INSECT SCIENCE

Description

Website: https://entomology.unl.edu/insect_science (https://entomology.unl.edu/insect_science/)

The field of insect science encompasses the agricultural, biological, and environmental sciences related to insects and their interactions with humans. Insects and their relatives are the most abundant animals on earth and are commonly found in all habitats. Insects are essential to maintaining healthy ecosystems. Management of both beneficial and pest insects is essential to global food security

Insect Science is designed to prepare students for careers utilizing the understanding of insects (and other arthropods) and their interactions with environmental and human systems (e.g., environmental quality, conservation biology, forensic investigation, and discovery research). The degree also provides appropriate preparation for entry into professional programs such as veterinary, medical, and research-based graduate degree programs.
Students with insect science degrees pursue careers in environmental science, conservation, agriculture, public health, horticulture, food processing, pest control, public education, and employment in state and federal government agencies.

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, excluding foreign languages. Students have up to 60 credit hours to remove world language deficiencies. 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 ensures 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 his/her 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.

Dordt College (Iowa)–Agricultural Education: Teaching Option. This program allows students to pursue an Agricultural Education Teaching Option degree leading toward a bachelor of science in agricultural

education. Students at Dordt College will complete 90 credit hours in the Agricultural Education: Teaching Option Transfer Program.

Residency

Students must complete at least 30 of the total hours for their degree using 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, HRTM, ENSC) and CASNR crosslisted courses taught by non-CASNR faculty.*

Online and Distance Education

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

For further information, contact:

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

Independent Study Rules

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

Independent study projects include research, literature review or extension of 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 insect science will be able to:

1. Achieve a broad understanding of insect biology, physiology, classification, ecology and behavior, and insect pest management.
2. Apply both science process and content knowledge and use evidence to address applied and theoretical problems as an individual and in a group.
3. Demonstrate complex entomological ideas to colleagues, students, and lay audiences through written communication and oral presentations.
4. Identify opportunities to increase the impact of beneficial insects and reduce the impact of pests and invasive arthropods in ecosystems.
5. Anticipate challenges that climate change will have on insect populations and potential impacts on food, feed, and human health.
6. Design and conduct entomological research from the first step of question formulation to the final step of dissemination of findings to the scientific community.

Major Requirements

Core Requirements

The curriculum includes coursework in biology, biochemistry, chemistry, genetics, mathematics, statistics, and physics. The core curriculum also focuses on insect biology, identification and classification, structure and function, ecology, and management. Students complete credit-bearing mentorships in entomology research, teaching, extension and

internships. Studies culminate with the completion of an undergraduate thesis. Students select from additional entomology courses beyond the core curriculum to further explore insect science. Additional free electives can be leveraged to obtain a career-relevant minor. A faculty advisor will help students navigate these options and decisions.

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.

College Integrative Course		
SCIL 101	Science and Decision-Making for a Complex World (ACE 8)	3
ENTO 485	Current Issues in Entomology (ACE 10)	3
Credit Hours Subtotal:		6
Communication		
Written Communication (ACE 1)		
Select one of the following:		3
ENGL 150	Writing and Inquiry	
ENGL 151	Writing and Argument	
ENGL 254	Writing and Communities	
JGEN 120	Basic Business Communication	
JGEN 200	Technical Communication I	
Communications and Interpersonal Skills (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	
NRES 301	Environmental Communication Skills	
TMFD 121	Visual Communication with Animation	
Credit Hours Subtotal:		6
Mathematics and Statistics (beyond college algebra) (ACE 3)		
STAT 218	Introduction to Statistics	3
Select one of the following:		3-5
MATH 102	Trigonometry	
MATH 103	College Algebra and Trigonometry	
MATH 104	Applied Calculus	
MATH 106	Calculus I	
Credit Hours Subtotal:		6
Natural Sciences		
CASNR Approved Life Sciences (ACE 4)		
CHEM 109A & CHEM 109L	General Chemistry I and General Chemistry I Laboratory	4
LIFE 120 & LIFE 120L	Fundamentals of Biology I and Fundamentals of Biology I laboratory	4
Credit Hours Subtotal:		8
CASNR Approved Physics (ACE 4)		
Select one of the following:		4-5
AGST 109	Physical Principles in Agriculture and Life Sciences	
PHYS 141	Elementary General Physics I	
PHYS 151	Elements of Physics	
PHYS 211	General Physics I	
Credit Hours Subtotal:		4
Economics, Humanities and Social Sciences (ACE 6)		
Select one of the following:		3
AECN 141	Introduction to the Economics of Agriculture (ACE 6)	
ECON 200	Economic Essentials and Issues	
ECON 211	Principles of Macroeconomics	
ECON 212	Principles of Microeconomics	
Credit Hours Subtotal:		3
ACE		
Select one course each from ACE outcomes 5, 7, and 9		9
Credit Hours Subtotal:		9
Departmental Requirements		
Entomology Courses		
ENTO 115 / BIOS 115	Insect Biology	3
ENTO 116 / BIOS 116	Insect Identification	1
ENTO 315	Undergraduate Research Seminar	3
ENTO 400	Biology and Classification of Insects	4
ENTO 401	Insect Physiology	3
ENTO 406	Insect Ecology	3
ENTO 412	Entomology and Pest Management	3
Entomology Electives		
Select 9 hours of additional ENTO courses at any level		9
Credit Hours Subtotal:		29
Experiential Learning for Career Development in Insect Science		
Select 5 hours from the following four categories: [1]		5
ENTO 309	Career Experience	
ENTO 395A	Experiential Learning for Career Development in Insect Science Research Experience	
ENTO 395B	Experiential Learning for Career Development in Insect Science Teaching Experience	
ENTO 395C	Experiential Learning for Career Development in Insect Science Extension Experience	
Credit Hours Subtotal:		5
Supporting Science Courses		
CHEM 110A & CHEM 110L	General Chemistry II and General Chemistry II Laboratory	4
CHEM 251	Organic Chemistry I	3
LIFE 121 & LIFE 121L	Fundamentals of Biology II and Fundamentals of Biology II Laboratory	4
BIOS 206	General Genetics	4
or PLAS 215	Genetics	

