HORTICULTURE

Description
Horticulture requires a broad education including knowledge of production, management, improvement, distribution, processing, and utilization of fruits, vegetables, ornamentals, and turf. Horticulture relies on an understanding of the basic sciences and involves competence in communication, aesthetic appreciation, and an awareness of consumer needs.

The following options are open to students in horticulture: horticulture entrepreneurship, landscape design, plant science, organic, and production.

Horticulture students are encouraged to enroll for credit in one or more career experiences after completing two years of formal training. Internships provide invaluable exposure to commercial/professional horticultural enterprises, and should be arranged through advisors.

Horticulture students take horticulture courses on a graded basis.

Electives chosen from social sciences or humanities would be valuable to students considering careers in extension horticulture, horticultural therapy, and other people-oriented aspects of horticulture.

College Requirements

College Admission
Requirements for admission into the College of Agricultural Sciences and Natural Resources (CASNR) are consistent with general University admission requirements (one unit equals one high school year): 4 units of English, 4 units of mathematics, 3 units of natural sciences, 3 units of social studies, and 2 units of foreign language. Students must also meet performance requirements (ACT composite of 20 or higher OR combined SAT score of 950 or higher OR rank in the top one-half of graduating class; transfer students must have a 2.0 (on a 4.0 scale) cumulative grade point average and a minimum C average in the last semester of attendance at another college. Transfer students who have completed less than 12 credit hours and a minimum C average in the last semester of attendance at another college, must have an accumulated average of C (2.0 on a 4.0 scale) or be within the first calendar year at UNL, whichever takes longer, excluding nonresident, must have an accumulated average of C (2.0 on a 4.0 scale) in all college study must submit either ACT or SAT scores.

To be considered for admission, a transfer student, Nebraska resident or nonresident, must have an accumulated average of C (2.0 on a 4.0 scale) and a minimum C average in the last semester of attendance at another college. Transfer students who have completed less than 12 credit hours of college study must submit either ACT or SAT scores.

Ordinarily, credits earned at an accredited college are accepted by the University. The College, however, will evaluate all hours submitted on an application for transfer and reserves the right to accept or reject any of them. Sixty is the maximum number of hours UNL will accept on transfer from a two-year college. Ninety is the maximum number of hours UNL will accept from a four-year college. Transfer credit in the degree
program must be approved by the degree program advisor on a Request for Substitution Form to meet specific course requirements, group requirements, or course level requirements in the major. At least 9 hours in the major field, including the capstone course, must be completed at UNL regardless of the number of hours transferred.

The College will accept no more than 10 semester hours of C-, D+, D and D- grades from other schools. The C-, D+, D and D- grades can only be applied to free electives. This policy does not apply to the transfer of grades from UNO or UNK to UNL.

Joint Academic Transfer Programs
The College of Agricultural Sciences and Natural Resources has agreements with many institutions to support joint academic programs. The transfer programs include dual degree programs and cooperative degree programs. Dual degree programs offer students the opportunity to receive a degree from a participating institution and also to complete requirements for a bachelor of science degree in CASNR. Cooperative programs result in a single degree from either UNL or the cooperating institution.

Dual Degree Programs
A to B Programs
The A to B Program, a joint academic program offered by the CASNR and participating community colleges, allows students to complete the first two years of a degree program at the participating community college and continue their education and study in a degree program leading toward a bachelor of science degree.

The A to B Program provides a basic knowledge plus specialized course work. Students transfer into CASNR with junior standing.

Depending on the community college, students enrolled in the A to B Program may complete the requirements for an associate of science at the community college, transfer to UNL, and work toward a bachelor of science degree.

Participating community colleges include:

- Central Community College
- Metropolitan Community College
- Mid-Plains Community College
- Nebraska College of Technical Agriculture
- Northeast Community College
- Southeast Community College
- Western Nebraska Community College

3+2 Programs
Two specialized degree programs in animal science and veterinary science are offered jointly with an accredited college or school of veterinary medicine. These two programs permit CASNR animal science or veterinary science students to receive a bachelor of science degree from UNL with a degree in animal science or veterinary science after successfully completing two years of the professional curriculum in veterinary medicine at an accredited veterinary school. Students who successfully complete the 3+2 Program, must complete the “Application for Degree” form and provide transcripts to the Credentials Clerk, Office of the University Registrar, 107 Canfield Administration Building, UNL. Students should discuss these degree programs with their academic advisor.

Cooperative Degree Programs
Academic credit from UNL and a cooperating institution is applied towards a four-year degree from either UNL (UNL degree-granting program) or the cooperating institution (non UNL degree-granting program). All have approved programs of study.

UNL Degree-Granting Programs
A UNL degree-granting program is designed to provide students the opportunity to complete a two-year program of study at one of the four-year institutions listed below, transfer to CASNR and complete the requirements for a bachelor of science degree.

Chadron State College. Chadron State College offers a 2+2 program leading to a grassland ecology and management degree program and a transfer program leading to a Bachelor of Science in Agricultural Education in the teaching option.

Wayne State College. Wayne State College offers a 3+1 program leading to a Bachelor of Science in Plant Biology in the ecology and management option.

University of Nebraska at Kearney. Transfer programs are available for students pursuing degree programs leading to a bachelor of science degree.

University of Nebraska at Omaha. The University of Nebraska at Omaha (UNO) cooperates with CASNR in providing four-semester pre-agricultural sciences, pre-natural resources, pre-food science and technology, pre-horticulture and pre-turfgrass and landscape management transfer programs.

A student enrolled in these programs may transfer all satisfactorily completed academic credits identified in the suggested program of study, and enter CASNR to study toward a degree program leading to a bachelor of science degree. The total program would require a minimum of four years or eight semesters (16 credit hours/semester or 120 credit hours).

UNL CASNR faculty teach horticulture and food science and technology courses at UNO to assist an urban population in better understanding the food processing, horticulture, and landscape horticulture industries.

For more information, contact the CASNR Dean’s Office, 800-472-8800, ext. 2541.

Non UNL Degree-Granting Programs
The CASNR cooperates with other institutions to provide course work that is applied towards a degree at the cooperating institution. Pre-professional programs offered by CASNR allow students to complete the first two or three years of a degree program at UNL prior to transferring and completing a degree at the cooperating institution.

Chadron State College—Range Science. The 3+1 Program in range science allows Chadron State College students to pursue a range science degree through Chadron State College. Students complete three years of course work at Chadron State College and one year of specialized range science course work (32 credit hours) at CASNR.

Dordt College (Iowa) – Agricultural Education: Teaching Option. This program allows students to pursue an Agricultural Education Teaching Option degree leading toward a bachelor of science in agricultural education. Students at Dordt College will complete 90 credit hours in the Agricultural Education: Teaching Option Transfer Program.
Residency
Students must complete at least 30 of the total hours for their degree using UNL credits. At least 18 of the 30 credit hours must be in courses offered through CASNR\(^1\) (e.g., BIO, ENV, SCIL, EAEP, HRTM, ENSC) and CASNR crosslisted courses taught by non-CASNR faculty.

Online and Distance Education
There are many opportunities to earn college credit online through the University of Nebraska–Lincoln. Some of these credits may be applicable not only as elective credits, but also toward the fulfillment of the College’s education requirements. Credits earned online may count toward residency. However, certain offerings may not be counted toward scholarship requirements or academic recognition criteria.

For further information, contact:
Office of Online and Distance Education
University of Nebraska-Lincoln
305 Brace Labs
Lincoln, NE 68588-0109
402-472-4681
http://online.unl.edu/

Independent Study Rules
Students wishing to take part in independent studies must obtain permission; complete and sign a contract form; and furnish copies of the contract to the instructor, advisor, departmental office, and the Dean’s Office. The contract should be completed before registration. Forms are available in 103 Agricultural Hall or online at the CASNR website.

Independent study projects include research, literature review or extension of course work under supervision and evaluation of a departmental faculty member.

Students may only count 12 hours of independent study toward their degrees and no more than 6 hours can be counted during their last 36 hours earned, excluding senior thesis, internships, and courses taught under an independent study number.

Other College Degree Requirements
Capstone Course Requirement
A capstone course is required for each CASNR degree program. A capstone course is defined as a course in which students are required to integrate diverse bodies of knowledge to solve a problem or formulate a policy of societal importance.

ACE Requirements
All students must fulfill the Achievement Centered Education (ACE) requirements. Information about the ACE program may be viewed at www.ace.unl.

The minimum requirements of CASNR reflect the common core of courses that apply to students pursuing degrees in the college. Students should work with an advisor to satisfy ACE outcomes 1, 2, 3, 4, 6 and 10 with the college requirements.

Catalog Rule
Students must fulfill the requirements stated in the catalog for the academic year in which they are first admitted to UNL or when they were first admitted to a Joint Academic Transfer Program. In consultation with advisors, a student may choose to follow a subsequent catalog for any academic year in which they are admitted to and enrolled as a degree-seeking student at UNL in the College of Agricultural Sciences and Natural Resources. Students must complete all degree requirements from a single catalog year. The catalog which a student follows for degree requirements may not be more than 10 years old at the time of graduation.

Learning Outcomes
Majors in Horticulture will be able to:

1. Demonstrate knowledge and credentials necessary to seek employment in the fruit, vegetable, greenhouse, floral, nursery and landscape industries.
2. Have had hands-on experience in the identification, propagation and commercial production of horticultural crops (production, science and entrepreneurship options).
3. Have created (on paper) a start-up business plan for a small horticultural business (entrepreneurship and production options).
4. Visually organize, compose and effectively communicate the design process and design solutions in tw- and three-dimensional graphic products and written information (landscape design-build option).
5. Demonstrate the ability to thoroughly assess a landscape site’s microclimate, soil, topography, plants and users then effectively apply that information to design development and problem-solving (landscape design-build option).
6. Effectively synthesize landscape design knowledge, the design process, and technical/communication skills to produce, implement, manage and evaluate creative sustainable design in developed landscapes (landscape design-build option).
7. Critically assess his or her design strengths and weaknesses (landscape design-build option).

Major Requirements
Horticulture Core
The following basic core courses are required for the horticulture degree program. In addition, students in horticulture must select and meet the requirements of one of the options, depending upon their basic needs and interests.

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCIL 101</td>
<td>Science and Decision-Making for a Complex World</td>
<td>3</td>
</tr>
<tr>
<td>AGRO 131</td>
<td>Plant Science</td>
<td>3</td>
</tr>
<tr>
<td>LIFE 120</td>
<td>Fundamentals of Biology I</td>
<td>3</td>
</tr>
<tr>
<td>LIFE 120L</td>
<td>Fundamentals of Biology I laboratory</td>
<td>1</td>
</tr>
<tr>
<td>HORT 133</td>
<td>Horticultural Plant Science Laboratory</td>
<td>1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Catalog Rule</th>
</tr>
</thead>
</table>
| Students must fulfill the requirements stated in the catalog for the academic year in which they are first admitted to UNL or when they were first admitted to a Joint Academic Transfer Program. In consultation with advisors, a student may choose to follow a subsequent catalog for any academic year in which they are admitted to and enrolled as a degree-seeking student at UNL in the College of Agricultural Sciences and Natural Resources. Students must complete all degree requirements from a single catalog year. The catalog which a student follows for degree requirements may not be more than 10 years old at the time of graduation.

For further information, contact:
Office of Online and Distance Education
University of Nebraska-Lincoln
305 Brace Labs
Lincoln, NE 68588-0109
402-472-4681
http://online.unl.edu/
HORT 153 / AGRO 153 / SOIL 153

Select one of the following (see option):

HORT 212 / LARC 212 / NRES 212 & HORT 213 / LARC 213 / NRES 213

HORT 212 / LARC 212 / NRES 212 & HORT 214 / NRES 214

HORT 221 Plant Propagation
HORT 395 Career Experience

Credit Hours Subtotal: 18

Communications

Written Communication (ACE 1)
Select one of the following:

ENGL 150 Writing and Inquiry
ENGL 151 Writing and Argument
ENGL 254 Writing and Communities
JGEN 120 Basic Business Communication
JGEN 200 Technical Communication I
JGEN 300 Technical Communication II

Oral Communication (ACE 2)
COMM 209 Public Speaking

Credit Hours Subtotal: 6

Mathematics and Analytical Skills (beyond college algebra)
Select 5 credits, see option (ACE 3)

Credit Hours Subtotal: 5

Economics, Humanities and Social Sciences

Select one of the following (see option, ACE 6):

ECON 211 Principles of Macroeconomics
ECON 212 Principles of Microeconomics
AECN 141 Introduction to the Economics of Agriculture

Select one course each from ACE outcomes 5, 7 (select HORT 200), 8 and 9

Credit Hours Subtotal: 15

Natural Sciences (ACE 4)

Physics
Select one of the following (see option):

MSYM 109 Physical Principles in Agriculture and Life Sciences
PHYS 141 Elementary General Physics I
PHYS 151 Elements of Physics
PHYS 211 General Physics I

Biology
Select one of the following (see option):

NRES 220 Principles of Ecology
BIOS 109

Mathematics (beyond core minimum) (ACE 3)
Select from Core Requirements:

MATH 104 Applied Calculus
STAT 218 Introduction to Statistics

Credit Hours Subtotal: 1

Natural Sciences
Select from Core Requirements:

BIOS 109
CHEM 105 Chemistry in Context I (ACE 4)
MSYM 109 Physical Principles in Agriculture and Life Sciences (ACE 4)

Credit Hours Subtotal: 0

Horticulture Entrepreneurship Option

Capstone
HORT 488 / ABUS 488 / AGRO 488 / EAEP 488 / ENTR 488 Business Management for Agricultural Enterprises (ACE 10)

Credit Hours Subtotal: 3

Mathematics (beyond core minimum) (ACE 3)
Select from Core Requirements:

ECON 211 Principles of Macroeconomics (ACE 6)

Credit Hours Subtotal: 0

Horticulture Courses

HORT 352 Production and Physiology of Horticultural Crops
HORT 462 Nursery Management and Crop Production

Select in the Core:

HORT 131 Plant Science

Select one lab of the following:

HORT 353 Vegetable Crop Production Laboratory
HORT 354 Fruit Production Laboratory
HORT 355 Perennial, Pot and Bedding Plant Production Laboratory

Select 9 hours of the following:

HORT 227 / AGRO 227 / PGAM 227 / TLMT 227 Introductory Turfgrass Management
HORT 228 / AGRO 228 / TLMT 228 Introduction to Landscape Management
HORT 261 Floral Design I
HORT 325 Greenhouse Practices and Management
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HORT 327 / AGRO 327 / TLMT 327</td>
<td>Turfgrass Science and Management</td>
<td></td>
</tr>
<tr>
<td>HORT 353</td>
<td>Vegetable Crop Production Laboratory (if not taken above)</td>
<td></td>
</tr>
<tr>
<td>HORT 354</td>
<td>Fruit Production Laboratory (if not taken above)</td>
<td></td>
</tr>
<tr>
<td>HORT 355</td>
<td>Perennial, Pot and Bedding Plant Production Laboratory (if not taken above)</td>
<td></td>
</tr>
<tr>
<td>HORT 470 / AGRO 470 / TLMT 470</td>
<td>Critical Thinking in Landscape Management</td>
<td></td>
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</tbody>
</table>

**Credit Hours Subtotal:** 17

**Pest Management**
Select two of the following: 6

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGRO 426 / HORT 426 / NRES 426</td>
<td>Invasive Plants</td>
<td></td>
</tr>
<tr>
<td>ENTO 403</td>
<td>Management of Horticultural Crop Insects</td>
<td></td>
</tr>
<tr>
<td>PLPT 369 / BIOS 369</td>
<td>Introductory Plant Pathology</td>
<td></td>
</tr>
</tbody>
</table>

**Credit Hours Subtotal:** 6

**Business and Economics**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HORT 275 / AECN 275 / AGRO 275 / EAEP 275 / ENTR 275</td>
<td>Agribusiness Entrepreneurial Finance</td>
<td>3</td>
</tr>
<tr>
<td>HORT 388 / ABUS 388 / AGRO 388 / EAEP 388 / ENTR 388</td>
<td>Agribusiness Entrepreneurship</td>
<td>3</td>
</tr>
<tr>
<td>ACCT 201 &amp; ACCT 202</td>
<td>Introductory Accounting I and Introductory Accounting II</td>
<td>6</td>
</tr>
<tr>
<td>BLAW 371</td>
<td>Legal Environment</td>
<td>3</td>
</tr>
<tr>
<td>ECON 212</td>
<td>Principles of Microeconomics</td>
<td>3</td>
</tr>
<tr>
<td>MRKT 341</td>
<td>Marketing</td>
<td>3</td>
</tr>
<tr>
<td>or ABUS 341</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MNGT 361</td>
<td>Human Resource Management</td>
<td>3</td>
</tr>
</tbody>
</table>

