DEPARTMENT OF ENTOMOLOGY

The Department of Entomology at Texas A&M University is one of the top entomology departments in the United States. We offer two undergraduate degrees, a Bachelor of Science degree in Entomology and a Bachelor of Science degree in Forensic and Investigative Sciences (FIVS). Our FIVS degree is the only bachelor’s degree in the state of Texas that is nationally accredited by the Forensic Science Education Programs Accreditation Commission (FEPAC) of the American Academy of Forensic Sciences. Both undergraduate degrees provide students with the necessary curriculum requirements to pursue graduate study in entomology, as well as in other professional fields, such as law and medicine.

Faculty

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

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

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

Bowling, Robert, Assistant Professor & Extension Specialist
Entomology
PHD, Kansas State University, 2003

Brewer, Michael, Associate Professor
Entomology
PHD, University of California, Riverside, 1990

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

Bynum, Edsel, Associate Professor & Extension Specialist
Entomology
PHD, Texas Tech University, 2003

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, 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

Knutson, Allen, Professor & Extension Entomologist
Entomology
PHD, Texas A&M University, 1987

McCutchen, Billy, AgriLife Professor
Entomology
PHD, University of California, Davis, 1993

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

Merchant, Michael, Professor & Urban Extension Entomologist
Entomology
PHD, Texas A&M University, 1989

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

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

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

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

Song, Hojun, Associate Professor
Entomology
PHD, The Ohio State University, 2006
Swiger, Sonja, Assistant Professor & Extension Specialist
Entomology
PHD, University of Florida, 2007

Sword, Gregory A, Professor
Entomology
PHD, The University of Texas at Austin, 1998

Szczepaniec, Ada, Assistant Professor
Entomology
PHD, University of Maryland, 2009

Tamborindeguy, Cecilia, Associate Professor
Entomology
PHD, Institut National Polytechnique de Toulouse, France, 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, 1986

Way, Michael Orrin, Professor
Entomology
PHD, University of California, Davis, 1982

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

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

Certificates


Courses

- Entomology (ENTO) (p. 2)
- Forensic and Investigative Science (FIVS) (p. 4)

Entomology

ENTO 201 General Entomology
Credits 3. 2 Lecture Hours. 2 Lab Hours.
Survey of the major classes of arthropods with special emphasis on species of economic or biological importance; general insect anatomy, physiology, metamorphosis and classification; survey of the biology of insect orders and major families using common injurious and beneficial species to relate material to production agriculture and the urban environment.

ENTO 208 Veterinary Entomology
Credits 2. 2 Lecture Hours.
Insects and their relatives causation of economic loss, impacts to well-being and transmission of disease pathogens to domestic and companion animals and wildlife as well as health and well-being of humans through occupational or recreational exposure; insect biology, economic importance and principles and methods of prevention and control.
Prerequisite: Co-enrollment in ENTO 209.

ENTO 209 Veterinary Entomology Laboratory
Credit 1. 2 Lab Hours.
Insects and their relatives causation of economic loss, impacts to well-being and transmission of disease pathogens to domestic and companion animals and wildlife, as well as health and well-being of humans through occupational or recreational exposure; laboratory emphasizes identification of major arthropod pests, use of microscopy and dissection equipment.
Prerequisite: Concurrent enrollment with ENTO 208.

ENTO 210 Global Public Health Entomology
Credits 3. 3 Lecture Hours.
Impacts of insects and insect-borne diseases on public health and well-being around the globe; insect biology, bloodfeeding, and transmission of human diseases; role of insect borne diseases on human history, socio-economic development, and public health infrastructure.
Prerequisite: Freshman or sophomore classification or approval of instructor.

ENTO 285 Directed Studies
Credits 0 to 4. 0 to 4 Other Hours.
Directed individual study in entomology.
Prerequisites: Freshman or sophomore classification; approval of instructor and department head.

ENTO 289 Special Topics in...
Credits 1 to 4. 1 to 4 Lecture Hours.
Selected topics in an identified area of entomology. May be repeated for credit.
Prerequisite: Approval of instructor.

