

MICHIGAN STATE UNIVERSITY

September 24, 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 Agricultural Technology Certificate in Viticulture
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 5, 2010: Agricultural Technology Certificate in Viticulture and attachments.



University Curriculum and Catalog

176 Administration Bldg.
East Lansing, MI
48824-1046

517-355-8420
Fax: 517-353-1935

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COLLEGE OF AGRICULTURE AND NATURAL RESOURCES

1. Request to establish a **Agricultural Technology Certificate in The Institute of Agricultural Technology in Viticulture**. The University Committee on Academic Policy (UCAP) will consider this request.

- a. **Background Information:**

The Institute of Agricultural Technology (IAT) provides Michigan State University with a unique niche in its capacity to help educate Michigan citizens and to help diversify the Michigan economy. The acceleration of the vision of the IAT is an initiative to develop partnerships with community colleges throughout Michigan to offer IAT programs at the local level.

Northwestern Michigan College, Lake Michigan College, the Viticulture and Enology Science and Technology Alliance (VESTA) and IAT are collaborating to offer a Viticulture Agricultural Technology Certificate.

In June 2008, a meeting was held in Traverse City with Michigan State University Horticulture faculty, Michigan State University Extension staff, the Michigan State University Institute of Agricultural Technology (IAT) Director and current Acting Associate Director, Michigan Grape and Wine Industry Council Director, wine and grape industry representatives, and administrators from Northwestern Michigan College (NMC) to explore the development of a certificate program in viticulture offered by Michigan State University IAT in partnership with NMC. The identified need for this program came from the wine and grape industry as communicated through Michigan State University Extension staff and the Michigan Grape and Wine Industry Council.

A certificate program in Viticulture and Enology was previously offered by Michigan State University IAT on campus, but was discontinued in Fall 2006 due to low enrollment. The grape and wine industry has continued to expand since that time. This fact as well as the plan to offer the program off-campus in partnership with community colleges in the major wine and grape regions of the state will increase the impact and improve the potential for more sustained student numbers.

Discussions with stakeholders, Department of Horticulture faculty, and IAT administrators continued through Fall 2008 and into 2009. During this period, an agreement with Lake Michigan College in southwest Michigan was being developed, and a Viticulture certificate was proposed as part of this community college partnership.

The Department of Horticulture continued to support the development of a Viticulture certificate, but made it very clear that they did not have the capacity to provide instruction for the program. As a result, IAT explored alternative ways to deliver the program and entered into discussions with the Viticulture and Enology Science and Technology Alliance (VESTA), a Midwest Regional Center of Excellence for online grape and wine education supported by a National Science Foundation Advanced Technical Education grant. IAT subsequently became an Alliance member.

The viticulture-specific portion of the curriculum for the Viticulture certificate is delivered through online VESTA courses.

Graduates of this program will have the opportunity to gain the following general skills:

- Basic understanding of technical math needed for budgeting, pesticide application, and business and technical operations in viticulture.
- Written and verbal communication skills needed to: prepare and deliver presentations; create narratives for budgets, strategic and maintenance plans and management goals; communicate effectively with supervisors, employees and the public.
- Computer skills to develop and maintain routine technical records and plans; office applications including but not limited to Word, PowerPoint, and Excel; internet skills and social networking.
- Some general knowledge of the wine and juice grape industry.

Graduates of this program will have the opportunity to develop the following technical skills:

- A general understanding of plant growth and development.
- Workplace safety.
- General vineyard establishment, maintenance and production, including harvesting and processing.
- Specific skills to manage vineyards.
- Pest management strategies and integrated pest management practices for grapes; and the specific knowledge to pass the Michigan Certified Pesticide Applicator private core exam.
- A general understanding of soils and soil science; and a specific understanding of water needs of grapes, irrigation timing, scheduling and the repair and maintenance of an irrigation system used in vineyards.

Graduates of this program will also receive extensive hands-on training and education through a required internship working with industry and via specific labs and practica in a variety of courses. This practical experience will further enhance the student's ability to be prepared for the job market or to continue his/her education.

The educational objectives are aligned with the educational objectives of the college and university with regard to providing experiential learning, promoting the development of critical thinking, and helping students develop the "soft" skills associated with leadership, entrepreneurship, and career development.

b. **Academic Programs Catalog Text:**

The Viticulture certificate is delivered in partnership between Northwestern Michigan College, Lake Michigan College, the Viticulture and Enology Science and Technology Alliance (VESTA), and the Michigan State University Institute of Agricultural Technology. The combination of online viticulture courses delivered by experts from throughout the United States, hands-on experience at local vineyards, fresh markets, juice processors, packing plants and wineries and fundamental plant science courses provide graduates with the specific expertise and skills needed for careers in the rapidly expanding grade industry – supplying grapes for table, juice and wine making.

Graduates of the program will receive a certificate from the Michigan State University Institute of Agricultural Technology. Students may continue their course work to obtain an Associate in Applied Science Degree from the community college partners in addition to the certificate from Michigan State University. Should students wish to continue their education, the appropriate pre-designated credits may be applied to a bachelor's degree program at Michigan State University if students meet the established transfer guidelines.

Requirements for Viticulture

1. All of the following courses (15 credits):

AT	293	Professional Internship in Agricultural Technology	3
ENT	110	Applied Entomology for Ornamentals and Turf	3
ESA	225	Land and Environmental Issues in Law and Policy	3
HRT	334	Current Issues in Viticulture and Enology	1
HRT	432	Principles and Practices of Grape Production I	3
PLP	200	Plant Diseases and their Pathogens	3
2. Complete additional course work through Northwestern Michigan College or Lake Michigan College as well as 16 credits through the Viticulture and Enology Science and Technology Alliance. All course work must be approved by the student's academic advisor.

