

# Entomology (ENT)

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## **ENT 110 General Entomology** (3 credit hours)

Considers how insects live, their internal and external structures and their functions, classification and identification and control when desirable. Recognition of economically important beneficial and destructive insects and mites occurring in North Carolina and neighboring states, stressing information on their life histories, damage and control.

Requisite: Agricultural Institute Only

*Typically offered in Fall only*

## **ENT 121 Pesticides and Their Utilization** (3 credit hours)

Basic characterization, classification, chemical and physical properties of pesticides. Use of pesticides including environmental effects; Federal and State laws and regulations relating to their manufacture, distribution and use; safety procedures including handling and storage; and application equipment including types, calibration, use and maintenance. TOTH

Requisite: Agricultural Institute Only

*Typically offered in Fall only*

## **ENT 132 Urban Pest Management** (3 credit hours)

Insects and related arthropods found in residential and industrial buildings, nature of damage, and their control. Identification and life history of the different pest species, methods to detect their presence, and integrated pest management strategies. Hands-on learning of species in laboratory with emphasis on current control techniques. Field trips required. Agricultural Institute Students only.

Requisite: Agricultural Institute Only

*Typically offered in Fall only*

## **ENT 163 Ornamental & Turf Insects** (3 credit hours)

Practical course in the biology, recognition, and management of common insect and related arthropod pests that attack ornamentals and turf. WALDVOGEL

Requisite: Agricultural Institute Only

*Typically offered in Spring only*

## **ENT 190 Current Topics in Pest Management** (1 credit hours)

Discussions of current topics of pest management. Topics selected by the students and instructors to include different phases of pest management. Discussions led by leaders in the various facets of the industry.

Requisite: Agricultural Institute Only

*Typically offered in Spring only*

## **ENT 201 Insects and People** (3 credit hours)

An introduction to the fascinating world of insects and how they interact with people. Included is a brief survey of insect history, diversity, structure and function, and behavior. This is followed by examples of beneficial and harmful insects in a variety of human activities including some sampling of the profound impacts insects have had on history, society and culture.

*GEP Natural Sciences, GEP Interdisciplinary Perspectives*

*Typically offered in Fall, Spring, and Summer*

## **ENT 207 Insects and Human Disease** (3 credit hours)

This course is an introduction to the many interactions between insects, other arthropods and humans that result in disease, ranging from simple anxiety, phobias, discomfort and pain, to transmission of pathogenic organisms causing sickness and even death. Included will be an understanding of the special physical and chemical adaptations of insects that enable them to cause us harm. The major groups of insects, mites, ticks and related arthropods associated with human suffering and disease as well as an introduction to the diseases transmitted by them will be presented. Finally, the course will present information on how major outbreaks of disease transmitted by the insects have influenced human populations, demographics, warfare, religion, and societal structure throughout recorded history.

*GEP Interdisciplinary Perspectives, GEP Global Knowledge, GEP Natural Sciences*

*Typically offered in Spring only*

## **ENT 212 Basic Entomology** (1 credit hours)

This course offers a brief and basic introduction to the world of insects and the discipline of entomology. It is intended as a primer for several other more specialized entomology classes such as forensic entomology and forest entomology.

*Typically offered in Fall and Spring*

## **ENT 305 Introduction to Forensic Entomology** (3 credit hours)

This course provides a broad overview of forensic entomology—a specialized field of entomology employed in medicocriminal investigations. Forensic entomology relies on knowledge of insect ecology, biology, taxonomy, physiology and development to elucidate the circumstances surrounding death. The role of arthropods associated with decomposed human remains is one of several valued disciplines in forensic sciences. Understanding the general principles of forensic entomology and their application will be the focus of this course.

*GEP Natural Sciences*

*Typically offered in Fall only*

## **ENT 401 Honey Bee Biology and Management** (3 credit hours)

A hands-on course in honey bee management including bee pollination of selected crops based on an understanding of bee biology, bee behavior, bee pathology, and bee botany. Students must be able to provide their transportation to field sites or arrange to work with a beekeeping mentor. Students may choose, but are not required, to purchase their own beekeeping equipment and hive.

Prerequisite: (ENT 201, ENT 203, ENT 425, BIO 105 or PB 200)

*Typically offered in Spring only*

## **ENT 402/FOR 402 Forest Entomology** (3 credit hours)

Fundamentals of morphology, classification, biology, ecology and control of insects attacking trees, with emphasis on silvicultural practices.

Prerequisite: Junior standing.

