Department of Entomology

Head: D. Ragsdale
Graduate Advisor: P. D. Teel

The Department of Entomology offers both Doctor of Philosophy and thesis-option Master of Science degrees in entomology. Within these programs, subject matter areas include arthropod ecology, biological control, integrated pest management, molecular biology, physiology, genetics and toxicology, plant resistance, systematics, and urban, medical/veterinary, and forensic entomology. Students come into the field of entomology with diverse interests, science backgrounds and career goals. Students are able to tailor their education and research interests for the respective degree program with the help of their major advisor and advisory committees. Graduates from these programs have become prominent leaders in entomological research, application, education, and regulatory affairs of private sector and government arenas, as well as international agencies and foreign countries.

The department occupies five floors of the Minnie Belle Heep Building and nearby buildings that house the Entomology Research Laboratory, the Biological Control Laboratory, Tick Research Laboratory, Forensic Entomology Laboratories, Rollins Urban and Structural Entomology Facility, and Janice and John G. Thomas Honey Bee Facility. Texas A&M is only one of a select group of U.S. locations for a federally approved quarantine laboratory. The department also maintains three multi-room greenhouses. The Texas A&M University Insect Collection is housed in the Minnie Belle Heep Building. It is the largest and most actively growing arthropod collection in the Southwest, containing approximately three million specimens representing more than 45,000 identified species. Graduate students often work with faculty located at 8 research and extension centers across Texas, each addressing entomological issues unique to their particular geographic region.

Specific course requirements in entomology are dependent upon previous training and professional experience. Students are expected to demonstrate mastery in the core knowledge areas of 1) insect biodiversity, systematics, and insect evolution; 2) insect ecology; 3) insect physiology, toxicology and insect genetics; 4) applied entomology on their graduate degree plans to be designed in consultation with their major advisor and advisory committee. Prospective students are directed to the Department of Entomology website for additional information.

Faculty

Adelman, Zachary N, Associate Professor
Entomology
PHD, Colorado State University Fort Collins, 2000

Behmer, Spencer T, Professor
Entomology
PHD, University of Arizona, 1998

Bernal, Julio S, Professor
Entomology
PHD, University of California, Riverside, 1995

Brundage, Adrienne L, Assistant Lecturer
Entomology
PHD, Texas A&M University, 2012

Coates, Craig J, Instructional Associate Professor
Entomology
PHD, Australian National University, 1997

Coulson, Robert N, Professor
Entomology
PHD, University of Georgia, 1969

Eubanks, Micky D, Professor
Entomology
PHD, University of Maryland, College Park, 1997

Hamer, Gabriel L, Assistant Professor
Entomology
PHD, Michigan State University, 2008

Heinz, Kevin M, Professor
Entomology
PHD, University of California, Riverside, 1989

Johnston, J S, Professor
Entomology
PHD, University of Arizona, 1972

Medina, Raul F, Professor
Entomology
PHD, University of Maryland, College Park, 2005

Myles II, Kevin M, Associate Professor
Entomology
PHD, Colorado State University, 2003

Oswald, John D, Professor
Entomology
PHD, Cornell University, 1991

Pietrantonio, Patricia, Professor
Entomology
PHD, University of California, Riverside, 1995

Ragsdale, David W, Professor
Entomology
PHD, Louisiana State University, 1980

Rangel Posada, Juliana, Assistant Professor
Entomology
PHD, Cornell University, 2010

Slotman, Michel A, Associate Professor
Entomology
PHD, Yale University, 2003

Song, Hojun, Associate Professor
Entomology
PHD, The Ohio State University Columbus, OH, 2006

Sword, Gregory A, Professor
Entomology
PHD, University of Texas at Austin, 1998
Tamborindeguy, Cecilia, Associate Professor
Entomology
PHD, Institut National Polytechnique de Toulouse, 2004

Tarone, Aaron M, Associate Professor
Entomology
PHD, Michigan State University, 2007

Teel, Pete D, Professor
Entomology
PHD, Oklahoma State University, 1978

Tomberlin, Jeffery K, Associate Professor
Entomology
PHD, University of Georgia, 2001

Vargo, Edward L, Professor
Entomology
PHD, University of Georgia, Athens, 1986

Woolley, James B, Professor
Entomology
PHD, University of California, Riverside, 1983

Zhu Salzman, Keyan, Professor
Entomology
PHD, Purdue University, 1994

### Masters
- Master of Science in Entomology (http://catalog.tamu.edu/graduate/colleges-schools-interdisciplinary/agriculture-life-sciences/entomology/ms)

### Doctoral
- Doctor of Philosophy in Entomology (http://catalog.tamu.edu/graduate/colleges-schools-interdisciplinary/agriculture-life-sciences/entomology/phd)

### Certificates
- Vector Biology and Vector-Borne Disease Response in Human and Animal Systems Certificate

### Courses

#### ENTO 601 Principles of Systematic Entomology
**Credits 3. 3 Lecture Hours.**
An introduction to the principles and theory of systematic zoology and comparative biology including species concepts and speciation; methods for higher classification including phylogenetic systematics, phenetics and evolutionary taxonomy; introduction to zoological nomenclature.
**Prerequisite:** Graduate classification in entomology or other biological sciences.