**Credit Hours Subtotal:** 24

**Free Electives**
Select 8-11 credits, suggested electives include: 8-11

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENTR 421 / MNGT 421</td>
<td>Identifying and Exploring Entrepreneurial Opportunities</td>
<td></td>
</tr>
<tr>
<td>ENTR 422 / MNGT 422</td>
<td>Managing Rapid Growth and Change in Organizations</td>
<td></td>
</tr>
<tr>
<td>ENTR 423 / MNGT 423</td>
<td>Business Plan Development and Decision Making</td>
<td></td>
</tr>
</tbody>
</table>

**Credit Hours Subtotal:** 11

**Core Requirements**
Complete requirements 58-61

**Credit Hours Subtotal:** 58

**Total Credit Hours:** 120

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**Landscape Design-Build Option**

**Second Internship or Career Experience**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HORT 395</td>
<td>Career Experience</td>
<td>1</td>
</tr>
</tbody>
</table>

**Credit Hours Subtotal:** 1

**Capstone Course**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HORT 469 / ARCH 469</td>
<td>Senior Landscape Design (ACE 10)</td>
<td>4</td>
</tr>
</tbody>
</table>

**Credit Hours Subtotal:** 4

**Mathematics**
Select from Core Requirements: 0

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 102</td>
<td>Trigonometry</td>
<td>0</td>
</tr>
<tr>
<td>STAT 218</td>
<td>Introduction to Statistics</td>
<td>0</td>
</tr>
</tbody>
</table>

**Credit Hours Subtotal:** 0

**Natural Sciences**
Select from Core Requirements: 0

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 105</td>
<td>Chemistry in Context I (ACE 4)</td>
<td>0</td>
</tr>
<tr>
<td>MSYM 109</td>
<td>Physical Principles in Agriculture and Life Sciences (ACE 4)</td>
<td>0</td>
</tr>
<tr>
<td>NRES 220 / BIOS 220</td>
<td>Principles of Ecology</td>
<td></td>
</tr>
</tbody>
</table>

**Credit Hours Subtotal:** 0

**Horticulture**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HORT 462</td>
<td>Nursery Management and Crop Production</td>
<td>4</td>
</tr>
</tbody>
</table>

Select in the Core: 0

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HORT 131</td>
<td>Plant Science</td>
<td>0</td>
</tr>
</tbody>
</table>

Select one, whichever is not taken in the Core, of the following: 3

<table>
<thead>
<tr>
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<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HORT 213</td>
<td>Landscape Plants II</td>
<td>3</td>
</tr>
<tr>
<td>HORT 214</td>
<td>Herbaceous Landscape Plants</td>
<td>3</td>
</tr>
</tbody>
</table>

**Credit Hours Subtotal:** 7

**Landscape Management**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>HORT 227 / AGRO 227 / PGAM 227 / TLMT 227</td>
<td>Introductory Turfgrass Management</td>
<td>3</td>
</tr>
<tr>
<td>HORT 228 / AGRO 228 / TLMT 228</td>
<td>Introduction to Landscape Management</td>
<td>3</td>
</tr>
<tr>
<td>HORT 453 / AGRO 453 / LARC 453 / SOIL 453</td>
<td>Urban Soil Properties and Management</td>
<td>3</td>
</tr>
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</table>

**Credit Hours Subtotal:** 9

**Business and Management**

<table>
<thead>
<tr>
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<th>Course Title</th>
<th>Credit Hours</th>
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<tbody>
<tr>
<td>HORT 275 / AECN 275 / AGRO 275 / EAEP 275 / ENTR 275</td>
<td>Agribusiness Entrepreneurial Finance</td>
<td>3</td>
</tr>
<tr>
<td>HORT 388 / ABUS 388 / AGRO 388 / ENTR 388 / EAEP 388</td>
<td>Agribusiness Entrepreneurship</td>
<td>3</td>
</tr>
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</table>

**Credit Hours Subtotal:** 9

**Business Electives**
Select 3 hours of the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>HORT 488</td>
<td>Business Management for Agricultural Enterprises</td>
</tr>
<tr>
<td>ABUS 488</td>
<td></td>
</tr>
<tr>
<td>AGRO 488</td>
<td></td>
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<tr>
<td>EAEP 488</td>
<td></td>
</tr>
<tr>
<td>ENTR 488</td>
<td></td>
</tr>
<tr>
<td>MNGT 361</td>
<td>Human Resource Management</td>
</tr>
<tr>
<td>MRKT 300</td>
<td>Contemporary Marketing</td>
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</tbody>
</table>

Credit Hours Subtotal: 9

**Design**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>HORT 265</td>
<td>Visual Communication for Landscape Design</td>
</tr>
<tr>
<td>HORT 267</td>
<td>Introduction to Landscape Design Studio</td>
</tr>
<tr>
<td>HORT 467</td>
<td>Planting Design</td>
</tr>
<tr>
<td>ARCH 467</td>
<td></td>
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<tr>
<td>LARC 467</td>
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</table>

Credit Hours Subtotal: 10

**Landscape Installation & Administration**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>HORT 300</td>
<td>Introduction to Landscape Construction</td>
</tr>
<tr>
<td>HORT 301</td>
<td>Introduction to Landscape Contracting</td>
</tr>
</tbody>
</table>

Credit Hours Subtotal: 6

**Landscape & Ecology Electives**

Select 6 hours of the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
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</thead>
<tbody>
<tr>
<td>AGRO 452</td>
<td>Irrigation Systems Management</td>
</tr>
<tr>
<td>MSYM 452</td>
<td></td>
</tr>
<tr>
<td>WATS 452</td>
<td></td>
</tr>
<tr>
<td>AGRO 107</td>
<td>Invasive Plant Species: Impacts on Ecosystems</td>
</tr>
<tr>
<td>NRES 107</td>
<td></td>
</tr>
<tr>
<td>AGRO 435</td>
<td>Agroecology</td>
</tr>
<tr>
<td>HORT 435</td>
<td></td>
</tr>
<tr>
<td>NRES 435</td>
<td></td>
</tr>
<tr>
<td>MSYM 354</td>
<td>Soil Conservation and Watershed Management</td>
</tr>
<tr>
<td>SOIL 354</td>
<td></td>
</tr>
<tr>
<td>WATS 354</td>
<td></td>
</tr>
<tr>
<td>NRES 417</td>
<td>Agroforestry Systems in Sustainable Agriculture</td>
</tr>
<tr>
<td>HORT 418</td>
<td></td>
</tr>
<tr>
<td>TLMT 326</td>
<td>Landscape Solutions</td>
</tr>
<tr>
<td>AGRO 326</td>
<td></td>
</tr>
<tr>
<td>HORT 326</td>
<td></td>
</tr>
<tr>
<td>WATS 361</td>
<td>Soils, Environment and Water Quality</td>
</tr>
<tr>
<td>AGRO 361</td>
<td></td>
</tr>
<tr>
<td>GEOL 361</td>
<td></td>
</tr>
<tr>
<td>NRES 361</td>
<td></td>
</tr>
<tr>
<td>SOIL 361</td>
<td></td>
</tr>
</tbody>
</table>

Credit Hours Subtotal: 6

**Free Electives**

Select 7-10 credits

Credit Hours Subtotal: 10

**Core Requirements**

Complete Requirements: 58-61

Credit Hours Subtotal: 58

**Total Credit Hours**: 120

---

**Plant Science Option**

**College Capstone (ACE 10)**

Select one of the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>HORT 403</td>
<td>Scientific Writing and Communication</td>
</tr>
<tr>
<td>AGRO 403</td>
<td></td>
</tr>
<tr>
<td>HORT 462</td>
<td>Nursery Management and Crop Production</td>
</tr>
<tr>
<td>HORT 488</td>
<td>Business Management for Agricultural Enterprises</td>
</tr>
<tr>
<td>ABUS 488</td>
<td></td>
</tr>
<tr>
<td>AGRO 488</td>
<td></td>
</tr>
<tr>
<td>EAEP 488</td>
<td></td>
</tr>
<tr>
<td>ENTR 488</td>
<td></td>
</tr>
</tbody>
</table>

Credit Hours Subtotal: 3

**Mathematics (beyond core minimum) (ACE 3)**

Select one of the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>MATH 104</td>
<td>Applied Calculus &amp; Introduction to Statistics</td>
</tr>
<tr>
<td>MATH 106</td>
<td>Calculus I</td>
</tr>
</tbody>
</table>

Credit Hours Subtotal: 1

**Natural Sciences**

Select from Core Requirements: 0

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 109</td>
<td>General Chemistry I</td>
</tr>
</tbody>
</table>

Select one of the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOS 109</td>
<td>Fundamentals of Biology I</td>
</tr>
<tr>
<td>LIFE 120    &amp; LIFE 120L</td>
<td>and Fundamentals of Biology I laboratory</td>
</tr>
<tr>
<td>LIFE 121    &amp; LIFE 121L</td>
<td>and Fundamentals of Biology II Laboratory</td>
</tr>
</tbody>
</table>

Select one of the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHYS 141</td>
<td>Elementary General Physics I</td>
</tr>
<tr>
<td>PHYS 151</td>
<td>Elements of Physics</td>
</tr>
<tr>
<td>PHYS 211</td>
<td>General Physics I</td>
</tr>
<tr>
<td>CHEM 110</td>
<td>General Chemistry II</td>
</tr>
</tbody>
</table>

Select one of the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 251    &amp; CHEM 253</td>
<td>Organic Chemistry I and Organic Chemistry I Laboratory</td>
</tr>
<tr>
<td>CHEM 255    &amp; CHEM 257</td>
<td>Biological Organic Chemistry and Biological Organic Chemistry Laboratory</td>
</tr>
</tbody>
</table>

Credit Hours Subtotal: 8

**Plant Sciences**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>AGRO 215</td>
<td>Genetics</td>
</tr>
<tr>
<td>AGRO 325</td>
<td>Introductory Plant Physiology</td>
</tr>
</tbody>
</table>

Credit Hours Subtotal: 8

**Pest Management**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENTO 115</td>
<td>Insect Biology</td>
</tr>
<tr>
<td>BIOS 115</td>
<td></td>
</tr>
<tr>
<td>ENTO 116</td>
<td>Insect Identification</td>
</tr>
<tr>
<td>BIOS 116</td>
<td></td>
</tr>
<tr>
<td>ENTO 403</td>
<td>Management of Horticultural Crop Insects</td>
</tr>
<tr>
<td>PLPT 369</td>
<td>Introductory Plant Pathology</td>
</tr>
<tr>
<td>BIOS 369</td>
<td></td>
</tr>
</tbody>
</table>

Credit Hours Subtotal: 10

**Horticulture**

Select in the Core:

Select one of the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>HORT 462</td>
<td>Nursery Management and Crop Production</td>
</tr>
<tr>
<td>HORT 488</td>
<td>Business Management for Agricultural Enterprises</td>
</tr>
<tr>
<td>ABUS 488</td>
<td></td>
</tr>
<tr>
<td>AGRO 488</td>
<td></td>
</tr>
<tr>
<td>EAEP 488</td>
<td></td>
</tr>
<tr>
<td>ENTR 488</td>
<td></td>
</tr>
</tbody>
</table>

Credit Hours Subtotal: 3

**Free Electives**

Select 7-10 credits

Credit Hours Subtotal: 10
<table>
<thead>
<tr>
<th>Course / Course Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>HORT 131 / AGRO 131</td>
<td>Plant Science</td>
</tr>
<tr>
<td>LIFE 120 &amp; LIFE 120L</td>
<td>Fundamentals of Biology I and Fundamentals of Biology I laboratory</td>
</tr>
<tr>
<td>Select one of the following:</td>
<td>4</td>
</tr>
<tr>
<td>HORT 352 &amp; HORT 353</td>
<td>Production and Physiology of Horticultural Crops and Vegetable Crop Production Laboratory or HORT 354 Fruit Production Laboratory or HORT 355 Perennial, Pot and Bedding Plant Production Laboratory</td>
</tr>
<tr>
<td>HORT 462</td>
<td>Nursery Management and Crop Production (if not taken as capstone)</td>
</tr>
<tr>
<td>Select 14 credits of the following:</td>
<td>14</td>
</tr>
<tr>
<td>HORT 213 / LARC 213 / NRES 213 or HORT 214 Herbaceous Landscape Plants</td>
<td>Landscape Plants II (if not taken in Core)</td>
</tr>
<tr>
<td>HORT 227 / AGRO 227 / PGAM 227 / TLMT 227</td>
<td>Introductory Turfgrass Management</td>
</tr>
<tr>
<td>HORT 261</td>
<td>Floral Design I</td>
</tr>
<tr>
<td>HORT 262</td>
<td>Floral Design II</td>
</tr>
<tr>
<td>HORT 325</td>
<td>Greenhouse Practices and Management</td>
</tr>
<tr>
<td>HORT 353</td>
<td>Vegetable Crop Production Laboratory (if not taken above)</td>
</tr>
<tr>
<td>HORT 354</td>
<td>Fruit Production Laboratory (if not taken above)</td>
</tr>
<tr>
<td>HORT 355</td>
<td>Perennial, Pot and Bedding Plant Production Laboratory (if not taken above)</td>
</tr>
<tr>
<td>HORT 396 or HORT 399 Independent Study</td>
<td>Current Projects and Topics in Horticulture</td>
</tr>
<tr>
<td>HORT 406 / AGRO 406 / NRES 406</td>
<td>Plant Ecophysiology: Theory and Practice</td>
</tr>
<tr>
<td>HORT 471 / HRTM 471 / NUTR 471</td>
<td>Vines, Wines and You</td>
</tr>
<tr>
<td>AGRO 426 / HORT 426 / NRES 426</td>
<td>Invasive Plants</td>
</tr>
<tr>
<td>Credit Hours Subtotal:</td>
<td>18</td>
</tr>
</tbody>
</table>

**Free Electives**

Select 10-15 credits

Credit Hours Subtotal: 14

**Core Requirements**

Complete requirements

Credit Hours Subtotal: 58

Total Credit Hours 120

**Production Option**

**College Capstone (ACE 10)**

HORT 462 Nursery Management and Crop Production 4

**Credit Hours Subtotal:** 4

**Natural Sciences**

Select from Core Requirements:

Chem 109 General Chemistry I

Select one of the following:

Bios 109 Life 121 Fundamentals of Biology II and Fundamentals of Biology II laboratory

Select one of the following:

Phys 141 Elementary General Physics I

Phys 151 Elements of Physics

Phys 211 General Physics I

Chem 110 General Chemistry II

Chem 251 Organic Chemistry I

or Chem 255 Biological Organic Chemistry

Credit Hours Subtotal: 7

**Mathematics**

Select from Core Requirements:

Math 102 Trigonometry

or Math 104 Applied Calculus

Stat 218 Introduction to Statistics (ACE 3)

Credit Hours Subtotal: 0

**Plant Sciences**

AGRO 215 / HORT 215 / TLMT 215 Genetics

AGRO 325 Introductory Plant Physiology

Credit Hours Subtotal: 8

**Horticulture**

Select one of the following in the Core:

HORT 131 Plant Science

LIFE 120 & LIFE 120L Fundamentals of Biology I and Fundamentals of Biology I laboratory

Select one of the following (whichever not taken in the Core):

HORT 213 / LARC 213 / NRES 213 Landscape Plants II

HORT 214 / NRES 214 Herbaceous Landscape Plants

HORT 325 Greenhouse Practices and Management

HORT 352 Production and Physiology of Horticultural Crops

HORT 353 Vegetable Crop Production Laboratory

HORT 354 Fruit Production Laboratory

HORT 355 Perennial, Pot and Bedding Plant Production Laboratory

Credit Hours Subtotal: 15

**Pest Management**

Ento 115 / Bios 115 Insect Biology

Ento 116 / Bios 116 Insect Identification

Ento 403 Management of Horticultural Crop Insects

Credit Hours Subtotal: 3
PLPT 369 / BIOS 369
Introductory Plant Pathology
Credit Hours Subtotal: 3

**Horticulture Electives**
Select at least 5 hours of courses of the following if not taken above:
- HORT 227 / AGRO 227 / PGAM 227 / TLMT 227
  Introductory Turfgrass Management
- HORT 261
  Floral Design I
- HORT 262
  Floral Design II
- HORT 396
  Current Projects and Topics in Horticulture
  or HORT 399
  Independent Study
- HORT 406 / AGRO 406 / NRES 406
  Plant Ecophysiology: Theory and Practice
- HORT 471 / HRTM 471 / NUTR 471
  Vines, Wines and You
- AGRO 366 / SOIL 366
  Soil Nutrient Relationships
- AGRO 426 / HORT 426 / NRES 426
  Invasive Plants
- PLPT 369L
  Introductory Plant Pathology Lab
Credit Hours Subtotal: 5

**Free Electives**
Select 9-13 credits
Credit Hours Subtotal: 9-13

**Core Requirements**
Complete requirements
Credit Hours Subtotal: 58

**Total Credit Hours**
120

**Sustainable Food Production Option**
**College Capstone (ACE 10)**
- HORT 488 / AGRO 488 / EAEP 488 / ENTR 488
  Business Management for Agricultural Enterprises
Credit Hours Subtotal: 3