*GEP Natural Sciences*

*Typically offered in Spring only*

**ENT 425 General Entomology** (3 credit hours)

This course explores the science of entomology by focusing on the basic principles of systematics, morphology, physiology, development, behavior, ecology, and management of insects. Field trips provide opportunities to collect insects and study their adaptations to a wide variety of natural environments.

Prerequisite: BIO 181 or BIO 140 or BIO 350

*GEP Natural Sciences*

*Typically offered in Fall only*

**ENT 470/PP 470/CS 470 Advanced Turfgrass Pest Management** (2 credit hours)

Characteristics and ecology of turfgrass weed, insect, and disease pests; identification and diagnosis of turfgrass pests, strategies for managing pests including cultural, mechanical, biological, and chemical methods; development of integrated pestmanagement programs, characteristics and modes of action for herbicides, insecticides, fungicides, and plant growth regulators; behavior and fate of pesticides in soil; and the development and management of pesticide resistant pest populations.

Prerequisite: C- or better in CS 200

*Typically offered in Spring only*

**ENT 492 External Learning Experience** (1-6 credit hours)

A learning experience within an academic framework that utilizes facilities and resources which are external to the campus. Contact and arrangements with prospective employers must be initiated by student and approved by a faculty adviser, the prospective employer, the departmental teaching coordinator and the academic dean prior to the experience.

Prerequisite: Sophomore standing

*Typically offered in Fall and Spring*

**ENT 493 Special Problems in Entomology** (1-6 credit hours)

A learning experience in agriculture and life sciences within an academic framework that utilizes campus facilities and resources. Contact and arrangements with prospective employers must be initiated by student and approved by a faculty adviser, the prospective employer, the departmental teaching coordinator and the academic dean prior to the experience.

Prerequisite: Sophomore standing

*Typically offered in Fall and Spring*

**ENT 495 Special Topics in Entomology** (1-3 credit hours)

Offered as needed to present materials not normally available in regular course offerings or for offering of new courses on a trial basis.

*Typically offered in Fall, Spring, and Summer*

**ENT 502 Insect Diversity** (4 credit hours)

Diversity of insect biology and structure with emphasis upon identification of adults; includes speciation, evolutionary relationships, approaches to classification, nomenclature, zoogeography and techniques of collection.

Prerequisite: ENT 425 or Graduate Standing

*Typically offered in Fall only*

**ENT 503 Insect Morphology and Physiology** (3 credit hours)

The objectives are to acquaint students with the internal morphology, histology, and ultra-structure and system functions of insects. The laboratory will assist in recognizing the internal anatomy and associated external structure of insects and provide practical experience in the study of insect function.

Prerequisite: (CH 221 or CH 225) and (CH 223 or CH 227) and ENT 425 or Graduate Standing

*Typically offered in Spring only*

**ENT 504 Professional Development for Agriculture and the Life Sciences** (2 credit hours)

A successful professional career in agriculture and the life sciences is not limited to understanding just the science of these disciplines. Also required is an understanding of career paths, professional ethics, written and verbal communication, safety, how to work with animals and human subjects, personal interactions, vita preparation, networking, and future directions of the discipline. These skills are essential to taking the knowledge obtained in our science and applying them to a career in the discipline. Graduate Standing required.

*Typically offered in Fall only*

*Offered in Even Years*

**ENT 506/GES 506 Principles of Genetic Pest Management** (3 credit hours)

Introduction to the biological aspects of genetic pest management (GPM). Genetic techniques for GPM, including historical uses (such as the sterile insect technique) and approaches that are currently in development. Practical issues relating to the deployment of GPM, including ecological and economic considerations.

*Typically offered in Fall only*

*Offered in Even Years*

**ENT 510/PP 510 Writing Proposals in Agriculture, Biology, and Ecology** (2 credit hours)

Participants will be guided through the process of writing, with the intention to submit, a fellowship or grant proposal to an appropriate program of their selection and effective peer review of grant or fellowship proposals. The course includes a combination of lectures, in class activities, and direct practice. Students will also interact with a wide variety of experts in grant writing and evaluation who serve as weekly guest reviewers.

*Typically offered in Fall only*

**ENT 520 Insect Behavior** (3 credit hours)

This course stresses comprehensive coverage of the principles of animal behavior using insects as models and examples. Physiology, genetics, mechanisms, behavioral ecology, and evolution of insect behavior will be covered.