Effective Spring 2011.

View a Program		Main Menu
Joy Speas, RO	Tuesday, 2/2/2010	
Program Name: Viticulture Degree: ATCT Sequence Number: 1	Program Request ID: 1555	
Effective Dates: Spring 2010 - Open Status: Interim Initial Action: New		
Requested Date: 10/14/2009 12:21:01 PM		
<p>1. Department/School/College: 02042 Institute of Agricultural Technology</p> <p>2. Name of Program: Viticulture</p> <p>3. Name of Degree: ATCT</p> <p>4. Type of Program:</p> <p>5. Effective Start Semester: Spring 2010 <i>Summer</i></p> <p>6. Target student audience for the program: Students desiring a certificate in viticulture in the Inst of Ag Technology</p> <p>7. Enrollment: What is the expected enrollment per year: 20 What is the minimum enrollment acceptable: 10</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. New Funds 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.). Additional programming funded via a loan from the Provost to the Institute of Agriculture Technology, and the first year of funding has been released for 2009-10 (part of a revenue-based initiative).</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</p>		

Who will provide the primary instruction. Describe any external linkages(industry, government, etc.):

Adjunct instructors who are experts in the Viticulture industry. Linkages with Viticulture and Enology Science and Technology Alliance (VESTA) and NSF Regional Center of Excellence; Community Colleges in Northwest and Southwest Michigan; Michigan Grape Growers.

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: None.

13. Will additional space be required:

Type:

Approximate amount: None.

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. Detailed description:

15a. In June 2008, a meeting was held in Traverse City with MSU Horticulture faculty, MSUE staff, the MSU Institute of Agricultural Technology (IAT) Director and current Acting Associate Director, Michigan Grape and Wine Industry Council Director, wine and grape industry representatives, and administrators from Northwestern Michigan College (NMC) to explore the development of a certificate program in viticulture offered by MSU IAT in partnership with NMC. The identified need for this program and the driver for this meeting came from the wine and grape industry as communicated through MSUE staff and the Michigan Grape and Wine Industry Council.

A certificate program in Viticulture and Enology was previously offered by MSU IAT on campus, but was cancelled in Fall 2006 due to low enrollment. The grape and wine industry has continued to expand since that time. This fact as well as the plan to offer the program off-campus in partnership with community colleges in the major wine and grape regions of the state will increase the impact and improve the potential for more sustained student numbers.

Discussions with stakeholders, Department of Horticulture faculty, and IAT administrators continued through Fall 2008 and into 2009. During this period, an agreement with Lake Michigan College in southwest Michigan was being developed, and a Viticulture certificate was proposed as part of this community college partnership.

The Department of Horticulture (HRT) continued to support the development of a Viticulture certificate, but made it very clear that they did not have the capacity to provide instruction for the program. As a result, IAT explored alternative ways to deliver the program and entered into

discussions with the Viticulture and Enology Science and Technology Alliance (VESTA), a Midwest Regional Center of Excellence for on-line grape and wine education supported by a National Science Foundation Advanced Technical Education grant. IAT subsequently became an Alliance member.

The viticulture-specific portion of the curriculum for the Viticulture certificate is delivered through on-line VESTA courses.

15b. The Department of Horticulture has historically served the wine and grape industry in Michigan and continues to effectively serve this growing industry. Viticulture falls under the discipline of horticulture.

15c. The program is housed in the Institute of Agricultural Technology (IAT) in the College of Agriculture and Natural Resources (CANR). The expertise for the industry resides in HRT in CANR. The Institute partners with HRT in order to offer the viticulture program and Horticulture has curricular oversight for the program. However, IAT is the only unit of CANR that has the authority to award pre-associate credit-bearing certificates.

15d. Educational Objectives: Graduates of this program will have the following general skills:

- A basic understanding of technical math needed for budgeting, pesticide application, and business and technical operations in viticulture.
- Written and verbal communication skills needed to: prepare and deliver presentations; create narratives for budgets, strategic and maintenance plans and management goals; communicate effectively with supervisors, employees and the public.
- Computer skills to develop and maintain routine technical records and plans; office applications including but not limited to Word, PowerPoint, and Excel; internet skills and social networking.
- Some general knowledge of the wine and juice grape industry

Graduates of this program will have the following technical skills:

- A general understanding of plant growth and development
- Workplace safety
- General vineyard establishment, maintenance and production, including harvesting and processing
- Specific skills to manage vineyards
- Pest management strategies and integrated pest management practices for grapes; and the specific knowledge to pass the Michigan Certified Pesticide Applicator private core exam.
- A general understanding of soils and soil science; and a specific understanding of water needs of grapes, irrigation timing, scheduling and the repair and maintenance of an irrigation system used in vineyards.

Graduates of this program will also receive extensive hands-on training and education through a required internship working with industry and specific labs and practicum in a variety of courses. This practical experience will further enhance the student's ability to be prepared for the job market or to continue their education.

The educational objectives are aligned with the educational objectives of the college and university with regard to providing experiential learning, promoting the development of critical

thinking, and helping students develop the “soft” skills associated with leadership, entrepreneurship, and career development.

15e. Faculty who were instrumental in developing the program are Thomas Smith, Paolo Sabbatini and Ron Perry. They will be instrumental in implementing the program.

15f. The plan for assessing the program is explained in the outcomes assessment form that is included later in this document.

15g. Program description: The Certificate in Viticulture provides students with an excellent background in plant science along with the specific expertise and skills needed for careers in the rapidly expanding grape industry - supplying grapes for table, juice and wine making. This skill and expertise is in demand in Michigan and throughout North America and beyond. The combination of on-line viticulture courses delivered by experts from throughout the United States, hands-on experience at local vineyards, fresh markets, juice processors, packing plants and wineries and the fundamental plant science courses makes graduates in the Viticulture program in high demand.

