

**ENTOMOLOGY**

**ENT**

**College of Agriculture and Natural Resources  
College of Natural Science**

**201. Insects and Society (N)**  
Winter, 4(4-0)

Influence of insects on the human race from a global and historical perspective. Environmental and cultural factors and how they influence and interrelate with the insects.

**250. Pests, Environmental Quality and Ecosystem Management (N)**  
Fall, 3(4-0)

Impact of pests and pesticides in ecosystems and society, with emphasis on integrated pest management and environmental quality.

**301. General Entomology**

Fall, Spring, Summer. Given at W. K. Kellogg Biological Station Summer term. Fall, Spring; 3(3-0) Summer: 3 credits. B S 211 and B S 212 recommended.

Biological relationships of insects. Insect behavior, ecology, and classification. Metamorphosis and development of insects.

**302. General Entomology Laboratory**

Fall, Spring, Summer. Given at W. K. Kellogg Biological Station Summer term. Fall, Spring; 2(0-6) Summer: 2 credits. ENT 301 or concurrently.

Insect diversity with emphasis on morphology, development, classification, identification, bionomics, and evolution. Stresses reproductive strategies and general adaptability as relates to the overall ecological success of insects.

**303. Entomological Techniques**

Spring, 2(0-6) ENT 301 or approval of department; ENT 302 recommended but not required.

Field entomology, including collecting and rearing techniques and methods of specimen preparation and preservation. Practical experience in insect identification and bionomics. Collection required.

**330. Forest Protection**

Fall, 4(4-0) FOR 304, FOR 305, FOR 320. Interdepartmental with the departments of Botany and Plant Pathology and Forestry. Administered by the Department of Forestry.

Procedures used to detect and respond to pest, fire and environmental problems in a variety of forest types.

**337. Forest and Shade Tree Entomology**

Fall, 4(3-2) Three terms of natural science.

Ecological relationships of insect/tree interactions. Taxonomy of insects and recognition of insect injury. Biological, chemical, silvicultural and integrated control methods. Insect collection required (see instructor during prior spring term).

**401. Problems**

Fall, Winter, Spring, Summer. 1 to 6 credits. May reenroll for a maximum of 12 credits. Approval of department.

Advanced individual work on a field or laboratory research problem or a study of published literature on a selected topic.

**973. Seminar in English Education**

Fall, Winter, Spring, 3 to 5 credits. May reenroll for a maximum of 10 credits if different topics are taken. Approval of instructor. Seminar in the teaching of English literature, language, and composition.

**975. The Reading Process and the Concept of Literacy**

Spring, 3(3-0) May reenroll for a maximum of 12 credits. Approval of department. The contributions of language and literary studies to our understanding of the reading process and our definitions of literacy.

**980. Studies in English Language**

Fall, Winter, Spring, 3(3-0) May reenroll for a maximum of 12 credits. The English language from the viewpoint of historical problems, literary analysis and pedagogical implications.

**981. Seminar: Earlier English Literature**

Fall, Winter, Spring, 3(3-0) May reenroll for a maximum of 12 credits. Special problems in English literature, beginning to 1660.

**982. Seminar: Later English Literature**

Fall, Winter, Spring, 3(3-0) May reenroll for a maximum of 12 credits. Special problems in English literature, 1660-1900.

**983. Seminar: American Literature**

Fall, Winter, Spring, 3(3-0) May reenroll for a maximum of 12 credits. Special problems in American literature, beginning to 1900.

**984. Seminar: Twentieth Century Literature**

Fall, Winter, Spring, 3(3-0) May reenroll for a maximum of 12 credits. Special problems in English and American literature, 1900 to the present.

**985. Seminar: Special Studies in Literary Form and Theory**

Fall, Winter, Spring, 3(3-0) May reenroll for a maximum of 12 credits. Forms, genres, and movements.

**986. Seminar: American Literature and Culture**

Fall, Winter, Spring, 3(3-0) May reenroll for a maximum of 12 credits. American literature in a cultural context, drawing upon popular and fine arts, the history of ideas, the history of social movements.

**998. Advanced Writing for Doctoral Candidates**

Fall, 3(3-0) May reenroll for a maximum of 12 credits. Admission to a doctoral program or approval of instructor. Training for writing dissertations and publishing in the sciences, humanities, and other fields. Includes a detailed analysis of each student's style, methods of organizing, practice in editing, and individual conferences.

**999. Doctoral Dissertation Research**

Fall, Winter, Spring, Summer. Variable credit. Approval of department.

**877. Myth, Ritual and Folklore in Literature**

Fall of odd-numbered years. 3(3-0) May reenroll for a maximum of 12 credits. Interdepartmental with Romance Languages.