*Typically offered in Spring only*

*This course is offered alternate even years*

**ENT 526 Organic Agriculture: Principles and Practices** (3 credit hours)

This is a multidisciplinary class, and lectures cover many aspects of organic production given by a number of experts from both on and off campus. Classes also include discussions of issues and controversies surrounding organic production, as well as field trips to selected farms. This course is restricted to upper level undergraduate, graduate, or post-baccalaureate continuing education students.

*Typically offered in Spring only  
Offered in Even Years*

**ENT 550 Fundamentals of Arthropod Management** (3 credit hours)

The principles underlying modern methods for protecting food, clothing, shelter and health from insect attack.

Prerequisite: ENT 425 or Graduate Standing  
*Typically offered in Fall only*

**ENT 582/ZO 582 Medical and Veterinary Entomology** (3 credit hours)

The morphology, taxonomy, biology and control of the arthropod parasites and disease vectors of man and animals. The ecology and behavior of vectors in relation to disease transmission and control.

Prerequisite: ENT 425 and ZO 315  
*Typically offered in Spring only  
Offered in Even Years*

**ENT 591 Special Topics In Entomology** (1-6 credit hours)

A variable credit lecture and laboratory series offering topics such as advanced beekeeping, morphology, physiology, systematics, behavior, biological control, nursery and ornamental pests, host plant resistance, information retrieval, biological monitoring and sampling, population modeling, extension entomology, computer methods and urban, forest and stored product pests.

Prerequisite: Graduate standing  
*Typically offered in Fall and Spring*

**ENT 601 Seminar** (1 credit hours)

Discussion of entomological topics selected and assigned by seminar chair.

Prerequisite: Graduate standing in ENT or closely allied fields  
*Typically offered in Fall and Spring*

**ENT 604 Insect Natural History and Field Ecology** (1 credit hours)

Diversity of ecological roles and lifestyles of insects and related arthropods using techniques in field ecology. Two week-long field trips to Coastal Plain and Mountains with orientation walks, evening lectures, and field projects. Taught during the two weeks prior to the Fall semester.

Prerequisite: Graduate standing in Entomology  
*Typically offered in Fall only*

**ENT 620 Special Problems** (1-6 credit hours)

Original research on special problems in entomology not related to a thesis problem. Provides experience and training in research. Credits Arranged.

*Typically offered in Spring only*

**ENT 641 Agricultural Entomology Practicum** (3 credit hours)

Practical experience in research, extension and commercial aspects of insect pest management on a broad range of agricultural crops under actual field conditions. Class meets 9 hours each Friday for 10 weeks from early June to mid-August. Students should register for Fall term.

Prerequisite: Economic entomology (ENT 762 recommended)  
*Typically offered in Fall only  
This course is offered alternate odd years*

**ENT 685 Master's Supervised Teaching** (1-3 credit hours)

Teaching experience under the mentorship of faculty who assist the student in planning for the teaching assignment, observe and provide feedback to the student during the teaching assignment, and evaluate the student upon completion of the assignment.

Prerequisite: Master's student  
*Typically offered in Spring only*

**ENT 690 Master's Examination** (1-9 credit hours)

For students in non thesis master's programs who have completed all other requirements of the degree except preparing for and taking the final master's exam.

Prerequisite: Master's student  
*Typically offered in Spring only*

**ENT 693 Master's Supervised Research** (1-9 credit hours)

Instruction in research and research under the mentorship of a member of the Graduate Faculty.

Prerequisite: Master's student  
*Typically offered in Fall, Spring, and Summer*

**ENT 695 Master's Thesis Research** (1-9 credit hours)

Thesis research.

Prerequisite: Master's student  
*Typically offered in Fall, Spring, and Summer*

**ENT 696 Summer Thesis Research** (1 credit hours)

For graduate students whose programs of work specify no formal course work during a summer session and who will be devoting full time to thesis research.

Prerequisite: Master's student  
*Typically offered in Summer only*

**ENT 699 Master's Thesis Preparation** (1-9 credit hours)

For students who have completed all credit hour requirements and full-time enrollment for the master's degree and are writing and defending their theses.

Prerequisite: Master's student  
*Typically offered in Fall, Spring, and Summer*

**ENT 726 Biological Control of Insects and Weeds** (3 credit hours)

Overview of the field of biological control and its role in Integrated Pest Management programs. Emphasis on the diversity and sometimes unusual interactions of insect parasitoids and predators with their hosts/prey, controversies in biological control, critical analysis of selected projects, and basic conceptual and "hands-on" tools for approaching biological control research and implementing projects.

