PLANT & LANDSCAPE SYSTEMS

Description

A degree in Plant and Landscape Systems aims to educate and develop professionals prepared to design and manage complex plant production, landscape, and soil management systems. Graduates will leverage an appreciation of nature; scientific knowledge and data; and teamwork, communication, and problem-solving skills to become leaders and change makers in horticultural, landscape, and turfgrass systems in Nebraska and beyond.

Options

The Plant and Landscape Systems major will include a core to be completed by all students and three options to allow students to specialize in professional areas of interest. The three primary options are:

1. Horticulture
2. Landscape Design and Management
3. Turfgrass Science and Management

The core curriculum provides the foundational knowledge and skills necessary for success in any career pathway in Plant and Landscape Systems, including courses in plant and soil science, pest biology, systems thinking, technical communication, and career development. Students build on this foundation to pursue focused expertise through a required option. Additionally, students will complement their program of study with two additional areas of professional specialization provided through emphases and/or minors. There are no additional admission requirements beyond the University of Nebraska–Lincoln's core course and performance requirements. Students are assigned a faculty advisor after New Student Enrollment.

The **Horticulture Option** will prepare students to manage specialty crops in field, landscape, greenhouse, and controlled environment systems. This option includes foundational knowledge in plant propagation and physiology, genetics, plant identification and selection, and specialty crop management. Graduates with a horticulture option will be ready for careers as hydroponic and urban agricultural growers; greenhouse or nursery crop managers; farm managers or consultants for vegetable, fruit, nut, herb, floral, or medicinal plants; research associates in field or greenhouse environments; suppliers and sales associates for specialty crop seeds and inputs; and plant-based innovators and entrepreneurs.

The **Landscape Design and Management Option** will prepare students to design landscapes and manage landscape plants that provide cultural, ecological, and production functions. Students will learn to identify plants and their functional benefits in the landscape, use those plants to design and communicate plans for transforming the landscape, and the technical knowledge to install and manage landscape plants using systems thinking. Students pursuing an option in landscape design and management may be interested in careers as a landscape designer or contractor; habitat restoration specialist; public gardens manager; and landscaping business owner.

The **Turfgrass Science and Management Option** will prepare students to manage turfgrass landscapes and businesses in the golf course, sports turf, sod, and lawn care industries. Students will apply knowledge of soils, turfgrass physiology and management, and pest management from this option to pursue careers as golf course superintendents, sports turf managers, lawn care specialists, and business owners.

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 sciences, and 2 units of world language. Students must also meet performance requirements: a 3.0 cumulative high school grade point average OR an ACT composite of 20 or higher, writing portion not required OR a score of 1040 or higher on the SAT Critical Reading and Math sections 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 2.0 on the most recent term of attendance.

Admission Deficiencies/Removal of Deficiencies

Students who are admitted to CASNR with core course deficiencies must remove these deficiencies within the first 30 credit hours at the University of Nebraska–Lincoln, or within the first calendar year at Nebraska, whichever takes longer. College-level coursework taken to remove deficiencies may be used to meet degree requirements in CASNR.

Deficiencies in the required entrance subjects can be removed by the completion of specified courses in the University or by correspondence.

The Office of Admissions, Alexander Building (south entrance), City Campus, provides information to new students on how deficiencies can be removed.

College Degree Requirements

Curriculum Requirements

The curriculum requirements of the College consist of three areas: ACE (Achievement-Centered Education), College of Agricultural Sciences and Natural Resources Core, and Degree Program requirements and electives. All three areas of the College Curriculum Requirements are incorporated within the description of the Major/Degree Program sections of the catalog. The individual major/degree program listings of classes ensure that a student will meet the minimum curriculum requirements of the College.

World Languages/Language Requirement

Two units of a world language are required. This requirement is usually met with two years of high school language.

Experiential Learning

All undergraduates in the College of Agricultural Sciences and Natural Resources must take an Experiential Learning (EL) designated course. This may include 0-credit courses designed to document co-curricular activities recognized as Experiential Learning.

Minimum Hours Required for Graduation

The College grants the bachelors degree in programs associated with agricultural sciences, natural resources, and related programs. Students working toward a degree must earn at least 120 semester hours of credit. A minimum cumulative grade point average of C (2.0 on a 4.0 scale) must be maintained throughout the course of studies and is required for graduation. Some degree programs have a higher cumulative grade point

average required for graduation. Please check the degree program on its graduation cumulative grade point average.

Grade Rules

Removal of C-, D, and F Grades

Only the most recent letter grade received in a given course will be used in computing a student's cumulative grade point average if the student has completed the course more than once and previously received a grade or grades below C in that course.

The previous grade (or grades) will not be used in the computation of the cumulative grade point average, but it will remain a part of the academic record and will appear on any transcript.

A student can remove from their cumulative average a course grade of C-, D+, D, D-, or F if the student repeats the same course at the University of Nebraska and receives a grade other than P (pass), I (incomplete), N (no pass), W (withdrew), or NR (no report). If a course is no longer being offered, it is not eligible for the revised grade point average computation process.

For complete procedures and regulations, see the Office of the University Registrar website at http://www.unl.edu/regrec/course-repeats (http://www.unl.edu/regrec/course-repeats/).

Pass/No Pass

Students in CASNR may take any course offered on a Pass/No Pass basis within the 24-hour limitation established by the Faculty Senate. However, a department may specify that the Pass/No Pass status of its courses be limited to non-majors or may choose to offer some courses for letter grades only.

GPA Requirements

A minimum cumulative grade point average of C (2.0 on a 4.0 scale) must be maintained throughout the course of studies and is required for graduation. Some degree programs have a higher cumulative grade point average required for graduation. Please check the degree program on its graduation cumulative grade point average.

Transfer Credit Rules

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 (60) is the maximum number of hours the University will accept on transfer from a two-year college. Ninety (90) is the maximum number of hours the University 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 the University of Nebraska–Lincoln 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 the University of Nebraska–Lincoln.

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 the requirements for a bachelor of science degree in CASNR. Cooperative programs result in a single degree from either the University of Nebraska–Lincoln 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 coursework. 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 the University of Nebraska–Lincoln, 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
- Nebraska Indian Community College
- 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 the University of Nebraska–Lincoln 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 provide transcripts and complete the Application for Degree form via MyRED. Students without MyRED access may apply for graduation in person at Husker Hub in the Canfield Administration Building, or by mail. Students should discuss these degree programs with their academic advisor.

Cooperative Degree Programs

Academic credit from the University and a cooperating institution are applied towards a four-year degree from either the University of Nebraska–Lincoln (University degree-granting program) or the cooperating institution (non-University degree-granting program). All have approved programs of study.

UNL Degree-Granting Programs

A University of Nebraska–Lincoln 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 and a 3+1 program leading to a bachelor of science in Applied Science.

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. Transfer programs are available for students pursuing degree programs leading to a bachelor of science degree.

Non University of Nebraska–Lincoln Degree-Granting Programs

CASNR cooperates with other institutions to provide coursework 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 the University 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 coursework at Chadron State College and one year of specialized range science coursework (32 credit hours) at CASNR.

Residency

Students must complete at least 30 of the total hours for their degree using University of Nebraska–Lincoln credits. At least 18 of the 30 credit hours must be in courses offered through CASNR[1] (>299) including the appropriate ACE 10 degree requirement or an approved ACE 10 substitution offered through another Nebraska college and excluding independent study regardless of the number of hours transferred. Credit earned during education abroad may be used toward the residency requirement if students register through the University of Nebraska–Lincoln and participate in prior-approved education abroad programs. The University of Nebraska–Lincoln open enrollment and summer independent study courses count toward residence.

[1] *Includes courses taught by CASNR faculty through interdisciplinary prefixes (e.g., LIFE, MBIO, ENVR, SCIL, EAEP, 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 coursework under the 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 ace.unl.edu (https://ace.unl.edu/).

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 the University of Nebraska–Lincoln or when they were first admitted to a Joint Academic Transfer Program. Students transferring from a community college, but without admission to a Joint Academic Transfer Program, may be eligible to fulfill the requirements as stated in the catalog for an academic year in which they were enrolled at the community college prior to attending the University of Nebraska-Lincoln. This decision should be made in consultation with academic advisors, provided the student a) was enrolled in a community college during the catalog year they are utilizing, b) maintained continuous enrollment at the previous institution for 1 academic year or more, and c) continued enrollment at the University of Nebraska-Lincoln within 1 calendar year from their last term at the previous institution. 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 the University of Nebraska–Lincoln 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

Graduates of plant and landscape systems will be able to:

1. Recognize, describe, and assess the value of nature.
2. Manage complex plant and soil systems which provide services for people and the planet.
3. Apply science and technology knowledge to problem solving.
4. Use diverse methods to generate, visualize, and communicate data that reveals truths and guides decision making.
5. Demonstrate effective communication to engage a target audience based on available information.
6. Lead and contribute to teams to amplify success in problem solving

Major Requirements

The following basic courses are required for a bachelor of science degree in plant and landscape systems. In addition, students must select and meet the requirements of one of the options, depending upon their particular interests and vocational goals. Courses with an '*' indicate that at least one additional course not found in the core or option requirements is required as a prerequisite.