Graduates of the program receive a Certificate from the MSU Institute of Agricultural Technology. Students may continue their class work to obtain an Associates Degree in Applied Science (AAS) from the community college partners. Should students wish to continue their education, the appropriate pre-designated credits will transfer to a bachelors program at MSU if students meet the established transfer guidelines.

15h. This program is offered only off-campus in southwest Michigan in partnership with Lake Michigan College and in northwest Michigan in partnership with Northwestern Michigan College, West Shore Community College, North Central Michigan College and Kirtland Community College. It may be offered at additional locations should the need arise in the future.

15i. NA

15j. NA

Viticulture Certificate in partnership with Northwestern Michigan College (NMC)

Michigan State University

HRT 334	Current Issues in Viticulture and Enology	1
PLP 200	Plant Diseases and their Pathogens	3
-ENT 111	Basics of Applied Entomology	3 2
✓AT 293	Professional Internship in Agriculture Technology	3
ESA 225	Land and Environmental Issues in Law <i>and Policy</i>	3
HRT 432	Principles and Practices of Grape Production I	<u>3</u>
		16 15

Northwestern Michigan College

ECO 201 or 202	Principles of Macroeconomics	3
ENG 111	English Composition	4
BIO 108	Plant Biology	4
CHM 101	Introductory Chemistry	4
CIS 100	An Introduction to Computers in Business	3

MTH 111	Intermediate Algebra	<u>4</u> 22
Viticulture and Enology Science and Technology Alliance (VESTA)		
VIN 111	Introduction to Viticulture and Vineyard Establishment	3
VIN 113	Winter Viticulture Technology	2
VIN 114	Spring Viticulture Technology	2
VIN 115	Summer and Fall Viticulture Technology	2
VIN 190	Vineyard Safety	1
VIN 293	Soils for Viticulture	3
<i>Elective:</i>		
VIN 146	Introduction to Enology	3
or VIN 266	Sensory Evaluation	<u>3</u>
Required for graduation		16 ⁵³ 54 credits

Viticulture Certificate in partnership with Lake Michigan College

Michigan State University		
HRT 334	Current Issues in Viticulture and Enology	1
PLP 200	Plant Diseases and their Pathogens	3
ENT 111	Basics of Applied Entomology	3 2
AT 293	Professional Internship in Agriculture Technology	3
ESA 225	Land and Environmental Issues in Law	3
HRT 432	Principles and Practices of Grape Production I	<u>3</u>
		16 ¹⁵

Lake Michigan College		
BUSA 203	Principles of Economics (Macro)	3
ENGL 101	English Composition	3
BIOL 112	Principles of Biology II	4
CHEM 101	Introductory Chemistry	4
CIS 100	Introduction to Computer Literacy	3
MATH 122	Intermediate Algebra	<u>4</u>
		21

Viticulture and Enology Science and Technology Alliance		
VIN 111	Introduction to Viticulture and Vineyard Establishment	3
VIN 113	Winter Viticulture Technology	2
VIN 114	Spring Viticulture Technology	2
VIN 115	Summer and Fall Viticulture Technology	2
VIN 190	Vineyard Safety	1
VIN 293	Soils for Viticulture	3
<i>Elective:</i>		
VIN 146	Introduction to Enology	3
or		
VIN 266	Sensory Evaluation	<u>3</u>
Required for graduation		16 ⁵² 53 credits

Michigan State University

Assessing Student Outcomes

College: Agriculture and Natural Resources
 Department: Institute of Agricultural Technology (IAT)
 Program or Major: Viticulture
 Program Level: Certificate
 Contact Person: Dr. Eunice Foster

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:

Viticulture Mission Statement
 11-9-09

To educate and train students for careers and for entrepreneurship in the rapidly expanding grape industry – supplying grapes for table, juice, and wine making-- thereby enabling students to become leaders and active participants in the grape and wine industry in Michigan, throughout North America, and the world.

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. A 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. A Licensure Examinations
8. B Locally developed pre-test or post-test for subject matter knowledge
9. C Senior thesis or major project
10. C Portfolio evaluation of student work
11. C Capstone courses
12. C Audio or Video tape evaluations

Indirect Methods of Assessment

1. C 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. A Exit interviews with students graduating or leaving the program
8. A Student satisfaction surveys
9. A Student course evaluations
10. B Focus group discussions
11. A Alumni surveys
12. B 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. C Community service/volunteerism participation
18. Other:

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. C Student journals
3. A Formal evaluation procedures from field-based supervisor
4. A Formal meetings between supervisor, student, and faculty
5. C Formal test of practical skills
6. Other:

Implementation Plans

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

We are fully integrating our Career Services specialist in evaluating program success relative to job placement.

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

Trying to assure that the assessment plan accurately reflects future success in the job market.

**Return this form to: Kelly Funk
221 Administration Building**

Assessing Student Outcomes modified and used with permission, Dr. Sharron L. Ronco, Florida Atlantic University

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".

