemistry Laboratory I	1
CSS 210	Fundamentals of Soil Science	3
HRT 203	Principles of Horticulture I	2
HRT 203L	Principles of Horticulture I Laboratory	1
HRT 204	Plant Propagation	2
HRT 205	Plant Mineral Nutrition	1
HRT 206	Training and Pruning Plants	1
HRT 207	Horticulture Career Development	1
HRT 361	Applied Plant Physiology	3
HRT 362	Applied Crop Improvement	1
HRT 404	Horticulture Management (W)	3
HRT 493	Professional Internship in Horticulture	3
PLB 105	Plant Biology	3
PLB 106	Plant Biology Laboratory	1

b. One of the following two concentrations: 33 or 42

Horticultural Science (33 credits):

- (1) All of the following courses (12 credits):
 - CSS 350 Introduction to Plant Genetics 3
 - ENT 404 Fundamentals of Entomology 3
 - HRT 221 Greenhouse Structures and Management 3
 - PLP 405 Plant Pathology 3
- (2) Twelve credits of designated production course work from an approved departmental list.
- (3) One of the following courses (3 credits):
 - HRT 401 Physiology and Management of Herbaceous Plants 3
 - HRT 480 Woody Plant Physiology 3
- (4) Two of the following courses (6 credits):
 - CSS 451 Biotechnology Applications for Plant Breeding and Genetics 3
 - HRT 401 Physiology and Management of Herbaceous Plants 3
 - HRT 403 Handling and Storage of Horticultural Crops 3
 - HRT 407 Horticulture Marketing 3
 - HRT 486 Biotechnology in Agriculture: Applications and Ethical Issues 3

Horticulture Landscape Design, Construction,

and Management (42 credits):

- (1) All of the following courses:
 - ATM 431 Irrigation, Drainage and Erosion Control Systems 3
 - CSS 232 Introduction to Turfgrass Management 3
 - HRT 210 Nursery Management 3
 - HRT 211 Landscape Plants I 3
 - HRT 212 Landscape Plants II 3
 - HRT 311 Landscape Design and Management Specifications 4
 - HRT 411 Landscape Contract Management 3
 - HRT 480 Woody Plant Physiology 3
 - LA 220 Graphic Communication 4
 - LA 330 Site Construction: Materials and Methods 4
 - MTH 116 College Algebra and Trigonometry 5
 - PLP 407 Diseases and Insects of Forest and Shade Trees 4

Insert 1

MINOR IN HORTICULTURE

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The minor is available as an elective to students who are enrolled in bachelor's degree programs at Michigan State University other than the Bachelor of Science Degree in Horticulture. With the approval of the department and college that administers the student's degree program, the courses that are used to satisfy the minor may also be used to satisfy the requirements for the bachelor's degree. At least 12 unique credits counted towards the requirements for a student's minor must not be used to fulfill the requirements for that student's major.

Students who plan to complete the requirements for the minor should consult an undergraduate adviser in Horticulture.

Requirements for the Minor in Horticulture

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2.	Complete 12 credits from the following:		
	HRT 205	Plant Mineral Nutrition	1
	HRT 206	Training and Pruning Plants	1
	HRT 211	Landscape Plants I	3
	HRT 212	Landscape Plants II	3
	HRT 213	Landscape Maintenance	2
	HRT 213L	Landscape Maintenance Field Laboratory	1
	HRT 218	Landscape Irrigation	3
	HRT 219	Landscape Computer Aided Design	2
	HRT 221	Greenhouse Structures and Management	3
	HRT 222	Ornamental Grasses	1
	HRT 242	Passive Solar Greenhouses for Protected Cultivation	1
	HRT 243	Organic Transplant Production	1
	HRT 244	Culinary and Medicinal Herbs	1
	HRT 251	Organic Farming Principles and Practices	3
	HRT 253	Compost Production and Use	1
	HRT 310	Nursery Management	3
	HRT 311	Landscape Design and Management Specifications	4
	HRT 323	Floriculture Production: Herbaceous Perennials and Annuals	3
	HRT 332	Tree Fruit Production and Management	2
	HRT 335	Berry Crop Production and Management	1
	HRT 341	Vegetable Production and Management	3
	HRT 361	Applied Plant Physiology	3
	HRT 362	Applied Crop Improvement	1
	HRT 403	Handling and Storage of Horticultural Crops	3
	HRT 407	Horticulture Marketing	3
	HRT 411	Landscape Contract Management	3
	HRT 415	Natural Landscape, Native Plants, and Landscape Restoration	2
	HRT 417	Sustainable Sites and Environmental Landscape Practices	3