**Mathematics**
Select from Core Requirements:
- MATH 102
  Trigonometry
- MATH 104
  Applied Calculus
- STAT 218
  Introduction to Statistics (ACE 3)
Credit Hours Subtotal: 0-1

**Horticulture**
Select in the Core:
- HORT 131
  Plant Science
Credit Hours Subtotal: 0

**Plant and Soil Management**
- HORT 352
  Production and Physiology of Horticultural Crops
  2

- HORT 353
  Vegetable Crop Production Laboratory
  2
- HORT 354
  Fruit Production Laboratory
  2
- AGRO 269 / SOIL 269
  Principles of Soil Management
  3
- AGRO 366 / SOIL 366
  Soil Nutrient Relationships
  4
- AGRO 439 / HORT 439
  Organic Farming and Food Systems
  3
Credit Hours Subtotal: 16

**Crop Protection**
- ENTO 403
  Management of Horticultural Crop Insects
  3
- PLPT 369 / BIOS 369
  Introductory Plant Pathology
  3
- PLPT 369L
  Introductory Plant Pathology Lab
  1
Credit Hours Subtotal: 7

**Ecology**
- NRES 220 / BIOS 220
  Principles of Ecology
  3
- AGRO 435 / HORT 435 / NRES 435
  Agroecology
  3
- AGRO 436 / NRES 436
  Agroecosystems Analysis
  or HORT 436
Credit Hours Subtotal: 6

**Natural Science**
Select in the Core:
- BIOS 109
  General Chemistry I
- CHEM 109
  General Chemistry II
- MSYM 109
  Physical Principles in Agriculture and Life Sciences
  or PHYS 141
  Elementary General Physics I
- AGRO 215 / HORT 215 / TLMT 215
  Genetics
  4
- AGRO 325
  Introductory Plant Physiology
  4
- CHEM 110
  General Chemistry II
  4
Credit Hours Subtotal: 12

**Business and Economics**
- HORT 388 / AGRO 388 / EAEP 388 / ENTR 388
  Agribusiness Entrepreneurship
  3
Credit Hours Subtotal: 3

**Free Electives**
Select 11-15 credits
Credit Hours Subtotal: 11-15

Suggested courses:
- HORT 325
  Greenhouse Practices and Management
- HORT 426
  Invasive Plants
- HORT 471 / HRTM 471 / NUTR 471
  Vines, Wines and You
Requirements for Minor Offered by Department

Horticulture Minor

A minor in horticulture consists of a minimum of 18 credit hours of horticulture including 6-8 hours at the 300 level or above. Advisors for the horticulture minor will be assigned by the head of the Department of Agronomy and Horticulture. Requirements are as follows:

**Core**
Select 10-12 credits of the following: 10-12

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>HORT 131</td>
<td>Plant Science</td>
</tr>
<tr>
<td>AGRO 131</td>
<td></td>
</tr>
<tr>
<td>HORT 133</td>
<td>Horticultural Plant Science Laboratory</td>
</tr>
<tr>
<td>HORT 200</td>
<td>Landscape and Environmental Appreciation</td>
</tr>
<tr>
<td>GEOG 200</td>
<td></td>
</tr>
<tr>
<td>LARC 200</td>
<td></td>
</tr>
</tbody>
</table>

or HORT 261 Floral Design I

or HORT 355 Perennial, Pot and Bedding Plant Production Laboratory

HORT 212 / LARC 212 / NRES 212

HORT 221 Plant Propagation

Credit Hours Subtotal: 12

**Electives**
Select 6-8 credits of the following: 6-8

<table>
<thead>
<tr>
<th>Course</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>HORT 325</td>
<td>Greenhouse Practices and Management</td>
</tr>
<tr>
<td>HORT 352</td>
<td>Production and Physiology of Horticultural Crops</td>
</tr>
<tr>
<td>HORT 353</td>
<td>Vegetable Crop Production Laboratory</td>
</tr>
<tr>
<td>HORT 354</td>
<td>Fruit Production Laboratory</td>
</tr>
<tr>
<td>HORT 355</td>
<td>Perennial, Pot and Bedding Plant Production Laboratory (if not taken above)</td>
</tr>
<tr>
<td>HORT 462</td>
<td>Nursery Management and Crop Production</td>
</tr>
</tbody>
</table>

Credit Hours Subtotal: 6

Total Credit Hours 18
AGRO 132 Agronomic Plant Science Laboratory
Prerequisites: AGRO 131 or parallel
Description: Growth, development, morphology and staging of annual and perennial monocot and dicot plants produced for grain, forage and grazing. Evaluation of seed, grain and forage quality for plants of agronomic importance.
Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1
Format: LAB
Prerequisite for: AGRO 278, HORT 278

AGRO 153 Soil Resources
Crosslisted with: HORT 153, SOIL 153
Prerequisites: High school chemistry or one semester college chemistry.
Description: Characteristics of soils in relation to their appropriate uses and protection. Principles and practices using cooperative exercises including discussion, assessment, planning, problem-solving, writing, and presentation involving all aspects of soils.
Credit Hours: 4
Max credits per semester: 4
Max credits per degree: 4
Format: LEC
Prerequisite for: AGRO 327, HORT 327, TLMT 327; AGRO 361, GEOL 361, NRES 361, SOIL 361, WATS 361; AGRO 455, AGRO 855, NRES 455, NRES 855, SOIL 455; AGRO 472, AGRO 872, NRES 472, NRES 872, SOIL 472, WATS 472; NRES 245, AGRO 245; NRES 319

AGRO 201 Agronomic Internship and Career Preparation
Description: Group activities to help formulate career goals, improve academic success skills, develop a resume and select an appropriate internship.
Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1
Format: LEC
Prerequisite for: AGRO 405

AGRO 204 Resource-Efficient Crop Management
Prerequisites: AGRO 131 and AGRO/SOIL 153, or equivalents.
Description: Integration of principles of crop and soil science, plant breeding, climatology and integrated pest management in the development and evaluation of crop management practices. Efficient use of solar radiation, water, nutrients, heat, carbon dioxide, and other resources in field crop management.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Prerequisite for: AGRO 405

AGRO 215 Genetics
Crosslisted with: HORT 215, TLMT 215
Prerequisites: 3 hrs biological sciences.
Description: Discovery of the biology of genes and the application of genetics principles to understand the control and inheritance of traits in families and populations. Focus is on animals and plants that are important in medicine, agriculture and nature. Learning emphasis is problem solving via online, instant feedback assessments, group discussion, experimental data analysis and context-based exams.
Credit Hours: 4
Max credits per semester: 4
Max credits per degree: 4
Format: LEC
Prerequisite for: ASCI 330; ASCI 486

AGRO 216 Plant Breeding Principles and Practice
Crosslisted with: HORT 216
Prerequisites: High school biology and chemistry. BIOS 101 and 101L, or 102 or equivalent recommended.
Description: Plant breeding theory and technique. Application of genetic principles to plant improvement. Experience with breeding agronomic and horticultural plant species to illustrate plant mating systems and breeding principles.
Credit Hours: 2
Max credits per semester: 2
Max credits per degree: 2
Format: LEC
Prerequisite for: AGRO 326, AGRO 327, HORT 327, TLMT 327; AGRO 326, HORT 327, HORT 327, TLMT 327; TLMT 395

AGRO 227 Introductory Turfgrass Management
Crosslisted with: HORT 227, PGAM 227, TLMT 227
Prerequisites: AGRO 131 or HORT 130 or BIOS 109.
Description: Introduction to turfgrasses, their management and use, and to the turfgrass industry.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Prerequisite for: AGRO 326, AGRO 327, HORT 326, TLMT 326; AGRO 327, HORT 327, TLMT 327; TLMT 395

AGRO 228 Introduction to Landscape Management
Crosslisted with: HORT 228, TLMT 228
Prerequisites: AGRO 131 or BIOS 109
Notes: TLMT/AGRO/HORT uses a team approach to problem solving, discussion, assessment planning, and oral presentations of applied case studies.
Description: An overview of landscape management and landscape design. Principles and practices.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Prerequisite for: AGRO 326, HORT 326, TLMT 326; AGRO 327, HORT 327, TLMT 327; TLMT 395

AGRO 229 Introductory Turfgrass Management Laboratory
Crosslisted with: TLMT 229, HORT 229
Description: Laboratory covering turfgrass identification and management. Concurrent enrollment with AGRO/HORT/TLMT 227 preferred. Required for Turfgrass Science majors, other students require instructor consent.
Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1

AGRO 240 Forage Crop and Pasture Management
Crosslisted with: RNGE 240
Prerequisites: AGRO 131 or BIOS 109 or equivalent
Description: Principles basic to the establishment, management, and utilization of forage crops and pastures. Plant identification and selection, seeding, fertilization, irrigation, forage quality and utilization, hay and silage preservation, and grazing management. The role of forages and ranges in developing a sustainable agriculture.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Prerequisite for: AGRO 445, AGRO 845, ASCI 451, ASCI 851, RNGE 445
AGRO 242 North American Wildland Plants
Crosslisted with: HORT 242, RNGE 242
Prerequisites: Permission, AGRO/RNGE 240 recommended.
Description: Identification and description of two-hundred important wildland plants of North America. Characteristics of these plants evaluated in terms of management implications.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

AGRO 245 Introduction to Grassland Ecology and Management
Crosslisted with: NRES 245
Prerequisites: AGRO 153
Description: Grassland ecology and management is relevant to students with education and career goals in managing natural resources in Nebraska and the Great Plains. About 50% of the land area in Nebraska is classified as grassland (or rangeland) and is the land type with the most opportunity for enhancing biodiversity and wildlife habitat. Applying ecological principles and social values to managing rangeland resources, students will develop a knowledge and appreciation for the various grassland management uses and techniques available to resource managers.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

AGRO 269 Principles of Soil Management
Crosslisted with: SOIL 269
Prerequisites: AGRO 153.
Description: Principles of soil management under dryland and irrigated conditions. Relationships of soil and climate resources to soil erosion, movement and storage of soil water, soil organic matter, and irrigation practice. Special problem topics such as acidity, alkali, drainage, and soil testing.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

AGRO 270 Biological Invaders
Crosslisted with: HORT 270, NRES 270, PLPT 270
Prerequisites: 3 hrs biological sciences.
Description: Impact of exotic species and invasive organisms: agricultural and medical emerging disease; predicting biological invasions; biological control; regulatory, monitoring, and control efforts; ecological impact.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

AGRO 275 Agribusiness Entrepreneurial Finance
Crosslisted with: AECN 275, EAEF 275, ENTR 275, HORT 275
Description: Overview of financial issues for agribusiness start-ups. Business funding specific to new enterprises. Case studies on financial practices for start-up firms.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

AGRO 278 Botany
Crosslisted with: HORT 278
Prerequisites: BIOS 101 and 101L or LIFE 120 and LIFE 120L or AGRO/HORT 131 and AGRO 132 or HORT 133.
Description: Introduction to the plant kingdom and to plants as biological organisms; structure and function of cells, tissues, and organs with emphasis on seed plants; the important processes and concepts of life cycles, evolution, and physiology.
Credit Hours: 4
Max credits per semester: 4
Max credits per degree: 4
Format: LEC
Offered: SPRING

AGRO 279 Soil Evaluation
Crosslisted with: NRES 279, SOIL 279
Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 3
Format: LEC

AGRO 295 Internship in Agronomy
Crosslisted with: RNGE 295, SOIL 295
Prerequisites: Sophomore standing and completion of internship approval form. The internship proposal is subject to approval by the department.
Description: Participation in agronomic applications and in agronomy-related areas of agribusiness; agronomic research in lab, greenhouse, or field; participation in farming practices other than those in which the student has had previous experience; or preparation of teaching materials.
Credit Hours: 1-3
Min credits per semester: 1
Max credits per semester: 3
Max credits per degree: 5
Format: FLD

AGRO 325 Introductory Plant Physiology
Prerequisites: Chemistry through organic or higher-level course in cell biology.
Notes: Botany recommended.
Credit Hours: 4

AGRO 326 Landscape Solutions
Crosslisted with: HORT 326, TLMT 326
Prerequisites: TLMT/AGRO/HORT 227 or 228
Description: Using processes and problem-solving approach to identify and analyze common landscape management situations in commercial, public, and residential landscapes. Integrate design, environment, function, pest and disease, and existing management practices to produce recommendations.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
AGRO 327 Turfgrass Science and Management
Crosslisted with: HORT 327, TLMT 327
Prerequisites: AGRO/HORT/SOIL 153; CHEM 105 or 109; and TLMT 227
Description: Scientific principles of turf species adaptation, turf and/or soil relationships, establishment, fertility, mowing, irrigation, and pest control of turf species.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

AGRO 330 Pruning Ornamentals
Crosslisted with: HORT 330, TLMT 330
Description: Why, when and how to prune ornamental landscape plants. Demonstrations and field opportunities on how to choose and how to use pruning tools correctly.
Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1
Format: LEC

AGRO 340 Range Management and Improvement
Crosslisted with: RNGE 340
Prerequisites: AGRO 240.
Description: The principles of range management within the ecosystem framework. Range improvement practices and grazing systems; plant control using biological, chemical and mechanical factors; prescribed burning; range seeding; range fertilization; and the integration of range with other forage resources.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Prerequisite for: AGRO 445, AGRO 845, ASCI 451, ASCI 851, RNGE 445

AGRO 361 Soils, Environment and Water Quality
Crosslisted with: GEOL 361, NRES 361, SOIL 361, WATS 361
Prerequisites: AGRO/HORT/SOIL 153; MATH 102 or 103; two semesters chemistry (CHEM 105, 106 or CHEM 109,110) and WATS/GEOL/NRES 281
Description: Chemical and physical processes that influence the fate and transport of contaminants (inorganic, organic, microbial) in soil-water environments. Extent, fate, mitigation and impact of various sources of pollution. Remedial technologies used for environmental restoration of contaminated environments.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Prerequisite for: AGRO 445, AGRO 845, ASCI 451, ASCI 851, RNGE 445

AGRO 366 Soil Nutrient Relationships
Crosslisted with: SOIL 366
Prerequisites: AGRO 153.
Description: Use of fertilizers as plant nutrient sources to produce healthy and nutritious plants, improve profit, insure enterprise sustainability, fulfill legal requirements, and protect soil and water quality. Addresses issues from production agriculture, natural resource utilization and preservation, and ornamental plant culture.
Credit Hours: 4
Max credits per semester: 4
Max credits per degree: 4
Format: LEC

AGRO 375 Innovations for Agriculture
Crosslisted with: HORT 375, AGRI 375, EAEP 375, TLMT 375
Description: Explore sustainability challenges in plant and animal agricultural systems, assess current solutions, and identify opportunities for innovation. Research, develop, prototype, test, and pitch an innovative product, service, or technology for agriculture.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Offered: FALL

AGRO 388 Agribusiness Entrepreneurship
Crosslisted with: HORT 388, ENTR 388, EAEP 388, ABUS 388
Description: Overview of types of agricultural enterprises. Basic accounting principles as they relate to agricultural businesses. Requires completion of a marketing plan specific to agricultural enterprises based on a business idea. Student team projects with emphasis on marketing.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Prerequisite for: HORT 301

AGRO 403 Scientific Writing and Communication
Crosslisted with: AGRO 803, HORT 403, HORT 803
Prerequisites: Senior standing or higher, an ACE 1 written communication course, an ACE 2 oral communication course, and permission of instructor.
Description: Reading and critiquing, writing, and presenting scientific information. Use research data to compose a manuscript in standard scientific format, and prepare and present a poster to a general audience. Ethical issues in research and writing.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Prerequisite for: HORT 301

AGRO 405 Crop Management Strategies
Prerequisites: Senior standing; AGRO 204, AGRO/SOIL 269; and permission. JGEN 200 and/or 300, and AECN 201 recommended
Notes: Capstone course. Requires participation in a three-day field trip prior to the beginning of the first semester. Students must notify instructor at time of early registration (dates are listed in Schedule of Classes). Cannot be taken "Pass/No Pass."
Description: Application, expansion, and integration of principles from agricultural, biological, and physical sciences into the development and management of cropping systems.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
ACE: ACE 10 Integrated Product