None

DEPARTMENT LEVEL APPROVAL STATUS

Approved: Institute of Agricultural Technology
1/4/2010 10:57:46 PM by Eunice Foster for Eunice F. Foster, Director

SIGNOFFS STATUS

Signed Off: Department of Community, Agriculture, Recreation and Resource Studies
1/5/2010 11:31:56 AM by Richard Paulsen for David Wright, Acting Chairperson

Signed Off: Department of Entomology
1/5/2010 9:11:42 AM by Heather Lenartson-Kluge for Ernest Delfosse, Chairperson

Signed Off: Department of Horticulture
1/5/2010 6:37:42 AM by William Baird for William V. Baird, Chairperson

Signed Off: Department of Plant Pathology

1/5/2010 7:40:55 AM by Ray Hammerschmidt for Ray Hammerschmidt, Chairperson

COLLEGE LEVEL APPROVAL STATUS

Approved: College of Agriculture and Natural Resources
1/5/2010 1:16:11 PM by Eunice Foster for Eunice F. Foster, Associate Dean

INSTITUTE of AGRICULTURAL TECHNOLOGY

Eunice F. Foster, Director

Founded in 1894, the Institute of Agricultural Technology delivers innovative, educational programs that develop career-ready graduates through intensive, practical learning and skill enhancement in agricultural, environmental, and applied technologies. The Institute seeks to prepare students for dynamic careers in a changing world. Certificate programs vary from 10 to 24 months in length, are highly respected statewide and nationally, and several have international reputations. Classes are taught by faculty and staff in the College of Agriculture and Natural Resources, so students gain from the research and extension programs at Michigan State University. For additional information on any of the certificate programs, write to the Institute of Agricultural Technology, Michigan State University, 120 Agricultural Hall, East Lansing, MI 48824-1039.

PROGRAMS

Agricultural Industries

One of every six jobs in the American economy is related to agricultural and food businesses. The curriculum in the Agricultural Industries program is designed to provide students with the technical and business skills necessary to be successful in any of these related fields. Career opportunities range from managing a farm or business (cash crop, animal, or fruit/vegetable) to working in the banking or farm credit industries. Ample opportunities are available in the management of farm supply stores or cooperatives, in agricultural input sales, in the insurance field, or in a number of agricultural processing and manufacturing industries.

The Agricultural Industries program allows students to customize their educational program to fit their own personal career goals. This program has two main areas of study—agronomy and business. However, the student who has an interest in the animal industry may obtain foundational knowledge in the species of his/her choice.

Requirements for Agricultural Industries

CREDITS

The student must complete 48 credits from the following:

1. All of the following courses (30 to 33 credits):

ABM 100	Decision-making in the Agri-Food System	3
ABM 130	Farm Management I	3
AT 045	Agricultural Communications	2
AT 055	Agricultural Finance	3
AT 071	Technical Mathematics	2
AT 291	Selected Topics in Agricultural Technology	2
AT 293	Professional Internship in Agricultural Technology	3 to 6
CSS 101	Introduction to Crop Science	3
CSS 105	Agricultural Industries Seminar	1
CSS 110	Computer Applications in Agronomy	2
CSS 120	Agricultural Industry Issues	3
CSS 302	Principles of Weed Management	3
2. One of the following courses (3 credits):

ABM 222	Agribusiness and Food Industry Sales (W)	3
ABM 225	Commodity Marketing I	3
3. Complete 12 to 15 credits from the following:

AE 150	Metal Fabrication Technology	2
AE 252	Gasoline and Diesel Engine Technology	3
AE 261	Principles of Animal Environments	2
ANS 110	Introductory Animal Agriculture	4
ANS 141	Draft Horse Basics	2
ANS 200A	Introductory Judging of Livestock or Carcass	1 or 2
ANS 203	Principles of Livestock Feeding	2
ANS 205	Reproduction in Livestock	2

ANS	211	Animal and Product Evaluation	3
ANS	222	Introductory Beef Cattle Management	3
ANS	232	Introductory Dairy Cattle Management	3
ANS	272	Introductory Swine Management	3
AT	291	Selected Topics in Agricultural Technology	2 to 6
CSS	124	Introduction to Sustainable Agriculture and Food Systems	1
CSS	135	Crop Scouting and Investigation	2
CSS	151	Seed and Grain Quality	2
CSS	201	Forage Crops	3
CSS	210	Fundamentals of Soil Science	3
CSS	212	Advanced Crop Production	2
CSS	222	New Horizons in Biotechnology	2
CSS	251	Organic Farming Principles and Practices	3
CSS	294	Issues in International Agriculture	1
ENT	111	Basics of Applied Entomology	2
HRT	203	Principles of Horticulture	3
HRT	205	Plant Mineral Nutrition	1
HRT	206	Training and Pruning Plants	1
HRT	335	Berry Crop Production and Management	1
HRT	341	Vegetable Production and Management	3
PLP	105	Fundamentals of Applied Plant Pathology	2
TSM	343	Principles of Precision Agriculture	3

Applied Plant Science

Employment and career opportunities continue to expand for those who have training and educational preparation in applied plant science. In response to this regional plant industry need, Northwestern Michigan College (NMC) and Lake Michigan College (LMC) partner with Michigan State University to offer a combined program, which enables students to complete an Associate of Applied Science degree through Northwestern Michigan College or Lake Michigan College as well as an MSU Institute of Agricultural Technology certificate - without leaving their local area.

Bringing together the world-acclaimed expertise of Michigan State University's College of Agriculture and Natural Resources and the "close to home" convenience of outstanding community colleges, the Applied Plant Science program prepares graduates for a wide range of employment and career choices. Each student receives personal, one-on-one help in selecting her/his program of study (including workplace internship). Students may earn their certificate in Applied Plant Science with concentrations in Commercial Horticulture Operations, Commercial Turfgrass Operations, or Landscape Horticulture.