Prerequisite: ENT 425 or Graduate Standing  
*Typically offered in Fall only  
Offered in Even Years*

**ENT 727/PP 727 Ecology of Soil Ecosystems** (3 credit hours)

This course will focus on the interactions between soil organisms and their environment, and the ecological consequences of these diverse complex interactions. In particular, it will explore the scientific evidence that illustrates links between soil organisms, ecosystem functioning and the quality of air and water systems, and examine why and how the related research was conducted. This course will bring together theory and research trends from distinct subject areas: soil microbiology, entomology and ecosystem ecology.

Prerequisite: One course in: (SSC 332, SSC 511, SSC 521, or SSC 532), or ecology (BO 360 or CS 430), or microbiology (MB 351), or consent of instructor.

*Typically offered in Spring only*

*This course is offered alternate even years*

**ENT 731 Insect Ecology** (3 credit hours)

The interrelationships among insects and components of their effective environments which result in dynamic spatial and temporal patterns of particular species. Also, the diverse roles of insects in structure and function of communities and ecosystems.

Prerequisite: ENT 425 or Graduate standing

*Typically offered in Spring only*

**ENT 762 Insect Pest Management In Agricultural Crops** (3 credit hours)

Critical review of the biology and ecology of representative beneficial and injurious insects and arachnids of agricultural crops and the advantages and limitations of advanced concepts of their management in selected agroecosystems.

Prerequisite: Graduate Standing

*Typically offered in Spring only*

**ENT 791 Special Topics In Entomology** (1-6 credit hours)

A variable credit lecture and laboratory series offering topics such as advanced beekeeping, morphology, physiology, systematics, behavior, biological control, nursery and ornamental pests, host plant resistance, information retrieval, biological monitoring and sampling, population modelling, extension entomology, computer methods and urban, forest and stored product pests.

Prerequisite: Graduate standing

*Typically offered in Fall and Spring*

**ENT 801 Seminar** (1 credit hours)

Discussion of entomological topics selected and assigned by seminar chair.

Prerequisite: Graduate standing in ENT or closely allied fields

*Typically offered in Fall and Spring*

**ENT 804 Insect Natural History and Field Ecology** (1 credit hours)

Diversity of ecological roles and lifestyles of insects and related arthropods using techniques in field ecology. Two week-long field trips to Coastal Plain and Mountains with orientation walks, evening lectures, and field projects. Taught during the two weeks prior to the Fall semester.

Prerequisite: Graduate standing in Entomology

*Typically offered in Fall only*

**ENT 820 Special Problems** (1-6 credit hours)

Original research on special problems in entomology not related to a thesis problem. Provides experience and training in research.

*Typically offered in Spring only*

**ENT 841 Agricultural Entomology Practicum** (3 credit hours)

Practical experience in research, extension and commercial aspects of insect pest management on a broad range of agricultural crops under actual field conditions. Class meets 9 hours each Friday for 10 weeks from early June to mid-August. Students should register for fall semester.

Prerequisite: Economic entomology (ENT 762 recommended)

*Typically offered in Fall only*

**ENT 885 Doctoral Supervised Teaching** (1-3 credit hours)

Teaching experience under the mentorship of faculty who assist the student in planning for the teaching assignment, observe and provide feedback to the student during the teaching assignment, and evaluate the student upon completion of the assignment.

Prerequisite: Doctoral student

*Typically offered in Fall and Spring*

**ENT 890 Doctoral Preliminary Exam** (1-9 credit hours)

For students who are preparing for and taking written and/or oral preliminary exams.

Prerequisite: Doctoral student

*Typically offered in Fall and Spring*

**ENT 893 Doctoral Supervised Research** (1-9 credit hours)

Instruction in research and research under the mentorship of a member of the Graduate Faculty.

Prerequisite: Doctoral student

*Typically offered in Fall, Spring, and Summer*

**ENT 895 Doctoral Dissertation Research** (1-9 credit hours)

Dissertation research.

Prerequisite: Doctoral student

*Typically offered in Fall, Spring, and Summer*

**ENT 896 Summer Dissertation Research** (1 credit hours)

For graduate students whose programs of work specify no formal course work during a summer session and who will be devoting full time to thesis research.

Prerequisite: Doctoral student

*Typically offered in Summer only*

**ENT 899 Doctoral Dissertation Preparation** (1-9 credit hours)

For students who have completed all credit hour, full-time enrollment, preliminary examination, and residency requirements for the doctoral degree, and are writing and defending their dissertations.

Prerequisite: Doctoral student

*Typically offered in Fall, Spring, and Summer*