AGRO 406 Crop Management Strategies
Prerequisites: Senior standing; AGRO 204, AGRO/SOIL 269; and permission. JGEN 200 and/or 300, and AECN 201 recommended
Notes: Capstone course. Requires participation in a three-day field trip prior to the beginning of the first semester. Students must notify instructor at time of early registration (dates are listed in Schedule of Classes). Cannot be taken "Pass/No Pass."
Description: Application, expansion, and integration of principles from agricultural, biological, and physical sciences into the development and management of cropping systems.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
ACE: ACE 10 Integrated Product
AGRO 406 Plant Ecophysiology: Theory and Practice
Crosslisted with: AGRO 806, HORT 406, HORT 806, NRES 406, NRES 806
Prerequisites: Junior standing, 4 hrs ecology, and 4 hrs botany or plant physiology.
Description: Principles of plant physiology which underlie the relationship between plants and their physical, chemical and biotic environments. An introduction to the ecological niche, limiting factors and adaptation. An overview of the seed germination and ecology, plant and soil water relations, nutrients, plant energy budgets, photosynthesis, carbon balance and plant-animal interactions. An introduction to various field equipment used in ecophysiological studies.
Credit Hours: 4
Max credits per semester: 4
Max credits per degree: 4
Format: LEC

AGRO 408 Microclimate: The Biological Environment
Crosslisted with: GEOG 408, HORT 408, METR 408, NRES 408, WATS 408, AGRO 808, GEOG 808, HORT 808, METR 808, NRES 808
Prerequisites: Junior standing, MATH 106 or equivalent, 5 hrs physics, major in any of the physical or biological sciences or engineering; or permission.
Description: Physical factors that create the biological environment. Radiation and energy balances of earth's surfaces, terrestrial and marine. Temperature, humidity, and wind regimes near the surface. Control of the physical environment through irrigation, windbreaks, frost protection, manipulation of light, and radiation. Applications to air pollution research. Instruments for measuring environmental conditions and remote sensing of the environment.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Groups: Physical Geography

AGRO 409A Case studies in plant breeding: Breeding for Disease Resistance
Crosslisted with: AGRO 809A, HORT 409A, HORT 809A
Description: The application of fundamental genetics principles in inheritance, gene mapping and DNA analysis to decision making by plant breeders with the goal of improving disease resistance in crop cultivars. Learning is structured by the genetics discovery story told in published research articles and the thinking process of plant breeders who will use these discoveries in their work.
Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1
Format: LEC

AGRO 409B Case Studies in plant breeding: Transgenic strategies for disease resistance
Crosslisted with: AGRO 809B, HORT 409B, HORT 809B
Description: The application of basic science and technology by plant genetic engineering experts with the goal of teaming with plant breeders to improve disease resistance in crop cultivars. Learning is structured by the genetics discovery story told in published research articles and the thinking process of genetic engineers and plant breeders who will use these discoveries in their work.
Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1
Format: LEC

AGRO 411 Crop Genetic Engineering
Crosslisted with: AGRO 811
Description: Basic steps required to produce genetically engineered crops. Genetic engineering procedures used to develop current crops and innovations that will lead to future products. Genetic engineering process and predicting how changes in different steps of the process influence the final crop. Application of genetic engineering technology to plan the development of new genetically engineered crops.
Credit Hours: 2
Max credits per semester: 2
Max credits per degree: 2
Format: LEC

AGRO 412 Crop and Weed Genetics
Crosslisted with: AGRO 812
Notes: A previous class in Genetics is highly recommended.
Description: Application of classical and molecular genetic principles to the explanation of variation observed in plant families and populations. Interpretation of information gathered from whole plant trait observation and from molecular analysis. Relationships between crops and weeds. Examples from genetic studies on both crop and weed species are the basis of course.
Credit Hours: 2
Max credits per semester: 2
Max credits per degree: 2
Format: LEC
Offered: SPRING

AGRO 414 Turfgrass Disease Management
Crosslisted with: AGRO 814, HORT 414, HORT 814, PLPT 414, PLPT 814, TLMT 414, TLMT 814
Prerequisites: BIOS/PLPT 369 or one semester of introductory plant pathology.
Description: Pathogens, epidemiology, and control of diseases specific to turfgrass.
Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1
Format: LEC

AGRO 419 Applications of Remote Sensing in Agriculture and Natural Resources
Crosslisted with: GEOG 419, GEOL 419, NRES 420, AGRO 819, GEOG 819, GEOL 819, NRES 820
Notes: GEOG 418/NRES 418 recommended
Description: Introduction to the practical uses of remote electromagnetic sensing in dealing with agricultural and water-resources issues.
Credit Hours: 4
Max credits per semester: 4
Max credits per degree: 4
Format: LEC
Groups: Techniques
AGRO 420 Bioinformatics Applications in Agriculture
Crosslisted with: AGRO 820
Prerequisites: AGRO 215 Genetics or equivalent. Undergraduate students must be at the senior class level standing.
Description: Introduction to applied computational methods to analyze biological data, efficiently manipulate large data sets, and automate workflows using Perl and Shell scripting. Learn strategies for assembling and analyzing data generated by modern high throughput sequencing platforms.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Offered: FALL

AGRO 426 Invasive Plants
Crosslisted with: AGRO 826, HORT 426, HORT 826, NRES 426, NRES 826
Prerequisites: AGRO/HORT/SOIL 153; BIOS 109.
Description: Identification, biology and ecology of weedy and invasive plants. Principles of invasive plant management by preventative, cultural, biological, mechanical and chemical means using an adaptive management framework. Herbicide terminology and classification, plant-herbicide and soil-herbicide interactions, equipment calibration and dosage calculations.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

AGRO 427 Turfgrass Systems Management
Crosslisted with: HORT 427, TLMT 427, AGRO 827, HORT 827, TLMT 827
Prerequisites: TLMT 227 and TLMT 327
Description: Critical evaluation of turfgrass settings to create economical and environmentally friendly management systems for professionally managed turf areas.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
ACE: ACE 10 Integrated Product

AGRO 429A Food Security: A Global Perspective
Prerequisites: Junior standing
Description: Overview of the technical and sociocultural dimensions of global food insecurity.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

AGRO 431 Site-specific Crop Management
Crosslisted with: AGEN 431, MSYM 431
Prerequisites: Senior standing; AGRO/SOIL 153; AGRO 204; or permission.
Description: Principles and concepts of site-specific management. Evaluation of geographic information systems for crop production practices. Practical experience with hardware and software necessary for successful application of information affecting crop management.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

AGRO 434 Plant Biochemistry
Crosslisted with: BIOC 434, BIOS 434, CHEM 434, AGRO 834, BIOC 834, BIOS 834, CHEM 834
Prerequisites: BIOC/BIOS/CHEM 431/831.
Description: Biochemical metabolism unique to plants. Relationships of topics previously acquired in general biochemistry to biochemical processes unique to plants. Biochemical mechanisms behind physiological processes discussed in plant or crop physiology.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

AGRO 435 Agroecology
Crosslisted with: AGRO 825, HORT 435, NRES 435, NRES 835
Prerequisites: For AGRO/HORT/NRES 435: Senior standing or permission. For AGRO/NRES 835: 12 hrs biological or agricultural sciences or permission.
Description: Integration of principles of ecology, plant and animal sciences, crop protection, and rural landscape planning and management for sustainable agriculture. Includes natural and cultivated ecosystems, population and community ecology, nutrient cycling, pest management, hydrologic cycles, cropping and grazing systems, landscape ecology, biodiversity, and socioeconomic evaluation of systems.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
ACE: ACE 10 Integrated Product

AGRO 436 Agroecosystems Analysis
Crosslisted with: AGRO 836, HORT 436, HORT 836
Prerequisites: Senior standing.
Notes: Cost of travel required. Summer travel course with multi-state faculty. Farm visits to Iowa, Minnesota and Nebraska.
Description: Analysis of production, economics, environmental impacts, and social integration aspects of farms and farming systems
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: FLD

AGRO 437 Animal, Food and Industrial Uses of Grain
Crosslisted with: AGRO 837
Prerequisites: CHEM 105 or 109, and one of the following: AGRO 204 or ASCI 250.
Description: Identification and comparison of grain quality characteristics desired by livestock feeders, human food processors and industrial users, and methods used to measure these characteristics.
Credit Hours: 2
Max credits per semester: 2
Max credits per degree: 2
Format: LEC
AGRO 438 Producing Grain for Animal, Food and Industrial Uses
Crosslisted with: AGRO 838
Prerequisites: CHEM 109 and one of the following: AGRO 204 or ASCI 250.
Notes: AGRO 215 and 437/837 recommended.
Description: Genetic development, production practices, and grain handling and storage procedures to deliver quality grain to livestock feeders, human food processors and industrial uses.
Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1
Format: LEC

AGRO 439 Organic Farming and Food Systems
Crosslisted with: AGRO 839, HORT 439, HORT 839
Prerequisites: 12 credits of agricultural or biological science, economics, or natural resources
Description: History of organic farming and horticultural systems, organic certification, nutrient and pest management in organic systems, planning organic enterprises including production and marketing, resilience of organic systems in ecological, economic, and social terms; future issues and potentials of organic food systems.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

AGRO 440 Great Plains Ecosystem
Crosslisted with: AGRO 840, NRES 840, RNGE 440, NRES 440
Prerequisites: Junior standing. BIOS 101 and 101L, or equivalent, recommended.
Description: Characteristics of Great Plains ecosystems, interrelationships of ecological factors and processes, and their application in the management of grasslands. Interactions of fire, vegetation, grazing animals and wildlife.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

AGRO 441 Perennial Plant Function, Growth, and Development
Crosslisted with: AGRO 841, HORT 441, HORT 841, RNGE 441
Prerequisites: AGRO 325 or equivalent.
Description: Principles of crop physiology and developmental morphology in relation to function, growth, development, and survival of perennial forage, range, and turf plants. The relationship of physiology and morphological development on plant use and management.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

AGRO 442 Wildland Plants
Crosslisted with: AGRO 842, NRES 842, RNGE 442, NRES 442
Prerequisites: Junior standing. BIOS 101 and 101L, or equivalent, recommended.
Description: Wildland plants that are important to grassland and shrubland ecosystem management and production. Distribution, utilization, classification, identification (including identification by vegetative parts), uses by Native Americans, and recognition of grasses, fords, shrubs, exotic and wetland plants.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

AGRO 444 Ecosystem Monitoring and Assessment
Crosslisted with: AGRO 844, NRES 844, RNGE 444, NRES 444
Prerequisites: Junior standing. NRES 220 or equivalent, recommended
Description: Measurement and monitoring of the important vegetation and environmental factors used to develop management guidelines in grasslands, savannas, woodlands, and wetlands. Emphasis on using ecosystem monitoring protocols for assessment of wildlife habitat, fuels management for wild-land fire, livestock production, and watershed function. Requires field sampling and travel to local field sites.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

AGRO 445 Livestock Management on Range and Pasture
Crosslisted with: AGRO 845, ASCI 451, ASCI 851, RNGE 445
Prerequisites: ASCI 250 and AGRO 240 or 340; AECN 201 recommended.
Notes: Capstone course. All students required to participate in a one-week field trip in central or western Nebraska prior to beginning of fall semester. Therefore, students must notify instructor at time of early registration (Dates are given in class schedule.)
Description: Analyzing the plant and animal resources and economic aspects of pasturage. Management of pasture and range for continued high production emphasized.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

AGRO 450 Climate and Society
Crosslisted with: GEOG 450, METR 450, NRES 452, AGRO 850, GEOG 850, METR 850, NRES 852
Prerequisites: Junior standing or above.
Description: Impact of climate and extreme climatic events on society and societal responses to those events. Global in scope and interdisciplinary.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

ACE: ACE 10 Integrated Product

AGRO 450 Climate and Society
Crosslisted with: GEOG 450, METR 450, NRES 452, AGRO 850, GEOG 850, METR 850, NRES 852
Prerequisites: Junior standing or above.
Description: Impact of climate and extreme climatic events on society and societal responses to those events. Global in scope and interdisciplinary.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Groups: Physical Geography
AGRO 452 Irrigation Systems Management
Crosslisted with: MSYM 452, MSYM 852, WATS 452
Prerequisites: MSYM 109 or PHYS 141 or PHYS 151 or PHYS 211
Notes: AGRO/SOIL 153 recommended.
Description: Irrigation management and the selection, evaluation, and improvement of irrigation systems. Includes soil-water measurement, crop water use, irrigation scheduling, irrigation efficiency, measurement of water flow, irrigation systems, groundwater and wells, pumping systems, applying chemicals with irrigation systems, and environmental and water resource considerations.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Offered: FALL
Prerequisite for: AGRO 854, MSYM 854

AGRO 453 Urban Soil Properties and Management
Crosslisted with: HORT 453, LARC 453, SOIL 453
Prerequisites: AGRO/HORT/SOIL 153.
Description: Characteristics of soils in urban settings. Evaluation of soils intended for intensive human uses. Manipulation and remediation of soils subject to construction and other stresses.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

AGRO 455 Soil Chemistry and Mineralogy
Crosslisted with: AGRO 855, NRES 455, NRES 855, SOIL 455
Prerequisites: AGRO/HORT/SOIL 153 or GEOL 101; CHEM 109 and 110; CHEM 221 or 251; or equivalent.
Description: Chemical and mineralogical properties of soil components. Inorganic colloidal fraction. Structures of soil minerals as a means of understanding properties, such as ion exchange and equilibria; release and supply of nutrient and toxic materials; and soil acidity and alkalinity.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

AGRO 458 Soil Physical Determinations
Crosslisted with: AGRO 858, NRES 458, NRES 858, SOIL 458
Prerequisites: SOIL/AGRO/GEOL/WATS 361; PHYS 141 or equivalent; MATH 102 or 103.
Description: Survey of measurement techniques and principles used in characterizing the physical properties of soils. Includes analysis of experimental design and sources of experimental error. Techniques include: particle size analysis, soil water content, pore size analysis, field sampling techniques, soil strength, and saturated hydraulic conductivity.
Credit Hours: 2
Max credits per semester: 2
Max credits per degree: 2
Format: LAB

AGRO 460 Soil Microbiology
Crosslisted with: BIOS 460, NRES 460, SOIL 460, AGRO 860, BIOS 860, NRES 860
Prerequisites: One semester microbiology; one semester biochemistry or organic chemistry.
Description: Soil from a microbe's perspective-growth, activity and survival strategies; principles governing methods to study microorganisms and biochemical processes in soil; mechanisms controlling organic matter cycling and stabilization with reference to C, N, S, and P; microbial interactions with plants and animals; and agronomic and environmental applications of soil microorganisms.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Offered: SPRING

AGRO 461 Soil Physics
Crosslisted with: GEOL 461, NRES 461, SOIL 461, WATS 461, AGRO 861, GEOL 861, NRES 861
Prerequisites: AGRO/SOIL 153; PHYS 141 or equivalent, one semester of calculus.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

AGRO 469 Bio-Atmospheric Instrumentation
Crosslisted with: GEOG 469, HORT 407, METR 469, MSYM 469, NRES 469, AGRO 869, GEOG 869, HORT 807, METR 869, MSYM 869, NRES 869
Prerequisites: Junior standing; MATH 106; 4 hrs physics; physical or biological science major.
Description: Discussion and practical application of principles and practices of measuring meteorological and related variables near the earth's surface including temperature, humidity, precipitation, pressure, radiation and wind. Performance characteristics of sensors and modern data collection methods are discussed and evaluated.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Groups: Physical Geography

AGRO 470 Critical Thinking in Landscape Management
Crosslisted with: HORT 470, TLMT 470
Prerequisites: AGRO/HORT/PGMP/TLMT 326.
Description: Using processes and strategies to identify and compare issues, make recommendations, demonstrate proficiency in field application as skills and techniques, and prepare cost estimates in the development of landscape management plans.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
ACE: ACE 10 Integrated Product
AGRO 472 Applied Soil Physics
Crosslisted with: AGRO 872, NRES 472, NRES 872, SOIL 472, WATS 472
Prerequisites: AGRO/HORT/SOIL 153 or equivalent; MATH 104 or MATH 106 or equivalent.
Description: Emphasis on applied soil physics. Discussion of theoretical principles followed by field and laboratory exercises and applications. Fluxes of water, solutes, air, and heat through the soil. Emphasis on water infiltration, water retention, other soil hydraulic properties. Components of soil water balance. Management of soil water.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

AGRO 475 Water Quality Strategy
Crosslisted with: GEOG 467, NRES 475, SOCI 475, SOIL 475, WATS 475, AGRO 875, CIVE 475, CIVE 875, CRPL 475, CRPL 875, GEOI 475, GEOI 875, MSYM 475, MSYM 875, POLS 475, POLS 875
Prerequisites: Senior standing or permission
Notes: Capstone course.
Description: Holistic approach to the selection and analysis of planning strategies for protecting water quality from nonpoint sources of contamination. Introduction to the use of methods of analyzing the impact of strategies on whole systems and subsystems; for selecting strategies; and for evaluating present strategies.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
ACE: ACE 10 Integrated Product
Groups: American Government/Public Pol

