Fall 2020 Course Descriptions as of 04/05/2020 08:11 PM

Information in Browse Course Catalog is subject to change. Information is term specific. Please refer to the appropriate term when searching for course content. Key to Course Descriptions may be found at: **http://rcs.registrar.arizona.edu/course_descriptions_key**.

Entomology (ENTO)

ENTO 160D1: Busy Bees and Fancy Fleas: How Insects Shaped Human History (3 units)
Description: For as long as humans have been on earth, we have coexisted with insects on their planet. There are 1.4 billion insects for every human - bugs have built and destroyed human empires, aided our advances, and propelled our catastrophes. Here we learn how insects have shaped our history and improved our health and wealth around the globe. Come meet your tiny neighbors!
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Discussion — May Be Offered
Lecture — Required
Course typically offered:
Main Campus: Spring
Online Campus: Summer

Enrollment requirement: Enrollment not allowed if you have previously taken TRAD 104 "Insects and Culture" (Topic 14).
General Education: TRAD 104

ENTO 170C2: Secrets of Success: How Insects Conquered Earth! (3 units)
Description: Terrestrial arthropods (insects and their relatives, such as spiders, scorpions, and mites) are the most successful and diverse form of life on Earth. In this course we cover the principles of basic their biology, including their structure and function, development, ecology, behavior and reproduction. We also emphasize their diverse array of unique roles in nature, many of which are exceedingly important to the maintenance and functioning of healthy and productive ecosystems. This course will serve as a primer to the basic concepts of biological science directed by our exploration of diversity and adaptations among terrestrial arthropods.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture — Required
Course typically offered:
Main Campus: Fall

General Education: NATS 104
Honors Course: Honors Contract
Honors Course: Honors Contract

-SA represents a Student Abroad & Student Exchange offering
-CC represents a Correspondence Course offering
May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.

ENTO 299: Independent Study (1 - 3 units)
Description: Qualified students working on an individual basis with professors who have agreed to supervise such work.
Grading basis: Alternative Grading: S, P, F
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 99 times.
Course typically offered:
Main Campus: Fall, Spring, Summer

ENTO 299H: Honors Independent Study (1 - 4 units)
Description: Qualified students working on an individual basis with professors who have agreed to supervise such work. Student and professor must contract with Honors College and agree upon extra research above and beyond individual plan.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Independent Study Required
Course typically offered:
Main Campus: Fall, Spring, Summer

Enrollment requirement: Student must be active in the Honors College.
Honors Course: Honors Course
Honors Course: Honors Course

ENTO 300: Insect Pest Management for Desert Cropping Systems (3 units)
Description: The course will focus on the principles and practices of insect pest management in agricultural crops. IPM concepts and management tactics will be discussed in detail. Case studies of successful pest management programs unique to SW desert cropping systems will be examined.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Course typically offered:
Main Campus: Fall (even years only)

ENTO 310: Living in Symbiosis (3 units)
Description: This course will provide an overview of the diversity of associations that exist between microbes and eukaryotic hosts. The course will span from highly integrated obligatory symbioses to loose associations. Emphasis will be placed on symbiotic associations with relevance to human medicine, veterinary sciences, and agriculture.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Equivalent to: ECOL 310, MIC 310, VSC 310
Also offered as: ACBS 310, ECOL 310, MIC 310
Course typically offered:
Main Campus: Fall

Enrollment requirement: ECOL 182R.

ENTO 391: Preceptorship (2 - 3 units)
Description: This course will provide specialized work on an individual basis, consisting of instruction and practice in actual service in the department of Entomology and/or EIS GIDP program. Undergraduate preceptors will work with course instructors assisting in the teaching of a variety of ENTO/ EIS courses. Students taking preceptorship units will learn student-centered teaching techniques, effective organizational and communication skills, as well as grading and work in the classroom assisting their peers.
Grading basis: Alternative Grading: S, P, F
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 3 times.
Course typically offered:
Main Campus: Fall, Spring

ENTO 391H: Preceptorship-Honors (2 - 3 units)
Description: This course will provide specialized work on an individual basis, consisting of instruction and practice in actual service in the department of Entomology and/or EIS GIDP program. Undergraduate preceptors will work with course instructors assisting in the teaching of a variety of ENTO/ EIS courses. Students taking preceptorship units will learn student-centered teaching techniques, effective organizational and communication skills, as well as grading and work in the classroom assisting their peers.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 3 times.
Course typically offered:
Main Campus: Fall, Spring

