806. Medieval Languages
Fall, Winter, Spring. 3(3-0) May re-enroll for a maximum of 6 credits.

810. Medieval Literature
Fall, Winter, Summer. 3(3-0) May re-enroll for a maximum of 6 credits.

811. Renaissance Literature
Fall, Winter, Spring. 3(3-0) May re-enroll for a maximum of 9 credits.

815. Restoration and Eighteenth Century Literature
Fall, Winter. 3(3-0) May re-enroll for a maximum of 6 credits.

820. Form and Genre
Fall, Winter, Spring. 3(3-0) May re-enroll for a maximum of 9 credits.

821. Nineteenth Century American Literature
Fall, Winter, Spring, Summer. 3(3-0) May re-enroll for a maximum of 9 credits.

824. Seventeenth Century Literature
Winter, Spring. 3(3-0) May re-enroll for a maximum of 6 credits.

828. Colonial and Revolutionary American Literature
Winter. 3(3-0) American literature, from the beginnings to 1729.

829. Twentieth Century Literature
Fall, Winter, Spring. 3(3-0) May re-enroll for a maximum of 6 credits.

830. Major Writers of American Literature
Fall. 3(4-0) Major in English—Secondary School Teaching or approval of department. Franklin through Whitman.

831. Major Writers of American Literature
Winter. 5(4-0) Major in English—Secondary School Teaching or approval of department. Twain to the present.

840. Writing Workshop for Teachers
Fall, Spring, Summer. 5(5-0) Major in English—Secondary School Teaching or approval of department. Emphasis on personal and public modes of writing; some discussion of methods of teaching writing; class discussion and evaluation of student writing; individual conferences.

845. Approaches to Language
Winter. 3(3-0) Major in English—Secondary School Teaching or approval of department. Modern linguistic approaches to language and the application of writing.

846. Approaches to Language
Winter. 3(3-0) Major in English—Secondary School Teaching or approval of department. Continuation of 845.
337. Forest and Shade Tree Entomology
Fall. 4(3-2) N S 193.
Provides an understanding of significance and nature of insect injury to forest and shade trees, based upon morphology, physiology, biology and taxonomy of insect and host. Analyzes ecological, chemical, cultural and silvicultural approaches to insect control in order to equip student with competence to carry out survey and action program assignments.

401. Problems
Fall, Winter, Spring, Summer. 1 to 8 credits.
May be re-registered 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.

404. Field Entomology
Summer. 6 credits.
One year of zoological science or teaching major in general science or approval of department. Given at W. K. Kellogg Biological Station.
Basic field work in entomology. Emphasis on the biology, collection and identification of insects common to the Gull Lake Biological Station area.

410. Agriculture 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.

411. Seminar
Fall, Winter. 1[1-2] Majors or approval of department. Reports by students, faculty, and representatives of the profession, with emphasis on current problems not covered in regular college subjects.

418. Systematic Entomology
Winter. 4(1-2) 301, 302.
General taxonomic course to acquaint the student with the various groups of insects.

420. Aquatic Insects
Fall. 4(2-4) 301, 302.
Biology, ecology and systematics of aquatic insects.

421. Stream Ecology
Summer. 3 credits. 420 or approval of department. Given at W. K. Kellogg Biological Station.
An in-depth examination of stream ecosystems—physical, chemical and biological aspects. Field work will be centered on local streams. Laboratory exercises will involve manipulations necessary for the determination of population energy budgets, with special emphasis on aquatic insects.

430. Economic Entomology
Winter. 3(2-2) 301, 302.
Recognition, life histories, behavior, ecology and integrated control of insects of economic importance.

438. Taxonomy of Immature Insects
Spring of even-numbered years. 4(1-9)
418.
Identification of immature insects with particular emphasis on the Holometabola.

440. External Morphology of Insects
Fall. 4(2-8) 301, 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.

441. Internal Morphology
Winter. 4(2-6) 440 or approval of department.
Morphology of the internal structure of insects. Emphasis on the evolutionary development of organs and organ systems of various representative insects.