College Integrative Course and ACE 8		
SCIL 101	Science and Decision-Making for a Complex World	3
Credit Hours Subtotal:		3
Plant and Landscape Systems Integrative Course		
PLAS 100	Plants, Landscapes, & the Environment	3
Credit Hours Subtotal:		3
Communications		
Written Communication (ACE 1)		
Select one of the following:		3
ENGL 150	Writing and Inquiry	
ENGL 151	Writing for Change	
ENGL 254	Writing and Communities	
JGEN 120	Basic Business Communication	
JGEN 200	Technical Communication I	
JGEN 300	Technical Communication II	
Oral Communication (ACE 2)		
Select one of the following:		3
ALEC 102	Interpersonal Skills for Leadership	
COMM 101	Communication in the 21st Century	
COMM 209	Public Speaking	
COMM 210	Communicating in Small Groups	
COMM 215	Visual Communication	
COMM 283	Interpersonal Communication	
COMM 286	Business and Professional Communication	
JGEN 300	Technical Communication II	
MRKT 257	Sales Communication	
TMFD 121	Visual Communication with Animation	
Credit Hours Subtotal:		6
Mathematics		
Select 5 credits from the following:		5
MATH 102	Trigonometry	
MATH 103	College Algebra and Trigonometry	
MATH 104	Applied Calculus	
MATH 106	Calculus I	
STAT 218	Introduction to Statistics	
Credit Hours Subtotal:		5
Economics (ACE 6)		
Select one of the following: [1]		3
AECN 141	Introduction to the Economics of Agriculture	
ECON 200	Economic Essentials and Issues	
ECON 211	Principles of Macroeconomics	
ECON 212	Principles of Microeconomics	
Credit Hours Subtotal:		3
Technical Data Communication		
PLAS 230	Technical Reporting in Plant and Landscape Systems	3
Credit Hours Subtotal:		3
Natural Sciences		
PLAS 131	Plant Science (ACE 4)	3
PLAS 153	Soil Resources	4
PLAS 278	Botany	4
Credit Hours Subtotal:		11
Career Experience [2]		
PLAS 95	Orientation Seminar	0
PLAS 295	Internship	1-3
Credit Hours Subtotal:		1
Pest Biology		
ENTO 105	Natural History of Arthropods Associated with Plants	2
PLPT 210	Plant Pathogens and Disease	2
Credit Hours Subtotal:		4
ACE Requirement		
Select one course each from ACE outcomes 5, 7, and 9		9
Credit Hours Subtotal:		9
Total Credit Hours		**48**

[1] *For students planning on pursuing AECN 200+ level courses, take* AECN 141 or ECON 212.

[2] *A second internship (*PLAS 395B*,* PLAS 395M*, or* PLAS 395T*) is required and is option specific.*

Horticulture Option

Horticulture Requirements		
CHEM 109A & CHEM 109L	General Chemistry I and General Chemistry I Laboratory	4
or CHEM 113A & CHEM 113L	Fundamental Chemistry I and Fundamental Chemistry I Laboratory	
or AGST 109	Physical Principles in Agriculture and Life Sciences	
or PHYS 141	Physics for Life Sciences I	
or PHYS 151	Elements of Physics	
PLAS 135	Experiments in Plant Science	1
PLAS 215	Genetics	4
PLAS 221	Plant Propagation	3
ENTO 116	Insect Identification	1

PLAS 306	Greenhouse Practices and Management	3
PLAS 395B	Internship in Horticulture	1-3
Select 6 hours from the following:		6
PLAS 201 / LARC 201 / NRES 201	Dendrology: Study and Identification of Trees and Shrubs	
PLAS 212 / LARC 212 / NRES 212	Woody Plants for Landscapes: Identification, Management, and Use	
PLAS 213	Cultivars and Varieties of Woody Plants for Landscapes	
PLAS 214	Herbaceous Landscape Plants	
Select 3 hours from the following:		3
NRES 220	Principles of Ecology	
PLAS 245	Introduction to Grassland Ecology and Management	
PLAS 270	Biological Invaders	
PLAS 440	Great Plains Ecosystem	
LARC 487	Introduction to Landscape Ecology	
Select 18 hours from the following courses:		18
PLAS 227	Introductory Turfgrass Management	
PLAS 307	Hydroponics for Growing Populations	
PLAS 319	Edible Landscapes	
PLAS 325	Introductory Plant Physiology	
PLAS 326	Landscape Management Solutions	
PLAS 330	Pruning Ornamentals	
PLAS 355	Perennial, Pot and Bedding Plant Production Laboratory	
PLAS 356	Seasonal Plant Production	
PLAS 430	Introduction to Plant Diagnostics	
PLAS 439	Organic Farming and Food Systems	
PLAS 453	Urban Soil Properties and Management	
PLAS 454	Specialty Crop Innovations	
PLAS 462	Cannabis Growth, Production and Breeding Basics	
PLAS 471	Vines, Wines and You	
PLAS 478	Plant Anatomy	
Select 6 hours of business, entrepreneurship, communication, and leadership		6
Any ACCT, AECN, ALEC, BLAW, ECON, EAEP, FINA, MNGT, or MRKT		
Select 9 hours of plant, soil, and pest management		9
Any PLAS, ENTO, PLPT, or NRES		
Capstone Course (ACE 10)		**3**
Select one of the following:		
PLAS 403	Scientific Writing and Communication	
PLAS 435	Agroecology	
PLAS 469	Ecological Landscape Design	
PLAS 470	Critical Thinking in Landscape Management	
PLAS 488	Entrepreneurship and Enterprise Development	
Free Electives		**10**
Credit Hours Subtotal:		72
Total Credit Hours		**72**

Landscape Design & Management Option

Landscape Design & Management Requirements		
CHEM 105A & CHEM 105L	Chemistry in Context I and Chemistry in Context I Laboratory	4
or CHEM 109A & CHEM 109L	General Chemistry I and General Chemistry I Laboratory	
or CHEM 113A & CHEM 113L	Fundamental Chemistry I and Fundamental Chemistry I Laboratory	
or AGST 109	Physical Principles in Agriculture and Life Sciences	
or PHYS 141	Physics for Life Sciences I	
or PHYS 151	Elements of Physics	
PLAS 135	Experiments in Plant Science	1
PLAS 212 / LARC 212 / NRES 212	Woody Plants for Landscapes: Identification, Management, and Use	3
PLAS 213	Cultivars and Varieties of Woody Plants for Landscapes	3
PLAS 214	Herbaceous Landscape Plants	3
PLAS 227	Introductory Turfgrass Management	3
PLAS 265	Landscape Design Communication	1
PLAS 267	Introduction to Landscape Design Studio	3
PLAS 300	Introduction to Landscape Construction	3
PLAS 326	Landscape Management Solutions	4
PLAS 395M	Internship in Landscape Design and Management	1-3
PLAS 467	Planting Design	4
Select 3 hours from:		3-4
CRPL 430	Planning with GIS	
NRES 218	Introduction to Geospatial Technologies	
NRES 415	GIS for Agriculture and Natural Resources	
NRES 418	Introduction to Remote Sensing	
GEOG 217	Principles of GIS	
Credit Hours Subtotal:		36
Capstone Course (ACE 10)		
Select one of the following:		3-4
PLAS 469	Ecological Landscape Design	
PLAS 470	Critical Thinking in Landscape Management	
Select 9 credits of PLAS at the 300 level or above		9
Select 6 credits of any CASNR course at the 300 level or above		6
Select 6 credits of business and/or leadership courses		6
ACCT, AECN, ALEC, BLAW, ECON, EAEP, FINA, MNGT, and MRKT		
Free Electives		**10-12**
Credit Hours Subtotal:		36
Total Credit Hours		**72**