Enrollment requirement: Student must be active in the Honors College.
Honors Course: Honors Course
Honors Course: Honors Course

ENTO 392: Directed Research (1 - 6 units)
Description: This course will provide students with an opportunity for hands-on-experience on multidisciplinary research being conducted by faculty members in the department of Entomology. Joining a research lab will allow students to move beyond the traditional classroom environment into an atmosphere of discovery, collaboration and focus on projects with broad impacts to the modern world. Moreover, participation in directed research activities will contribute to the development of mentoring relationships with faculty and other members of research groups, stimulate familiarity with scientific literature and exposure to a variety of instrumentation or scientific techniques while promoting awareness of safety practices.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Independent Study Required
Course typically offered:
Main Campus: Fall, Spring

Recommendations and additional information: Completion of UA online laboratory safety course. Access courses at: https://d2l.arizona.edu. Find the link to "Laboratory Chemical Safety." Print your scores and give it to your faculty mentor.

ENTO 393: Internship (1 - 6 units)
Description: Specialized work on an individual basis, consisting of training and practice in actual service in a technical, business, or governmental establishment.
Grading basis: Alternative Grading: S, P, F
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 99 times.
Course typically offered:
Main Campus: Fall, Spring, Summer

ENTO 399: Independent Study (1 - 3 units)
Description: Qualified students working on an individual basis with professors who have agreed to supervise such work.
Grading basis: Alternative Grading: S, P, F
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 99 times.
Course typically offered:
Main Campus: Fall, Spring, Summer

ENTO 401: Ecological Physiology (3 units)
Description: During ontogeny, organisms constantly have to adjust their physiology in response to the environment they encounter. This course will provide an integrative understanding of life history evolution from the perspective of the constraints imposed by their underlying physiology. We will emphasize how physiological tradeoffs at the level of the whole organism ultimately define an organism¿s life history and fitness. The course will provide students with a conceptual approach to the integration of whole-organism physiology underlying life history traits. Relevant physiological, evolutionary and ecological background necessary to understand the concepts discussed will be given in lecture. Course will focus primarily on insects and will also use examples from other animals.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Also offered as: ECOL 401, PSIO 401
Co-convened with: EIS 501
Course typically offered:
Main Campus: Fall (odd years only)

Recommendations and additional information: MCB 181R, MCB 181L and ECOL 182R, ECOL 182L.
Enrollment requirement: ECOL 302 and ECOL 335

ENTO 403L: Parasitology Laboratory (1 unit)
Description: Parasite morphology and diagnostic laboratory techniques.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Laboratory Required
Equivalent to: ECOL 403L, ENTO 403L, MIC 403L, MICR 403L
Also offered as: ACBS 403L, ECOL 403L, MIC 403L
Course typically offered:
Main Campus: Fall

Recommendations and additional information: Twelve units of biology and microbiology.
Home department: School of Animal & Comparative Biomedical Sciences

ENTO 403R: Biology of Animal Parasites (3 units)
Description: Biology of host-parasite relationships with emphasis on parasites of veterinary and human importance. Parasite morphology and physiology, life cycles, epidemiology, pathogenesis and zoonotic potential.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Equivalent to: ECOL 403R, ENTO 403R, MIC 403R, MICR 403R
Also offered as: ACBS 403R, ECOL 403R, MIC 403R
Course typically offered:
Main Campus: Fall

Recommendations and additional information: Twelve units of biology and microbiology.
Home department: School of Animal & Comparative Biomedical Sciences

ENTO 405: Aquatic Entomology (4 units)
Description: Morphological, physiological and behavioral adaptations of insects to life in water; taxonomy and ecology of aquatic insects.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Laboratory Required
Lecture Required
Equivalent to: ECOL 405, WFSC 405
Also offered as: ECOL 405, WFSC 405
Course typically offered:
Main Campus: Spring

Recommendations and additional information: ECOL 182R and ECOL 182L.
Field trip: Field trip.

ENTO 407: Insect Discovery (3 units)
Description: Insect Discovery is a special course that combines an introduction to insect biology with practical experience in science outreach. Students will learn insect biology through lectures, labs and field trips, and communicate their knowledge to elementary school children by leading hands-on, inquiry-based science activities.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Laboratory Required
Lecture Required
Also offered as: RNR 407
Course typically offered:
Main Campus: Spring

Recommendations and additional information: Previous biology course work is necessary.
Field trip: Field trip to the Tucson Botanical Gardens and various insect collecting trips.
Student Engagement Activity: Professional Development
Student Engagement Competency: Professionalism

ENTO 415R: Insect Biology (3 units)
Description: Examination of how insects function morphologically, physiologically, and behaviorally. Investigation of relationships between members of Insecta and how they interact with other major taxa, both plant and animal. See http://ag.arizona.edu/classes/ento415/ for class information and list of lectures.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Equivalent to: ECOL 415R
Also offered as: ECOL 415R
Course typically offered:
Main Campus: Fall

Recommendations and additional information: ECOL 182R and ECOL 182L.