Requirements for Applied Plant Science

1. All of the following courses (21 credits):

AT	293	Professional Internship in Agricultural Technology	3
CSS	210	Fundamentals of Soil Science	3
ENT	111	Basics of Applied Entomology	3
ESA	225	Land and Environmental Issues in Law and Policy	3
HRT	213	Landscape Maintenance	2
HRT	215	Landscape Industries Seminar	1
HRT	218	Landscape Irrigation	3
PLP	200	Plant Diseases and Pathogens	3
2. One of the following concentrations (9 credits):

Commercial Horticulture Operations
 Complete 9 credits from the following:

HRT	205	Plant Mineral Nutrition	1
HRT	208	Pruning and Training Systems in Horticulture	3
HRT	221	Greenhouse Structures and Management	3
HRT	242	Passive Solar Greenhouses for Protected Cultivation	1
HRT	251	Organic Farming Principles and Practices	3
HRT	253	Compost Production and Use	1
HRT	332	Tree Fruit Production and Management	2
HRT	335	Berry Crop Production and Management	1
HRT	341	Vegetable Production and Management	3

Commercial Turfgrass Operations

 1. All of the following courses:

CSS	202	The World of Turf	2
CSS	203	Applied Turf Management	1
CSS	290	Independent Study in Crop and Soil Science	1
CSS	292	Management of Turfgrass Weeds	3
 2. Complete a minimum of 2 credits from the following:

CSS	181	Pesticide and Fertilizer Application Technology	3
HRT	111	Landscape Design	3
HRT	208	Pruning and Training Systems in Horticulture	3
HRT	211	Landscape Plants I	3
HRT	212	Landscape Plants II	3
HRT	214	Landscape and Turfgrass Business Operations	2
HRT	290	Independent Study in Horticulture	2

Landscape Horticulture
 All of the following courses:

- HRT 111 Landscape Design 3
- HRT 211 Landscape Plants I 3
- HRT 212 Landscape Plants II 3
- 3. One of the following:
 - a. Complete 21 credits of course work from Lake Michigan College as approved by the student's academic advisor.
 - b. Complete 22 credits of course work from Northwestern Michigan College as approved by the student's academic advisor.

Beef Cattle Management

This program allows specialization in the area of beef cattle management in a one-year intensified program. It provides knowledge and experience in the management of both cow/calf and feedlot enterprises. There is a demand for industrious young people with practical experience to fill positions of responsibility as herd managers, assistant herd managers, and other livestock-related jobs.

Agriculture, in this rapidly changing era, requires aggressive young people who have specialized training in modern scientific practices. While the demands for success are great, the opportunities for success are limited only by a person's desires or imagination.

Requirements for Beef Cattle Management

CREDITS

- The student must complete 35 credits from the following:
1. All of the following courses:
 - ANS 110 Introductory Animal Agriculture 4
 - ANS 122A Feedlot Clerkship 2
 - ANS 122B Beef Cow Calf Clerkship 2
 - ANS 203 Principles of Livestock Feeding 2
 - ANS 205 Reproduction in Livestock 2
 - ANS 222 Introductory Beef Cattle Management 3
 - AT 045 Agricultural Communications 2
 - AT 071 Technical Mathematics 2
 - AT 293 Professional Internship in Agricultural Technology 6
 2. Both of the following courses:
 - ABM 100 Decision-making in the Agri-Food System 3
 - ABM 130 Farm Management I 3
 3. Complete 7 credits of elective course work 7

Dairy Management

Because dairy farming is among the leading agricultural enterprises in Michigan, the dairy program has been developed to meet the specialized needs of the herd manager and commercial dairy farmer. Opportunities abound for persons with the combination of classroom training in the areas of dairy husbandry, nutrition, artificial insemination, crops, and farm management and the practical experience that may be obtained on any of the many co-operating dairy farms in Michigan and the surrounding states.

Programs of study tailored to meet the individual's wants and needs are designed around the subject matter areas of agricultural economics, communications, crop and soil sciences, and agricultural mechanics. Additionally, students learn about the continuing changes in rural living, which have a great influence on agriculture.

Requirements for Dairy Management

CREDITS

- The student must complete 48 credits from the following:
1. All of the following courses (32 credits):
 - ANS 132 Dairy Farm Management Seminar 1
 - ANS 203 Principles of Livestock Feeding 2
 - ANS 205 Reproduction in Livestock 2
 - ANS 215 Growth, Health and Lactation in Dairy Cattle 2
 - ANS 222 Introductory Beef Cattle Management 3
 - ANS 230 Dairy Herd Management 3
 - ANS 232 Introductory Dairy Cattle Management 3
 - ANS 233 Dairy Feed Management 3
 - ANS 235 Dairy Herd Reproduction 2
 - ANS 238 Dairy Health Management 3
 - AT 045 Agricultural Communications 2
 - AT 071 Technical Mathematics 2
 - AT 291 Selected Topics in Agricultural Technology 2
 - AT 293 Professional Internship in Agricultural Technology 6
 - CSS 110 Computer Applications in Agronomy 2

2. Complete 16 credits of elective course work from the following:		
ABM 100	Decision-making in the Agri-Food System	3
ABM 130	Farm Management I	3
ABM 225	Commodity Marketing I	3
ANS 110	Introductory Animal Agriculture	4
ANS 222	Introductory Beef Cattle Management	3
AT 055	Agricultural Finance	3
CSS 101	Introduction to Crop Science	3
CSS 120	Agricultural Industry Issues	3
CSS 201	Forage Crops	3
CSS 212	Advanced Crop Production	2

Electrical Technology

There is a need for highly trained electricians. Electrical contractors need electricians capable of planning complex wiring and solving difficult wiring problems. Wiring systems today are complex. In some cases, equipment breakdowns must be repaired promptly to avoid devastating losses.

The Electrical Technology program is a complete electrical apprenticeship program recognized by the State Electrical Administrative Board. Graduates of the program receive credit for two years of experience by completing only 15 months of training. Four years of experience are required for the State Journeyman Electrician License Exam.

The program covers residential, farm, commercial, and industrial wiring; single and three phase motors and generators; electrical control systems wiring, design and troubleshooting; lighting system design; electrical system design; heating; animal and human environment control; electrical estimating; and electrical business management.

Grounds Management

The Grounds Management certificate is delivered in partnership between Wayne County Community College District and the Michigan State University Institute of Agricultural Technology. It is designed for persons interested in careers managing commercial, private, school, or community athletic facilities and landscapes.