Majors

- Bachelor of Science in Entomology (http://catalog.tamu.edu/undergraduate/agriculture-life-sciences/entomology-bs)
- Bachelor of Science in Forensic and Investigative Sciences, Pre-Law Emphasis (http://catalog.tamu.edu/undergraduate/agriculture-life-sciences/entomology/forensic-investigative-sciences-prelaw-bs-emphasis)
- Bachelor of Science in Forensic and Investigative Sciences, Science Emphasis (http://catalog.tamu.edu/undergraduate/agriculture-life-sciences/entomology/forensic-investigative-sciences-science-bs-emphasis)

Minors

- Entomology Minor (http://catalog.tamu.edu/undergraduate/agriculture-life-sciences/entomology/minor)
ENTO 291 Research
Credits 0 to 4. 0 to 4 Other Hours.
Research conducted under the direction of faculty member in entomology. May be repeated 2 times for credit.
Prerequisites: Freshman or sophomore classification and approval of instructor.

ENTO 300/WFSC 300 Field Studies
Credits 3. 3 Other Hours.
Integration of principles of animal and plant ecology with environmental factors to characterize wildlife populations. Intensive analysis of specific areas will emphasize either the development of a wildlife management plan or a general vertebrate natural history survey.
Prerequisite: Junior or senior classification.
Cross Listing: WFSC 300/ENTO 300.

ENTO 301 Biodiversity and Biology of Insects
Credits 4. 3 Lecture Hours. 3 Lab Hours.
Introduction to orders and most important families of insects; order-level morphology and family-level natural history; collection of insects identified to family level provides introduction to collection methods and specimen preparation.
Prerequisites: ENTO 201 or ENTO 208; 6 hours of biological sciences; junior or senior classification or approval of instructor.

ENTO 305 Evolution of Insect Structure
Credits 3. 2 Lecture Hours. 3 Lab Hours.
External morphology of insects; evolution of form and function.
Prerequisite: 6 hours of biological sciences.

ENTO 306 Insect Physiology
Credits 3. 2 Lecture Hours. 3 Lab Hours.
Physiology of insects; structure and function of internal organ systems and their role in insect success.
Prerequisite: ENTO 201 or ENTO 208; BIOL 111 and BIOL 112; CHEM 101/CHEM 111 and CHEM 102/CHEM 112.

ENTO 313 Biology of Insects
Credits 3. 2 Lecture Hours. 3 Lab Hours.
Study of the orders and important families of insects and related arthropods, including general biology, relationships with plants and other animals, and characteristics used in identification.
Prerequisite: 3 hours of biological science.

ENTO 315 Biotechnology and Society
Credits 3. 3 Lecture Hours.
Understanding the technology and principles of biotechnology, interpreting and communicating biotechnology reports of both popular press and peer-reviewed scientific articles.
Prerequisite: Junior or senior classification or approval of instructor.

ENTO 320 Honey Bee Biology
Credits 3. 3 Lecture Hours.
Introduction of honey bee biology and beekeeping practices to science and non-science majors; honey bees as the model insect to introduce general principles of biology and entomology.
Prerequisite: Junior or senior classification or approval of instructor.

ENTO 321 Beekeeping
Credit 1. 3 Lab Hours.
Basic Knowledge and techniques used in apiculture; tools and knowledge needed to keep bees responsibly and productively.
Prerequisites: ENTO 320 or concurrent enrollment, junior or senior classification or approval of instructor.

ENTO 322 Insects and Human Society
Credits 3. 3 Lecture Hours.
Emphasis on the role insects have played in the development of human cultures; aspects include health, food production and storage, art, music and architecture; overview of historic, present day, and future roles insects will have on environmental movements (green societies), and in underdeveloped, developing and developed societies.
Prerequisite: Junior or senior classification.

ENTO 401 Principles of Integrated Pest Management
Credits 3. 2 Lecture Hours. 3 Lab Hours.
Integrated pest management (IPM) concepts, principles, development and application; IPM constitutes a series of pest control tactics and strategies toward more sustainable agriculture, natural resources, and urban and rural health and well-being.
Prerequisite: ENTO 201 or ENTO 208.

ENTO 402 Field-Crop Insects
Credits 3. 2 Lecture Hours. 3 Lab Hours.
Application of management strategies for insect/mite pests of small grains, corn, cotton, rice, sorghum, stored products and sunflower; nature and symptoms of damage, life history and habits of common pests. Laboratory consists of pest and pest damage identification supported by field trips.
Prerequisite: ENTO 201 or equivalent.