ENTO 417: Insect Systematics (4 units)
Description: Insect Systematics is a four unit lecture/lab course offered to undergraduate and graduate students with an interest in learning basic principles of systematics, insect structure, phylogeny and classification, and insect identification.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Laboratory Required
Lecture Required
Co-convened with:
Course typically offered:
Main Campus: Fall (even years only)

Recommendations and additional information: ECOL 182R and ECOL 182L.

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ENTO 432: Comparative Immunology (3 units)
Description: How have vertebrate immune systems evolved from simple origins? We will cover comparative immunology of prokaryotes, protozoans, plants, fungi, invertebrates, and "lower" vertebrates. By studying the origins and evolution of immunity across the history of life, and following the progression of immune system complexity across different lineages, we begin to see patterns that help explain how our immune system developed from those of our ancestors. Such comparative study will highlight the strengths and weaknesses of our immune system, and point to ways in which other organisms have overcome the same pathogenic stresses we currently face. This class will pull together data from many fields, including immunology, molecular and cell biology, ecology, and evolution.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Also offered as: ACBS 432, ECOL 432, MCB 432, MIC 432
Co-convened with: EIS 532
Course typically offered:
Main Campus: Fall

Enrollment requirement: MCB 181R and MCB 181L, ECOL 182R and ECOL 182L, or instructor consent.

ENTO 436: Agro-ecology (3 units)
Description: Agro-ecology is the application of ecological principles to the production of food and fiber. The underlying goals are to assess and promote the long-term sustainability of agricultural production systems. Through this course we will study how agro-ecosystems vary across time and space and will examine the trade-offs associated with different cropping systems and management practices. We will begin with a brief history of major trends in agriculture, then examine the ecological interactions involved in crop production, observe how these interactions shape agricultural practices and conclude with a discussion of domestic and international government policies that influence agricultural sustainability.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Lecture Required
Also offered as: ENVS 436, PLS 436, RNR 436
Course typically offered:
Main Campus: Spring

Recommendations and additional information: ECOL 302.

ENTO 446: Insect Pathogens: Biocontrol Agents & Biological Models (4 units)
Description: Ecology and biology of insect pathogens (viruses, bacteria, protozoa, nematodes). Diagnostics, safety testing of pathogens. Genomics and genetic engineering of entomopathogens. Insect pathogens as biological model organisms. Applications in medical and veterinary research and pharmaceutical bioprospecting.
Grading basis: Regular Grades
Career: Undergraduate

Course Components:		
	Discussion	May Be Offered
	Laboratory	May Be Offered
	Lecture	Required

Repeatable: Course can be repeated a maximum of 2 times.
Equivalent to: INSC 446, MCB 446, MIC 446, PLP 446, VSC 446
Also offered as: MCB 446, MIC 446, PLP 446
Course typically offered:
Main Campus: Spring

Recommendations and additional information: ENTO 411, ENTO 415L, ENTO 415R or consent of instructor.
Field trip: Field trip.

ENTO 457: Medical-Veterinary Entomology (3 units)
Description: An overview of medically important arthropods and the diseases they transmit. Special attention will be paid to newly emerging and locally important vectors and diseases. Basic coursework in biology or entomology is required.
Grading basis: Student Option ABCDE/PF
Career: Undergraduate

Course Components:		
	Lecture	Required

Equivalent to: ECOL 457, INSC 457, VSC 457
Also offered as: ACBS 457, ECOL 457
Course typically offered:
Main Campus: Spring

Recommendations and additional information: ECOL 182R, ECOL 182L.