Turfgrass Science & Management Option

Turfgrass Science & Management Requirements

PLAS 135	Experiments in Plant Science	1
PLAS 325	Introductory Plant Physiology	4
CHEM 109A & CHEM 109L	General Chemistry I and General Chemistry I Laboratory	4
or CHEM 113A & CHEM 113L	Fundamental Chemistry I and Fundamental Chemistry I Laboratory	
AGST 109	Physical Principles in Agriculture and Life Sciences	4
or PHYS 141	Physics for Life Sciences I	
or PHYS 151	Elements of Physics	
PLAS 227	Introductory Turfgrass Management	3
PLAS 229	Introductory Turfgrass Management Laboratory	1
PLAS 327	Turfgrass Science and Management	3
PLAS 395T	Internship in Turfgrass Science and Management	1-3
PLAS 427	Turfgrass Systems Management (ACE 10)	3
Select 3 hours of plant identification from:		3
PLAS 212	Woody Plants for Landscapes: Identification, Management, and Use	
PLAS 213	Cultivars and Varieties of Woody Plants for Landscapes	
PLAS 214	Herbaceous Landscape Plants	
PLAS 442	Wildland Plants	
Select 3 hours of technology from:		3
CRPL 430	Planning with GIS	
GEOG 217	Principles of GIS	
NRES 218	Introduction to Geospatial Technologies	
NRES 415	GIS for Agriculture and Natural Resources	
NRES 418	Introduction to Remote Sensing	
Select 6 hours of supporting courses from:		6
ENTO 403	Management of Horticultural Crop Insects	
METR 100	Weather and Climate	
NRES 211	Introduction to Conservation Biology	
PGAM XXX		
PLAS 321	Arboriculture: Maintenance & Selection of Landscape Trees	
PLAS 326	Landscape Management Solutions	
PLAS 426 / NRES 426	Invasive Plants	
PLAS 430	Introduction to Plant Diagnostics	
PLPT 400 & 400L	Intermediate Plant Pathology and Intermediate Plant Pathology Lab	
Select 4 hours from the following:		4
AGRI 310	Study Tours in International Agriculture	
AGRI 311	Study Tours in US Agriculture (Turf & GPA Golf Management)	
AGRI 311	Study Tours in US Agriculture (GCSAA/ SFMA)	
PLAS 391T	Special Topics in Turfgrass Science and Management	
PLAS 395T	Internship in Turfgrass Science and Management (3rd experience)	
PGAM 495	Internship in PGA Golf Management	
Select 6 hours of soils from:		6
SOIL 366	Soil Nutrient Relationships	
SOIL 453	Urban Soil Properties and Management	
SOIL 460	Soil Microbial Ecology	
SOIL 472	Applied Soil Physics	
Select 9 hours of business from:		9
ACCT, AECN, BLAW, ECON, EAEP, FINA, MNGT, MRKT or PGAM		
Select 6 hours of communication form:		6
ALEC, COMM, HRTM, or PGAM		
Free Electives		**11**
Credit Hours Subtotal:		72
Total Credit Hours		**72**

Requirements for Minor Offered by Department

Horticulture Minor

A minor in horticulture consists of a minimum of 18 credit hours, including at least 6 hours at the 300 level or above. A total of no more than 3 hours of credit in PLAS 395B Internship in Horticulture, PLAS 391B Special Topics in Horticulture, or PLAS 399 Independent Study may be applied to the minor.

Core Courses

PLAS 131	Plant Science	3
PLAS 133	Horticultural Plant Science Laboratory [1]	1
PLAS 212 / LARC 212 / NRES 212	Woody Plants for Landscapes: Identification, Management, and Use	3
or PLAS 213 / LARC 212 / NRES 212	Cultivars and Varieties of Woody Plants for Landscapes	
or PLAS 214 / NRES 214	Herbaceous Landscape Plants	
PLAS 221	Plant Propagation	3
Credit Hours Subtotal:		10

Additional Courses

Select 8 hours, 6 of which must be at the 300-level or above. It is recommended, but not required, to select courses within one focus area.		8
Horticulture Knowledge		
PLAS 100	Plants, Landscapes, & the Environment	
PLAS 153 / SOIL 153	Soil Resources [2]	
or PLAS 278	Botany	
or PLAS 325	Introductory Plant Physiology	
PLAS 200 / GEOG 200 / LARC 200	Landscape and Environmental Appreciation	
Controlled Growing Environments		
PLAS 306	Greenhouse Practices and Management	
PLAS 307	Hydroponics for Growing Populations	

PLAS 355	Perennial, Pot and Bedding Plant Production Laboratory
PLAS 356	Seasonal Plant Production
PLAS 454	Specialty Crop Innovations
Floral Design and Management	
PLAS 261	Floral Design I
PLAS 262	Floral Design II
PLAS 306	Greenhouse Practices and Management
PLAS 355	Perennial, Pot and Bedding Plant Production Laboratory
Urban Food Systems	
PLAS 306	Greenhouse Practices and Management
PLAS 307	Hydroponics for Growing Populations
PLAS 319	Edible Landscapes
PLAS 471 / HRTM 471 / NUTR 471	Vines, Wines and You
Plant Identification and Systematics	
BIOS 471	Plant Systematics
PLAS 201 / LARC 201 / NRES 201	Dendrology: Study and Identification of Trees and Shrubs
PLAS 212 / LARC 212 / NRES 212	Woody Plants for Landscapes: Identification, Management, and Use
PLAS 213 / LARC 213 / NRES 213	Cultivars and Varieties of Woody Plants for Landscapes
PLAS 214 / NRES 214	Herbaceous Landscape Plants
PLAS 319	Edible Landscapes
PLAS 242 / GRAS 242 / RNGE 242	North American Wildland Plants
PLAS 426 / NRES 426	Invasive Plants
PLAS 442 / GRAS 442 / NRES 442 / RNGE 442	Wildland Plants
Crop Production	
PLAS 307	Hydroponics for Growing Populations
PLAS 355	Perennial, Pot and Bedding Plant Production Laboratory
PLAS 356	Seasonal Plant Production
PLAS 454	Specialty Crop Innovations
Credit Hours Subtotal:	8
Total Credit Hours	**18**

[1] *If* PLAS 132 *or* PLAS 134 *has already been taken,* PLAS 133 *is not required. However, 18 credit hours are still required for the minor. Students may replace the 1 credit from* PLAS 133 *with any of the courses listed below in the minor.*

[2] *Only one of these courses may be used toward the horticulture minor.*

Turfgrass Science and Management Minor

A minor in turfgrass science management consists of a minimum of 18 credit hours. A total of no more than 3 hours of credit in PLAS 395T or PLAS 391T may be applied to the minor.

Core Courses		
PLAS 131	Plant Science	3
PLAS 227	Introductory Turfgrass Management	3
PLAS 229	Introductory Turfgrass Management Laboratory	1
PLAS 327	Turfgrass Science and Management	3
PLAS 395T	Internship in Turfgrass Science and Management	1-3
or PLAS 391T	Special Topics in Turfgrass Science and Management	
Additional Courses		
Select 7 hours from the following:		7
PLAS 153 / SOIL 153	Soil Resources	
AGRI 311	Study Tours in US Agriculture	
PLAS 395T	Internship in Turfgrass Science and Management	
PLAS 391T	Special Topics in Turfgrass Science and Management	
PLAS 427	Turfgrass Systems Management	
PLAS 453 / LARC 453 / SOIL 453	Urban Soil Properties and Management	
Credit Hours Subtotal:		18
Total Credit Hours		**18**

Landscape Design and Management Minor

A minor in landscape design and management consists of a minimum of 18 credit hours, including at least 6 credits at the 300 level or above. A total of no more than 3 credits of PLAS 395M Internship in Landscape Design and Management may be applied to the minor.

Core Courses		
PLAS 265	Landscape Design Communication	1
PLAS 267	Introduction to Landscape Design Studio	3
or DSGN 120	Design Drawing	
PLAS 326	Landscape Management Solutions	4
Select 3 credits of plant identification:		3
PLAS 201 / LARC 201 / NRES 201	Dendrology: Study and Identification of Trees and Shrubs	
PLAS 212 / LARC 212 / NRES 212	Woody Plants for Landscapes: Identification, Management, and Use	
PLAS 213 / LARC 213 / NRES 213	Cultivars and Varieties of Woody Plants for Landscapes	
PLAS 214 / NRES 214	Herbaceous Landscape Plants	
Select 7 credits (2 credits of which must be at the 300-level or above) from the following:		7

PLAS 200 / GEOG 200 / LARC 200	Landscape and Environmental Appreciation
PLAS 201 / LARC 201 / NRES 201	Dendrology: Study and Identification of Trees and Shrubs
PLAS 212 / LARC 212 / NRES 212	Woody Plants for Landscapes: Identification, Management, and Use
PLAS 213 / LARC 213 / NRES 213	Cultivars and Varieties of Woody Plants for Landscapes
PLAS 214 / NRES 214	Herbaceous Landscape Plants
PLAS 227	Introductory Turfgrass Management
PLAS 300	Introduction to Landscape Construction
PLAS 319	Edible Landscapes
PLAS 330	Pruning Ornamentals
PLAS 391L	Special Topics in Landscape Design and Management
PLAS 395M	Internship in Landscape Design and Management
PLAS 453 / LARC 453 / SOIL 453	Urban Soil Properties and Management
PLAS 467 / ARCH 467 / LARC 467	Planting Design
PLAS 469 / ARCH 469	Ecological Landscape Design
PLAS 470	Critical Thinking in Landscape Management
Credit Hours Subtotal:	18
Total Credit Hours	**18**