BIOC 401 & BIOC 401L	Elements of Biochemistry and Laboratory for Elements of Biochemistry	4
BIOS 207	Ecology and Evolution	4
Credit Hours Subtotal:		23
Free Electives		
Select 20-21 hours		20-21
Credit Hours Subtotal:		21
Total Credit Hours		**120**

[1] *Maximum of 3 hours from any one category.*

Requirements for Minor Offered by Department

Insect Science Minor

A minor in insect science will consist of at least 18 credit hours of entomology, including at least 6 hours at the 300 level or above. BIOS 381 Invertebrate Zoology, and up to 3 hours of ENTO 496 Independent Study in Entomology, may be counted towards the minor requirements. The course of study leading to a minor in insect science must be developed in consultation with, and be approved by, an advisor in the Department of Entomology. Advisors for the minor are assigned by the Head of the Department of Entomology.

ENTO 105 Natural History of Arthropods Associated with Plants
Description: Classification and biology of plant-feeding insects; how insects damage plants; principles of insect ecology and integrated pest management.
Credit Hours: 2
Max credits per semester: 2
Max credits per degree: 2
Grading Option: Graded
Offered: FALL

ENTO 109 Beekeeping
Description: Life history and habits of the honey bee; methods of management; honey and wax production; apiary equipment; pollination; identity and control of bee diseases.
Credit Hours: 2
Max credits per semester: 2
Max credits per degree: 2
Grading Option: Graded with Option

ENTO 115 Insect Biology
Crosslisted with: BIOS 115
Description: Fundamental insect biology (anatomy, development, physiology, behavior, ecology and diversity). Economic and medical importance of insects and principles of insect pest management.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Prerequisite for: ENTO 200; ENTO 400; PLPT 210
ACE: ACE 4 Science
Course and Laboratory Fee: $10

ENTO 116 Insect Identification
Crosslisted with: BIOS 116
Description: Identification of representative orders and families of insects by their anatomy, metamorphosis, habits and habitats. Sight recognition emphasized but dichotomous keys also used. Interrelation of insect and habitats stressed.
Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1
Grading Option: Graded with Option
Course and Laboratory Fee: $15

ENTO 200 Behavior of Arthropods
Prerequisites: ENTO 115 or equivalent introductory course
Description: An in-depth look at how arthropods find and defend their resources, how they avoid predators, how they find mates, how they mate, and how some exist in highly ordered social settings.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option

ENTO 222 Insects and Society
Description: Covers the intersection of insects and humans with topics ranging from food, disease, environmental and cultural interfaces, and engineering design. Investigative activities explore human attitudes towards insects, knowledge, and conservation behaviors towards insects.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded
Offered: SPRING

ENTO 300 Toxins in the Environment
Crosslisted with: BIOS 300, NRES 300
Prerequisites: One semester BIOS and one semester CHEM
Description: Introduction to the principles of toxicology as they apply to environmental contaminants, agri-chemicals, and industrial and naturally occurring chemicals.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option