AGRO 477 Great Plains Field Pedology
Crosslisted with: GEOG 467, NRES 477, SOIL 477, GEOG 867, NRES 877
Prerequisites: AGRO/SOIL 153.
Description: Spatial relationship of soil properties on various parts of landscape typical of the Plains, causal factors, and predictions of such relationships on other landscapes. Grouping these properties into classes, naming the classes, and the taxonomy that results from this grouping. Application of a taxonomy to a real situation through making a field soil survey in a region representative of the Plains border, predicting land use response of various mapped units as it affects the ecosystem, and evaluating the effectiveness of the taxonomic system used in the region surveyed.
Credit Hours: 4
Max credits per semester: 4
Max credits per degree: 4
Format: LEC
Groups: Physical Geography

AGRO 478 Plant Anatomy
Crosslisted with: BIOS 478, BIOS 878, AGRO 878, HORT 478, HORT 878
Prerequisites: 8 hrs biological sciences
Notes: BIOS 109 recommended.
Description: Development, structure, and function of tissues and organs of the higher plants. Relationships of structure to physiology and ecology of plants.
Credit Hours: 4
Max credits per semester: 4
Max credits per degree: 4
Format: LEC

AGRO 480 Modified Rootzones
Crosslisted with: HORT 480, TLMT 880, AGRO 880, HORT 880
Description: Modified rootzones and their applications in the turfgrass and landscape management industry. Correct applications and construction techniques. Offered as a five-week course.
Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1
Format: LEC

AGRO 484 Water Resources Seminar
Crosslisted with: GEOG 484, GEOL 484, NRES 484, WATS 484, NRES 884, AGRO 884, GEOG 884, GEOG 884, WATS 884
Prerequisites: Junior or above standing, or permission
Description: Seminar on current water resources research and issues in Nebraska and the region.
Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1
Format: LEC

AGRO 488 Business Management for Agricultural Enterprises
Crosslisted with: HORT 488, HORT 888, EAEP 488, ENTR 488, EAEP 888, AGRO 888, ENTR 888, ABUS 488
Description: Research a specific agricultural enterprise. Develop and present a business plan using materials from the primary area of interest. HORT 488/888 requires the completion of a shadowing assignment and the analysis of case studies.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
ACE: ACE 10 Integrated Product

AGRO 489 Urbanization of Rural Landscapes
Crosslisted with: AGRO 889, CRPL 489, HORT 489, HORT 889, CRPL 889
Prerequisites: Senior standing, graduate standing, or permission.
Description: Development converts rural landscapes into housing, roads, malls, parks, and commercial uses. This process fragments landscapes and changes ecosystem functions, drives up land prices, and pushes agriculture into more marginal areas. This multi-disciplinary, experiential course guides students in learning about the urbanization process, the impacts on landscapes, people, and the community, and the choices that are available to informed citizens.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

AGRO 495 Grasslands Seminar
Crosslisted with: ENTO 495, GRAS 495, HORT 495, NRES 495, RNGE 495, SOIL 495
Prerequisites: Junior standing.
Description: Topic varies and deals with different aspects of forage and/or range and/or livestock, turf and/or landscape grasses, natural habitats, and wetlands.
Credit Hours: 1-2
Min credits per semester: 1
Max credits per semester: 2
Max credits per degree: 4
Format: LEC
AGRO 496 Independent Study
Crosslisted with: AGRO 896, RNGE 496, SOIL 496
Credit Hours: 1-6
Min credits per semester: 1
Max credits per semester: 6
Max credits per degree: 12
Format: IND

AGRO 498 Senior Project
Crosslisted with: SOIL 498
Prerequisites: Senior standing.
Notes: A two-semester sequence. Students should select one credit hour the first semester and three credits the second semester. The first semester will be used for planning, topic selection, and identifying a project adviser. The second semester will be used to carry out the research project, prepare a written report, and possibly an oral presentation.
Description: Carry out and report on a research project.
Credit Hours: 1-3
Min credits per semester: 1
Max credits per semester: 3
Max credits per degree: 3
Format: IND

AGRO 499H Honors Thesis
Crosslisted with: RNGE 499H, SOIL 499H
Prerequisites: Admission to the University Honors Program and permission, AGRI 299H recommended.
Description: Conduct a scholarly research project and write a University Honors Program or undergraduate thesis.
Credit Hours: 3-6
Min credits per semester: 3
Max credits per semester: 6
Max credits per degree: 6
Format: IND

HORT 100 Plants, Landscapes, & the Environment
Crosslisted with: AGRO 100, TLMT 100
Description: Introduction to a diverse range of plant and landscape systems and management strategies for balancing economic and environmental sustainability. Foundational principles of plant biology, landscape ecology, and environmental science using real-world case studies.
Credit Hours: 3
Min credits per semester: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Offered: FALL/SPR

HORT 127 Survey of Turfgrass and Landscape Management
Crosslisted with: TLMT 127, AGRO 127
Description: Introduction to careers, internships and co-curricular activities in turfgrass and landscape management.
Credit Hours: 1
Min credits per semester: 1
Max credits per semester: 1
Max credits per degree: 1
Format: LEC

HORT 130 Introduction to Horticulture Science
Description: Introduction to the scientific concepts and practical skills involved in horticultural science.
Credit Hours: 4
Min credits per semester: 4
Max credits per semester: 4
Max credits per degree: 4
Format: LEC
Prerequisite for: AGRO 227, HORT 227, PGAM 227, TLMT 227; HORT 325

HORT 131 Plant Science
Crosslisted with: AGRO 131
Description: Biology of plants grown for food, fiber, fun, or fuel. Plant life cycles in managed ecosystems and their role in global carbon and water cycles. Mechanisms plants use to drive and control their growth, propagate, and change to compete with other organisms in their environment.
Credit Hours: 3
Min credits per semester: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Prerequisite for: AGRO 227, HORT 227, PGAM 227, TLMT 227; AGRO 228, HORT 228, TLMT 228; AGRO 240, RNGE 240; AGRO 278, HORT 278; BIOS 369, PLPT 369; HORT 212, NRES 212, LARC 212; HORT 353; HORT 355; NRES 220; NRES 302, HORT 302
ACE: ACE 4 Science

HORT 133 Horticultural Plant Science Laboratory
Prerequisites: AGRO 131 or parallel
Description: Growth, anatomy, morphology and physiology of fruits, vegetables, woody plants, ornamentals and turf. Emphasis on both field and greenhouse grown horticultural plants.
Credit Hours: 1
Min credits per semester: 1
Max credits per semester: 1
Max credits per degree: 1
Format: LAB
Prerequisite for: AGRO 278, HORT 278; HORT 355

HORT 153 Soil Resources
Crosslisted with: AGRO 153, SOIL 153
Prerequisites: High school chemistry or one semester college chemistry.
Description: Characteristics of soils in relation to their appropriate uses and protection. Principles and practices using cooperative exercises including discussion, assessment, planning, problem-solving, writing, and presentation involving all aspects of soils.
Credit Hours: 4
Min credits per semester: 4
Max credits per semester: 4
Max credits per degree: 4
Format: LEC
Prerequisite for: AGRO 327, HORT 327, TLMT 327; AGRO 361, GEOL 361, NRES 361, SOIL 361, WATS 361; AGRO 455, AGRO 855, NRES 455, NRES 855, SOIL 455; AGRO 472, AGRO 872, NRES 472, NRES 872, SOIL 472, WATS 472; NRES 245, AGRO 245; NRES 319

HORT 170 Residential Landscape Design
Description: Introductory course in home landscaping focusing on basic design elements and processes. Students prepare a program, analyze a dwelling and site, determine a phased budget, conceptualize a layout, and select detailed elements and techniques to implement a design for an actual residence.
Credit Hours: 2
Min credits per semester: 2
Max credits per semester: 2
Max credits per degree: 2
Format: LEC
HORT 200 Landscape and Environmental Appreciation
Crosslisted with: GEOG 200, LARC 200
Description: Values and processes in human landscapes and natural environments. Concepts and tools to understand the context of local and global environments and significant historical landscapes. Landscape as an indicator of aesthetic quality, design principles and processes as integrators of humans and nature, and the garden as a model for creating sustainable landscapes.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Prerequisite for: HORT 267
ACE: ACE 7 Arts ACE 9 Global/Diversity
Groups: Human-Economic Geography

HORT 201 Dendrology: Study and Identification of Trees and Shrubs
Crosslisted with: NRES 201
Description: An introduction to the naming, identification, and natural history of woody trees and shrubs in North American with emphasis on trees common to Nebraska. Covers morphology, natural site conditions, wildlife and human uses of woody trees and shrubs.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Offered: FALL

HORT 211 Landscape Plants I
Crosslisted with: NRES 212, LARC 212
Prerequisites: HORT 131
Notes: Requires Saturday off-campus field trips.
Description: Identification using botanical and common names for herbaceous annuals, perennials, grasses, ground covers, vines, trees, and shrubs commonly found in Great Plains gardens, parks, and landscapes is stressed through field visits.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Prerequisite for: ARCH 467, ARCH 567, ARCH 867, LARC 467, HORT 467

HORT 212 Landscape Plants II
Crosslisted with: NRES 213, LARC 213
Prerequisites: HORT/LARC/NRES 212.
Notes: Continuation of HORT/LARC/NRES 212.
Description: Site requirements, landscape use, natural history, and specific needs of herbaceous ornamentals, grasses, ground covers, vines, trees, and shrubs commonly found in Great Plains gardens, parks, and landscapes. Common cultivars and additional species not covered in HORT/LARC/NRES 212.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

HORT 214 Herbaceous Landscape Plants
Crosslisted with: NRES 214
Description: Identification of herbaceous plants with ornamental value in the landscape including native and introduced annuals, perennials, grasses and cultivars. Typical ecological associations, environmental tolerances and/or intolerance, cultural requirements, and design characteristics.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

HORT 215 Genetics
Crosslisted with: AGRO 215, TLMT 215
Prerequisites: 3 hrs biological sciences
Description: Discovery of the biology of genes and the application of genetics principles to understand the control and inheritance of traits in families and populations. Focus is on animals and plants that are important in medicine, agriculture and nature. Learning emphasis is problem solving via online, instant feedback assessments, group discussion, experimental data analysis and context-based exams.
Credit Hours: 4
Max credits per semester: 4
Max credits per degree: 4
Format: LEC
Prerequisite for: ASCI 330; ASCI 486

HORT 216 Plant Breeding Principles and Practice
Crosslisted with: AGRO 216
Prerequisites: High school biology and chemistry. BIOS 101 and 101L, or 102 or equivalent recommended.
Description: Plant breeding theory and technique. Application of genetic principles to plant improvement. Experience with breeding agronomic and horticultural plant species to illustrate plant mating systems and breeding principles.
Credit Hours: 2
Max credits per semester: 2
Max credits per degree: 2
Format: LEC

HORT 221 Plant Propagation
Prerequisites: BIOS 109 or permission.
Description: Principles and practices involved in sexual and asexual propagation of herbaceous and woody plants. Laboratory work includes actual practice to gain skill and experience on the different methods of propagating plants.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Prerequisite for: HORT 325

HORT 227 Introductory Turfgrass Management
Crosslisted with: AGRO 227, PGAM 227, TLMT 227
Prerequisites: AGRO 131 or HORT 130 or BIOS 109.
Description: Introduction to turfgrasses, their management and use, and to the turfgrass industry.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Prerequisite for: AGRO 326, HORT 326, TLMT 326; AGRO 327, HORT 327, TLMT 327; TLMT 395
HORT 228 Introduction to Landscape Management
Crosslisted with: AGRO 228, TLMT 228
Prerequisites: AGRO 131 or BIOS 109
Notes: TLMT/AGRO/HORT uses a team approach to problem solving, discussion, assessment planning, and oral presentations of applied case studies.
Description: An overview of landscape management and landscape design. Principles and practices.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Prerequisite for: AGRO 326, HORT 326, TLMT 227

HORT 229 Introductory Turfgrass Management Laboratory
Crosslisted with: TLMT 229, AGRO 229
Description: Laboratory covering turfgrass identification and management. Concurrent enrollment with AGRO/HORT/TLMT 227 preferred. Required for Turfgrass Science majors, other students require instructor consent.
Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1
Format: LAB

HORT 242 North American Wildland Plants
Crosslisted with: AGRO 242, RNGE 242
Prerequisites: Permission, AGRO/RNGE 240 recommended.
Description: Identification and description of two-hundred important wildland plants of North America. Characteristics of these plants evaluated in terms of management implications.
Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 4
Format: LEC

HORT 261 Floral Design I
Description: Principles of floral design and retail florist shop management, while offering practical experience in all aspects of flower arranging. Includes identification, care and handling, marketing and critiquing of floral designs.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Prerequisite for: HORT 262
ACE: ACE 7 Arts

HORT 262 Floral Design II
Prerequisites: HORT 261 or permission.
Description: Advanced styles of floral design, foliage plant care and retail shop layout, as well as practical business knowledge in managing a small business. Topics include personnel, advertising, sales and floral marketing.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

HORT 265 Visual Communication for Landscape Design
Prerequisites: HORT 200.
Description: Graphic and oral presentation techniques for landscape design; sketching; introduction to use of various media and computers for visual communication and landscape analysis.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LAB
Prerequisite for: HORT 267

HORT 267 Introduction to Landscape Design Studio
Prerequisites: HORT 200, HORT 265 or permission
Notes: HORT 267 requires individual and team projects, studio critiques, presentations, and may require off-campus site visits outside of scheduled class time.
Description: Introduction to the process and elements of landscape design.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: SDO
Prerequisite for: HORT 300; HORT 301
Groups: Techniques

HORT 270 Biological Invaders
Crosslisted with: AGRO 270, NRES 270, PLPT 270
Prerequisites: 3 hrs biological sciences.
Description: Impact of exotic species and invasive organisms: agricultural and medical emerging disease; predicting biological invasions; biological control; regulatory, monitoring, and control efforts; ecological impact.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

HORT 275 Agribusiness Entrepreneurial Finance
Crosslisted with: AECN 275, EAEP 275, ENTR 275, AGRO 275
Description: Overview of financial issues for agribusiness start-ups. Business funding specific to new enterprises. Case studies on financial practices for start-up firms.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

HORT 278 Botany
Crosslisted with: AGRO 278
Prerequisites: BIOS 101 and 101L or LIFE 120 and LIFE 120L or AGRO/HORT 131 and AGRO 132 or HORT 133.
Description: Introduction to the plant kingdom and to plants as biological organisms; structure and function of cells, tissues, and organs with emphasis on seed plants; the important processes and concepts of life cycles, evolution, and physiology.
Credit Hours: 4
Max credits per semester: 4
Max credits per degree: 4
Format: LEC
Offered: SPRING
HORT 300 Introduction to Landscape Construction
**Prerequisites:** HORT 267 or concurrent
**Notes:** Offered Spring Semester of odd years and alternate with HORT 301. HORT 300 requires field trips to landscape installation sites.
**Description:** Principles underlying the management of the greenhouse.
**Credit Hours:** 3
**Max credits per semester:** 3
**Max credits per degree:** 3
**Format:** LEC
**Offered:** SPRING

HORT 301 Introduction to Landscape Contracting
**Prerequisites:** HORT 267 and HORT 388 or concurrent
**Notes:** Offered Spring of even years and alternate with HORT 300.
**Description:** Overview of the landscape contracting business and administration of contracts, cost estimation and bidding.
**Credit Hours:** 3
**Max credits per semester:** 3
**Max credits per degree:** 3
**Format:** LEC
**Offered:** SPRING

HORT 302 Tree Biology
**Crosslisted with:** NRES 302
**Prerequisites:** BIOS 101, LIFE 120, HORT 131 or permission
**Description:** The study of the structure and function of woody plants, with a focus on trees growing in temperate climates. Covers the basics of wood physiology in terms of the biological, physical, and chemical processes utilized by tree to function. The anatomy and morphology of trees with a focus on the impacts of tree maintenance to the structure and function of landscape trees.
**Credit Hours:** 3
**Max credits per semester:** 3
**Max credits per degree:** 3
**Format:** LEC
**Offered:** FALL

HORT 303 Purchasing
**Crosslisted with:** genesis 303
**Prerequisites:** Junior standing or permission
**Description:** Covers practical application of the science of tree growth, development, and management in human dominated landscapes. Tree selection for varying landscapes and objectives, proper planting and pruning, identification and correction of tree defects, and working with tree pest issues.
**Credit Hours:** 4
**Max credits per semester:** 4
**Max credits per degree:** 4
**Format:** LEC
**Offered:** SPRING

HORT 304 Turfgrass Science and Management
**Prerequisites:** AGRO/HORT/STOL 153; CHEM 105 or 109; and TLMT 227
**Description:** Scientific principles of turf species adaptation, turf and/or soil relationships, establishment, fertility, mowing, irrigation, and pest control of turf species.
**Credit Hours:** 3
**Max credits per semester:** 3
**Max credits per degree:** 3
**Format:** LEC

HORT 305 Landscape Solutions
**Crosslisted with:** AGRO 326, TLMT 326
**Prerequisites:** TLMT/AGRO/HORT 227 or 228
**Description:** Using processes and problem-solving approach to identify and analyze common landscape management situations in commercial, public, and residential landscapes. Integrate design, environment, function, pest and disease, and existing management practices to produce recommendations.
**Credit Hours:** 3
**Max credits per semester:** 3
**Max credits per degree:** 3
**Format:** LEC