PLAS 92 Plant Biology Portfolio and Assessment
Crosslisted with: NRES 92
Prerequisites: Junior standing in Plant Biology degree program
Notes: Required for graduation. Offered every Fall during the first 5 weeks. Pass/No Pass only.
Description: Development of an experiential portfolio and completion of an online survey as part of assessment activities.
Credit Hours: 0
Max credits per semester:
Max credits per degree:
Grading Option: Pass No Pass

PLAS 95 Orientation Seminar
Prerequisites: First-semester first-year student (<26 credits); Plant and Landscape Systems, Agronomy, or Plant Biology major
Notes: Degree requirement for all first-year students in the Plant and Landscape Systems, Agronomy, and Plant Biology majors. Waived for those joining the majors with >26 credits.
Description: Group and individual activities to help discover career opportunities, improve academic success skills, identify beneficial co-curricular activities, and select appropriate internships.
Credit Hours: 0
Max credits per semester:
Max credits per degree:
Grading Option: Pass No Pass
Offered: FALL

PLAS 100 Plants, Landscapes, & the Environment
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 explored within the context of these systems.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Offered: FALL/SPR
ACE: ACE 4 Science

PLAS 107 Invasive Plant Species: Impacts on Ecosystems
Crosslisted with: NRES 107
Notes: Online only
Description: The flora of the earth is constantly being re-distributed by natural and human forces. As plant species change locations, they affect ecosystems, but how? In this course, students will learn how invasive plants establish and spread in ecosystems and develop an understanding of their impacts on ecosystems from local to global scales.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded
Offered: FALL/SPR
ACE: ACE 9 Global/Diversity

PLAS 127 Survey of Turfgrass and Landscape Management
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
Grading Option: Graded with Option

PLAS 131 Plant Science
Description: The biology of plants grown for food, feed, fuel, fiber and fun! Starting with natural and managed ecosystems and their interactions, the course then introduces how plants obtain and manage water and nutrients before giving a big picture view of carbon assimilation, metabolism and storage in terms of plant productivity and growth in variable environments. The way plants respond to endogenous and applied growth regulators as well as genetic signals is described, before considering the role of genetics in plant pest interactions and management.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Offered: FALL/SPR
Prerequisite for: ENTO 308; NRES 220; NRES 302, PLAS 302; NRES 310; PLAS 132; PLAS 133; PLAS 134; PLAS 135; PLAS 204; PLAS 221; PLAS 227; PLAS 240, RNGE 240, GRAS 240; PLAS 278; PLAS 325; PLAS 353; PLAS 355; PLPT 210
ACE: ACE 4 Science
Course and Laboratory Fee: $5

PLAS 132 Agronomic Plant Science Laboratory
Prerequisites: PLAS 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
Grading Option: Graded with Option
Prerequisite for: ENTO 308; PLAS 306; PLAS 307
Course and Laboratory Fee: $10

PLAS 133 Horticultural Plant Science Laboratory
Prerequisites: PLAS 131 or parallel
Description: Horticulture plant morphology, physiology, cell anatomy and plant growth are explored through application of practices used in industry. Emphasis on intensive production systems appropriate to specialty and greenhouse grown horticultural plants
Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1
Grading Option: Graded with Option
Offered: FALL/SPR
Prerequisite for: PLAS 306; PLAS 307; PLAS 356

PLAS 134 Plant Sciences Laboratory
Prerequisites: Prior or concurrent enrollment in PLAS 131 required.
Notes: Open to all majors and minors, except Agronomy or Horticulture.
Description: An exploration of plant morphology, physiology, and maturation with an emphasis on environmental, biotic, and human interactions within production and landscape systems. Not open to Agronomy or Horticulture majors or minors.
Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1
Grading Option: Graded
Prerequisite for: ENTO 308; PLAS 306; PLAS 307

PLAS 135 Experiments in Plant Science
Prerequisites: PLAS 131 or concurrent or LIFE 120 or concurrent
Description: Designing and conducting hypothesis-driven research with plants to measure response to abiotic factors in their growing environment. Experiences include the scientific process from observation of plant growth phenomena, review of relevant peer-reviewed published research, formulation of testable hypotheses, methods planning, data assimilation and analysis, and writing and oral communication of results in the style of research professionals.
Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1
Grading Option: Graded with Option
Offered: FALL

PLAS 153 Soil Resources
Crosslisted with: SOIL 153
Description: Investigation into the physical, chemical and biological properties of soils, in relation to their appropriate uses, protection, and vital roles or functions in broader plant-soil systems. Apply exercises such as discussion, evidence-based writing, assessment, planning, problem-solving, and presentations in relation to principles and practices involving all aspects of soils.
Credit Hours: 4
Max credits per semester: 4
Max credits per degree: 4
Grading Option: Graded with Option
Offered: FALL/SPR
Prerequisite for: AGEN 431, PLAS 431, AGST 431; AGST 354, SOIL 354; LARC 487, NRES 487; NRES 245, PLAS 245; NRES 255, PLAS 255, SOIL 255; NRES 319; PLAS 204; PLAS 269, SOIL 269; PLAS 327; PLAS 361, GEOL 361, NRES 361, SOIL 361; PLAS 366, SOIL 366; PLAS 453, LARC 453, SOIL 453; PLAS 455, AGRO 855, NRES 455, NRES 855, SOIL 455; PLAS 472, AGRO 872, NRES 472, NRES 872, SOIL 472
Course and Laboratory Fee: $15

PLAS 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
Grading Option: Graded with Option
ACE: ACE 7 Arts ACE 9 Global/Diversity

PLAS 201 Dendrology: Study and Identification of Trees and Shrubs
Crosslisted with: NRES 201, LARC 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
Grading Option: Graded with Option
Offered: FALL
Course and Laboratory Fee: $10

PLAS 204 Resource-Efficient Crop Management
Prerequisites: PLAS 131 and PLAS/SOIL 153
Description: The integration of crop and soil science, plant breeding, climatology and integrated pest management disciplines to develop and evaluate crop management strategies that make the most efficient use of natural resources such as solar radiation, water, and soil, as well as other external inputs utilized for field crop management.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Offered: SPRING
Prerequisite for: AGEN 431, PLAS 431, AGST 431; PLAS 405

PLAS 212 Woody Plants for Landscapes: Identification, Management, and Use
Crosslisted with: NRES 212, LARC 212
Description: Identification, basic management and design uses of trees and shrubs for sustainable landscapes, with an emphasis on native plants and plants adapted to the Plains states. Emphasis is on live specimens in outdoor environments, supported by online resources.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Offered: FALL

PLAS 213 Cultivars and Varieties of Woody Plants for Landscapes
Crosslisted with: NRES 213, LARC 213
Description: Characteristics of commercially available trees and shrubs used in urban landscapes. Compares differences among cultivars, design uses, and management issues using a combination of live specimens in outdoor environments and online resources.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Offered: SPRING

PLAS 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
Grading Option: Graded with Option

PLAS 215 Genetics
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
Grading Option: Graded with Option
Prerequisite for: AGRO 810, BIOC 810, HORT 810, BIOC 410, PLAS 410; AGRO 815, PLAS 415; ASCI 330; PLPT 418, PLPT 818, MBIO 418
Course and Laboratory Fee: $20

PLAS 216 Plant Breeding Principles and Practice
Prerequisites: High school biology and chemistry.
Notes: BIOS 101 and 101L 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
Grading Option: Graded with Option

PLAS 221 Plant Propagation
Prerequisites: PLAS 131
Notes: Recommend PLAS 278 taken previously or concurrently
Description: Practice different methods of plant propagation and explore the effects of environmental management on propagation success using the scientific method.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Offered: SPRING
Prerequisite for: PLAS 356
Course and Laboratory Fee: $35

PLAS 227 Introductory Turfgrass Management
Prerequisites: PLAS 131 or PLAS 278 or either concurrently.
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
Grading Option: Graded with Option
Offered: FALL
Prerequisite for: PLAS 327

PLAS 229 Introductory Turfgrass Management Laboratory
Description: Laboratory covering turfgrass identification and management.
Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1
Grading Option: Graded with Option
Offered: FALL
Course and Laboratory Fee: $40

PLAS 230 Technical Reporting in Plant and Landscape Systems
Notes: This course is intended for first or second year students.
Description: Learn introductory data science skills necessary to collect, manage, and analyze data. Gain the necessary skills to interpret and effectively communicate information derived from data.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded
Offered: FALL/SPR