Graduates of the program will receive a certificate from the Michigan State University Institute of Agricultural Technology and will have the opportunity to complete a test to become a certified pesticide applicator with the Michigan Department of Agriculture. Additional course work may lead to a Certificate in Grounds Management from Michigan State University and a Certificate in Facilities Maintenance from Wayne County Community College District, making the graduate more qualified to manage both indoor and outdoor facilities. Students may continue their course work to obtain an Associate in Applied Science Degree from Wayne County Community College District in addition to the certificate from Michigan State University.

Requirements for Grounds Management

The student must complete 50 credits from the following:

1. All of the following courses (25 credits):

AT 291	Special Topics in Agricultural Technology	1
AT 293	Professional Internship in Agricultural Technology	3
CSS 202	The World of Turf	2
CSS 203	Applied Turf Management	1
CSS 210	Fundamentals of Soil Science	3
CSS 269	Turfgrass Strategies: Integration and Synthesis	2
CSS 292	Management of Turfgrass Weeds	3
ENT 111	Basics of Applied Entomology	2
HRT 214	Landscape and Turfgrass Business Operations	2
HRT 218	Landscape Irrigation	3
PLP 104	Applied Plant Pathology for Ornamentals and Turf	3
2. Complete 25 credits of course work from Wayne County Community College District as approved by the student's academic advisor.

Horse Management

The horse management program places emphasis on acquisition of equine husbandry skills that will prepare students for jobs in the ever-growing horse industry or for the management of their own farms and horses. Students are required to complete a one-semester placement training experience working with professionals in the horse industry. Study abroad opportunities may also be incorporated into the student's program. The horse industry has exciting job opportunities for students who have a passion for horses and a strong work ethic. Students who complete this program will be prepared for positions ranging from assistant trainers to managers of small farms and from racetrack groomers to tack and equipment sales personnel.

Requirements for Horse Management

			CREDITS
The student must complete 48 credits from the following:			
1. All of the following courses (37 to 40 credits):			
ABM 130	Farm Management I	.....	3
ANS 140	Fundamentals of Horsemanship	.....	2
ANS 145	Horse Behavior and Welfare	.....	1
ANS 146	Fundamentals of Horse Training	.....	3
ANS 147	Horse Management Placement Seminar	.....	1
ANS 149	Horse Management Clerkship	.....	2
ANS 200D	Introductory Judging of Horses	.....	2
ANS 203	Principles of Livestock Feeding	.....	2
ANS 205	Reproduction in Livestock	.....	2
ANS 240	Horse Farm Management	.....	3
ANS 242	Introductory Horse Management	.....	3
ANS 243	Horse Nutrition and Feeding	.....	2
ANS 245	Horse Exercise Physiology	.....	2
AT 045	Agricultural Communications	.....	2
AT 071	Technical Mathematics	.....	2
AT 293	Professional Internship in Agricultural Technology	.....	6
CSS 110	Computer Applications in Agronomy	.....	2
2. Complete 8 to 11 credits of elective course work from the following:			
ANS 110	Introductory Animal Agriculture	.....	4
ANS 141	Draft Horse Basics	.....	2
ANS 142	Horse Training for Competition	.....	2
ANS 148	Methods of Instructing Safe Horsemanship	.....	2
ANS 290	Independent Study in Agricultural Technology	.....	2 to 6
ANS 300D	Advanced Horse Judging	.....	2
AT 291	Selected Topics in Agricultural Technology	.....	2
CSS 201	Forage Crops	.....	3
KIN 125	First Aid and Personal Safety	.....	3
Study abroad	.....	.....	6

Landscape and Nursery

The current demand for landscape horticulturalists is due to the rapid expansion in industrial and home landscapes as well as city, state, and environmental improvement projects. Graduates of the landscape and nursery program work as owners, managers, buyers, or salespersons in retail firms, commercial landscape construction, and nursery production firms as well as for private enterprises.

The program combines the theories and principles of classroom instruction with the practical experience of placement training. Although the emphasis is on landscape and nursery, other important aspects of a college education are included. Students are required to take courses in fields such as communications, botany, biochemistry, soil science, plant diseases, and personnel practices.

The Landscape and Nursery Program is offered by the Department of Horticulture in cooperation with the Institute of Agricultural Technology.

Landscape and Lawn Management

The Landscape and Lawn Management program is a unique partnership between the Michigan State University College of Agriculture and Natural Resources' Institute of Agricultural Technology and Grand Rapids Community College. This program provides students an opportunity to gain the necessary skills for a success-

ful career in the billion-dollar landscape and nursery industry without leaving the Grand Rapids area. Graduates of the program work as owners, managers, buyers, or salespersons in retail firms, commercial landscape construction and maintenance operations, and as well as for private enterprises.

The program combines the theories and principles of classroom instruction with the practical experience of placement training. Although the emphasis is on landscape and lawn management, other important aspects of a college education are included. Students are required to take courses in fields such as written communications, botany, business management, computer science, soil science, plant pathology, entomology, ornamental plant identification, and much more.

Upon completion of the program requirements for the certificate, students also have the option of completing 18 additional credits at Grand Rapids Community College to obtain an Associate of Applied Arts and Sciences degree. The additional courses are in business, chemistry, written communications, humanities, and social science.

