ENTO - ENTOMOLOGY

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: ENTO 601 or approval of instructor.
Cross Listing: GENE 606 and ECCB 606.

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, neuro-
endocrinology, nerve action, cell structure, respiration, circulation,
excretion and flight; functional integration and regulatory processes of
the 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 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
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 627 Insect Behavior and Natural History
Credits 3. 2 Lecture Hours. 3 Lab Hours.
Broadly introduce the study of insect behavior with particular emphasis
on hands-on activities in documenting the natural history of insects
via field observations as well as conducting behavioral experiments
using live insects; exposure to various types of insect behaviors such as
feeding, defense, communication, and mating; learn how scientists have
investigated these behaviors by discussing current and classic literature;
learn theoretical and practical approaches involved in behavioral research
in preparation to design and carry out individual research.
Prerequisites: One semester of introductory entomology or equivalent, or
approval of instructor; graduate classification.
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 632 Professional Grant and Contract Writing in Entomology  
Credits 3. 3 Lecture Hours.  
Scientific and academic professional development; art of CV and grant writing; process of peer review evaluations of work.  
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 641 Engineering Vector Populations  
Credits 3. 3 Lecture Hours.  
Genetic strategies developed and deployed to control vector-borne diseases; vector population replacement, reduction or elimination; CRISPR and Cas9, gene drive and sterile insect technique; social, regulatory, political and ecological factors concerning genetic technologies.

ENTO 681 Seminar  
Credit 1. 1 Lecture Hour.  
Oral reports and discussions of current research and developments in entomology 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.