

# ENTOMOLOGY (ENTO)

## ENTO 800 Insect Biodiversity

**Prerequisites:** 12 hrs. of biological sciences, graduate standing and ENTO 116 or equivalent for entomology majors

**Description:** Classification, taxonomy, and biology of adult insects. Identification of orders and families of insects using keys. Collection required using techniques for collecting, preparing, and curating. One oral/written term paper required.

**Credit Hours:** 4

**Max credits per semester:** 4

**Max credits per degree:** 4

**Grading Option:** Grade Pass/No Pass Option

**Course and Laboratory Fee:** \$20

## ENTO 801 Insect Physiology

**Crosslisted with:** ENTO 401

**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:** Grade Pass/No Pass Option

## ENTO 801L Insect Physiology Lab

**Prerequisites:** CHEM 251 or CHEM 255; 12 hrs. entomology or biological sciences (zoology)

**Notes:** Must also register for required lecture ENTO 801.

**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:** 1

**Max credits per semester:** 1

**Max credits per degree:** 1

**Grading Option:** Grade Pass/No Pass Option

**Course and Laboratory Fee:** \$50

## ENTO 802 Aquatic Insects

**Crosslisted with:** BIOS 485, BIOS 885, ENTO 402, 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:** Grade Pass/No Pass Option

**Prerequisite for:** BIOS 485L, BIOS 885L, ENTO 402L, ENTO 802L, NRES 402L, NRES 802L

## ENTO 802L Identification of Aquatic Insects

**Crosslisted with:** BIOS 485L, BIOS 885L, ENTO 402L, 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:** Grade Pass/No Pass Option

**Course and Laboratory Fee:** \$25

## ENTO 803 Management of Horticultural Crop Insects

**Crosslisted with:** ENTO 403

**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:** Grade Pass/No Pass Option

## ENTO 805 Introduction to Entomology

**Description:** Introduction to insects (diversity, identification, morphology and physiology, ecology and behavior, and pest management). Beneficial, economic, and medical importance of insects.

**Credit Hours:** 1

**Max credits per semester:** 1

**Max credits per degree:** 1

**Grading Option:** Graded

**Offered:** FALL/SPR

**Prerequisite for:** ENTO 412, ENTO 812; ENTO 800

## ENTO 806 Insect Ecology

**Crosslisted with:** BIOS 406, BIOS 806, ENTO 406

**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:** Grade Pass/No Pass Option

## ENTO 809 Insect Control by Host-Plant Resistance

**Crosslisted with:** ENTO 409

**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. Investigate 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:** Grade Pass/No Pass Option

## ENTO 810 Insects as Educational Tools for the Classroom

**Prerequisites:** Introductory entomology course

**Description:** Overview of insects. Insect diversity, insect structure and function, insect ecology and behavior, and the beneficial and detrimental roles insects play. Integrating the study of insects into the classroom to enhance science education.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Grade Pass/No Pass Option

### **ENTO 812 Entomology and Pest Management**

**Crosslisted with:** ENTO 412

**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:** Grade Pass/No Pass Option

**Course and Laboratory Fee:** \$50

### **ENTO 813 Biological Control of Pests**

**Crosslisted with:** PLPT 813

**Prerequisites:** 12 hrs biological sciences and/or agricultural sciences

**Description:** Principles and practices of using natural enemies and antagonists to manage the abundance of pests and reduce economic losses.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Grade Pass/No Pass Option

### **ENTO 814 Forensic Entomology**

**Crosslisted with:** ENTO 414, 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:** Grade Pass/No Pass Option

### **ENTO 815 Medical Entomology**

**Crosslisted with:** ENTO 415

**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:** Grade Pass/No Pass Option

**Course and Laboratory Fee:** \$50

### **ENTO 815A Self-pollinated Crop Breeding**

**Crosslisted with:** AGRO 815A

**Prerequisites:** AGRO 215

**Description:** Self-pollinated plant breeding theory and methods. Pedigree, bulk, single seed descent, back-crossing methods and inbreeding theory.

**Credit Hours:** 1

**Max credits per semester:** 1

**Max credits per degree:** 1

**Grading Option:** Grade Pass/No Pass Option

**Prerequisite for:** AGRO 816B; AGRO 816E

**Course and Laboratory Fee:** \$40

### **ENTO 815B Germplasm and Genes**

**Crosslisted with:** AGRO 815B

**Prerequisites:** AGRO 215

**Description:** Obtaining germplasm and genes from cultivated plants, wild relatives of cultivated plants, and the biosphere. Origination of crops, mutation genetics, biotechnology as a source of genes, chromosomal engineering and plant reproduction.