HORT 306 Production and Physiology of Horticultural Crops
**Prerequisites:** HORT 130 or AGRO 131; parallel HORT 353 or 354.
**Description:** Principles underlying the management and production of floricultural, fruit and vegetable crops.
**Credit Hours:** 2
**Max credits per semester:** 2
**Max credits per degree:** 2
**Format:** LEC

HORT 307 Vegetable Crop Production Laboratory
**Prerequisites:** AGRO/HORT 131. HORT 133 suggested.
**Description:** Vegetable crop production principles and practices, both locally and from a global perspective. Experience with seeding, transplant production, and growing of vegetables in field and greenhouse.
**Credit Hours:** 2
**Max credits per semester:** 2
**Max credits per degree:** 2
**Format:** LAB

HORT 308 Fruit Production Laboratory
**Prerequisites:** HORT 130 or AGRO 131.
**Description:** Fruit crop production principles and practices, both locally and from a global perspective. Experience with planting, pruning and layout of orchard, vineyard and small fruit crops, greenhouse propagation, and production practices.
**Credit Hours:** 2
**Max credits per semester:** 2
**Max credits per degree:** 2
**Format:** LAB

HORT 309 Greenhouse Practices and Management
**Prerequisites:** HORT 130, 221
**Description:** Principles underlying the management of the greenhouse.
**Credit Hours:** 4
**Max credits per semester:** 4
**Max credits per degree:** 4
**Format:** LEC

HORT 310 HORT 130, 221
**Description:** Materials, systems, and methods for constructing landscapes.
**Credit Hours:** 3
**Max credits per semester:** 3
**Max credits per degree:** 3
**Format:** LEC

HORT 311 Arboriculture: Maintenance & Selection of Landscape Trees
**Crosslisted with:** NRES 321
**Prerequisites:** Junior standing or permission
**Description:** Covers practical application of the science of tree growth, development, and management in human dominated landscapes. Tree selection for varying landscapes and objectives, proper planting and pruning, identification and correction of tree defects, and working with tree pest issues.
**Credit Hours:** 4
**Max credits per semester:** 4
**Max credits per degree:** 4
**Format:** LEC
**Offered:** SPRING

HORT 312 Laboratory and Field Training
**Groups:** Laboratory and Field Training

HORT 313 Landscape Solutions
**Crosslisted with:** AGRO 326, TLMT 326
**Prerequisites:** TLMT/AGRO/HORT 227 or 228
**Description:** Using processes and problem-solving approach to identify and analyze common landscape management situations in commercial, public, and residential landscapes. Integrated design, environment, function, pest and disease, and existing management practices to produce recommendations.
**Credit Hours:** 3
**Max credits per semester:** 3
**Max credits per degree:** 3
**Format:** LEC

HORT 314 Turfgrass Science and Management
**Crosslisted with:** AGRO 327, TLMT 327
**Prerequisites:** AGRO/HORT/STOL 153; CHEM 105 or 109; and TLMT 227
**Description:** Scientific principles of turf species adaptation, turf and/or soil relationships, establishment, fertility, mowing, irrigation, and pest control of turf species.
**Credit Hours:** 3
**Max credits per semester:** 3
**Max credits per degree:** 3
**Format:** LEC

HORT 315 Landscape Solutions
**Crosslisted with:** AGRO 326, TLMT 326
**Prerequisites:** TLMT/AGRO/HORT 227 or 228
**Description:** Using processes and problem-solving approach to identify and analyze common landscape management situations in commercial, public, and residential landscapes. Integrate design, environment, function, pest and disease, and existing management practices to produce recommendations.
**Credit Hours:** 3
**Max credits per semester:** 3
**Max credits per degree:** 3
**Format:** LEC

HORT 316 Production and Physiology of Horticultural Crops
**Prerequisites:** HORT 130 or AGRO 131; parallel HORT 353 or 354.
**Description:** Principles underlying the management and production of floricultural, fruit and vegetable crops.
**Credit Hours:** 2
**Max credits per semester:** 2
**Max credits per degree:** 2
**Format:** LEC

HORT 317 Vegetable Crop Production Laboratory
**Prerequisites:** AGRO/HORT 131. HORT 133 suggested.
**Description:** Vegetable crop production principles and practices, both locally and from a global perspective. Experience with seeding, transplant production, and growing of vegetables in field and greenhouse.
**Credit Hours:** 2
**Max credits per semester:** 2
**Max credits per degree:** 2
**Format:** LAB

HORT 318 Fruit Production Laboratory
**Prerequisites:** HORT 130 or AGRO 131.
**Description:** Fruit crop production principles and practices, both locally and from a global perspective. Experience with planting, pruning and layout of orchard, vineyard and small fruit crops, greenhouse propagation, and production practices.
**Credit Hours:** 2
**Max credits per semester:** 2
**Max credits per degree:** 2
**Format:** LAB

HORT 319 Greenhouse Practices and Management
**Prerequisites:** HORT 130, 221
**Description:** Principles underlying the management of the greenhouse.
**Credit Hours:** 4
**Max credits per semester:** 4
**Max credits per degree:** 4
**Format:** LEC
HORT 355 Perennial, Pot and Bedding Plant Production Laboratory
Prerequisites: AGRO/HORT 131 and HORT 133; HORT 352 recommended.
Description: Growing conditions of specific perennial, annual, pot plants, cut flowers. How to schedule and cost account plant production. Care of post-production plants. Experience propagating and growing perennial, pot and bedding plants and cut flowers in the greenhouse.
Credit Hours: 2
Max credits per semester: 2
Max credits per degree: 2
Format: LAB

HORT 375 Innovations for Agriculture
Crosslisted with: AGRI 375, AGRO 375, EAEP 375, TLMT 375
Description: Explore sustainability challenges in plant and animal agricultural systems, assess current solutions, and identify opportunities for innovation. Research, develop, prototype, test, and pitch an innovative product, service, or technology for agriculture.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Offered: FALL

HORT 388 Agribusiness Entrepreneurship
Crosslisted with: AGRO 388, ENTR 388, EAEP 388, ABUS 388
Description: Overview of types of agricultural enterprises. Basic accounting principles as they relate to agricultural businesses. Requires completion of a marketing plan specific to agricultural enterprises based on a business idea. Student team projects with emphasis on marketing.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Prerequisite for: HORT 301

HORT 395 Career Experience
Prerequisites: Sophomore standing; HORT major.
Notes: HORT 395 requires advanced permission before registering for the course. A written and oral report is required at the completion of the career experience.
Description: Participation in a horticulture enterprise (other than in one of those in which the student has had previous experience).
Credit Hours: 1-5
Min credits per semester: 1
Max credits per semester: 5
Max credits per degree: 5
Format: FLD

HORT 396 Current Projects and Topics in Horticulture
Prerequisites: Sophomore standing; 12 hours in subject areas dealing with plant sciences; and permission.
Notes: A completed and approved study plan contract is required.
Description: Independent or group projects, readings, or research focusing on current aspects of horticulture.
Credit Hours: 1-5
Min credits per semester: 1
Max credits per semester: 5
Max credits per degree: 5
Format: IND

HORT 399 Independent Study
Prerequisites: Junior standing; 12 hrs plant science; and permission.
Notes: HORT 399 requires advance approval of plan of work and is to be under the supervision and evaluation of a Horticulture departmental faculty member. Oral and written reports are mandatory at the completion of this Independent Study.
Description: Individual or group projects in research, literature review, or extension of course work.
Credit Hours: 1-5
Min credits per semester: 1
Max credits per semester: 5
Max credits per degree: 12
Format: IND

HORT 403 Scientific Writing and Communication
Crosslisted with: AGRO 403, AGRO 803, HORT 803
Prerequisites: Senior standing or higher, an ACE 1 written communication course, an ACE 2 oral communication course, and permission of instructor
Description: Reading and critiquing, writing, and presenting scientific information. Use research data to compose a manuscript in standard scientific format, and prepare and present a poster to a general audience. Ethical issues in research and writing.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
ACE: ACE 10 Integrated Product

HORT 406 Plant Ecophysiology: Theory and Practice
Crosslisted with: AGRO 406, HORT 406, NRES 406, NRES 806, AGRO 406
Prerequisites: Junior standing; 4 hrs ecology; and 4 hrs botany or plant physiology.
Description: Principles of plant physiology which underlie the relationship between plants and their physical, chemical and biotic environments. An introduction to the ecological niche, limiting factors and adaptation. An overview of the seed germination and ecology, plant and soil water relations, nutrients, plant energy budgets, photosynthesis, carbon balance and plant-animal interactions. An introduction to various field equipment used in ecophysiological studies.
Credit Hours: 4
Max credits per semester: 4
Max credits per degree: 4
Format: LEC

HORT 407 Bio-Atmospheric Instrumentation
Crosslisted with: AGRO 469, GEOS 469, METR 469, MSYM 469, NRES 469, AGRO 869, GEOS 869, HORT 807, METR 869, MSYM 869, NRES 869
Prerequisites: Junior standing; MATH 106; 4 hrs physics; physical or biological science major.
Description: Discussion and practical application of principles and practices of measuring meteorological and related variables near the earth's surface including temperature, humidity, precipitation, pressure, radiation and wind. Performance characteristics of sensors and modern data collection methods are discussed and evaluated.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Groups: Physical Geography
HORT 408 Microclimate: The Biological Environment  
Crosslisted with: AGRO 408, GEOG 408, METR 408, NRES 408, WATS 408, AGRO 808, GEOG 808, HORT 808, METR 808, NRES 808  
Prerequisites: Junior standing, MATH 106 or equivalent, 5 hrs physics, major in any of the physical or biological sciences or engineering; or permission.  
Description: Physical factors that create the biological environment. Temperature, humidity, and wind regimes near the surface. Control of the physical environment through irrigation, windbreaks, frost protection, manipulation of light, and radiation. Applications to air pollution research. Instruments for measuring environmental conditions and remote sensing of the environment.  
Credit Hours: 3  
Max credits per semester: 3  
Max credits per degree: 3  
Format: LEC  
Groups: Physical Geography

HORT 409A Case studies in plant breeding: Breeding for Disease Resistance  
Crosslisted with: AGRO 409A, AGRO 809A, HORT 809A  
Description: The application of fundamental genetics principles in inheritance, gene mapping and DNA analysis to decision making by plant breeders with the goal of improving disease resistance in crop cultivars. Learning is structured by the genetics discovery story told in published research articles and the thinking process of plant breeders who will use these discoveries in their work.  
Credit Hours: 1  
Max credits per semester: 1  
Max credits per degree: 1  
Format: LEC

HORT 409B Case Studies in plant breeding: Transgenic strategies for disease resistance  
Crosslisted with: AGRO 409B, AGRO 809B, HORT 809B  
Description: The application of basic science and technology by plant genetic engineering experts with the goal of improving disease resistance in crop cultivars. Learning is structured by the genetics discovery story told in published research articles and the thinking process of genetic engineers and plant breeders who will use these discoveries in their work.  
Credit Hours: 1  
Max credits per semester: 1  
Max credits per degree: 1  
Format: LEC

HORT 414 Turfgrass Disease Management  
Crosslisted with: AGRO 414, AGRO 814, HORT 814, PLPT 414, PLPT 814, TLMT 414, TLMT 814  
Prerequisites: BIOS/PLPT 369 or one semester of introductory plant pathology.  
Description: Pathogens, epidemiology, and control of diseases specific to turfgrass.  
Credit Hours: 1  
Max credits per semester: 1  
Max credits per degree: 1  
Format: LEC

HORT 418 Agroforestry Systems in Sustainable Agriculture  
Crosslisted with: HORT 818, NRES 417, NRES 817  
Prerequisites: 12 hours biological or agricultural sciences.  
Description: The roles of woody plants in sustainable agricultural systems of temperate regions. Emphasis on the ecological and economic benefits of trees and shrubs in the agricultural landscape. Topics include: habitat diversity and biological control; shelterbelts structure, function, benefits and design; intercropping systems; silvopastoral systems; riparian systems; and production of timber and specialty crops. Comparison of temperate agroforestry systems to those of tropical areas.  
Credit Hours: 3  
Max credits per semester: 3  
Max credits per degree: 3  
Format: LEC

HORT 426 Invasive Plants  
Crosslisted with: AGRO 426, AGRO 826, HORT 826, NRES 426, NRES 826  
Prerequisites: AGRO/HORT/SOIL 153; BIOS 109.  
Description: Identification, biology and ecology of weedy and invasive plants. Principles of invasive plant management by preventative, cultural, biological, mechanical and chemical means using an adaptive management framework. Herbicide terminology and classification, plant-herbicide and soil-herbicide interactions, equipment calibration and dosage calculations.  
Credit Hours: 3  
Max credits per semester: 3  
Max credits per degree: 3  
Format: LEC

HORT 427 Turfgrass Systems Management  
Crosslisted with: AGRO 427, TLMT 427, AGRO 827, HORT 827, TLMT 827  
Prerequisites: TLMT 227 and TLMT 327  
Description: Critical evaluation of turfgrass settings to create economical and environmentally friendly management systems for professionally managed turf areas.  
Credit Hours: 3  
Max credits per semester: 3  
Max credits per degree: 3  
Format: LEC  
ACE: ACE 10 Integrated Product

HORT 429A Food Security: A Global Perspective  
Prerequisites: Junior standing  
Description: Overview of the technical and sociocultural dimensions of global food insecurity.  
Credit Hours: 3  
Max credits per semester: 3  
Max credits per degree: 3  
Format: LEC
HORT 435 Agroecology  
**Crosslisted with:** AGRO 435, AGRO 835, NRES 435, NRES 835  
**Prerequisites:** For AGRO/HORT/NRES 435: Senior standing or permission. For AGRO/NRES 835: 12 hrs biological or agricultural sciences or permission.  
**Description:** Integration of principles of ecology, plant and animal sciences, crop protection, and rural landscape planning and management for sustainable agriculture. Includes natural and cultivated ecosystems, population and community ecology, nutrient cycling, pest management, hydrologic cycles, cropping and grazing systems, landscape ecology, biodiversity, and socioeconomic evaluation of systems.  
**Credit Hours:** 3  
**Max credits per semester:** 3  
**Max credits per degree:** 3  
**Format:** LEC  
**ACE:** ACE 10 Integrated Product  

HORT 436 Agroecosystems Analysis  
**Crosslisted with:** AGRO 436, AGRO 836, HORT 836  
**Prerequisites:** Senior standing.  
**Notes:** Cost of travel required. Summer travel course with multi-state faculty. Farm visits to Iowa, Minnesota and Nebraska.  
**Description:** Analysis of production, economics, environmental impacts, and social integration aspects of farms and farming systems  
**Credit Hours:** 3  
**Max credits per semester:** 3  
**Max credits per degree:** 3  
**Format:** LEC  

HORT 439 Organic Farming and Food Systems  
**Crosslisted with:** AGRO 839, AGRO 439, HORT 839  
**Prerequisites:** 12 credits of agricultural or biological science, economics, or natural resources  
**Description:** History of organic farming and horticultural systems, organic certification, nutrient and pest management in organic systems, planning organic enterprises including production and marketing, resilience of organic systems in ecological, economic, and social terms; future issues and potentials of organic food systems.  
**Credit Hours:** 3  
**Max credits per semester:** 3  
**Max credits per degree:** 3  
**Format:** LEC  

HORT 441 Perennial Plant Function, Growth, and Development  
**Crosslisted with:** AGRO 441, AGRO 841, HORT 841, RNGE 441  
**Prerequisites:** AGRO 325 or equivalent.  
**Description:** Principles of crop physiology and developmental morphology in relation to function, growth, development, and survival of perennial forage, range, and turf plants. The relationship of physiology and morphological development on plant use and management.  
**Credit Hours:** 3  
**Max credits per semester:** 3  
**Max credits per degree:** 3  
**Format:** LEC  

HORT 453 Urban Soil Properties and Management  
**Crosslisted with:** AGRO 453, LARC 453, SOIL 453  
**Prerequisites:** AGRO/HORT/SOIL 153.  
**Description:** Characteristics of soils in urban settings. Evaluation of soils intended for intensive human uses. Manipulation and remediation of soils subject to construction and other stresses.  
**Credit Hours:** 3  
**Max credits per semester:** 3  
**Max credits per degree:** 3  
**Format:** LEC  

HORT 462 Nursery Management and Crop Production  
**Prerequisites:** AGRO/HORT 131; HORT 221  
**Notes:** Offered spring semester of even-numbered calendar years.  
**Description:** Principles underlying the production of nursery crops and the profitable management of a nursery. Propagation, crop scheduling, transplanting, handling, and transportation of nursery crops. Cultural considerations such as media, fertilizers, irrigation, and pest control. Economic aspects of running a business include creating income and balance sheets.  
**Credit Hours:** 4  
**Max credits per semester:** 4  
**Max credits per degree:** 4  
**Format:** LEC  
**ACE:** ACE 10 Integrated Product  