ENTO 308 Management of Field Crop Insects
Prerequisites: BIOS 101 and BIOS 101L or LIFE 120 and LIFE 120L or PLAS 131 and PLAS 132/PLAS 134
Notes: ENTO 115 recommended
Description: Focuses on the concepts and principles of management of beneficial and pest insects that are associated with field crops.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Offered: SPRING

ENTO 309 Career Experience
Prerequisites: Junior standing; introductory courses in entomology; and permission prior to enrolling
Notes: Course must be concluded with preparation of a written report. P/N only.
Description: Career experience in applied practices is provided via employment with an entomology-related agency, business or industry, research, extension, or teaching activity.
Credit Hours: 1-3
Min credits per semester: 1
Max credits per semester: 3
Max credits per degree: 4
Grading Option: Pass No Pass
Experiential Learning: Internship/Co-op

ENTO 315 Undergraduate Research Seminar
Description: Provides an understanding of qualitative, quantitative, and mixed methods approaches for research studies. Focuses on knowing the definition for different research approaches, considering philosophical world views, reviewing the literature, understanding the use of theory, anticipating ethical issues, and developing writing strategies.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded
Offered: SPRING

ENTO 395 Experiential Learning for Career Development in Insect Science
Prerequisites: Sophomore standing.
Notes: A faculty adviser for the area of interest must be identified prior to registering for the course.
Description: Application and integration of the Insect Science curriculum within the context of extension and service, research, or teaching experience.
Credit Hours: 1-5
Min credits per semester: 1
Max credits per semester: 5
Max credits per degree: 5
Grading Option: Graded with Option

ENTO 395A Experiential Learning for Career Development in Insect Science Research Experience
Prerequisites: Sophomore standing.
Notes: A faculty adviser for the area of interest must be identified prior to registering for the course.
Description: Application and integration of the Insect Science curriculum within the context of extension and service, research, or teaching experience.
Credit Hours: 1-5
Min credits per semester: 1
Max credits per semester: 5
Max credits per degree: 5
Grading Option: Graded with Option
Experiential Learning: Research

ENTO 395B Experiential Learning for Career Development in Insect Science Teaching Experience
Prerequisites: Sophomore standing.
Notes: A faculty adviser for the area of interest must be identified prior to registering for the course.
Description: Application and integration of the Insect Science curriculum within the context of extension and service, research, or teaching experience.
Credit Hours: 1-5
Min credits per semester: 1
Max credits per semester: 5
Max credits per degree: 5
Grading Option: Graded with Option
Experiential Learning: Student Teaching/Education Practicum

ENTO 395C Experiential Learning for Career Development in Insect Science Extension Experience
Prerequisites: Sophomore standing.
Notes: A faculty adviser for the area of interest must be identified prior to registering for the course.
Description: Application and integration of the Insect Science curriculum within the context of extension and service, research, or teaching experience.
Credit Hours: 1-5
Min credits per semester: 1
Max credits per semester: 5
Max credits per degree: 5
Grading Option: Graded with Option
Experiential Learning: Creative Activity

ENTO 400 Biology and Classification of Insects
Prerequisites: ENTO 115 or equivalent introductory course.
Description: Survey of orders and common families of insects with emphasis on biology, ecology, and phylogeny. Sight recognition of major orders and families, identification of other families with keys. Insect collection required.
Credit Hours: 4
Max credits per semester: 4
Max credits per degree: 4
Grading Option: Graded with Option
Course and Laboratory Fee: $20

ENTO 401 Insect Physiology
Crosslisted with: ENTO 801
Prerequisites: CHEM 251 or CHEM 255;12 hrs entomology or biological sciences (zoology)
Description: Functions and other phenomena associated with the major organ systems of insects; the cuticle, nervous, circulatory, digestive, metabolism, nutrition, locomotion, reproduction, respiration, and growth and development.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option

ENTO 402 Aquatic Insects
Crosslisted with: BIOS 485, BIOS 885, ENTO 802, NRES 402, NRES 802
Prerequisites: 12 hrs biological sciences
Description: Biology and ecology of aquatic insects.
Credit Hours: 2
Max credits per semester: 2
Max credits per degree: 2
Grading Option: Graded with Option
Prerequisite for: BIOS 485L, BIOS 885L, ENTO 402L, ENTO 802L, NRES 402L, NRES 802L