The concepts, scholarship, and methods of study and research in mythology, ritual, and folklore, with special attention to their use in literature and drama.

**880. Proseminar for Master's Degree Candidates**

Fall of even-numbered years. 3(3-0) May reenroll for a maximum of 12 credits. Individual scholarly work under guidance.

**885. Studies in the History of Literary Criticism**

Winter of even-numbered years. 3(3-0) May reenroll for a maximum of 12 credits. The history of literary criticism.

**886. Studies in Modern Criticism**

Spring of odd-numbered years. 3(3-0) May reenroll for a maximum of 12 credits. ENG 885.

Continuation of ENG 885.

**895A. College Teaching of English Language and Literature: History and Issues**

Fall of even-numbered years. 3(3-0) May reenroll for a maximum of 12 credits. Approval of instructor.

Literature, literary criticism, writing, and reading in the English language as academic subjects.

**895B. College Teaching of English Language and Literature: Reading**

Winter of odd-numbered years. 3(3-0) May reenroll for a maximum of 12 credits. Approval of instructor.

Integration of the teaching of writing and reading in English with stress on relevant research in reading in such areas as: linguistics, applied linguistics, psycholinguistics, language acquisition.

**895C. College Teaching of English Language and Literature: Writing**

Spring, 3(3-0) May reenroll for a maximum of 12 credits. Approval of instructor.

Integration of the teaching of writing and reading in English with stress on relevant research in writing and composition such as linguistics, applied linguistics, psycholinguistics, and language acquisition.

**896. Practicum in English Language and Literature**

Fall, Winter, Spring, Summer. 2 to 6 credits. May reenroll for a maximum of 12 credits. Approval of department.

Supervised graduate practicums, observations, internships in the teaching of English language and literature.

**899. Master's Thesis Research**

Fall, Winter, Spring, Summer. Variable credit. Approval of department.

**901. Studies in Comparative Literature**

Fall, Winter, Spring, 3(3-0) May reenroll for a maximum of 12 credits. Interdepartmental with Romance Languages.

Critical approaches to genre, periodization, and influence.

**955. Studies in Shakespeare**

Winter of odd-numbered years. 3(3-0) May reenroll for a maximum of 12 credits. Special problems in Shakespeare.

**970. Graduate Reading Course**

Fall, Winter, Spring, Summer. 1 to 5 credits. May reenroll for a maximum of 12 credits. Approval of department.

Supervised reading course in English and American literature for Ph.D. candidates.

## Description — Entomology

of

### Courses

#### 410. Apiculture and Pollination

Spring. 3(2-2)

Biology of the honey bee and some of the wild bees. Relationships between bees and flowering plants. Value of bees in crop pollination. Introduction to management with visits to the University apiary.

#### 415. Insect Behavior

Winter of even-numbered years. 3(3-0)  
ENT 301, ENT 302; ZOL 313 recommended.

Mechanisms and adaptive significance of communication, orientation, food and habitat selection and behavioral rhythmicity in insects.

#### 418. Systematic Entomology

Winter. 4(1-9) ENT 301, ENT 302.

General taxonomic course to acquaint the student with the various groups of insects.

#### 420. Aquatic Insects

Spring. 4(3-3) ENT 301, ENT 302.

Biology, ecology and systematics of aquatic insects. Insect collection required.

#### 425. Agricultural Entomology

Winter. 4(3-2) One year of biological or agricultural sciences.

Natural processes of insect populations and associated techniques that are important to agriculture.

#### 438. Taxonomy of Immature Insects

Spring of even-numbered years. 4(1-9)  
ENT 418.

Identification of immature insects with particular emphasis on the Holometabola.

#### 440. External Morphology of Insects

Fall. 4(2-6) ENT 301, ENT 302, or approval of department.

Morphological concepts of external skeletal parts of insects. Emphasis on evolutionary development of structures from the Apterygota through the Pterygota.

#### 444. Insect Ecology

Fall of odd-numbered years. 3(3-0)  
One course in introductory entomology.

Unique characteristics and principles of insect ecology. Trophic relationships, populations, climate, co-existence, competition, behavior, communities and distributions.

#### 450. Insect Physiology

Fall of even-numbered years. 5(3-4)  
ENT 301, ENT 302; 1 biochemistry or physiology course; 1 year of chemistry including 1 term of organic.

General and comparative physiology of insects, treating molecular, tissue and organ function. Laboratory exercises emphasizing mastery of sound experimental procedures.

#### 455. Toxicology of Insecticides

Winter of odd-numbered years. 4(4-0)  
1 term organic chemistry.

Properties of insecticides. Mode of action, metabolism and movement in animals. Safety and potential hazards to humans and wildlife. Fates of insecticides in the environment.