ENTO 403 Urban Entomology
Credits 3. 2 Lecture Hours. 3 Lab Hours.
Biological, economic importance and control strategies for arthropod pests commonly invading households and commercial structures in urban environments; laboratory consists of urban pest identification and special presentations and demonstrations covering topics related to urban pest problems and their control. Offered in 2011-2012 academic year and alternating years thereafter.
Prerequisite: ENTO 201 or equivalent or approval of instructor.

ENTO 423 Medical Entomology
Credits 3. 2 Lecture Hours. 3 Lab Hours.
Biologies, disease relationships, and control of insects and other arthropods parasitic on or in humans; aspect of the fields of clinical and preventative medicine; survey, collection and taxonomy of medically-important arthropods in laboratory sessions.
Prerequisite: Junior or senior classification or approval of instructor.

ENTO 424 Insect Ecology
Credits 3. 2 Lecture Hours. 3 Lab Hours.
Provides basic ecological background with an applied interpretation, emphasizing influences of insect populations and communities on ecosystem processes that influence landscape structure, function and change.
Prerequisites: ENTO 201 or equivalent; 3 hours of biological sciences; junior or senior classification or approval of instructor.

ENTO 425 Disease Ecology
Credits 3. 3 Lecture Hours.
Ecological interactions that influence the distribution and abundance of pathogens, vectors, and hosts ultimately determine the spread of disease; impacts of urbanization, climate change, and other human influenced environmental changes on disease dynamics; integration of disease ecology into pathogen and vector monitoring and comprehensive strategies to reduce disease occurrence.
Prerequisite: Junior or senior classification, or approval of instructor.
ENTO 426/VIBS 426 Methods in Vector-Borne Disease Ecology  
**Credits 3. 1 Lecture Hour. 5 Lab Hours.**  
Methodological understanding of how vector-borne diseases are studied in the field and laboratory; hands-on exploration of the ecology 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.  
**Prerequisites:** Junior or senior classification and approval of instructor.  
**Cross Listing:** VIBS 426/ENTO 426.

ENTO 428 Insect Biotechnology  
**Credits 3. 3 Lecture Hours.**  
Applications of genetic engineering and biotechnology; specific problems dealing with insects and control of insect pests.  
**Prerequisites:** GENE 301 or GENE 315 or GENE 320/BIMS 320; junior or senior classification or approval of instructor.

ENTO 429 Insect Biotechnology Laboratory  
**Credit 1. 3 Lab Hours.**  
Basic technical experience in insect molecular biology and biotechnology, including genomic DNA isolation, PCR, cloning, sequencing and gene manipulation techniques; focus on insect applications for improvement of human health and agriculture.  
**Prerequisites:** ENTO 428; concurrent enrollment in ENTO 428; junior or senior classification or approval of instructor.

ENTO 431/FIVS 431 The Science of Forensic Entomology  
**Credits 3. 3 Lecture Hours.**  
Explores the science, methodology and technology employed to gather, preserve and present information about insects and other arthropods in such a manner that this information can be used in courts of law as evidence and testimony to help resolve issues of a criminal or civil nature.  
**Prerequisite:** Junior or senior classification or approval of instructor.  
**Cross Listing:** FIVS 431/ENTO 431.

ENTO 432/FIVS 432 Applied Forensic Entomology  
**Credit 1. 3 Lab Hours.**  
Laboratory-based course offering practical experience using scientific information, methodology, technology, and legal procedures inherent to the field of forensic entomology; emphasis on collecting, preserving, and identifying information as evidence and expert witness testimony in courts of law.  
**Prerequisites:** Concurrent enrollment in ENTO 431/FIVS 431; junior or senior classification or approval of instructor.  
**Cross Listing:** FIVS 432/ENTO 432.

ENTO 435 Case Studies in Problem Solving  
**Credits 3. 3 Lecture Hours.**  
Development of reasoning strategies by examining a variety of case studies, science and scientific methods; solving real-world problems as part of an investigative team.  
**Prerequisite:** Senior classification or approval of instructor.

ENTO 450/WFSC 450 Caribbean Conservation  
**Credits 2. 6 Lab Hours.**  
Provide experience in and appreciation for diverse tropical habitats and the problems associated with conserving these habitats; design and conduct individual research projects on topics of their choice with approval from the instructors on project design and feasibility.  
**Prerequisites:** Concurrent enrollment in ENTO 300/WFSC 300 and ENTO 451/WFSC 451; junior or senior classification.  
**Cross Listing:** WFSC 450/ENTO 450.