Organic Farming

Organic farming is one of the fastest growing and expanding areas of agriculture. There are viable business opportunities for small-scale producers to meet the consumer demand for fresh, local vegetables, fruits and herbs by marketing at the growing number of farmer's markets, community supported agriculture (CSA) farms, as well as other direct and wholesale markets. This program is a 12-month (January to December) introduction to intensive and year-round organic farming. The organic farming program consists of course work, the operation of a diversified small-scale organic farm on the Michigan State University campus, and a 16-week placement training or apprenticeship on a working farm or with a community or urban garden project. Emphasis is on the production of vegetables, fruit, herbs, and cut flowers with CSA and farm stand marketing. Winter production occurs in unheated and heated greenhouses. The curriculum includes how to build and maintain soil quality and fertility primarily with on-farm resources and farming methods that cultivate a diverse, profitable and resilient farm. No previous farming experience is required. This program is especially suitable for applicants seeking a new direction and employment related to organic farming and gardening, community and urban garden projects, and other food system and environmental careers.

Requirements for Organic Farming

	CREDITS
1. All of the following courses (26 credits):	
AT 045 Agricultural Communications	2
AT 071 Technical Mathematics	2
HRT 242 Passive Solar Greenhouses for Protected Cultivation ..	1
HRT 243 Organic Transplant Production	1
HRT 251 Organic Farming Principles and Practices	3
HRT 252 Organic Certification and Farm Plans	1
HRT 253 Compost Production and Use	1
HRT 256 Organic Produce Direct Marketing	1
HRT 257 Organic Produce Wholesale Marketing	1
HRT 258 Study a Farm	3
HRT 259A Student Organic Farm Practicum I	3
HRT 259B Student Organic Farm Practicum II	4
HRT 259C Student Organic Farm Practicum III	3
2. One of the following courses (2 or 3 credits):	
HRT 109 Introduction to Applied Plant Science	2
PLB 105 Plant Biology	3
3. Complete a minimum of 10 credits from the following:	
ANS 110 Introductory Animal Agriculture	4
AT 291 Selected Topics in Agricultural Technology	2
AT 293 Professional Internship in Agricultural Technology ..	3
CSS 101 Introduction to Crop Science	3
CSS 110 Computer Applications in Agronomy	2
CSS 201 Forage Crops	3
CSS 210 Fundamentals of Soil Science	3
CSS 212 Advanced Crop Production	2
CSS 360 Soil Biology	3
HRT 221 Greenhouse Structures and Management	3

HRT	244	Culinary and Medicinal Herbs	1
HRT	245	Specialty Cut Flowers	1
HRT	290	Independent Study in Horticulture	1 or 2
HRT	332	Tree Fruit Production and Management	2
HRT	335	Berry Crop Production and Management	1
HRT	341	Vegetable Production and Management	3
PLP	105	Fundamentals of Applied Plant Pathology	2

Turfgrass Management

A rapidly expanding turfgrass industry offers many challenging job opportunities for trained personnel. The growing demand for recreational areas and rededication to the maintenance of beauty in America has created a shortage of turfgrass specialists.

Golf Course Emphasis

The golf course emphasis provides the fundamentals of turfgrass technology necessary primarily for the supervision and management of golf courses. Attractive starting salaries and many job opportunities are available with excellent potential for advancement. Previous work experience on a golf course maintenance crew is expected.

Requirements for the Golf Course Emphasis

CREDITS

All of the following courses (54 credits):

AT	291	Selected Topics in Agricultural Technology	4
AT	293	Professional Internship in Agricultural Technology	3
CSS	110	Computer Applications in Agronomy	2
CSS	171	Operations Budgeting for Golf Course Managers	2
CSS	178	Turfgrass Irrigation	3
CSS	181	Pesticide and Fertilizer Application Technology	3
CSS	210	Fundamentals of Soil Science	3
CSS	232	Turfgrass Management	4
CSS	262	Turfgrass Management Seminar	2
CSS	264	Golf Course Design and Construction Techniques	2
CSS	267	Performance Turf Design and Construction	2
CSS	269	Turfgrass Strategies: Integration and Synthesis	2
CSS	272	Turfgrass Soil Fertility	2
CSS	292	Management of Turfgrass Weeds	3
CSS	382	Turfgrass Physiology	2
ENT	364	Turfgrass Entomology	3
HRT	213	Landscape Maintenance	2
HRT	213L	Landscape Maintenance Field Laboratory	1
PLB	105	Plant Biology	3
PLP	366	Turf Pathology	3
Elective		.....	3

Students must enroll in two separate 2-credit sections of AT 291: Turf and Landscape Analytic Practices for 2 credits and Spanish for Turf and Landscape for 2 credits.

Students must enroll in two separate 1-credit sections of CSS 262.

Sports and Commercial Turf Management Emphasis

The sports and commercial turf management emphasis is designed for persons interested in careers in these areas. These are rapidly growing areas of turfgrass management and offer rewarding job opportunities.

Requirements for the Sports and Commercial Turf Management Emphasis

All of the following courses (54 credits):

AT	291	Selected Topics in Agricultural Technology	2
AT	293	Professional Internship in Agricultural Technology	3 to 6
CSS	110	Computer Applications in Agronomy	2
CSS	178	Turfgrass Irrigation	3
CSS	181	Pesticide and Fertilizer Application Technology	3
CSS	210	Fundamentals of Soil Science	3
CSS	232	Turfgrass Management	4
CSS	262	Turfgrass Management Seminar	2
CSS	267	Performance Turf Design and Construction	2
CSS	269	Turfgrass Strategies: Integration and Synthesis	2
CSS	272	Turfgrass Soil Fertility	2
CSS	292	Management of Turfgrass Weeds	3
CSS	382	Turfgrass Physiology	2
ENT	364	Turfgrass Entomology	3
HRT	109	Introduction to Applied Plant Science	2
HRT	213	Landscape Maintenance	2
HRT	213L	Landscape Maintenance Field Laboratory	1

HRT 214 Landscape and Turfgrass Business Operations 2
 PLP 366 Turf Pathology 3
 Electives 5 to 8

Students who do not demonstrate English proficiency through the IAT placement test or college-level transfer credit must complete AT 045 Agricultural Communications (2 credits) or an equivalent course.