#### 460. Medical Entomology

Spring. 4(3-3) ENT 301, ENT 302, or approval of department.

Distribution and biology of important arthropod vectors of diseases to humans, disease symptoms, life cycle of the infectious agent, reservoirs, urticating arthropods, anaphylactic reactions, myiasis, and prophylactic measures.

#### 470. Nematode Diseases of Economic Plants

Spring of odd-numbered years. 4(3-3)  
BOT 405. Interdepartmental with the Department of Botany and Plant Pathology.

Major nematode diseases of economically important plants, with emphasis on diagnostic symptoms, nematode biology and principles of control.

#### 478. Stream Ecology

Fall. 3(3-0) ENT 420, ZOL 389 or BOT 450 or F W 302 or approval of department. Interdepartmental with the departments of Fisheries and Wildlife, and Zoology. Administered by the Department of Fisheries and Wildlife.

Biological, chemical, physical, and geological processes which determine the structure and function of stream ecosystems.

#### 812. Graduate Seminar Topics

Fall, Winter. 1(1-0) May reenroll if different topic is taken. Graduate students and approval of department.

Graduate level seminars on current research and philosophy. Student participation required.

#### 815. Biological Control

Spring of even-numbered years. 3(2-3)  
Approval of department.

Properties of entomophagous species; relationships to population ecology and systematics; foreign exploration, colonization, manipulation, and evaluation; interactions with pesticides, analysis of successful programs, and future trends. Collection for taxonomic lab to be made the summer before.

#### 820. Applied Insect Ecology

Fall of odd-numbered years. 3(2-3)  
Approval of department.

Ecological factors in an insect's ecosystem that can be manipulated for the purpose of pest management. Critical evaluation of current and classical literature presented by students in both oral and written reports.

#### 871. Biology of Nematodes

Spring of even-numbered years. 4(2-6)  
ENT 470 or approval of department. Interdepartmental with the Department of Botany and Plant Pathology.

Ontogeny, taxonomy, morphology, pathology and ecology of nematodes, with special reference to plant-parasitic and phytopathogenic species.

#### 881. Biology of the Arthropoda

Winter. 5(3-6) ZOL 308 or approval of department. Interdepartmental with and administered by the Department of Zoology.

Ecology, life cycles, morphology, taxonomy, and distribution of arthropoda other than insects.

#### 890. Problems

Fall, Winter, Spring, Summer. 1 to 6 credits. May reenroll for a maximum of 12 credits. Majors or approval of department.

Advanced individual work in: apiculture, aquatic insects, insect biochemistry, biosystematics, economic insects, insect ecology, forest insects, morphology, nematology, insect physiology, plant disease transmission, insect toxicology, araneida, acarina, medical entomology, chemistry of insecticides, insect biology, extension entomology, systems.

#### 899. Master's Thesis Research

Fall, Winter, Spring, Summer. Variable credit. Approval of department.

#### 940. Analytical Techniques for Biological Compounds I

Winter of odd-numbered years. 4(2-6)  
Organic chemistry, approval of department.

Application, extraction, cleanup and purification techniques employed in analysis of biologically active compounds. Stresses use of radioisotopes, and column, paper, thin-layer, and molecular sieve chromatography.

#### 941. Analytical Techniques for Biological Compounds II

Winter of even-numbered years. 4(2-6)  
ENT 940.

Analytical techniques used for identification and quantification of biologically active compounds. Emphasis on spectroscopy and gas-liquid chromatography.

#### 999. Doctoral Dissertation Research

Fall, Winter, Spring, Summer. Variable credit. Approval of department.

## ENVIRONMENTAL ENGINEERING

See Civil and Environmental Engineering.

## FAMILY AND CHILD ECOLOGY

FCE

### College of Human Ecology

#### 118. Family Resources

Fall. 3(2-2)

Skill development in identification, description and classification of human and non-human family resources on a historical and cross-cultural basis.

#### 145. The Individual, Marriage and the Family

Fall, Winter, Spring. 4(4-0) Students may not receive credit in both FCE 145 and S W 228.

Individual as young adult. Alternative living patterns. Marriage as social institution. Courtship and marriage patterns. Adjustments in marriage. Attitudes and roles in family living. Crises situations. Family planning.

#### 200. Ecological Approach to Family and Health

Fall, Winter. 2(2-0) Sophomores. Not open to HEC majors.

Use of the human ecosystem perspective to study people and their various environments with focus on family and health support systems.

#### 221. Human Services in the Community

Fall, Spring. 4(3-3)

Analysis of human and community needs: roles of professionals and volunteers in providing community and human services. Participation in community agency required.

#### 238. Personal Finance

Fall, Winter, Spring. 3(3-0)

Strategies, techniques and resources useful in the management of personal finance.