#### ENTO 602 Insect Biodiversity and Biology
**Credits 4. 3 Lecture Hours. 3 Lab Hours.**
Biodiversity and biology of the orders and selected families of insects; order-level morphology, family-level natural history and identification; field trips and an insect collection provide experience with insect collecting methods, specimen preparation techniques and field biology.
**Prerequisite:** 6 hours of biological sciences.

#### ENTO 606 Quantitative Phylogenetics
**Credits 3. 2 Lecture Hours. 3 Lab Hours.**
Designed to provide the theory and tools required for inference of phylogenetic (evolutionary) relationships among biological taxa using various types of comparative data including morphological characters, biochemical and molecular characters, and DNA sequences; hands-on analysis of data using contemporary tools.
**Prerequisite:** Entomology 601 or approval of instructor.
**Cross Listing:** GENE 606 and WFSC 646.

#### ENTO 608 Principles of Biological Control
**Credits 3. 3 Lecture Hours.**
Theory and practices relating to the role and use of natural enemies in arthropod and plant population regulation; review and analysis of projects in biological control; biology and behavior of entomophagous arthropods.
**Prerequisite:** ENTO 201 or equivalent or approval of instructor.

#### ENTO 610 Host Plant Resistance
**Credits 3. 3 Lecture Hours.**
Host plant resistance programs from the standpoint of the plant breeder, plant pathologist and entomologist; team taught with each discipline represented; roundtable discussion of assigned readings and lectures.
**Prerequisite:** Approval of instructor.
**Cross Listing:** SCSC 610 and PLPA 610.

#### ENTO 612 Insect Evolution
**Credits 3. 3 Lecture Hours.**
Review current and historical ideas about the phylogeny and evolution of the major groups of hexapods; includes evidential basis for hypotheses of monophyly, competing phylogenetic hypotheses, major innovations and trends affecting the adaptive radiations of specific taxa, morphological character systems, and history of insect classification and the major character systems.
**Prerequisite:** One semester of insect or invertebrate zoology.

#### ENTO 614 Insect Community Ecology
**Credits 3. 3 Lecture Hours.**
Provide a strong and contemporary foundation in insect population, community and evolutionary ecology; review historical and theoretical perspectives, current philosophies, approaches and a description of classic experiments used to test and modify theories on topics including insect herbivore-plant interactions; major biological forces affecting population dynamics and community structure (resource availability, competition, predation, mutualisms, etc.).
**Prerequisite:** Graduate classification.

#### ENTO 615 Insect Physiology
**Credits 3. 3 Lecture Hours.**
Physiological processes of insects; metabolism, nutrition, neuroendocrinology, nerve action, cell structure, respiration, circulation, excretion and flight; functional integration and regulatory processes of total organism.
**Prerequisite:** ENTO 306 or equivalent.

#### ENTO 617 Acarology
**Credits 4. 3 Lecture Hours. 3 Lab Hours.**
Systematics, morphology, physiology, and ecology of ticks and mites; management of acarine pests of humans, animals and plants; role of parasitic species in causation and transmission of diseases.
**Prerequisite:** ENTO 208 or equivalent. (Offered in 2010-2011 and alternate years thereafter.)
ENTO 618 Medical and Veterinary Entomology  
Credits 3. 2 Lecture Hours. 3 Lab Hours.  
Taxonomy, biology and epidemiological role of insects and other  
arthropods that directly and/or indirectly affect the health and well-being  
of humans and animals.  
Prerequisite: Graduate classification or approval of instructor.

ENTO 619 Insect Toxicology  
Credits 3. 3 Lecture Hours.  
Classification and properties of major types of insecticides; chemistry,  
metabolism and mode of action; selectivity, use hazards, residues  
and resistance; environmental problems: biological magnification,  
persistence and effects on non-target organisms.  
Prerequisites: One course in organic chemistry and ENTO 615 or approval  
of instructor.