Program offerings in both emphasis areas are integrated with other areas in turfgrass and landscape and nursery. Courses include technical, communication, mathematics, and business content. Placement training opportunities are offered at many leading industrial businesses.

Swine Management

Food production, including that of pork, is increasing along with the world's population due to the use of scientific technologies and skilled people. If we are to keep pace with the growing population, we will need more of these two vital inputs. The tasks of developing new technologies and new human resources are equally challenging.

The swine management program is designed to prepare people for careers in modern pork production anywhere in the world. The one-year program judiciously balances "hands-on" training with classroom instruction in the areas of animal care, nutrition, housing maintenance, swine health, reproduction, records management, environmental management and personnel management. Students also gain practical experience through a summer-long internship on a commercial swine farm in Michigan or beyond. Swine management graduates will have numerous career opportunities including: farm owners/operators, managers or assistant managers (breeding herd, farrowing, nursery, grower-finisher, transportation, feeds, marketing), department supervisors or regional representatives.

Requirements for Swine Management

			CREDITS
The student must complete 35 credits from the following:			
1. All of the following courses (32 credits):			
ABM 130	Farm Management I		3
AEE 110	Foundations of ANR Communications: Learning and Leadership		2
ANS 110	Introductory Animal Agriculture		4
ANS 171	Swine Clerkship		2
ANS 203	Principles of Livestock Feeding		2
ANS 205	Reproduction in Livestock		2
ANS 272	Introductory Swine Management		3
AT 045	Agricultural Communications		2
AT 055	Agricultural Finance		3
AT 071	Technical Mathematics		2
AT 291	Selected Topics in Agricultural Technology		2
AT 293	Professional Internship in Agricultural Technology		6
CSS 110	Computer Applications in Agronomy		2
2. Complete 3 credits of elective course work			3

Insert ①

Admission

Applicants for technical programs must be high school graduates. A strong background in communications, mathematics, and science will help prepare the student for successful completion of a technical training program.

The admission process includes a consideration of the student's academic record, work experience, recommendations from employers, test scores, and other criteria. In some cases, students may be invited to Michigan State University for an interview.

Financial Aid

Institute of Agricultural Technology students are eligible for financial aid. Scholarships are provided by industry groups and individual business firms and are awarded to students who have demonstrated superior scholastic ability or an outstanding work record.

Viticulture

The Viticulture certificate is delivered in partnership between Northwestern Michigan College, Lake Michigan College, the Viticulture and Enology Science and Technology Alliance (VESTA), and the Michigan State University Institute of Agricultural Technology. The combination of online viticulture courses delivered by experts from throughout the United States, hands-on experience at local vineyards, fresh markets, juice processors, packing plants and wineries and fundamental plant science courses provide graduates with the specific expertise and skills needed for careers in the rapidly expanding grade industry – supplying grapes for table, juice and wine making.

Graduates of the program will receive a certificate from the Michigan State University Institute of Agricultural Technology. Students may continue their course work to obtain an Associate in Applied Science Degree from the community college partners in addition to the certificate from Michigan State University. Should students wish to continue their education, the appropriate pre-designated credits may be applied to a bachelor's degree program at Michigan State University if students meet the established transfer guidelines.

Requirements for Viticulture

1. All of the following courses (15 credits):

AT	293	Professional Internship in Agricultural Technology	3
ENT	110	Applied Entomology for Ornamentals and Turf	3
ESA	225	Land and Environmental Issues in Law and Policy	3
HRT	334	Current Issues in Viticulture and Enology	1
HRT	432	Principles and Practices of Grape Production I	3
PLP	200	Plant Diseases and their Pathogens	3

2. Complete additional course work through Northwestern Michigan College or Lake Michigan College as well as 16 credits through the Viticulture and Enology Science and Technology Alliance. All course work must be approved by the student's academic advisor.

Veterans Education

The programs offered by the Institute of Agricultural Technology are approved by the Department of Veterans Affairs as Cooperative Veterans Training Programs. Under some Chapters of Title 38, U.S. Code, veterans may receive educational benefits. Veterans planning to enroll should contact the Veterans Certification Section of the Office of the Registrar to determine their eligibility.

Michigan Works

Students in the Institute of Agricultural Technology are eligible for sponsorship under the guidelines of the Michigan Works Program. Students must arrange sponsorship with the appropriate Michigan Works office.

Institute of Agricultural Technology Transfer Student Admission

Institute of Agricultural Technology students who have completed their respective Institute of Agricultural Technology programs will, upon completion of the applications process, be considered for transfer admission to Michigan State University. Acceptance is determined by the applicant's previous academic record and his or her proposed program.

To complete the application process, the student must:

1. Complete and submit a signed request (*Student Intent to Transfer Form*) to the Institute of Agricultural Technology, as soon as the student develops an interest in transferring, in order to inform the Institute of Agricultural Technology of the desire to transfer to a baccalaureate program. The request must be signed by the program coordinator and by the Institute of Agricultural Technology Director in order to facilitate proper student advising by the Institute of Agricultural Technology.
2. Have a minimum grade point average of 3.0 upon completion of the Institute of Agricultural Technology program and satisfy all other requirements for admission.
3. Earn a minimum grade of 2.0 in WRA 110 or its equivalent.
4. Earn a minimum grade of 2.0 in MTH 103 or its equivalent.
5. Apply to the baccalaureate program using the application form from the Office of Admissions and Scholarships. It is recommended that students apply at the beginning of the semester they are to graduate from the Institute of Agricultural Technology.
6. Additional requirements may apply for limited enrollment programs.
7. Complete all other undergraduate application requirements.

For additional information regarding transfer admission, refer to the *Transfer Student Admission* statement in the *Undergraduate Education* section of this catalog.