ENTO 402L Identification of Aquatic Insects
Crosslisted with: BIOS 485L, BIOS 885L, ENTO 802L, NRES 402L, NRES 802L
Prerequisites: Parallel ENTO 802, NRES 402/802, BIOS 485/885.
Description: Identification of aquatic insects to the family level.
Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1
Grading Option: Graded with Option
Course and Laboratory Fee: $25

ENTO 403 Management of Horticultural Crop Insects
Crosslisted with: ENTO 803
Prerequisites: Introductory biology course.
Description: The biology, ecology and management of insect pests of horticultural crops such as vegetables, fruit trees, trees and shrubs, greenhouse crops, turf and ornamentals. Employing Integrated Pest Management (IPM) strategies to maintain pests below damaging levels while minimizing the use of traditional insecticides.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option

ENTO 406 Insect Ecology
Crosslisted with: BIOS 406, BIOS 806, ENTO 806
Prerequisites: BIOS/NRES 220 and 222.
Description: Biotic and abiotic factors as they influence insect development, behavior, distribution, and abundance.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option

ENTO 409 Insect Control by Host-Plant Resistance
Crosslisted with: ENTO 809
Prerequisites: 12 hrs agricultural sciences and/or biological sciences including one course in entomology and one course in genetics.
Description: Explore resistance of crops to herbivorous arthropods. Iinvestigate how insect behavior and physiology are affected by resistance, critically review current research on plant resistance genes, and the molecular, biochemical and physiological aspects of insect/microbe interactions with host plants.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option

ENTO 412 Entomology and Pest Management
Crosslisted with: ENTO 812
Prerequisites: Introductory course in ENTO.
Description: Principles and practices of managing insects pests. Pest management theory, use of sampling, evaluation, tactics, types of insect pests, and current issues.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Course and Laboratory Fee: $50

ENTO 414 Forensic Entomology
Crosslisted with: ENTO 814, FORS 414, FORS 814
Prerequisites: ENTO 115 or equivalent introductory course.
Description: Application of entomology to legal issues. Criminal investigations, insects of forensic importance, insect succession on carrion, and case studies.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option

ENTO 415 Medical Entomology
Crosslisted with: ENTO 815
Prerequisites: Introductory course in ENTO.
Description: Direct and indirect importance of insects in human medicine. Principles of arthropod-borne disease, medically important arthropod groups, and arthropod-transmitted diseases.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
Course and Laboratory Fee: $50

ENTO 416 Forensic Insect Succession
Crosslisted with: ENTO 816
Description: Forensic insect succession and specific forensically important insects including their life cycle, biology, and association with decomposition. Case studies about how forensic entomology has been used in solving crimes will also be covered.
Credit Hours: 1
Max credits per semester: 1
Max credits per degree: 1
Grading Option: Graded
Offered: SPRING

ENTO 485 Current Issues in Entomology
Prerequisites: Senior standing; completion of ENTO core requirements.
Notes: Capstone course. Fulfills the capstone requirement for the insect science major.
Description: The application and integration of biological principles of the insect science program.
Credit Hours: 3
Max credits per semester: 3
Max credits per degree: 3
Grading Option: Graded with Option
ACE: ACE 10 Integrated Product

ENTO 495 Grasslands Seminar
Crosslisted with: PLAS 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

ENTO 496 Independent Study in Entomology
Crosslisted with: ENTO 896
Prerequisites: 12 hrs biological sciences and/or agricultural sciences.
Notes: Independent study contracts must be filed with the department.
Description: Individual or group projects in research, literature review, or extension of course work.
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

ENTO 499H Honors Thesis
Prerequisites: Admission to the University Honors Program and permission, AGRI 299H recommended.
Description: Conduct a scholarly research project and write a University Honors Program 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

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

Career Information

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

Jobs of Recent Graduates

- Insect Zoo Coordinator, Iowa State University - Ames, IA
- Medical Officer, United States Navy - Jacksonville, FL

Internships

- Discovery Group Intern, Pioneer - York, NE
- Plant Breeding Intern, Dow Chemical - York, NE

Graduate & Professional Schools

- Entomology, University of Arkansas - Fayetteville, AR
- Plant Pathology/Entomology, Auburn University - Auburn, AL
- Entomology, Washington State University - Pullman, WA
- Master's in Science, University of Georgia - Athens, GA
- Master's in Entomology, University of Nebraska-Lincoln - Lincoln, NE
- Ph.D., University of Nebraska-Lincoln - Lincoln, NE
- Horticulture, University of Nebraska Lincoln - Lincoln, NE