ENTO 620 Biology and Systematics of Entomophagous Insects  
Credits 3. 2 Lecture Hours. 3 Lab Hours.  
Systematics of entomophagous insects at the family level; collecting  
and rearing parasitoids from their hosts; emphasis on groups used in  
biological control.  
Prerequisite: ENTO 301 or approval of instructor. (Offered in 2010-2011  
and alternate years thereafter.)

ENTO 625/GEOG 625 Landscape Ecology  
Credits 3. 2 Lecture Hours. 3 Lab Hours.  
Study of structure, function and change in a heterogeneous land  
area composed of interacting ecosystems; examine basic ecological  
principles dealing with landscape structure.  
Prerequisite: Approval of instructor.  
Cross Listing: GEOG 625/ENTO 625.

ENTO 626/VIBS 626 Methods in Vector-Borne Disease Ecology  
Credits 3. 1 Lecture Hour. 5 Lab Hours.  
Methodological understanding of how vector-borne disease are studied  
in the field and the laboratory; hands-on exploration of the ecology  
of disease systems in a one health framework; concepts of design,  
execution, and presentation of research projects; outdoor field work and  
bio-safety level 2 laboratory.  
Cross Listing: VIBS 626/ENTO 626.

ENTO 628 Arthropod Genomes and Gene Expression  
Credits 3. 3 Lecture Hours.  
Introduction to the vocabulary and experimental procedures routinely  
used for molecular genetic studies using arthropod systems as model  
examples; discussion of germ-line transformation, transient gene  
expression, and the analysis of tissue-specific and genome-wide gene  
expression.  
Prerequisite: GENE 301 or equivalent.

ENTO 630 Insect Interactions with Microbes and Plant Hosts  
Credits 3. 3 Lecture Hours.  
Concepts on phytophagous piercing/sucking insects, their complex  
interactions with their host plants and associated microbes, including  
transmission of plant pathogens.  
Prerequisites: Graduate classification or approval of instructor.

ENTO 631 Principles of Integrated Pest Management  
Credits 3. 2 Lecture Hours. 3 Lab Hours.  
IPM history, conceptual foundations and basic principles; human  
practices aimed to reduce human carbon and chemical footprints on  
our planet; a series of pest control efforts towards a more sustainable  
agriculture.  
Prerequisite: Graduate classification or approval of instructor.

ENTO 635 Vector-Borne Disease Management and Response In Human  
and Animal Systems  
Credits 3. 3 Lecture Hours.  
Integration of arthropod vector biology and surveillance with response  
and management of vector-borne disease outbreaks; complex  
interactions of diverse authorities in vector-borne disease management  
and response; participation in designing, operating and assessing  
outbreak response and management plans; capstone experience in the  
Vector Biology and Vector-Borne Disease Response certificate.  
Prerequisite: ENTO 618.

ENTO 645 Arthropods as Vectors of Plant Pathogens  
Credits 3. 3 Lecture Hours.  
Concepts on transmission of plant pathogens, discussion of  
transmission mechanisms, characteristics of insect vectors and their  
consequences for plant protection.  
Prerequisites: Graduate classification or approval of instructor.

ENTO 681 Seminar  
Credit 1. 1 Lecture Hour.  
Oral reports and discussions of current research and developments in  
etomology and related fields; designed to broaden understanding of  
problems in field and to stimulate research.  
Prerequisite: Graduate classification.

ENTO 684 Professional Internship  
Credits 1 to 4. 1 to 4 Other Hours.  
On-the-job training in the fields of pest identification, home and garden  
pest control, medical and veterinary pest control, and pest management  
of food and fiber crop pests.  
Prerequisite: Graduate classification in the Master of Agriculture program  
in economic entomology or plant protection.

ENTO 685 Directed Studies  
Credits 1 to 9. 1 to 9 Other Hours.  
Entomological problems not pertaining to thesis or dissertation. May be  
repeated for credit.  
Prerequisites: Graduate classification with major or minor in entomology;  
approval of department head.

ENTO 689 Special Topics in...  
Credits 1 to 4. 1 to 4 Lecture Hours. 0 to 4 Lab Hours.  
Selected topics in an identified area of entomology. May be repeated for credit.  
Prerequisite: Graduate classification.

ENTO 690 Theory of Research  
Credit 1. 1 Lecture Hour.  
Examination of concepts and theories in entomological research  
including applications of novel technologies and experimental approach.  
May be repeated for credit.  
Prerequisite: Graduate classification.

ENTO 691 Research  
Credits 1 to 23. 1 to 23 Other Hours.  
Research problems on taxonomy, life histories, biological control, ecology  
and physiology of insects, and toxicology of insecticides.  
Prerequisite: Graduate classification.