HORT 467 Planting Design  
**Crosslisted with:** ARCH 467, ARCH 567, ARCH 867, LARC 467  
**Prerequisites:** HORT/LARC/NRES 212; ARCH 210 or HORT/LARC 266.  
**Description:** Design processes, principles, and elements as applied to the use of native and ornamental plant materials. Aesthetic, functional, and micro-climatic arrangements of plant material in parks, on commercial property, on home grounds, along roadways, and in urban open spaces. Develop a palette of plants and graphics for designs.  
**Credit Hours:** 4  
**Max credits per semester:** 4  
**Max credits per degree:** 4  
**Format:** LEC  

HORT 469 Senior Landscape Design  
**Crosslisted with:** ARCH 469  
**Prerequisites:** HORT 341 and/or permission.  
**Description:** Capstone course for the landscape option. Students work individually on real-world projects with actual clients. They select the project location and scope in consultation with the instructor prior to the semester this course is taken. The project must reflect evidence of a design process, design articulation and communication understandable to the client and provide in depth drawings, details needed to carry out the implementation of the design.  
**Credit Hours:** 4  
**Max credits per semester:** 4  
**Max credits per degree:** 4  
**Format:** SDO  
**ACE:** ACE 10 Integrated Product
HORT 470 Critical Thinking in Landscape Management  
Crosslisted with: AGRO 470, TLMT 470  
Prerequisites: AGRO/HORT/PGMP/TLMT 326.  
Description: Using processes and strategies to identify and compare issues, make recommendations, demonstrate proficiency in field application as skills and techniques, and prepare cost estimates in the development of landscape management plans.  
Credit Hours: 3  
Max credits per semester: 3  
Max credits per degree: 3  
Format: LEC  
ACE: ACE 10 Integrated Product  

HORT 471 Vines, Wines and You  
Crosslisted with: HORT 871, NUTR 471, NUTR 871, HRTM 471, HRTM 871  
Prerequisites: 6 hrs science or equivalent experience; 21 years of age or older  
Notes: Proof of age is required.  
Description: Origin, botany, historical and cultural significance of the grapevine and related species. Principles and practices of vineyard establishment, management and processing of grape products, importance and/or scope of grape and wine industry; global and local significance. Culinary applications, health, environmental and safety-related issues, business and industry relations and experience.  
Credit Hours: 3  
Max credits per semester: 3  
Max credits per degree: 3  
Format: LEC  

HORT 478 Plant Anatomy  
Crosslisted with: BIOS 478, BIOS 878, AGRO 478, AGRO 878, HORT 878  
Prerequisites: 8 hrs biological sciences  
Notes: BIOS 109 recommended.  
Description: Development, structure, and function of tissues and organs of the higher plants. Relationships of structure to physiology and ecology of plants.  
Credit Hours: 4  
Max credits per semester: 4  
Max credits per degree: 4  
Format: LEC  

HORT 480 Modified Rootzones  
Crosslisted with: AGRO 480, TLMT 480, TLMT 880, AGRO 880, HORT 880  
Description: Modified rootzones and their applications in the turfgrass and landscape management industry. Correct applications and construction techniques. Offered as a five-week course.  
Credit Hours: 1  
Max credits per semester: 1  
Max credits per degree: 1  
Format: LEC  

HORT 488 Business Management for Agricultural Enterprises  
Crosslisted with: HORT 888, EAEF 488, AGRO 488, ENTR 488, EAEF 888, AGRO 888, ENTR 888, ABUS 488  
Description: Research a specific agricultural enterprise. Develop and present a business plan using materials from the primary area of interest. HORT 488/888 requires the completion of a shadowing assignment and the analysis of case studies.  
Credit Hours: 3  
Max credits per semester: 3  
Max credits per degree: 3  
Format: LEC  
ACE: ACE 10 Integrated Product  

HORT 489 Urbanization of Rural Landscapes  
Crosslisted with: AGRO 489, AGRO 889, CRPL 489, HORT 889, CRPL 889  
Prerequisites: Senior standing, graduate standing, or permission.  
Description: Development converts rural landscapes into housing, roads, malls, parks, and commercial uses. This process fragments landscapes and changes ecosystem functions, drives up land prices, and pushes agriculture into more marginal areas. This multi-disciplinary, experiential course guides students in learning about the urbanization process, the impacts on landscapes, people, and the community, and the choices that are available to informed citizens.  
Credit Hours: 3  
Max credits per semester: 3  
Max credits per degree: 3  
Format: LEC  

HORT 495 Grasslands Seminar  
Crosslisted with: AGRO 495, ENTO 495, GRAS 495, NRES 495, RNGE 495, SOIL 495  
Prerequisites: Junior standing.  
Description: Topic varies and deals with different aspects of forage and/or range and/or livestock, turf and/or landscape grasses, natural habitats, and wetlands.  
Credit Hours: 1-2  
Min credits per semester: 1  
Max credits per semester: 2  
Max credits per degree: 4  
Format: LEC  

HORT 499H Honors Thesis  
Prerequisites: Admission to the University Honors Program and permission. AGRI 299H recommended.  
Description: Conduct a scholarly research project and write a University Honors Program undergraduate thesis.  
Credit Hours: 3-6  
Min credits per semester: 3  
Max credits per semester: 6  
Max credits per degree: 6  
Format: IND  

TLMT 100 Plants, Landscapes, & the Environment  
Crosslisted with: HORT 100, AGRO 100  
Description: Introduction to a diverse range of plant and landscape systems and management strategies for balancing economic and environmental sustainability. Foundational principles of plant biology, landscape ecology, and environmental science using real-world case studies.  
Credit Hours: 3  
Max credits per semester: 3  
Max credits per degree: 3  
Format: LEC  
Offered: FALL/SPR  

TLMT 127 Survey of Turfgrass and Landscape Management  
Crosslisted with: AGRO 127, HORT 127  
Description: Introduction to careers, internships and co-curricular activities in turfgrass and landscape management.  
Credit Hours: 1  
Max credits per semester: 1  
Max credits per degree: 1  
Format: LEC
TLMT 215 Genetics
Crosslisted with: AGRO 215, HORT 215
Prerequisites: 3 hrs biological sciences
Description: Discovery of the biology of genes and the application of genetics principles to understand the control and inheritance of traits in families and populations. Focus is on animals and plants that are important in medicine, agriculture and nature. Learning emphasis is problem solving via online, instant feedback assessments, group discussion, experimental data analysis and context-based exams.
Credit Hours: 4
Max credits per semester: 4
Max credits per degree: 4
Format: LEC
Prerequisite for: ASCI 330; ASCI 486

TLMT 227 Introductory Turfgrass Management
Crosslisted with: AGRO 227, HORT 227, PGAM 227
Prerequisites: AGRO 131 or HORT 130 or BIOS 109.
Description: Introduction to turfgrasses, their management and use, and to the turfgrass industry.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Prerequisite for: AGRO 326, HORT 326, TLMT 326; AGRO 327, HORT 327, TLMT 327; TLMT 395

TLMT 228 Introduction to Landscape Management
Crosslisted with: AGRO 228, HORT 228
Prerequisites: AGRO 131 or BIOS 109
Notes: TLMT/AGRO/HORT uses a team approach to problem solving, discussion, assessment planning, and oral presentations of applied case studies.
Description: An overview of landscape management and landscape design. Principles and practices.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
Prerequisite for: AGRO 326, HORT 326, TLMT 326; TLMT 395

TLMT 229 Introductory Turfgrass Management Laboratory
Crosslisted with: AGRO 229, HORT 229
Description: Laboratory covering turfgrass identification and management. Concurrent enrollment with AGRO/HORT/TLMT 227 preferred. Required for Turfgrass Science majors, other students require instructor consent.
Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1
Format: LEC

TLMT 295 Turfgrass and Landscape Management Extended Internship
Prerequisites: Sophomore standing; TLMT/AGRO/HORT/PGAM 227 or 228.
Notes: TLMT 295 requires advanced permission before registering for the course. Written and oral reports are required at the completion of the internship.
Description: Participation in a turfgrass or landscape management enterprise other than one in which the student has had previous experience.
Credit Hours: 1-12
Min credits per semester: 1
Max credits per semester: 12
Max credits per degree: 12
Format: FLD

TLMT 326 Landscape Solutions
Crosslisted with: AGRO 326, HORT 326
Prerequisites: TLMT/AGRO/HORT 227 or 228
Description: Using processes and problem-solving approach to identify and analyze common landscape management situations in commercial, public, and residential landscapes. Integrate design, environment, function, pest and disease, and existing management practices to produce recommendations.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

TLMT 327 Turfgrass Science and Management
Crosslisted with: AGRO 327, HORT 327
Prerequisites: AGRO/HORT/SOIL 153; CHEM 105 or 109; and TLMT 227
Description: Scientific principles of turf species adaptation, turf and/or soil relationships, establishment, fertility, mowing, irrigation, and pest control of turf species.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC

TLMT 330 Pruning Ornamentals
Crosslisted with: AGRO 330, HORT 330
Description: Why, when and how to prune ornamental landscape plants. Demonstrations and field opportunities on how to choose and how to use pruning tools correctly.
Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1
Format: LEC

TLMT 375 Innovations for Agriculture
Crosslisted with: HORT 375, AGRI 375, AGRO 375, EAEP 375
Description: Explore sustainability challenges in plant and animal agricultural systems, assess current solutions, and identify opportunities for innovation. Research, develop, prototype, test, and pitch an innovative product, service, or technology for agriculture.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Format: LEC
**TLMT 395 Career Experience**

**Prerequisites:** Sophomore standing and TLMT 227 or TLMT 228; advance approval required.

**Description:** Participation in a turfgrass or landscape management enterprise other than one in which the student has had previous experience. Written and oral reports are required at the completion of the career experience.

**Credit Hours:** 1-5

**Min credits per semester:** 1

**Max credits per semester:** 5

**Max credits per degree:** 5

**Format:** FLD

**TLMT 414 Turfgrass Disease Management**

**Crosslisted with:** AGRO 414, AGRO 814, HORT 414, HORT 814, PLPT 414, PLPT 814, TLMT 814

**Prerequisites:** BIOS/PLPT 369 or one semester of introductory plant pathology.

**Description:** Pathogens, epidemiology, and control of diseases specific to turfgrass.

**Credit Hours:** 1

**Max credits per semester:** 1

**Max credits per degree:** 1

**Format:** LEC

**TLMT 427 Turfgrass Systems Management**

**Crosslisted with:** AGRO 427, HORT 427, AGRO 827, HORT 827, TLMT 827

**Prerequisites:** TLMT 227 and TLMT 327

**Description:** Critical evaluation of turfgrass settings to create economical and environmentally friendly management systems for professionally managed turf areas.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Format:** LEC

**ACE:** ACE 10 Integrated Product

**TLMT 470 Critical Thinking in Landscape Management**

**Crosslisted with:** AGRO 470, HORT 470

**Prerequisites:** AGRO/HORT/PGMP/TLMT 326.

**Description:** Using processes and strategies to identify and compare issues, make recommendations, demonstrate proficiency in field application as skills and techniques, and prepare cost estimates in the development of landscape management plans.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Format:** LEC

**ACE:** ACE 10 Integrated Product

**TLMT 480 Modified Rootzones**

**Crosslisted with:** AGRO 480, HORT 480, TLMT 880, AGRO 880, HORT 880

**Description:** Modified rootzones and their applications in the turfgrass and landscape management industry. Correct applications and construction techniques. Offered as a five-week course.

**Credit Hours:** 1

**Max credits per semester:** 1

**Max credits per degree:** 1

**Format:** LEC

**PLEASE NOTE**

This document represents a sample 4-year plan for degree completion with this major. Actual course selection and sequence may vary and should be discussed individually with your college or department academic advisor. Advisors also can help you plan other experiences to enrich your undergraduate education such as internships, education abroad, undergraduate research, learning communities, and service learning and community-based learning.

**horticulture - horticulture entrepreneurship**

**Icon Legend: Critical**

**14 HR TERM 1**

**Horticulture Core Course**

complete HORT 131

3hr

C

HORT 131 becomes critical to your success in the major if not completed by the fourth term of enrollment. It will fulfill the ACE 4 requirement.

**Foundation Plant Soil**

complete HORT 133, HORT 153

5hr

C

HORT 133 and 153 become critical to your success in the major if not completed by the fourth term of enrollment.

**College Course**

complete SCIL 101

3hr

**ACE 1 Written**

complete 1 from ENGL 150, ENGL 151, ENGL 254, JGEN 120, JGEN 200, JGEN 300

3hr

**16 HR TERM 2**

**ACE 4 Physics**

complete MSYM 109

4hr

**Advanced Hort Core**

complete HORT 221

3hr

**College Algebra Req**

complete MATH 104
Competition of a MATH course becomes critical to your success in the major if not completed by the second term.

ACE 6 Economics
complete ECON 212

ACE 7 Arts
complete HORT 200

16 HR TERM 3
Hort Core/Landscape Plnts
complete HORT 212

ACE 2 Oral Comm
complete COMM 209

ACE 5 Humanities
complete 1 from ACE5

ACE 4 Chemistry
complete CHEM 105

CHEM 105 becomes critical to your success in the major if not completed by the fourth term of enrollment.

Supporting Business
complete HORT 388

16 HR TERM 4
Hort Core/Landscape Plnts
complete HORT 213

Botany

13 HR TERM 6
Horticulture Management
complete 1 from HORT 227, HORT 228, HORT 261, HORT 325, HORT 327, HORT 353, HORT 354, HORT 355, HORT 470

Accounting
complete ACCT 201

Supporting Business
complete BLAW 371

Horticulture Production
complete 2 from HORT 352, HORT 353, HORT 354, HORT 355

Complete HORT 352 and choose one from HORT 353, 354, and 355.

13 HR TERM 7
ACE 9 Global/Human Divers
Horticulture Production
complete HORT 462
4hr

Supporting Business
complete HORT 275
3hr

Electives
complete Any Course
3hr

16 HR TERM 8

ACE 10 Capstone
complete HORT 488
3hr

Horticulture Management
complete 1 from HORT 227, HORT 228, HORT 261, HORT 325, HORT 327, HORT 353, HORT 354, HORT 355, HORT 470
3hr

Pest Management
complete 1 from AGRO 426, ENTO 403, PLPT369#
3hr

Electives
complete Any Course
3hr

Supporting Business
complete MRKT 341
3hr

Graduation Requirements
1. Performance Measure: 2.00 GPA required for graduation.
2. ***Total Credits Applying Toward 120 Total Hours***

horticulture - landscape design-build
Icon Legend: Critical

15 HR TERM 1

College Course
complete SCIL 101
3hr

Horticulture Core Course
complete HORT 131
3hr

Electives
complete Any Course
4hr

Supporting Business
complete MNGT 361
3hr

15 HR TERM 9

ACE 8 Ethical Principles
complete 1 from ACE8

Horticulture Management
complete 1 from HORT 227, HORT 228, HORT 261, HORT 325, HORT 327, HORT 353, HORT 354, HORT 355, HORT 470
3hr

Pest Management
complete 1 from AGRO 426, ENTO 403, PLPT369#
3hr

Electives
complete Any Course
3hr

Supporting Business
complete MNGT 361
3hr

Horticulture Core Course
complete HORT 133

Foundation Plant Soil
complete HORT 133
1hr
College Algebra Reqt
complete MATH 102

Completion of a MATH course becomes critical to your success in the major if not completed by the second term of enrollment.

ACE 5 Humanities
complete 1 from ACE5

ACE 1 Written
complete 1 from ENGL 150, ENGL 151, ENGL 254, JGEN 120, JGEN 200, JGEN 300

14 HR TERM 2
Ecology
complete NRES 220

Advanced Hort Core
complete HORT 221

Electives
complete Any Course

ACE 7 Arts
complete HORT 200

ACE 4 Physics
complete MSYM 109

16 HR TERM 3
Hort Core/Landscape Plnts
complete HORT 212

Landscape Management
complete HORT 228, HORT 227

Design
complete HORT 265

ACE 4 Chemistry
complete CHEM 105

CHEM 105 becomes critical to your success in the major if not completed by the fourth term of enrollment.

16 HR TERM 4
Hort Core/Landscape Plnts
complete HORT 213

Design
complete HORT 267

Foundation Plant Soil
complete HORT 153

HORT 153 becomes critical to your success in the major if not completed by the fourth term of enrollment.