ENTO 451/WFSC 451 Caribbean Research Seminar  
**Credit 1. 1 Other Hour.**  
Document research activities; keep a journal of activities and research methods during study abroad trips.  
**Prerequisites:** Concurrent enrollment in ENTO 300 and 450; junior or senior classification.  
**Cross Listing:** WFSC 451/ENTO 451.

ENTO 481 Seminar  
**Credit 1. 1 Lecture Hour.**  
Report of original investigations, current literature and special features of entomology.  
**Prerequisites:** ENTO 201 or equivalent; junior or senior classification.

ENTO 482 Occupational and Professional Development  
**Credits 2. 2 Lecture Hours.**  
Organized instruction in written and oral communication; acquaint students with private and public-sector companies and agencies as well as leading professionals from these firms to reinforce academic instruction and prepare students for the transition to employment, graduate and professional schools.  
**Prerequisite:** ENTO 201 or ENTO 208; or approval of instructor.

ENTO 484 Professional Internship  
**Credits 0 to 4. 0 to 4 Other Hours.**  
Independent study and supervised field experience related to a professional area of interest in entomology. May be taken two times for credit.  
**Prerequisite:** Junior or senior classification or approval of instructor.  

ENTO 485 Directed Studies  
**Credits 0 to 4. 0 to 4 Other Hours.**  
Individual problems.  
**Prerequisites:** ENTO 201 or equivalent; junior or senior classification; approval of instructor and department head.

ENTO 489 Special Topics in...  
**Credits 1 to 4. 0 to 4 Lecture Hours. 0 to 4 Lab Hours.**  
Selected topics in an identified area of entomology. May be repeated for credit.  
**Prerequisite:** Approval of instructor.

ENTO 491 Research  
**Credits 0 to 4. 0 to 4 Other Hours.**  
Faculty supervised research in entomology. May be taken two times for credit. Registration in multiple sections of this course are possible within a given semester provided that the per semester credit hour limit is not exceeded.  
**Prerequisites:** Junior or senior classification or approval of instructor.

**Forensic and Investigative Science**

**FIVS 123 Forensic Investigations**  
**Credits 3. 3 Lecture Hours.**  
Overview of forensics from incident scene to court room verdict; principles, concepts, tools and methodologies used in the science and practice of forensics; examination of various forensic fields; evidence recognition, analysis, interpretation and presentation to diverse audiences.
FIVS 205 Introduction to Forensic and Investigative Sciences  
Credits 3. 3 Lecture Hours.  
(FORS 2440) Introduction to Forensic and Investigative Sciences. Overview of principles, procedures, and concepts of forensic and investigative sciences; instruction in the definitions, scope, and use of tools, techniques and protocols in forensic applications used to resolve social, regulatory, and legal disputes.  
Prerequisite: Freshman or sophomore classification or approval of instructor.  

FIVS 285 Directed Studies  
Credits 0 to 4. 0 to 4 Other Hours.  
Directed individual study in forensic and investigative sciences. May be repeated for credit.  
Prerequisites: Freshman or sophomore classification; approval of instructor and department head.  

FIVS 289 Special Topics in...  
Credits 1 to 4. 1 to 4 Lecture Hours. 0 to 4 Lab Hours.  
Selected topics in an identified area of forensic and investigative sciences. May be repeated for credit.  

FIVS 291 Research  
Credits 0 to 4. 0 to 12 Lab Hours.  
Research conducted under the direction of a faculty member in the department of entomology. May be repeated 3 times for credit.  
Prerequisite: Freshman or sophomore classification.  

FIVS 308 Forensic Implications of Inheritance  
Credits 4. 3 Lecture Hours. 3 Lab Hours.  
Forensic genetics with an emphasis on human molecular genetics, population genetics, and genetic application in the forensic sciences.  
Prerequisites: BIOL 112; upper division in forensic and investigative sciences; junior or senior classification.  

FIVS 316 Biotechnology and Forensics  
Credits 4. 3 Lecture Hours. 3 Lab Hours.  
Introduction of applications of biotechnology for agriculture and human health purposes; description of experimental protocols used to create genetically modified organisms (GMOs); discussion of the risks, benefits, and regulations controlling the use of biotechnology in society.  
Prerequisites: GENE 301 or GENE 310 or FIVS 308 or approval of instructor.  

