808. Studies in Theatre History
Fall, Winter, Spring, Summer. 3(3-0) May reenroll for a maximum of 18 credits. Approval of department.
Selected periods in Western and Asian Theatre History emphasizing the theatre as a cultural expression and a performing art.

809. Acting Theory
Fall. 2(2-0) Approval of instructor.
Discussion of the theories, processes, techniques, and styles of acting set forth in the writings of prominent performers, teachers, and critics.

899. Master's Thesis Research
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

990. Special Problems—Theatre
Fall, Winter, Spring, Summer. 1 to 6 credits. May reenroll for a maximum of 15 credits.
Special problems in theatre research and experimentation with emphasis on the relation of theatre to other disciplines.

999. Doctoral Dissertation Research
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

URBAN PLANNING

See Geography.

VETERINARY MEDICINE (COLLEGE OF) V M

511. Introduction to Veterinary Medicine I
Fall. 2(2-0) First-term Veterinary Medicine students.
Species and breed identification, predisposition for specific diseases, basic care and feeding, restraint and handling of small domestic animals, unusual pets, and laboratory animals.

517. Perspectives in Veterinary Medicine
Fall. 1(1-0) First-term Veterinary Medicine students.
Ethical principles, historical background and organization of the veterinary profession.

521. Introduction to Veterinary Medicine II
Spring. 4(3-4) Third-term Veterinary Medicine students.
Restraint, physical examination and diagnostic procedures in food animals and horses. Fundamentals of equine conformation, gaits, shoeing and routine medical care.

531. Animal Behavior
Winter. 3(3-0) Second-term Veterinary Medicine students.
Emphasis on behavior of animals relating to disease prevention and treatment. Veterinary ethology including animal communications, reproduction, restraint, handling, housing and feeding habits.

540. Metabolic Diseases and Endocrinology
Winter. 2(2-0) Fifth-term Veterinary Medicine students.
Biochemical and physiological basis of metabolic and endocrine diseases of animals including diagnosis, treatment and management.

542. Principles of Radiology
Fall. 2(2-0) Fourth-term Veterinary Medicine students.
Fundamentals of veterinary radiography. Normal radiographic anatomy. Principles of radiographic interpretation. Radiation safety.

544. Veterinary Epidemiology
Fall. 4(4-0) Fourth-term Veterinary Medicine students.
Meaning and relevancy of biostatistics in veterinary medicine. Descriptive and inferential statistics. Study design and critical literature review. Disease determinants, ecology, distribution and populations at risk. Analytic-clinical investigative epidemiology.

550. Preventive Veterinary Medicine and Public Health
Spring. 4(4-0) Sixth-term veterinary medicine students.
Public health aspects of veterinary medicine. Preventive and regulatory medicine including meat and milk hygiene, water supply and treatment, solid and liquid waste treatment and disposal and zoonosis.

560. Urinary System
Spring. 3(3-0) Sixth-term Veterinary Medicine students.
Normal and abnormal structure and function, diagnostic methods, and the medical and surgical manipulation of the urinary system.

561. Core of Medicine Laboratories I
Spring. 2(0-6) Sixth-term Veterinary Medicine students.
Classification diagnosis and treatment of diseases of the urinary, hematopoietic, nervous, integumetary and visual systems of animals.

562. Hematopoietic System
Spring. 2(2-0) Sixth-term Veterinary Medicine students.
Normal structure and function of the hematopoietic system and pathophysiologic effects of hematopoletic diseases. Clinical manifestations, laboratory evaluation and medical management.

563. Visual System
Spring. 2(2-0) Sixth-term Veterinary Medicine students.
Methods of examination, diagnosis, and treatment of ocular diseases.

564. Survey of Infectious Agents
Winter. 3(3-0) Fifth-term veterinary medicine students.
Host-microorganism relationship in diseases of animals; laboratory diagnosis, treatment, control, and public health significance.

566. Nervous System
Spring. 3(3-0) Sixth-term Veterinary Medicine students.
Normal and abnormal neural structure and function in animals with emphasis on clinical neurology and neuropathology.

568. Integumentary System
Spring. 3(3-0) Sixth-term Veterinary Medicine students.
Diseases of the integumentary system of animals with emphasis on laboratory examinations, interpretations of pathological features, diagnosis and treatment.

570. Principles of Anesthesia
Fall. 2(2-0) Seventh-term Veterinary Medicine students.
Principles and techniques of administering anesthetic agents. Supportive care including fluid therapy. Emergency procedures. Euthanasia agents.