PLAS 240 Forage Crop and Pasture Management
Crosslisted with: RNGE 240, GRAS 240
Prerequisites: PLAS 131 or BIOS 101 or LIFE 120
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
Grading Option: Graded with Option
Offered: FALL/SPR
Prerequisite for: PLAS 340, RNGE 340, GRAS 340; PLAS 445, AGRO 845, ASCI 451, ASCI 851, RNGE 445, GRAS 445

PLAS 242 North American Wildland Plants
Crosslisted with: RNGE 242, GRAS 242
Prerequisites: Permission.
Notes: PLAS/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
Grading Option: Graded with Option
Offered: FALL/SPR

PLAS 245 Introduction to Grassland Ecology and Management
Crosslisted with: NRES 245
Prerequisites: PLAS 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
Grading Option: Graded with Option
Prerequisite for: PLAS 340, RNGE 340, GRAS 340

PLAS 255 Soil Health and Environment
Crosslisted with: NRES 255, SOIL 255
Prerequisites: SOIL 153
Description: Develop a life-long interest in observing and studying soil health and ecosystems. Provide the necessary academic skills to incorporate soil health principles into real-world applications, including natural resource conservation, evaluation of regenerative practices, and promotion of environmental sustainability. Prepare professionals and advocates of soil ecosystems.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded
Offered: FALL
Course and Laboratory Fee: $50

PLAS 261 Floral Design I
Description: Principles, interpretation, and emotional responses of floral design. Explored and practical experience in all aspects of flower arranging. Includes floral product identification, care, handling, marketing and critiquing of floral designs.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Offered: FALL/SPR
Prerequisite for: PLAS 262
ACE: ACE 7 Arts
Course and Laboratory Fee: $125

PLAS 262 Floral Design II
Prerequisites: PLAS 261
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
Grading Option: Graded with Option
Offered: SPRING
Course and Laboratory Fee: $125

PLAS 265 Landscape Design Communication
Description: Introduction to graphic and oral presentation and communication techniques for landscape design, based on design principles and elements. Includes demonstration and discussion of various media and technologies.
Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1
Grading Option: Graded with Option
Offered: SPRING
Prerequisite for: PLAS 267
Course and Laboratory Fee: $10

PLAS 267 Introduction to Landscape Design Studio
Prerequisites: PLAS 265 or concurrent enrollment in PLAS 265
Notes: Individual and team projects, in-class exercises and presentations, and site visits to urban landscapes will be a part of the course experience.
Description: Process and elements used to design sustainable residential and small urban landscapes.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Offered: SPRING
Prerequisite for: PLAS 300; PLAS 301
Groups: Techniques

PLAS 269 Principles of Soil Management
Crosslisted with: SOIL 269
Prerequisites: PLAS 153
Description: Current state-of-knowledge of soil and water management; impacts of water and wind erosion on soil productivity, and nutrient dynamics; soil management in response to the increased climate variability; improved management practices such as conservation tillage (i.e., no-till), cropping systems, cover crops, crop residue management, perennial systems, water management and irrigation; nutrient cycling; and soil quality and health.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Offered: FALL
Prerequisite for: PLAS 405

PLAS 270 Biological Invaders
Crosslisted with: 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
Grading Option: Graded with Option

PLAS 275 Agribusiness Entrepreneurial Finance
Crosslisted with: AECN 275, EAEP 275, ENTR 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
Grading Option: Graded with Option

PLAS 278 Botany
Prerequisites: BIOS 101 or LIFE 120 or PLAS 131
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
Grading Option: Graded with Option
Offered: SPRING
Prerequisite for: PLAS 227
Course and Laboratory Fee: $40

PLAS 279 Soil Evaluation
Crosslisted with: NRES 279, SOIL 279
Notes: PLAS/SOIL 153 recommended, but not required. This course includes an inter-collegiate Soil Judging contest that takes place in the North Central region of the United States during the course of the class, or a course-based undergraduate research experience.
Description: Apply fundamental knowledge to the description of soils in the field. Application of techniques employed in writing descriptions of soil morphology and in classifying and interpreting soils.
Credit Hours: 2
Max credits per semester: 2
Max credits per degree: 2
Grading Option: Graded with Option
Offered: FALL
Prerequisite for: NRES 379, PLAS 379, SOIL 379
Course and Laboratory Fee: $100
Experiential Learning: Fieldwork

PLAS 291 Special Topics in Plant and Landscape Systems
Prerequisites: Permission.
Notes: Requires advanced permission before registering for the course.
Description: Topics vary.
Credit Hours: 1-6
Min credits per semester: 1
Max credits per semester: 6
Max credits per degree: 12
Grading Option: Graded with Option
Offered: FALL/SPR

PLAS 295 Internship
Crosslisted with: RNGE 295, SOIL 295
Prerequisites: Sophomore standing and completion of an internship contract. The internship contract is subject to approval by the department. Internships completed without a signed contract may not qualify for credit.
Notes: Pass/No Pass only; requires advanced permission before registering for the course.
Description: Professional experience in a plant, landscape or soil interest area. Experience may be with a business, government agency, organization, or a university research, extension, or teaching program.
Credit Hours: 1-3
Min credits per semester: 1
Max credits per semester: 3
Max credits per degree: 6
Grading Option: Pass No Pass
Offered: FALL/SPR
Experiential Learning: Internship/Co-op

PLAS 300 Introduction to Landscape Construction
Prerequisites: PLAS 267 or concurrent
Description: Materials, systems, and methods for constructing sustainable residential and small urban landscapes. Includes site grading, hardscapes, irrigation, lighting, ponds and water features, using a combination of guest speakers, site visits and online resources.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Offered: SPRING
Course and Laboratory Fee: $15

PLAS 301 Introduction to Landscape Contracting
Prerequisites: PLAS 267 and PLAS 388 or concurrent
Notes: Offered Spring of even years and alternate with PLAS 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
Grading Option: Graded
Offered: SPRING
Groups: Techniques

PLAS 302 Tree Biology
Crosslisted with: NRES 302
Prerequisites: BIOS 101 or LIFE 120 or PLAS 131
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
Grading Option: Graded with Option
Offered: FALL

PLAS 306 Greenhouse Practices and Management
Prerequisites: PLAS 132 or PLAS 133 or PLAS 134 or LIFE 120
Description: Principles and practices involved in the development, operation and use of greenhouses and other protected plant growth environments.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Offered: SPRING

PLAS 307 Hydroponics for Growing Populations
Prerequisites: PLAS 132 or PLAS 134 or PLAS 133 or LIFE 120
Description: Globally diverse peoples are explored through culture, diets, food production systems, and environment with emphasis on the application of hydroponic plant production systems to address food needs that are culturally conscious. Hydroponic methodologies are investigated and prototypes are designed, built, and tested for proof of concept.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded
Offered: FALL/SPR
ACE: ACE 9 Global/Diversity

PLAS 319 Edible Landscapes
Prerequisites: Junior Standing or permission
Description: Identification, environmental requirements, and sustainable care and management of herbaceous perennial and woody plants with both edible and aesthetic landscape value. Historical and human cultural ties or ethnobotanical traditions associated with the plants will be utilized for appropriate plant selection and use.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Offered: SPRING
ACE: ACE 9 Global/Diversity

PLAS 321 Arboriculture: Maintenance & Selection of Landscape Trees
Crosslisted with: NRES 321
Prerequisites: Junior standing
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
Grading Option: Graded with Option
Offered: SPRING
Groups: Laboratory and Field Training
Course and Laboratory Fee: $65

PLAS 325 Introductory Plant Physiology
Prerequisites: PLAS 131 or LIFE 120
Description: Introduction to physiological and developmental processes in plants. Topics include plant-water relations, photosynthesis, carbon metabolism and source-sink translocation, light responses, hormonal regulation during growth, development and environmental stresses such as drought, heat, salinity, flooding stress among others. Emphasizes the development of a broader knowledge of how crops respond to abiotic factors associated with changing climate through conceptual integration of physiological and molecular processes. Science communication skills and teamwork experience are developed through oral presentations and poster sessions.
Credit Hours: 4
Max credits per semester: 4
Max credits per degree: 4
Grading Option: Graded with Option
Offered: SPRING
Prerequisite for: PLAS 441, AGRO 841, HORT 841, RNGE 441, GRAS 441

PLAS 326 Landscape Management Solutions
Notes: The course will include site visits, guest speakers and collaborations.
Description: Use a problem-solving approach to identify and analyze landscape management situations in commercial, public, and residential landscapes. Focus will be on environmental assessment, human intent and function, seasonal and materials-specific best management practices applied to plants, hardscapes, pests and diseases to produce recommendations.
Credit Hours: 4
Max credits per semester: 4
Max credits per degree: 4
Grading Option: Graded with Option
Offered: FALL