FIVS 401/SCSC 401 Forensic Soil Science  
Credits 3. 2 Lecture Hours. 2 Lab Hours.  
Examination of soils biology, chemistry and physical attributes to solve crimes; soil and geologic characteristics associated with crime scene examination; physical, biological and chemical characteristics and use of trace evidence.  
Prerequisite: Junior or senior classification.  
Cross Listing: SCSC 401/FIVS 401.  

FIVS 415 Practice and Principles of Science and Law  
Credits 3. 3 Lecture Hours.  
Introduction to series of practitioners of forensic science and the justice system; receive instruction on principles, procedures, and practices used in solving legal and societal issues; examine scientific method and scientific knowledge as applied through expert testimony; enhance critical thinking and reasoning skills in studying and debating different positions of current issues of science and law.  
Prerequisites: FIVS 205, FIVS 431/ENTO 431 and FIVS 432/ENTO 432; senior classification or approval of instructor; concurrent enrollment with FIVS 435.  

FIVS 421 Latent Print Processing  
Credits 2. 1 Lecture Hour. 3 Lab Hours.  
Information, techniques, and methodologies for processing latent fingerprints and enhancing visible fingerprints at and from crime scenes, as well as from physical evidence.  
Prerequisites: FIVS 205, upper division forensic and investigative sciences academic standing, and approval of instructor.  

FIVS 422 Crime Scene Investigation  
Credits 2. 1 Lecture Hour. 3 Lab Hours.  
Principles, procedures, processes and hands-on experience for conducting investigations ranging from general crime scene to death investigations.  
Prerequisites: FIVS 205, upper division forensic and investigative sciences academic standing, and approval of instructor.  

FIVS 431/ENTO 431 The Science of Forensic Entomology  
Credits 3. 3 Lecture Hours.  
Explores the science, methodology and technology employed to gather, preserve, and present information about insects and other arthropods in such a manner that this information can be used in courts of law as evidence and testimony to help resolve issues of a criminal or civil nature.  
Prerequisites: Junior classification or approval of instructor.  
Cross Listing: ENTO 431/FIVS 431.  

FIVS 432/ENTO 432 Applied Forensic Entomology  
Credit 1. 3 Lab Hours.  
Laboratory-based course affording practical experience using scientific information, methodology, technology, and legal procedures inherent to the field of forensic entomology; emphasis on collecting, preserving, and identifying information as evidence and expert witness testimony in courts of law.  
Prerequisites: Concurrent enrollment with FIVS 431/ENTO 431; junior classification or approval of instructor.  
Cross Listing: ENTO 432/FIVS 432.  

FIVS 435 Case Studies in Problem Solving  
Credits 3. 3 Lecture Hours.  
Development of reasoning strategies by examining a variety of case studies; science and scientific method solving real-world problems as part of an investigative team.  
Prerequisite: Senior classification or approval of instructor; concurrent enrollment with FIVS 415.  

FIVS 481 Seminar  
Credit 1. 1 Lecture Hour.  
Analysis of research topics related to the fields of forensic science and law. May be taken 4 times for credit.  
Prerequisite: Junior or senior classification or approval of instructor.  

FIVS 482 Occupational and Professional Development  
Credits 2. 2 Lecture Hours.  
Organized instruction in written and oral communication; acquaint students with private and public-sector companies and agencies as well as leading professionals from these firms to reinforce academic instruction and prepare students for the transition to employment, graduate and professional schools.  
Prerequisite: Junior or senior classification or approval of instructor.  

FIVS 484 Professional Internship  
Credits 0 to 4. 0 to 12 Lab Hours.  
Independent study and supervised field experience related to a professional area or interest in forensic science. May be taken 3 times for credit.  
Prerequisite: Junior or senior classification or approval of instructor.
FIVS 485 Directed Studies
Credits 0 to 4. 0 to 4 Other Hours.
Directed individual study in forensic and investigative sciences. May be repeated for credit.
Prerequisites: Junior or senior classification; upper-division FIVS only; approval of instructor and department head.

FIVS 489 Special Topics in...
Credits 1 to 4. 1 to 4 Lecture Hours. 0 to 4 Lab Hours.
Selected topics in an identified area of forensic and investigative sciences. May be repeated for credit.

FIVS 491 Research
Credits 0 to 4. 0 to 12 Lab Hours.
Research conducted under the direction of a faculty member in the department of entomology. May be repeated 3 times for credit.
Prerequisite: Junior or senior classification.