571. Core of Medicine Laboratories II
Fall. 1(0-3) Seventh-term Veterinary Medicine students.
Classification, diagnosis and treatment of diseases of the cardiovascular, respiratory and digestive systems of animals. Preanesthetic and anesthetic procedures and skills.

572. Cardiovascular System
Fall. 3(3-0) Seventh-term Veterinary Medicine students.
Pathogenesis, diagnosis, and management of cardiovascular diseases of animals. Anatomical, physiological, pathological and pharmacological principles providing basis for medical and surgical treatment. Diagnostic and surgical procedures and radiologic interpretation.

574. Respiratory System
Winter. 4(4-0) Eighth-term Veterinary Medicine students.
Pathogenesis, diagnosis, and management of respiratory diseases of animals; anatomical, physiological and surgical treatments. Diagnostic and surgical procedures and radiologic interpretation.

576. Digestive System I
Fall. 4(4-0) Seventh-term Veterinary Medicine students.
Pathogenesis, diagnosis, and treatment of diseases of the alimentary tract and digestive organs of small animals.

578. Principles of Surgery I
Fall. 3(2-3) Seventh-term Veterinary Medicine students.
Fundamentals of surgery. Common procedures used in soft tissue surgery with small animals.

580. Theriogenology
(516.) Fall. 6(5-3) Seventh-term Veterinary Medicine students.
Reproductive function and diseases of animals' genital structure and function and endocrine controls. Examination, diagnosis and treatment of the mammary gland and reproductive tract.

581. Core of Medicine Laboratories III
Winter. 3(0-9) Eighth-term Veterinary Medicine students.
Diagnosis and treatment of diseases of the reproductive, digestive and musculosketal systems.

582. Musculoskeletal System I
Winter. 3(3-0) Eighth-term Veterinary Medicine students.
Diagnosis and treatment of musculoskeletal diseases of animals with emphasis on pathological changes, radiological techniques, and interpretation of radiographs.

586. Digestive System II

Winter. 4(4-0) Eighth-term Veterinary Medicine students.

Pathogenesis, diagnosis and treatment of diseases of the alimentary tract and digestive organs of food animals and horses.

588. Principles of Surgery II

Winter. 3(2-3) Eighth-term Veterinary Medicine students.

Fundamental large animal surgery. Surgical techniques and management of animals before, during and after surgery.

590. Client Communication and Jurisprudence

Spring. 2(2-0) Ninth-term Veterinary Medicine students.

Communication and interviewing skills for effective client relations. Communication aspects of medical records and their use in medical problem solving. Legal responsibilities of the veterinary medical profession.

591. Core of Medicine Laboratories IV

Spring. 2(0-6) Ninth-term Veterinary Medicine students.

Diagnosis and treatment of common toxicologic conditions, musculoskeletal disorders and orthopedic conditions in animals.

592. Musculoskeletal System II

Spring. 4(4-0) Eighth-term Veterinary Medicine students.

Diagnosis, prognosis and management of musculoskeletal diseases of large animals. Anatomical relationships of normal to abnormal function. Surgical procedures applicable to the equine and ruminant. Radiographic diagnosis and interpretation of various lameness conditions.

594. Veterinary Toxicology

Spring. 4(4-0) Ninth-term Veterinary Medicine students.

Pharmacological basis and pathological features of diseases of animals caused by common toxic chemicals with emphasis on clinical manifestations, diagnosis, prevention, and treatment.

596. Diseases of Bones and Joints

Spring. 3(3-0) Ninth-term Veterinary Medicine students.

Anatomy and pathophysiology of diseases of bones and joints. Diagnosis, prognosis and treatment of abnormalities involving bones and joints.

602. Veterinary Practice Management

Spring. 2(2-0) Ninth-term Veterinary Medicine students, approval of college.

Establishment of a veterinary practice.

610. Veterinary Externship

Fall, Winter, Spring, Summer. 6 to 12 credits. May reenroll for a maximum of 12 credits. Veterinary Medicine students; completion of preclinical courses and approval of college. Students may not receive credit in both V M 610 and LCS 674.

Clinical or research experience in an off-campus setting.

ZOOLOGY ZOL

College of Human Medicine
College of Natural Science

203. Resource Ecology

(IDC 200.) Fall, Winter, Spring, Summer. 3(3-0) Interdepartmental with the departments of Fisheries and Wildlife, Forestry, Geography, and Resource Development. Administered by the Department of Fisheries and Wildlife.