450. Insect Physiology
Spring. 4(2-3) 441; PSL 401; 1 year of chemistry or approval of department.
Comparative physiology of insects with ecological and functional aspects of organs and organ systems.

460. Medical Entomology
Winter. 4(3-3) 301, 302, or approval of department.
Distribution and biology of important arthropod vectors of diseases to man, disease symptoms, life cycle of the infectious agent, reservoirs, urticating arthropods, anaphylactic reactions, myiasis, and pyrophylactic measures.

470. Introductory Nematology
Winter of odd-numbered years. 3(2-2)
Interdepartmental with the Department of Botany and Plant Pathology.
Biology, taxonomy and control of plant parasitic and saprophytic nematodes.

480. Insects in Relation to Plant Diseases
(860.) Winter of even-numbered years. 4(2-4) 302.
Interdepartmental with the Department of Botany and Plant Pathology.
Relationships of insects, mites and nematodes to important plant diseases incited by bacteria, fungi, viruses and toxins. Mode of transmission and means of control. Transmission techniques and important plant-pathogen-insect relationships.

490. Topics in Entomology
(870.) Fall, Winter, Spring. Summer.
Variable credit. Majors or approval of department.
Advanced work in medical entomology, ecology, advanced forest entomology, soil arthropods, behavior and biological control.

505. Advanced Taxonomy
Fall, Winter, Spring, 4(0-12) 401 or approval of department.
May enroll for a maximum of 24 credits. 418, 440.
Classification in depth of a single order of insects, including comparative morphology of the group and survey of recent and classical literature.

811. Ecology of Aquatic Insects
Summer of every third year given in 1969. 3 credits. 420 or approval of department.
Given at W. K. Kellogg Biological Station.
Aquatic insects, their physiology, distribution and survey of classification.

820. Insect Ecology
Fall of even-numbered years. 3(3-2)
Approval of department.
Insects and various invertebrates in relation to their environment. Factors affecting populations, speciation and distribution. Application of basic ecological principles to integrated control measures.

821. Advanced Stream Ecology
Summer. 3 credits. 421 or approval of instructor. Given at W. K. Kellogg Biological Station.
Stream ecosystem energy budget models with emphasis on individual projects involving both laboratory and field experiments. Particularly useful will be made of artificial streams and locally abundant species of aquatic insects.

830. Insect Biochemistry
Winter. 4(2-3) 440.
Biochemistry, intermediary metabolism and the biochemistry of development in insects; stresses biochemical differences between insects and higher animals.

831. Insect Biochemistry Laboratory
Summer of even-numbered years. 2(0-6) 530 or concurrently.
Laboratory to accompany 830. Experiments designed to elucidate the biochemical mechanisms of importance to insects.

838. Principles of Toxicology
Spring of odd-numbered years. 3(3-0)
Twenty credits in zoology and/or entomology, or approval of department.
Methods and principles of systematic zoology and entomology, including a historical survey of the pre-Linnéan and post-Linnéan systems of classification. International rules of zoological nomenclature and their emendations.

840. Insect Toxicology
Winter of odd-numbered years. 5(3-6) 301, 309.
Chemical and physical properties of insecticides, relationship of chemical structure to mode of action, and physiological basis of toxicological action.

881. Biology of the Arthropoda
Winter. 5(5-6) ZOL 481 or approval of department. Interdepartmental with and administered by the Zoology Department.
Ecology, life cycles, morphology, taxonomy, and distribution of arthropods other than insects.

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

940. Analytical Techniques for Biological Compounds
Fall. 4(3-6) Organic chemistry, approval of department.
Application, extraction, cleanup and purification techniques employed in analysis of biologically active compounds. Stresses use of radioisotopes, and columns, paper, thin-layer, and molecular sieve chromatography.

941. Analytical Techniques for Biological Compounds
Winter. 4(2-6) 940.
Analytical techniques used for identification and quantitation of biologically active compounds. Emphasis on spectroscopy and gas-liquid chromatography.

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

EXTENSION PERSONNEL DEVELOPMENT 

EPD

College of Agriculture and Natural Resources

501. Seminar in Cooperative Extension Service
Fall, Winter, Spring. 1 to 3 credits. Approval of department.