Business/Management
complete HORT 275

ACE 2 Oral Comm
complete COMM 209

1 HR TERM 5
Advanced Hort Core
complete HORT 395
13 HR TERM 6
Landscape Plants
complete HORT 214

1 hr
Career Experience
complete HORT 395

15 HR TERM 7
Landscape/Ecology Elect
complete 1 from HORT 452, AGRO 107, AGRO 435, MSYM 354, NRES 417, TLMT 326, WATS 361

3 hr
ACE 8 Ethical Principles
complete 1 from ACE8

3 hr
ACE 3 Math/Statistics
complete STAT 218

15 HR TERM 8
Landscape Install/Admin
complete either HORT 300 or HORT 301

1 HR TERM 9
Business/Management
complete 1 from HORT 275, HORT 388, MNGT 361, MRKT 300, HORT 488

3 hr
Landscape/Ecology Elect
complete 1 from AGRO 107, AGRO 435, HORT 452, MSYM 354, NRES 417, TLMT 326, WATS 361

3 hr
ACE 6 Economics
complete 1 from ECON 212, ECON 211, AECN 141

3 hr
Electives
complete Any Course

6 hr
14 HR TERM 10
Horticulture Production
complete HORT 462

3 hr
Landscape Install/Admin
complete either HORT 300 or HORT 301

3 hr
ACE 10 Capstone
complete HORT 469

4 hr
Electives
complete Any Course

3 hr
Graduation Requirements
1. Performance Measure: 2.00 GPA required for graduation.
2. ***Total Credits Applying Toward 120 Total Hours***
horticulture - plant science

14 HR TERM 1

Foundation Plant Soil
complete HORT 133
1hr

HORT 133 becomes critical to your success in the major if not completed by the fourth term of enrollment.

Pest Management
complete ENTO 115, ENTO 116
4hr

College Course
complete SCIL 101
3hr

Horticulture Core Course
complete HORT 131
3hr

HORT 131 becomes critical to your success in the major if not completed by the fourth term of enrollment. It will fulfill the ACE 4 requirement.

College Algebra Reqt
complete MATH 104
3hr

Completion of a MATH course becomes critical to your success in the major if not completed by the second term. This course will count towards the ACE 3 requirement.

14 HR TERM 2

Foundation Plant Soil
complete HORT 153
4hr

HORT 153 becomes critical to your success in the major if not completed by the fourth term of enrollment.

17 HR TERM 3

ACE 4 Chemistry
complete CHEM 109
4hr

CHEM 109 becomes critical to your success in the major if not completed by the fourth term of enrollment.

ACE 3 Math/Statistics
complete STAT 218
3hr

ACE 7 Arts
complete HORT 200
3hr

Hort Core/Landscape Plnts
complete HORT 212
3hr

Horticulture Production
complete 2 from HORT 352, HORT 353, HORT 354, HORT 355
4hr

Complete HORT 352 and choose one from HORT 353, 354, and 355.

ACE 1 Written
complete 1 from ENGL 150, ENGL 151, ENGL 254, JGEN 120, JGEN 200, JGEN 300
3hr

14 HR TERM 4

ACE 4 Chemistry
complete CHEM 110
4hr
Plant Sciences
complete AGRO 215

Hort Core/Landscape Plnts
complete HORT 213

ACE 6 Economics
complete 1 from AECN 141, ECON 211, ECON 212

1 HR TERM 5
Advanced Hort Core
complete HORT 395

16 HR TERM 6
Pest Management
complete PLPT369#

Additional Horticulture
complete 1 from AGRO 426, HORT 213, HORT 214, HORT 227, HORT 261, HORT 262, HORT 325, HORT 353, HORT 354, HORT 355, HORT 396, HORT 399, HORT 406, HORT 471

Organic Chemistry
complete CHEM 251, CHEM 253

ACE 2 Oral Comm
complete COMM 209

Electives
complete Any Course

15 HR TERM 7
ACE 4 Physics

Plant Sciences
complete AGRO 325

Additional Horticulture
complete 1 from AGRO 426, HORT 213, HORT 214, HORT 227, HORT 261, HORT 262, HORT 325, HORT 353, HORT 354, HORT 355, HORT 396, HORT 399, HORT 406, HORT 471

Electives
complete Any Course

16 HR TERM 8
ACE 8 Ethical Principles
complete 1 from ACE8

Additional Horticulture
complete 1 from AGRO 426, HORT 213, HORT 214, HORT 227, HORT 261, HORT 262, HORT 325, HORT 353, HORT 354, HORT 355, HORT 396, HORT 399, HORT 406, HORT 471

ACE 5 Humanities
complete 1 from ACE5

Electives
complete Any Course

13 HR TERM 9
ACE 9 Global/Human Divers
complete 1 from ACE9

ACE 10 Capstone
complete 1 from HORT 403, HORT 462, HORT 488

**Addition Horticulture**

complete 1 from AGRO 426, HORT 213, HORT 214, HORT 227, HORT 261, HORT 262, HORT 325, HORT 353, HORT 354, HORT 355, HORT 396, HORT 399, HORT 406, HORT 471

**Pest Management**

complete ENTO 403

**Graduation Requirements**

1. Performance Measure: 2.00 GPA required for graduation.
2. **Total Credits Applying Toward 120 Total Hours**

### Horticulture - Production

**13 HR TERM 1**

**Foundation Plant Soil**

complete HORT 133

1 hr

HORT 133 becomes critical to your success in the major if not completed by the fourth term of enrollment.

**Pest Management**

complete ENTO 115, ENTO 116

4 hr

**College Course**

complete SCIL 101

3 hr

**Horticulture Core Course**

complete HORT 131

3 hr

HORT 131 becomes critical to your success in the major if not completed by the fourth term of enrollment. It will fulfill the ACE 4 requirement.

**College Algebra Reqt**

complete MATH 102

2 hr

Completion of a MATH course becomes critical to your success in the major if not completed by the second term of enrollment. This course will count towards the ACE 3 requirement.

**17 HR TERM 2**

**Foundation Plant Soil**

complete HORT 153

4 hr

HORT 153 becomes critical to your success in the major if not completed by the fourth term of enrollment.

**Advanced Hort Core**

complete HORT 221

3 hr

**Life Science**

complete BIOS 109

4 hr

**ACE 1 Written**

complete 1 from ENGL 150, ENGL 151, ENGL 254, JGEN 120, JGEN 200, JGEN 300

3 hr

**ACE 7 Arts**

complete HORT 200

3 hr

**14 HR TERM 3**

**ACE 4 Chemistry**

complete CHEM 109

4 hr

CHEM 109 becomes critical to your success in the major if not completed by the fourth term of enrollment.

**Hort Core/Landscape Plnts**

complete HORT 212

3 hr
<table>
<thead>
<tr>
<th>Term</th>
<th>Course Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Horticulture Production</strong></td>
<td>complete HORT 352, HORT 353</td>
<td>4hr</td>
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<tr>
<td><strong>ACE 3 Math/Statistics</strong></td>
<td>complete STAT 218</td>
<td>3hr</td>
</tr>
<tr>
<td><strong>16 HR TERM 4</strong></td>
<td><strong>ACE 4 Chemistry</strong></td>
<td>complete CHEM 110</td>
</tr>
<tr>
<td></td>
<td><strong>Hort Core/Landscape Plants</strong></td>
<td>complete HORT 213</td>
</tr>
<tr>
<td></td>
<td><strong>ACE 6 Economics</strong></td>
<td>complete 1 from AECN 141, ECON 211, ECON 212</td>
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<td></td>
<td><strong>ACE 2 Oral Comm</strong></td>
<td>complete COMM 209</td>
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<tr>
<td></td>
<td><strong>ACE 8 Ethical Principles</strong></td>
<td>complete 1 from ACE8</td>
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<tr>
<td><strong>17 HR TERM 5</strong></td>
<td><strong>Pest Management</strong></td>
<td>complete PLPT369#</td>
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<td></td>
<td><strong>Landscape Plants</strong></td>
<td>complete HORT 214</td>
</tr>
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<td></td>
<td><strong>Horticulture Production</strong></td>
<td>complete HORT 354, HORT 355</td>
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<tr>
<td><strong>Advanced Hort Core</strong></td>
<td>complete HORT 395</td>
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<tr>
<td><strong>ACE 4 Chemistry</strong></td>
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<td>3hr</td>
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<tr>
<td><strong>Electives</strong></td>
<td>complete Any Course</td>
<td>3hr</td>
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<tr>
<td><strong>14 HR TERM 6</strong></td>
<td><strong>Plant Sciences</strong></td>
<td>complete AGRO 325</td>
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<td></td>
<td><strong>ACE 5 Humanities</strong></td>
<td>complete 1 from ACE5</td>
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<td><strong>ACE 9 Global/Human Divers</strong></td>
<td>complete 1 from ACE9</td>
</tr>
<tr>
<td></td>
<td><strong>Horticulture Electives</strong></td>
<td>complete 1 from AGRO 366, AGRO 426, HORT 227, HORT 261, HORT 262, HORT 396, HORT 399, HORT 406, HORT 471, PLPT 369L</td>
</tr>
<tr>
<td><strong>15 HR TERM 7</strong></td>
<td><strong>Plant Sciences</strong></td>
<td>complete AGRO 215</td>
</tr>
<tr>
<td></td>
<td><strong>ACE 4 Physics</strong></td>
<td>complete PHYS 141</td>
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</tbody>
</table>
Horticulture Electives
complete 1 from AGRO 366, AGRO 426, HORT 227, HORT 261, HORT 262,
HORT 396, HORT 399, HORT 406, HORT 471, PLPT 369L

Electives
complete Any Course

14 HR TERM 8

Horticulture Production
complete HORT 325

Pest Management
complete ENTO 403

ACE 10 Capstone
complete HORT 462

Electives
complete Any Course

Graduation Requirements
1. Performance Measure: 2.00 GPA required for graduation.
2. ***Total Credits Applying Toward 120 Total Hours***

horticulture - sustainable food production

14 HR TERM 1

Foundation Plant Soil
complete either HORT 133 or HORT 153

HORT 133 and 153 become critical to your success in the major if not completed by the fourth term of enrollment.

College Course
complete SCIL 101

Horticulture Core Course
complete HORT 131

15 HR TERM 2

Advanced Hort Core
complete HORT 221

College Algebra Reqt
complete MATH 102

Completion of a MATH course becomes critical to your success in the major if not completed by the second term of enrollment.

ACE 7 Arts
complete HORT 200

Botany
complete BIOS 109

ACE 2 Oral Comm
complete COMM 209

16 HR TERM 3

ACE 4 Chemistry
complete CHEM 109
<table>
<thead>
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<th>Credits</th>
<th>Term</th>
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<td>CHEM 109</td>
<td>becomes critical to your success in the major if not completed by the fourth term of enrollment.</td>
<td><strong>13 HR TERM 4</strong></td>
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<tr>
<td><strong>Plant/Soil Management.</strong></td>
<td>complete AGRO 269</td>
<td><strong>13 HR TERM 4</strong></td>
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<td><strong>Business/Economics</strong></td>
<td>complete HORT 388</td>
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<td><strong>Hort Core/Landscape Plnts</strong></td>
<td>complete HORT 212</td>
<td><strong>13 HR TERM 4</strong></td>
</tr>
<tr>
<td><strong>ACE 3 Math/Statistics</strong></td>
<td>complete STAT 218</td>
<td><strong>13 HR TERM 4</strong></td>
</tr>
<tr>
<td><strong>ACE 4 Chemistry</strong></td>
<td>complete CHEM 110</td>
<td><strong>13 HR TERM 4</strong></td>
</tr>
<tr>
<td><strong>Hort Core/Landscape Plnts</strong></td>
<td>complete HORT 213</td>
<td><strong>13 HR TERM 4</strong></td>
</tr>
<tr>
<td><strong>ACE 6 Economics</strong></td>
<td>complete 1 from AECN 141, ECON 211, ECON 212</td>
<td><strong>13 HR TERM 4</strong></td>
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<tr>
<td><strong>Ecology</strong></td>
<td>complete NRES 220</td>
<td><strong>13 HR TERM 4</strong></td>
</tr>
<tr>
<td><strong>Crop Protection</strong></td>
<td>complete either PLPT 369 or PLPT 369L</td>
<td><strong>14 HR TERM 7</strong></td>
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<td><strong>Horticulture Production</strong></td>
<td>complete HORT 352, HORT 353, HORT 354</td>
<td><strong>14 HR TERM 7</strong></td>
</tr>
<tr>
<td><strong>ACE 5 Humanities</strong></td>
<td>complete 1 from ACE5</td>
<td><strong>14 HR TERM 7</strong></td>
</tr>
<tr>
<td><strong>Electives</strong></td>
<td>complete Any Course</td>
<td><strong>14 HR TERM 7</strong></td>
</tr>
<tr>
<td><strong>14 HR TERM 7</strong></td>
<td><strong>Plant Sciences</strong></td>
<td>complete AGRO 325</td>
</tr>
<tr>
<td><strong>Plant/Soil Management.</strong></td>
<td>complete AGRO 366</td>
<td><strong>14 HR TERM 7</strong></td>
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<tr>
<td><strong>Electives</strong></td>
<td>complete Any Course</td>
<td><strong>14 HR TERM 7</strong></td>
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<tr>
<td><strong>Ecology</strong></td>
<td>complete AGRO 435</td>
<td><strong>14 HR TERM 7</strong></td>
</tr>
<tr>
<td><strong>15 HR TERM 8</strong></td>
<td><strong>Plant Sciences</strong></td>
<td>complete AGRO 215</td>
</tr>
<tr>
<td><strong>ACE 8 Ethical Principles</strong></td>
<td>complete 1 from ACE8</td>
<td><strong>15 HR TERM 8</strong></td>
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</tbody>
</table>
### Term 9

**ACE 4 Physics**
- Complete PHYS 141 (3hr)

**Electives**
- Complete any course (5hr)

#### 16 HR TERM 9

**ACE 9 Global/Human Divers**
- Complete 1 from ACE9 (3hr)

**Plant/Soil Management**
- Complete AGRO 439 (3hr)

**Crop Protection**
- Complete ENTO 403 (3hr)

**ACE 10 Capstone**
- Complete HORT 488 (3hr)

**Electives**
- Complete any course (4hr)

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**Graduation Requirements**
1. Performance Measure: 2.00 GPA required for graduation.
2. ***Total Credits Applying Toward 120 Total Hours***

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**Career Information**

*The following represents a sample of the internships, jobs and graduate school programs that current students and recent graduates have reported.*

**Jobs of Recent Graduates**
- Owner, Landscape Design Business - Arlington NE
- Landscape Designer, Campbell’s Nursery - Lincoln NE
- Greenhouse Manager, Faller Landscape & Nursery - York NE
- Propagation Manager, Heritage Nursery - Roca NE
- Production Manager, KM Landscaping - Yutan NE
- Horticulturist, Lincoln Parks and Recreation - Lincoln NE
- Research Technologist, University of Nebraska-Lincoln - Lincoln NE
- Tree and Shrub Specialist, Finke Gardens and Nursery - Lincoln NE
- Head Floral Designer, Blooms - Omaha NE
- Extension 4-H Agent, Kansas State University Research & Extension - Dodge City KS
- Plant Science Professional Intern, Walt Disney World - Orlando FL
- UNL Cooperative Extension Intern, Fillmore County Extension - Geneva NE
- Design Intern, Sunken Gardens - Lincoln NE
- Nursery Production Intern, Spruce Point Tree Farm - Hotchkiss CO
- Greenhouse Assistant, UNL Dept of Agronomy & Horticulture - Lincoln NE
- Horticulture Intern, Midwest Hop Producers - Plattsmouth NE
- Public Gardening Intern, Downtown Lincoln Association - Lincoln NE
- Assistant Vineyard Manager, Oak Creek Vineyard - Raymond NE
- Plant Production and Landscaping Intern, Campbell’s Nursery - Lincoln NE
- Marketing Intern, Nebraska 4-H Foundation - Lincoln NE
- Design Intern, Sunken Gardens - Lincoln NE
- Nursery Production Intern, Spruce Point Tree Farm - Hotchkiss CO
- Greenhouse Assistant, UNL Dept of Agronomy & Horticulture - Lincoln NE
- Horticulture Intern, Midwest Hop Producers - Plattsmouth NE
- Public Gardening Intern, Downtown Lincoln Association - Lincoln NE
- Assistant Vineyard Manager, Oak Creek Vineyard - Raymond NE
- Plant Production and Landscaping Intern, Campbell’s Nursery - Lincoln NE
- Longwood Graduate Program, University of Delaware - Newark DE
- Ph.D. in Agronomy and Horticulture, University of Nebraska-Lincoln - Lincoln NE
- Entomology Masters, University of Nebraska-Lincoln - Lincoln NE
- Masters in Environmental Science, University of Nebraska-Lincoln - Lincoln NE
- Masters in Landscape Architecture, Iowa State University - Ames IA
- Masters in Plant Pathology, University of Nebraska-Lincoln - Lincoln NE
- Masters in Horticulture, University of Nebraska-Lincoln - Lincoln NE
- Masters in Agronomy, University of Nebraska-Lincoln - Lincoln NE
- Masters in Entomology, Washington State University - Pullman WA
- Masters in Horticulture, Kansas State University - KS