PLAS 327 Turfgrass Science and Management
Prerequisites: PLAS/SOIL 153; CHEM 105A and 105L or CHEM 109A and 109L; and PLAS 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
Grading Option: Graded with Option

PLAS 330 Pruning Ornamentals
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
Grading Option: Graded with Option

PLAS 340 Range Management and Improvement
Crosslisted with: RNGE 340, GRAS 340
Prerequisites: PLAS 240 or NRES 245
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
Grading Option: Graded with Option
Offered: SPRING
Prerequisite for: PLAS 445, AGRO 845, ASCI 451, ASCI 851, RNGE 445, GRAS 445

PLAS 353 Vegetable Crop Production Laboratory
Prerequisites: PLAS 131
Notes: PLAS 133, PLAS 221, and PLAS 352 recommended.
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
Grading Option: Graded with Option
Offered: FALL
Course and Laboratory Fee: $40

PLAS 355 Perennial, Pot and Bedding Plant Production Laboratory
Prerequisites: PLAS 131
Notes: PLAS 133, PLAS 221, and PLAS 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
Grading Option: Graded with Option
Offered: FALL
Course and Laboratory Fee: $30

PLAS 356 Seasonal Plant Production
Prerequisites: PLAS 133, 221
Description: Methodology of plant production for seasonal ornamental and vegetable plants to meet the needs of the consumer horticulture industry. Supply procurement, product selection, asexual & seed propagation, young plant liners, plant culture & manipulation to meet qualities and market demand are explored. Crops are grown and marketed.
Credit Hours: 2
Max credits per semester: 2
Max credits per degree: 2
Grading Option: Graded
Offered: SPRING

PLAS 361 Soils, Environment and Water Quality
Crosslisted with: GEOL 361, NRES 361, SOIL 361
Prerequisites: PLAS/SOIL 153; MATH 102 or 103; two semesters chemistry (CHEM 105A and 105L, CHEM 106A and 106L, CHEM 109A and 109L, CHEM 110A and 110L) and WATS/GEOG/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
Grading Option: Graded with Option
Prerequisite for: PLAS 458, AGRO 858, NRES 458, NRES 858, SOIL 458

PLAS 366 Soil Nutrient Relationships
Crosslisted with: SOIL 366
Prerequisites: PLAS 153
Description: Explores nutrient behaviors in soil and factors affecting nutrient management. Students work on developing fertilizer plans for complex plant production systems that follow the right place, right amount, right source, right time philosophy and ensure production of healthy and nutritious plants, improve profits and enterprise sustainability, fulfill legal requirements, and protect soil and water quality.
Credit Hours: 4
Max credits per semester: 4
Max credits per degree: 4
Grading Option: Graded with Option
Offered: SPRING
Prerequisite for: PLAS 405

PLAS 375 Innovations for Agriculture
Crosslisted with: AGRI 375, EAEP 375
Prerequisites: Junior or Senior class standing.
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
Grading Option: Graded
Offered: FALL

PLAS 379 Advanced Soil Evaluation
Crosslisted with: NRES 379, SOIL 379
Prerequisites: PLAS/NRES/SOIL 279
Notes: This course includes a national- or regional-level inter-collegiate Soil Judging contest that takes place during the course of the class.
Description: Apply fundamental knowledge and improve field techniques to the description and interpretation of soils in the field. Application of techniques employed in writing descriptions of soil morphology and in classifying and interpreting soils.
Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 7
Grading Option: Graded with Option
Offered: FALL/SPR
Course and Laboratory Fee: $150
Experiential Learning: Fieldwork

PLAS 388 Business Systems in Entrepreneurship
Crosslisted with: ENTR 388, EAEP 388, ABUS 388
Description: Introductory models for a startup business. Ideation, customer segments, value proposition, minimal viable product and market fit.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Offered: FALL/SPR
Prerequisite for: PLAS 301

PLAS 391A Special Topics in Agronomy
Prerequisites: Permission.
Notes: Requires advanced permission before registering for the course.
Description: Topics vary.
Credit Hours: 1-6
Min credits per semester: 1
Max credits per semester: 6
Max credits per degree: 12
Grading Option: Graded with Option
Offered: FALL/SPR

PLAS 391B Special Topics in Horticulture
Prerequisites: Permission.
Notes: Requires advanced permission before registering for the course.
Description: Topics vary.
Credit Hours: 1-6
Min credits per semester: 1
Max credits per semester: 6
Max credits per degree: 12
Grading Option: Graded with Option
Offered: FALL/SPR

PLAS 391L Special Topics in Landscape Design and Management
Prerequisites: Permission.
Notes: Requires advanced permission before registering for the course
Description: Topics vary.
Credit Hours: 1-6
Min credits per semester: 1
Max credits per semester: 6
Max credits per degree: 12
Grading Option: Graded with Option
Offered: FALL/SPR

PLAS 391T Special Topics in Turfgrass Science and Management
Prerequisites: Permission
Notes: Requires advanced permission before registering for the course
Description: Topics vary.
Credit Hours: 1-6
Min credits per semester: 1
Max credits per semester: 6
Max credits per degree: 12
Grading Option: Graded with Option
Offered: FALL/SPR

PLAS 395A Internship in Agronomy
Prerequisites: Junior standing or higher. Permission.
Notes: A contract with the instructor is required before the start of the internship for course credit. Two or more courses in Agronomy above the 200 level are strongly recommended.
Description: Advanced internship in an agronomic enterprise. Must be a business, government agency, organization, or university research, teaching, or extension program in which the student does not have previous internship credit.
Credit Hours: 1-3
Min credits per semester: 1
Max credits per semester: 3
Max credits per degree: 6
Grading Option: Pass No Pass
Offered: FALL/SPR
Experiential Learning: Internship/Co-op

PLAS 395B Internship in Horticulture
Prerequisites: Junior standing or higher. Permission.
Notes: A contract with the instructor is required before the start of the internship for course credit. Two or more courses in Horticulture above the 200 level are strongly recommended.
Description: Advanced internship experience in a horticulture enterprise. Must be a business, government agency, organization or university research, teaching, or extension program in which the student does not have previous internship credit.
Credit Hours: 1-3
Min credits per semester: 1
Max credits per semester: 3
Max credits per degree: 6
Grading Option: Pass No Pass
Offered: FALL/SPR
Experiential Learning: Internship/Co-op

PLAS 395M Internship in Landscape Design and Management
Prerequisites: Junior standing or higher. Permission.
Notes: A contract with the instructor is required before the start of the internship for course credit. Two or more courses in Landscape Design and Management above the 200 level are strongly recommended.
Description: Advanced professional experience in a landscape design and/or management enterprise. Experience must be with a business, government agency, organization, or a university research, extension, or teaching program in which the student does not have previous internship credit.
Credit Hours: 1-3
Min credits per semester: 1
Max credits per semester: 3
Max credits per degree: 6
Grading Option: Pass No Pass
Offered: FALL/SPR
Experiential Learning: Internship/Co-op

PLAS 395T Internship in Turfgrass Science and Management
Prerequisites: Junior standing or higher. Permission.
Notes: Pass/No Pass only; requires advanced permission before registering for the course.
Description: Advanced internship in a turfgrass science and management enterprise. Must be a business, government agency, organization, university research, teaching, or extension program in which the student does not have previous internship credit.
Credit Hours: 1-3
Min credits per semester: 1
Max credits per semester: 3
Max credits per degree: 6
Grading Option: Pass No Pass
Offered: FALL/SPR
Experiential Learning: Internship/Co-op

PLAS 398R Research Experiences in Grasslands
Crosslisted with: GRAS 398R, NRES 398R
Description: Scientific and research training and necessary soft skills for researchers, using grasslands as a study system. Provides individualized opportunities for engagement with scientific methods, which include experiential learning, acquisition and refinement of skills that enhance higher-learning opportunities, and increased marketability for future employment or postgraduate degrees.
Credit Hours: 1-3
Min credits per semester: 1
Max credits per semester: 3
Max credits per degree: 5
Grading Option: Graded
Offered: FALL
Experiential Learning: Research

PLAS 399 Independent Study
Prerequisites: Junior standing; 12 hrs plant science; and permission.
Notes: 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
Grading Option: Graded with Option

PLAS 403 Scientific Writing and Communication
Crosslisted with: 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
Grading Option: Graded
ACE: ACE 10 Integrated Product