**Credit Hours:** 1

**Max credits per semester:** 1

**Max credits per degree:** 1

**Grading Option:** Grade Pass/No Pass Option

**Prerequisite for:** AGRO 816B; AGRO 816E

**Course and Laboratory Fee:** \$40

### **ENTO 815D Cross-pollinated Crop Breeding**

**Crosslisted with:** AGRO 815D

**Prerequisites:** AGRO 215

**Description:** Cross-pollinated breeding theory and methods. Genes in populations, recurrent selection methods, creating populations, hybrid production practices, and population improvement theory.

**Credit Hours:** 1

**Max credits per semester:** 1

**Max credits per degree:** 1

**Grading Option:** Grade Pass/No Pass Option

**Prerequisite for:** AGRO 816B; AGRO 816E

**Course and Laboratory Fee:** \$40

### **ENTO 816 Forensic Insect Succession**

**Crosslisted with:** ENTO 416

**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 817 Pest Management Systems**

**Prerequisites:** 10 hrs entomology and crop production courses

**Description:** Different philosophies and theories of insect pest management, theory vs. reality of management, interactions of public and private sectors, development and implementation of pest management programs.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Grade Pass/No Pass Option

### **ENTO 818 Insect Identification and Natural History**

**Prerequisites:** Introductory course in entomology

**Notes:** Credit toward the degree may not be earned in both ENTO 800 and ENTO \*818.

**Description:** Biology and identification of major insect orders, families, classification, and ecology.

**Credit Hours:** 4

**Max credits per semester:** 4

**Max credits per degree:** 4

**Grading Option:** Grade Pass/No Pass Option

**Offered:** SPRING

**Course and Laboratory Fee:** \$20

**ENTO 819 Insect Behavior****Prerequisites:** Introductory course in entomology**Description:** The process of behavioral study involves investigating the relationship between animals and their surroundings, and their response to their kin and to other organisms. Topics include characterizing how insects 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:** Grade Pass/No Pass Option**ENTO 820 Insecticide Toxicology****Prerequisites:** 12 hrs biological sciences; 4 hrs organic chemistry**Description:** Principles of toxicology, insecticide classification, mode of action, metabolism and consequences of insecticide use.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**ENTO 822 Cultural Entomology****Description:** Introduction to how insects and related arthropods have influenced human culture historically and in scientific discovery. Topics include the medical impact of insects on mankind, including widespread disease transmission, use in warfare, and therapeutic medicine. Explores how insects are represented by indigenous peoples and in Western popular culture through artifacts like visual art, literature, and music. Human perception regarding insects is also examined through the many benefits that arthropods provide, including use as food and feed and consumer product goods and services.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** FALL**ENTO 825 Management of Agronomic Crop Insects****Prerequisites:** An introductory entomology course**Description:** Identification, biology, ecology and management of insect pests of agronomic crops such as corn, soybeans, sorghum, wheat, and alfalfa. Integrated Pest Management (IPM) strategies employed 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:** Grade Pass/No Pass Option**ENTO 827 Population and Ecological Genetics****Prerequisites:** Introductory Genetics, Introductory Algebra**Description:** Introduction to key theoretical concepts in population genetics and their application. Mutation, genetic drift, structured populations, natural selection, molecular evolution.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**ENTO 828 Scientific Illustration****Crosslisted with:** AGRI 828, AGRO 828, HORT 828**Prerequisites:** 12 hrs agricultural and/or biological sciences.**Description:** Prepare scientifically accurate, high quality illustrations and graphics for the teaching, presentation, and publication of scientific information. Drawing techniques, drafting, copyright, and publication and presentation of scientific art work.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**Course and Laboratory Fee:** \$10**ENTO 830 Introduction to the Development of Distance Education Courses****Crosslisted with:** ALEC 830**Description:** Introduction to practical aspects of developing and facilitating distance education courses. Create and facilitate interaction, assessments, course delivery, assignments, course etiquette and ADA compliance. Develop a distance course module grounded in distance education theory and instructional design principles.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Grade Pass/No Pass Option**ENTO 835 Chemical Ecology of Insect-Plant Interactions****Prerequisites:** 15 hours of agricultural sciences and/or biological sciences including one course in entomology & one course in biochemistry.**Description:** A focus on insect-plant interactions including direct and indirect plant defenses against herbivory, tritrophic interactions among plant, insect herbivores and herbivore natural enemies, biochemical mechanisms of plant defenses, insect herbivore-produced elicitors of plant defenses, semiochemicals based IPM, chemical ecology of insect vectors of plant diseases, and chemical ecology of insect pollination.**Credit Hours:** 3**Max credits per semester:** 3**Max credits per degree:** 3**Grading Option:** Graded**Offered:** SPRING**ENTO 837 IPM in Sensitive Environments****Description:** Concepts of Integrated Pest Management (IPM) and methods used to control insect pests in sensitive environments such as schools, day cares, hospitals, nursing homes, zoos, and prisons.**Credit Hours:** 1**Max credits per semester:** 1**Max credits per degree:** 1**Grading Option:** Grade Pass/No Pass Option**Offered:** FALL