ENTO 468: Integrated Pest Management (3 units)
Description: Principles underlying the management of arthropods in agricultural systems.
Grading basis: Regular Grades
Career: Undergraduate

Course Components:		
	Lecture	Required

Co-convened with: EIS 568
Course typically offered: Online Campus: Summer

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ENTO 491: Preceptorship (2 - 3 units)
Description: This course will provide specialized work on an individual basis, consisting of instruction and practice in actual service in the department of Entomology and/or EIS GIDP program. Undergraduate preceptors will work with course instructors assisting in the teaching of a variety of ENTO/ EIS courses. Students taking preceptorship units will learn student-centered teaching techniques, effective organizational and communication skills, as well as grading and work in the classroom assisting their peers.
Grading basis: Alternative Grading: S, P, F
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 3 times.
Course typically offered:
Main Campus: Fall, Spring

ENTO 491H: Preceptorship-Honors (2 - 3 units)
Description: This course will provide specialized work on an individual basis, consisting of instruction and practice in actual service in the department of Entomology and/or EIS GIDP program. Undergraduate preceptors will work with course instructors assisting in the teaching of a variety of ENTO/ EIS courses. Students taking preceptorship units will learn student-centered teaching techniques, effective organizational and communication skills, as well as grading and work in the classroom assisting their peers.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 3 times.
Course typically offered:
Main Campus: Fall, Spring

Enrollment requirement: Student must be active in the Honors College.
Honors Course: Honors Course
Honors Course: Honors Course

ENTO 492: Directed Research (1 - 6 units)
Description: This course will provide students with an opportunity for hands-on-experience on multidisciplinary research being conducted by faculty members in the department of Entomology. Joining a research lab will allow students to move beyond the traditional classroom environment into an atmosphere of discovery, collaboration and focus on projects with broad impacts to the modern world. Moreover, participation in directed research activities will contribute to the development of mentoring relationships with faculty and other members of research groups, stimulate familiarity with scientific literature and exposure to a variety of instrumentation or scientific techniques while promoting awareness of safety practices.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Independent Study Required
Course typically offered:
Main Campus: Fall, Spring

Recommendations and additional information: Completion of UA online laboratory safety course. Access courses at: https://d2l.arizona.edu. Find the link to "Laboratory Chemical Safety." Print your scores and give it to your faculty mentor.

ENTO 493: Internship (1 - 3 units)
Description: Specialized work on an individual basis, consisting of training and practice in actual service in a technical, business, or governmental establishment.
Grading basis: Alternative Grading: S, P, F
Career: Undergraduate
Course Components: Independent Study Required
Course typically offered:
Main Campus: Fall, Spring

ENTO 497C: Controlled Environment Agriculture IPM (3 units)
Description: Integrated Pest Management Principles, methods, and practices commonly used in controlled environment agriculture operations. Includes hands on monitoring and identification of pests in the Controlled Environment Agriculture Center (CEAC) teaching/research greenhouses.
Grading basis: Student Option ABCDE/PF
Career: Undergraduate
Flat Fee: $24
Course Components: Workshop Required
Equivalent to: ABE 497C, AGTM 497C
Also offered as: AGTM 497C, BE 497C
Co-convened with: EIS 597C
Course typically offered:
Main Campus: Spring

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ENTO 498: Senior Capstone1995 (1 - 3 units)
Description: A culminating experience for majors involving a substantive project that demonstrates a synthesis of learning accumulated in the major, including broadly comprehensive knowledge of the discipline and its methodologies. Senior standing required.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Independent Study Required
Course typically offered:
Main Campus: Fall, Spring

ENTO 498H: Honors Thesis (3 units)
Description: An honors thesis is required of all the students graduating with honors. Students ordinarily sign up for this course as a two-semester sequence. The first semester the student performs research under the supervision of a faculty member; the second semester the student writes an honors thesis.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 3 times.
Course typically offered:
Main Campus: Fall, Spring

Recommendations and additional information: Consent of instructor.
Enrollment requirement: Student must be active in the Honors College.
Honors Course: Honors Course
Honors Course: Honors Course

ENTO 499: Independent Study (1 - 5 units)
Description: Qualified students working on an individual basis with professors who have agreed to supervise such work.
Grading basis: Alternative Grading: S, P, F
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 99 times.
Course typically offered:
Main Campus: Fall, Spring, Summer

ENTO 499H: Honors Independent Study (3 units)
Description: Qualified students working on an individual basis with professors who have agreed to supervise such work.
Grading basis: Regular Grades
Career: Undergraduate
Course Components: Independent Study Required
Repeatable: Course can be repeated a maximum of 3 times.
Course typically offered:
Main Campus: Fall, Spring

Enrollment requirement: Student must be active in the Honors College.
Honors Course: Honors Course
Honors Course: Honors Course

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-CC represents a Correspondence Course offering
May Be Offered Departments may offer this component in some semesters. See the Schedule of Classes for term-specific offerings.