PLAS 405 Crop Management Strategies
Prerequisites: Senior standing; PLAS 204, PLAS/SOIL 269 or PLAS/SOIL 366; and permission.
Notes: JGEN 200 and/or JGEN 300, and AECN 201 recommended; a pre-semester trip is required.
Description: Application, expansion, and integration of principles from agricultural, economic and social sciences into systems-level the development and management of cropping systems.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Offered: FALL
ACE: ACE 10 Integrated Product
Course and Laboratory Fee: $60

PLAS 406 Plant Ecophysiology: Theory and Practice
Crosslisted with: AGRO 806, 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
Grading Option: Graded with Option

PLAS 407 Bio-Atmospheric Instrumentation
Crosslisted with: GEOG 469, METR 469, AGST 469, NRES 469, AGRO 869, GEOG 869, HORT 807, METR 869, AGST 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
Grading Option: Graded with Option

PLAS 408 Microclimate: The Biological Environment
Crosslisted with: GEOG 408, METR 408, NRES 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.
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
Grading Option: Graded with Option
Prerequisite for: BSEN 954, NRES 954

PLAS 409A Case studies in plant breeding: Breeding for Disease Resistance
Crosslisted with: AGRO 809A, HORT 809A
Notes: A previous class in genetics is highly recommended.
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
Grading Option: Graded with Option
Offered: FALL/SPR

PLAS 409B Case Studies in plant breeding: Transgenic strategies for disease resistance
Crosslisted with: AGRO 809B, 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
Grading Option: Graded with Option
Offered: FALL/SPR

PLAS 410 Plant Molecular Biology
Crosslisted with: AGRO 810, BIOC 810, HORT 810, BIOC 410
Prerequisites: BIOS 201 or PLAS 215
Notes: LIFE 120 and BIOC 401 are suggested
Description: This course covers the molecular genetic basis of biological function in plants. Emphasis is on genetics (genome organization, gene structure and function, regulation of gene expression and genetic engineering) and molecular biology of the plant cell (cell compartments, cell reproduction, energy flow, reproductive development). The course uses published research articles in plant biology as primary learning resources.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Offered: SPRING

PLAS 411 Crop Genetic Engineering
Crosslisted with: AGRO 811
Notes: A previous class in genetics is highly recommended.
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, and 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
Grading Option: Graded with Option
Offered: FALL

PLAS 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
Grading Option: Graded with Option
Offered: SPRING

PLAS 414 Turfgrass Disease Management
Crosslisted with: AGRO 814, 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
Grading Option: Graded with Option

PLAS 415 Applied Plant Breeding and Genetics
Crosslisted with: AGRO 815
Prerequisites: PLAS 215 or BIOS 201
Notes: For AGRO 815, a previous genetics course is highly recommended.
Description: The goals for plant improvement, the theories plant breeders apply to make genetic improvement and the tools and methods that can be used to develop a plant breeding pipeline.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Offered: SPRING
Course and Laboratory Fee: $40

PLAS 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
Grading Option: Graded with Option

PLAS 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
Prerequisites: Junior standing
Description: Introduction to the basic methods and practical applications of remote sensing to map, monitor and assess agricultural and natural resources and other environmental changes
Credit Hours: 4
Max credits per semester: 4
Max credits per degree: 4
Grading Option: Graded with Option
Course and Laboratory Fee: $35

PLAS 420 Bioinformatics Applications in Agriculture
Crosslisted with: AGRO 820
Prerequisites: PLAS 215 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. 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
Grading Option: Graded with Option
Offered: FALL

PLAS 425 Cover Crops in Agroecosystems
Crosslisted with: AGRO 825
Prerequisites: PLAS 131 or PLAS 278 ; PLAS/SOIL 153 (or equivalent)
Description: Explore the management, environmental, economic, and social considerations of cover crops across a diversity of agricultural production systems and regions. Grow cover crops, measure benefits and tradeoffs, and apply knowledge to make management and policy recommendations.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded
Offered: FALL

PLAS 426 Invasive Plants
Crosslisted with: AGRO 826, HORT 826, NRES 426, NRES 826
Prerequisites: PLAS/SOIL 153; PLAS 131
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
Grading Option: Graded with Option
Offered: SPRING

PLAS 427 Turfgrass Systems Management
Crosslisted with: AGRO 827, HORT 827, TLMT 827
Prerequisites: PLAS 227 and PLAS 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
Grading Option: Graded with Option
ACE: ACE 10 Integrated Product
Course and Laboratory Fee: $50

PLAS 429 Plant Biotechnology Applications
Crosslisted with: AGRO 829
Prerequisites: Faculty Permission
Description: Application of plant biotechnology to answer biological questions. Development of writing and thinking skills with a working knowledge of plant biology and biotechnology. Learning in a lab focused setting to solidify skills used in molecular biology, biochemistry, cell biology, and computational biology.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded
Offered: SPRING
Course and Laboratory Fee: $40

PLAS 429A Food Security: A Global Perspective
Crosslisted with: AGRO 829A, HORT 829A, NRES 429A, NRES 829A, NUTR 429A, NUTR 829A
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
Grading Option: Graded with Option

PLAS 430 Introduction to Plant Diagnostics
Crosslisted with: AGRO 830, HORT 830, PLPT 830
Prerequisites: PLAS 131 or LIFE 121 and ENTO 105 or ENTO 115 and PLPT 210
Description: Presents a broad view of the various challenges to plant health including abiotic and biotic disease, insects, and weeds. Learn a systematic approach to the diagnosis of plant disorders through hands-on exercises and case studies with application to agronomic and specialty crops and gain experience in presenting their findings to various audiences.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option

PLAS 431 Site-specific Crop Management
Crosslisted with: AGEN 431, AGST 431
Prerequisites: Senior standing; PLAS/SOIL 153; PLAS 204.
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
Grading Option: Graded with Option

PLAS 433 Permaculture: Sustainable Living
Crosslisted with: HORT 833
Notes: This is a Great Plains IDEA course. Restricted to upper level undergraduate, graduate, or matriculated continuing education students.
Description: Permaculture means "permanent culture," and ..."is the conscious design and maintenance of cultivated ecosystems that have the diversity, stability, and resilience of a natural ecosystem." [Bill Mollison] This course will explore a design/thinking methodology that seeks to provide our essential physical needs, food, water, shelter, energy, etc., while doing so in an environmentally friendly, sustainable manner.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option

PLAS 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
Grading Option: Graded with Option

PLAS 435 Agroecology
Crosslisted with: AGRO 835, NRES 435, NRES 835
Prerequisites: For PLAS/NRES 435: Senior standing. For AGRO/NRES 835: 12 hrs biological or agricultural sciences.
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
Grading Option: Graded with Option
ACE: ACE 10 Integrated Product

PLAS 436 Agroecosystems Analysis
Crosslisted with: 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
Grading Option: Graded with Option

PLAS 437 Animal, Food and Industrial Uses of Grain
Crosslisted with: AGRO 837
Prerequisites: CHEM 105A and CHEM 105L or CHEM 109A and 109L, and one of the following: PLAS 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
Grading Option: Graded with Option

PLAS 438 Producing Grain for Animal, Food and Industrial Uses
Crosslisted with: AGRO 838
Prerequisites: CHEM 109A and 109L and one of the following: PLAS 204 or ASCI 250.
Notes: PLAS 215 and PLAS 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
Grading Option: Graded with Option

PLAS 439 Organic Farming and Food Systems
Crosslisted with: AGRO 839, 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
Grading Option: Graded with Option

PLAS 440 Great Plains Ecosystem
Crosslisted with: AGRO 840, NRES 840, RNGE 440, NRES 440, GRAS 440
Prerequisites: Junior standing.
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
Grading Option: Graded with Option
Offered: SPRING

PLAS 441 Perennial Plant Function, Growth, and Development
Crosslisted with: AGRO 841, HORT 841, RNGE 441, GRAS 441
Prerequisites: PLAS 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
Grading Option: Graded with Option
Offered: SPRING

PLAS 442 Wildland Plants
Crosslisted with: AGRO 842, NRES 842, RNGE 442, NRES 442, GRAS 442
Prerequisites: Junior standing.
Notes: PLAS 131 or LIFE 121 and 121L 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, forbs, shrubs, exotic and wetland plants.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Offered: FALL

PLAS 444 Ecosystem Monitoring and Assessment
Crosslisted with: AGRO 844, NRES 844, RNGE 444, NRES 444, GRAS 444
Prerequisites: Junior standing.
Notes: 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
Grading Option: Graded with Option
Offered: FALL

PLAS 445 Livestock Management on Range and Pasture
Crosslisted with: AGRO 845, ASCI 451, ASCI 851, RNGE 445, GRAS 445
Prerequisites: ASCI 250 and PLAS 240 or PLAS 340
Notes: AECN 201 recommended. 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
Grading Option: Graded with Option
Offered: FALL
ACE: ACE 10 Integrated Product
Course and Laboratory Fee: $300

