407 Diseases and Insects of Forest and Shade Trees
Spring. 4(3-3) Interdepartmental with Plant Biology and Plant Pathology. Administered by Plant Pathology. P: (PLB 105 or BS 162 or LB 144) and Completion of Tier I Writing Requirement SA: BOT 407
Diseases, insects, and environmental problems affecting trees in forests, parks, suburbs, and nurseries. Methods of control.

410 Apiiculture and Pollination
Fall, Spring. 2(1-2) P: BS 162 or PLB 105 or LB 144
Biology of bees and their relationship to flowers, pollination and crop production. Offered first ten weeks of semester. Laboratory sessions at MSU apiary.

422 Aquatic Entomology
Fall of odd years. 3(2-3) Interdepartmental with Fisheries and Wildlife and Integrative Biology. Administered by Entomology. P: BS 162 SA: ENT 420
Biology, ecology and systematics of aquatic insects in streams, rivers and lakes. Field trips and aquatic insect collection required.

460 Medical Entomology
Spring of odd years. 3(2-2) P: ENT 404 or MMG 201 or MMG 301 or approval of department R: Open to juniors and open to seniors and open to graduate students. Transmission and management of infectious diseases involving insects and aracnids.

461 Field Ecology of Disease Vectors
Summer. 3(1-4) Summer. W. K. Kellogg Biological Station. Administered by Entomology. RB: (ENT 404 or Entomology) or Courses in Epidemiology or Public Health. R: Not open to freshmen. Collection and identification of arthropod vectors of human and animal diseases in Michigan. Assays for associated pathogens. Integration of disease ecology and public health responses to vector-borne disease

469 Biomonitoring of Streams and Rivers
Summer of odd years. 3(2-3) Interdepartmental with Fisheries and Wildlife. Administered by Entomology. P: BS 162 or LB 144
Practical field and lab rapid bioassessment methodologies used to sample and assess the biota of streams and rivers. Sampling and identification of fish, macroinvertebrates and other biota.

477 Pesticides in Pest Management
Fall of even years. 3(3-0) Interdepartmental with Crop and Soil Sciences and Horticulture. Administered by Entomology. RB: General chemistry, entomology, plant pathology, weed science. R: Open to juniors or seniors or graduate students. Chemistry, modes of action, product development and regulation of pesticides. Environmental and social aspects of pesticide use.

479 Organic Pest Management (W)
Spring. 3(2-2) P: Completion of Tier I Writing Requirement RB: An undergraduate course in ecology and/or pest management. R: Open to juniors or seniors or graduate students or approval of department. Theory, philosophy and application of organic pest management systems. Field trips required.

812 Graduate Seminar
Fall, Spring. 1(1-0) A student may earn a maximum of 10 credits in all enrollments for this course. Current research topics. Student presentation required.

818 Adult Insect Taxonomy
Fall of odd years. 4(1-6) P: ENT 404 or approval of department. Identification, morphology, biology and evolutionary relationships of adult insects. Insect collection required.

838 Immature Insect Taxonomy
Fall of even years. 4(1-6) P: ENT 404 or approval of department. Classification, identification, morphology, biology and evolutionary relationships of immature insects. Emphasis on terrestrial holometabola. Collection required.

848 Biological Control of Insects and Weeds
Spring of odd years. 3(2-2) RB: (ENT 404) or Ecology Principles and practices in the application of natural enemies to control arthropod and weed pests. Identification and biology of beneficial species (parasitoids, predators, pathogens) and the ecological basis for their use in pest management systems.

850 Insect Physiology
Spring of odd years. 3(2-2) P: ENT 404 or approval of department RB: Biochemistry Description of insect form and function. Examples of how physiological systems are coordinated for complex biological functions.

851 Insect Physiology and Molecular Biology
Fall of odd years. 3(3-0) Interdepartmental with Genetics. Administered by Entomology. RB: General entomology (ENT 404 or equivalent); general biology (organismal and cellular); genetics Structure and function of physiological systems in insects, and current understanding of how these systems work at the molecular level.

890 Independent Study
Fall, Spring. Summer. 1 to 3 credits. A student may earn a maximum of 8 credits in all enrollments for this course. R: Open to graduate students. Individual study on a field or laboratory research topic or review of published literature on a topic of interest.
### Master's Research
**Term:** Fall, Spring, Summer  
**Credits:** 1 to 6 credits  
A student may earn a maximum of 10 credits in all enrollments for this course.  
**Restriction:** Open only to master's students in the Department of Entomology.  

Master's degree Plan B research paper.

### Master's Thesis Research
**Term:** Fall, Spring, Summer  
**Credits:** 1 to 12 credits  
A student may earn a maximum of 24 credits in all enrollments for this course.  
**Restriction:** Open only to master's students in the Department of Entomology.  

Master's thesis research.

### Doctoral Dissertation Research
**Term:** Fall, Spring, Summer  
**Credits:** 1 to 12 credits  
A student may earn a maximum of 36 credits in all enrollments for this course.  
**Restriction:** Open to doctoral students.  

Doctoral dissertation research.