**ENTO 850 Forensic Insect Morphology**

**Description:** Comparative study of major insect external structures, emphasizing the various modifications that are important in the success of insects. Introduces the morphological (structure and function) features of insects, both in general as well as highlighting some major orders of forensic importance and the characteristics that define and differentiate the families within these orders. Identifying families and species of insects collected at a crime scene can be essential in determining accurate post-mortem interval (PMI).

**Credit Hours:** 1

**Max credits per semester:** 1

**Max credits per degree:** 1

**Grading Option:** Graded

**Offered:** SUMMER

**ENTO 888 MS Degree Project**

**Prerequisites:** Completion of 24 hrs toward the MS degree

**Description:** Application of graduate course work for the non-thesis MS degree program.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Pass No-Pass

**ENTO 896 Independent Study in Entomology**

**Crosslisted with:** ENTO 496

**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:** Grade Pass/No Pass Option

**Course and Laboratory Fee:** \$50

**ENTO 899 Masters Thesis**

**Prerequisites:** Admission to masters degree program and permission of major adviser

**Credit Hours:** 1-10

**Min credits per semester:** 1

**Max credits per semester:** 10

**Max credits per degree:** 99

**Grading Option:** Pass No-Pass

**ENTO 905 Seminar in Entomology**

**Description:** Presentation of topics in entomology or related subjects.

**Credit Hours:** 1

**Max credits per semester:** 1

**Max credits per degree:** 8

**Grading Option:** Grade Pass/No Pass Option

**ENTO 915 Presentation Methods**

**Prerequisites:** Permission

**Description:** This course prepares entomology graduate students to give scientific and public presentations. It includes instruction in preparing posters and on-screen shows, image editing, finding entomological resources in libraries and on the internet, insect photography, and public speaking. Students develop a portfolio of their work, and they make two 12- and one 30-minute presentations to their classmates.

**Credit Hours:** 3

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Grade Pass/No Pass Option

**Course and Laboratory Fee:** \$50

**ENTO 960 Biosystematics and Nomenclature**

**Crosslisted with:** BIOS 960

**Description:** Methods and principles of systematics and nomenclature.

**Credit Hours:** 2-3

**Min credits per semester:** 2

**Max credits per semester:** 3

**Max credits per degree:** 3

**Grading Option:** Grade Pass/No Pass Option

**ENTO 991 Advanced Topics in Entomology**

**Prerequisites:** Permission

**Description:** Advanced study of selected topics not presented in established courses.

**Credit Hours:** 1-5

**Min credits per semester:** 1

**Max credits per semester:** 5

**Max credits per degree:** 5

**Grading Option:** Grade Pass/No Pass Option

**ENTO 996 Research in Entomology**

**Credit Hours:** 1-12

**Min credits per semester:** 1

**Max credits per semester:** 12

**Max credits per degree:** 12

**Grading Option:** Grade Pass/No Pass Option

**ENTO 999 Doctoral Dissertation**

**Prerequisites:** Admission to doctoral degree program and permission of supervisory committee chair

**Description:** Research credits required for a doctoral dissertation for completion of degree.

**Credit Hours:** 1-24

**Min credits per semester:** 1

**Max credits per semester:** 24

**Max credits per degree:** 55

**Grading Option:** Pass No-Pass