PLAS 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.
Notes: Offered spring semester of even-numbered calendar years.
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
Grading Option: Graded with Option
Offered: SPRING

PLAS 452 Irrigation Systems Management
Crosslisted with: AGST 452, AGST 852
Prerequisites: AGST 109 or PHYS 141 or PHYS 151 or PHYS 211
Notes: PLAS/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
Grading Option: Graded with Option
Offered: FALL
Prerequisite for: AGEN 854, AGST 854; AGST 855

PLAS 453 Urban Soil Properties and Management
Crosslisted with: LARC 453, SOIL 453
Prerequisites: PLAS/SOIL 153
Description: Characteristics of soils in urban settings. Evaluation of soils intended for intensive human uses and strategies for their use. Identification of specific issues related to urban soils. Manipulation or remediation of soils subject to construction and other stresses.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Offered: SPRING

PLAS 454 Specialty Crop Innovations
Crosslisted with: AGRO 854, HORT 854
Prerequisites: Junior standing; PLAS 100, 131, 153
Description: Learn state-of-the-art, scale-appropriate methods for growing and marketing specialty crops like fruits, vegetables, and cut flowers in field and high-tunnel production systems. Test innovative products and systems of your own design to gain a competitive advantage in local markets.
Credit Hours: 4
Max credits per semester: 4
Max credits per degree: 4
Grading Option: Graded
Offered: SPRING

PLAS 455 Soil Chemistry and Mineralogy
Crosslisted with: AGRO 855, NRES 455, NRES 855, SOIL 455
Prerequisites: PLAS/SOIL 153 or GEOL 101; CHEM 109A/L and CHEM 110A/L; CHEM 221 or CHEM 221A & CHEM 221L or 251.
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. Forms and functions of organic matter in soil.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Offered: SPRING

PLAS 457 Green Space and Urban Forestry Management
Crosslisted with: NRES 457, NRES 857
Prerequisites: Junior or senior standing, Graduate student or permission
Description: A focus on the management of trees, parks, and green infrastructure in rural and urban communities. Perspectives from community planning, landscape architecture, urban forestry, natural resources, horticulture, and environmental policy. Development and implementation of green space and forest management plans encompassing societal needs and biological limitations in rural and urban communities.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Offered: SPRING
ACE: ACE 10 Integrated Product

PLAS 458 Soil Physical Determinations
Crosslisted with: AGRO 858, NRES 458, NRES 858, SOIL 458
Prerequisites: SOIL/PLAS/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
Grading Option: Graded with Option

PLAS 460 Soil Microbial Ecology
Crosslisted with: BIOS 460, NRES 460, SOIL 460, AGRO 860, BIOS 860, NRES 860
Prerequisites: Senior standing.
Notes: Recommend having a strong science background, including courses from the agronomic, environmental, microbiology, engineering or medicine disciplines.
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
Grading Option: Graded with Option
Offered: SPRING

PLAS 461 Soil Physics
Crosslisted with: NRES 461, SOIL 461, AGRO 861, NRES 861
Prerequisites: PLAS/SOIL 153; PHYS 141 or equivalent, one semester of calculus.
Description: Principles of soil physics. Movement of water, air, heat, and solutes in soils. Water retention and movement, including infiltration and field water regime. Movement of chemicals in soils.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option

PLAS 462 Cannabis Growth, Production and Breeding Basics
Crosslisted with: AGRO 862, HORT 862
Prerequisites: PLAS 131 or LIFE 121; PLAS 215 or BIOS 201
Notes: PLAS 221 recommended
Description: History, breeding and production of cannabis for medicinal marijuana and hemp for fiber use when grown using a growth room, greenhouse, high tunnel and/or field. Clarification between scientific evidence and casual information.
Credit Hours: 2
Max credits per semester: 2
Max credits per degree: 2
Grading Option: Graded
Offered: FALL/SPR

PLAS 467 Planting Design
Crosslisted with: ARCH 467, ARCH 567, ARCH 867, LARC 467
Description: Processes, principles, and elements using plant materials as a key component of landscapes designed for human intent. Focus is on a systems approach, combining environmental attributes with functional needs to create aesthetic, functional, and sustainable landscapes for parks, commercial property, and residences using a combination of site visits and online resources.
Credit Hours: 4
Max credits per semester: 4
Max credits per degree: 4
Grading Option: Graded with Option
Offered: FALL
Course and Laboratory Fee: $25

PLAS 469 Ecological Landscape Design
Crosslisted with: ARCH 469
Prerequisites: Permission
Description: Integration of ecological and environmental assessment, design process and management considerations to create detailed landscape plans for public, private, and commercial clients. Includes dream landscape project. Individuals and collaborative teams will develop concepts and details, conduct client meetings and studio critiques, and communicate graphically and verbally through presentations.
Credit Hours: 4
Max credits per semester: 4
Max credits per degree: 4
Grading Option: Graded with Option
Offered: SPRING
ACE: ACE 10 Integrated Product
Course and Laboratory Fee: $25

PLAS 470 Critical Thinking in Landscape Management
Prerequisites: PLAS 228
Description: Use processes and strategies to develop complete landscape management plans for public and/or private clients. Use data to evaluate and compare issues; make practical, science-based recommendations; and prepare cost estimates. Develop and present a complete landscape management plan for a public client.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Offered: SPRING
ACE: ACE 10 Integrated Product
Course and Laboratory Fee: $25

PLAS 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
Grading Option: Graded with Option
Course and Laboratory Fee: $95

PLAS 472 Applied Soil Physics
Crosslisted with: AGRO 872, NRES 472, NRES 872, SOIL 472
Prerequisites: PLAS/SOIL 153; MATH 102 or MATH 104 or MATH 106.
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
Grading Option: Graded with Option
Offered: FALL

PLAS 475 Water Quality Strategy
Crosslisted with: NRES 475, NRES 875, SOIL 475, AGRO 875, CIVE 475, CIVE 875, CRPL 475, CRPL 875, GEOL 475, GEOL 875, AGST 475, AGST 875
Prerequisites: Senior undergraduate or graduate student status.
Notes: Capstone course.
Description: Introduces methods to identify, analyze, strategize, justify and develop planning approaches to protect water quality from nonpoint source contamination. Focuses on identifying present water quality issues and situations, investigating adverse impacts on whole systems and subsystems over time, developing effective planning strategies, and assessing strategy effectiveness.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Offered: SPRING
ACE: ACE 10 Integrated Product

PLAS 477 Great Plains Field Pedology
Crosslisted with: GEOG 467, NRES 477, SOIL 477, GEOG 867, NRES 877
Prerequisites: PLAS/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
Grading Option: Graded with Option
Course and Laboratory Fee: $80

PLAS 478 Plant Anatomy
Crosslisted with: BIOS 478, BIOS 878, AGRO 878, HORT 878
Prerequisites: 8 hrs biological sciences
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
Grading Option: Graded with Option

PLAS 480 Modified Root Zones
Crosslisted with: TLMT 880, AGRO 880, HORT 880
Prerequisites: PLAS 153/SOIL 153
Notes: Recommend CHEM 105A/CHEM 105L or CHEM 109A/CHEM 109L, PLAS 131, PLAS 227, and PLAS 453 or PLAS 472
Description: Modified root zones and their applications in the turfgrass and landscape management industry. Correct applications and construction techniques.
Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1
Grading Option: Graded with Option
Offered: SPRING

PLAS 484 Water Resources Seminar
Crosslisted with: GEOG 484, GEOL 484, NRES 484, NRES 884, AGRO 884, GEOG 884, GEOL 884
Prerequisites: Junior or above standing
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
Grading Option: Graded with Option

PLAS 488 Entrepreneurship and Enterprise Development
Crosslisted with: HORT 888, EAEP 488, ENTR 488, EAEP 888, AGRO 888, ENTR 888, ABUS 488
Description: The process of starting your own enterprise. Competitive environment, risk management, finance for business startups, funding, and business plan writing.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Offered: FALL/SPR
ACE: ACE 10 Integrated Product

PLAS 489 Urbanization of Rural Landscapes
Crosslisted with: AGRO 889, CRPL 489, HORT 889, CRPL 889
Prerequisites: Senior standing or graduate standing.
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
Grading Option: Graded with Option

PLAS 495 Grasslands Seminar
Crosslisted with: 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
Grading Option: Graded with Option

PLAS 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
Grading Option: Graded with Option
Course and Laboratory Fee: $50

PLAS 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
Grading Option: Graded with Option

PLAS 499H Honors Thesis
Crosslisted with: RNGE 499H, SOIL 499H
Prerequisites: Admission to the University Honors Program and permission.
Notes: 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
Grading Option: Graded