Basic concepts of ecology which are the unifying basis for resource management, conservation policy and the analysis of environmental quality. Extensive use of guest lecturers.

301. Nature and Homo Sapiens

Spring. 4(4-0) Three terms of natural science; not open to zoology majors.

A case study approach which explores the interaction of technical, social, economic and legal influences on the management of contemporary environmental issues in Michigan.

302. Vertebrate Life of the Past

Fall. 3(3-0) One course in physical or biological science or Juniors. Interdepartmental with and administered by Geology.

Fossil vertebrates from fish to humans.

304. Biology, Behavior and Humans

Winter. 3(3-0) Juniors; not open to zoology majors.

Examines philosophical and biological issues which make the study of animal behavior relevant to humans. Emphasizes history of animal behavior, current theories, and experiments relating biological and environmental determinants of adaptive and non-adaptive behavior patterns.

306. Invertebrate Biology

Fall. 4(3-3) B S 212.

Systematics, morphology, and natural history of invertebrate animals. Laboratory includes identification of live and preserved animals and recognition of morphological characteristics of selected groups.

307. Vertebrate Biology

Winter. 4(3-3) B S 212.

Systematics, morphology and natural history of vertebrate animals. Laboratory includes identification of live and preserved animals and recognition of morphological characteristics of selected groups.

313. Animal Behavior

(413.) Spring: 4(4-0). Given at W. K. Kellogg Biological Station Summer term of odd-numbered years: 4 credits. B S 211.

Description of the known behavior of the various vertebrate and invertebrate phyla with emphasis upon adaptive significance. Thus, special attention will be given to mating, defensive, and nutritive behavior. The genetics and ontogeny of behavioral patterns will be presented where known. Behavior will be related to the ecology of various animal populations.

317. Principles of Development

Fall, Spring. 3(3-0) B S 212.

Development of animals, especially vertebrates. Principles are illustrated by modern experimental studies of developmental problems.

318. Principles of Development Laboratory

Fall, Spring. 2(0-6) ZOL 317 or concurrently; B S 212.

Principles of development illustrated by analysis of the ontogeny of selected organisms.

337. The Fossil Record of Organic Evolution

Spring. 3(3-0) One course in a natural science; Juniors. Interdepartmental with and administered by Geology.

The direct evidence for organic evolution in the fossil record. Evolution of life from prebiological systems to humans. Impact of fossil discoveries on human thought.

341. Human Heredity

Fall, Winter. 4(4-0) Sophomores. Not open to zoology majors. Students may not receive credit in more than one of the following: ZOL 341, ZOL 441.

Inheritance of human physiological, and psychological traits. Forces that influence human evolution. Applications of heredity in fields of education, sociology, anthropology, psychology, dentistry, and medicine.

389. Animal Ecology

Winter, Summer. Given at W. K. Kellogg Biological Station Summer term. Winter: 4(3-4) Summer: 4 credits. B S 212 or concurrently.

Animals in relation to their environment. Factors affecting the distribution and abundance of animals. Interrelationships between climate, soils, vegetation, geologic history and animal life. Population characteristics as related to reproduction and mortality factors.

391. Zoological Problems

Fall, Winter, Spring, Summer. 1 to 8 credits. May reenroll for a maximum of 12 credits. Juniors; B S 212; 6 credits in zoology; approval of department.

Advanced work in morphology, field zoology, genetics, mammalogy, ornithology, or ichthyology.

400H. Honors Work

Fall, Winter, Spring. 1 to 5 credits. May reenroll for a maximum of 15 credits. Juniors; approval of department.

401. Comparative Physiology I

Fall. 4(3-4) PSL 240 or B S 212; CEM 131 or CEM 141. Interdepartmental with and administered by the Department of Physiology.

A comparison of osmoregulation, digestion, respiration, and other physiological processes in a wide range of organisms.

402. Comparative Physiology II

Winter. 4(4-0) PSL 401 or approval of department. Interdepartmental with the Department of Physiology.

A comparison of sensory, motor, endocrine and other integrative mechanisms in animals.

404. Biological and Ecological Concepts for Engineers and Mathematicians

Winter. 3(3-0) Approval of department. Interdepartmental with Systems Science.

Biological and ecological concepts important to formal analysis of living systems, vital properties, processes, and limitations; population dynamics, selection, competition, and predation; ecological community structure and function; industrialized ecosystem.