## VETERINARY MEDICINE (COLLEGE OF) V M

**511. *Introduction to Veterinary Medicine I***
*(V M 500A.) 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***
*(500B.) Winter. 4(3-4) Second-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***
*(500E) Spring. 3(3-0) Third-term Veterinary Medicine students.*
Emphasis on behavior of animals relating to disease prevention and treatment. Lectures, discussions and demonstrations on veterinary ethology including animal communications, reproduction, restraint, handling, housing and feeding habits.

**540. *Metabolic Diseases and Endocrinology***
*(503.) Fall. 2(2-0) Fourth-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 Decision Making***
*Fall. 2(2-0) Fourth-term Veterinary Medicine students.*
Clinical and experimental information and financial decisions.

**550. *Veterinary Public Health and Epidemiology***
*(520.) Winter. 5(5-0) Fifth-term Veterinary Medicine students.*
Public health aspects of veterinary medicine. Principles of epidemiology and their application to the study of diseases of animal populations.

**560. *Urinary System***
*(507.) 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***
*(509.) 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 Systems***
*(532.) Spring. 2(2-0) Sixth-term Veterinary Medicine students.*
Methods of examination, diagnosis, and treatment of ocular diseases.

**564. *Survey of Infectious Agents***
*(510.) Spring. 4(4-0) Sixth-term Veterinary Medicine students.*
Host-microorganism relationship in diseases of animals; laboratory diagnosis, treatment, control, and public health significance.

**566. *Nervous System***
*(512.) 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***
*(524.) 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. 2(0-6) 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***
*(513.) 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***
*(515.) Fall. 4(4-0) Seventh-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***
*(522.) 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.) Winter. 5(5-0) Eighth-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***
*(526.) 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***
*(501.) 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***
*(534.) 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**

*(530.) 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**

*(536.) 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. 8 to 16 credits. May reenroll for a maximum of 16 credits. Veterinary Medicine students; completion of preclinical courses and approval of college. Students may not receive credit in both V M 610 and LSM 674.*

Clinical or research experience in an off-campus setting.

## ZOOLOGY ZOL

**College of Human Medicine**
**College of Natural Science**
**College of Osteopathic Medicine**

**IDC. Resource Ecology and Man**

*For course description, see Interdisciplinary Courses.*

**301. Nature and Man**

*Fall. 4(2-6) Three terms of natural science; not open to zoology majors.*

Relates man to his natural environment. Chief emphasis on identifying characteristic animal life in broad areas of nature and how man fits or misfits into these. Lectures, laboratory and field trips illustrate this relationship.

**302. Vertebrate Life of the Past**

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

Fossil vertebrates from fish to man.

**303. Introductory Animal Systematics**

*Fall. 5(5-0) B S 212.*

General survey of animals including origin, evolution and dispersal, morphological characteristics, reproductive patterns, behavior, ecology and zoogeography of invertebrates and vertebrates.

**304. Biology, Behavior and Man**

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

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

**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.

**320. Vertebrate Systematics Laboratory**

*Winter. 2(0-6) ZOL 303. Open to Zoology majors only; others: approval of department.*

Systematics, morphology and natural history of vertebrate animals as illustrated by representative species within the seven classes.

**325. Invertebrate Systematics Laboratory**

*Winter. 2(0-6) ZOL 303. Open to Zoology majors only; others: approval of department.*

Comparative morphology and taxonomy of the major invertebrate phyla and an examination of their characteristic behavior and physiology.

**337. The Fossil Record of Organic Evolution**

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

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

**341. Human Heredity**

*Fall, Winter, Summer. 4(4-0) Three terms of Natural Science; 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.

**344. Introductory Animal Systematics Laboratory**

*Fall. 2(1-3) ZOL 303 concurrently. Interdepartmental with and administered by Lyman Briggs College.*

Laboratory examination of form and function of representative vertebrate and invertebrate animals.

**389. Animal Ecology**

*Winter. 4(3-4) 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. Variable credit. Juniors.*

**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.

**405H. Experiments in Zoology I**

*(405.) Fall. 4(0-12) Approval of instructor.*

An integrated series of selected experiments in the topics of behavior, ecology, morphology and physiology.

**406. Experiments in Zoology II**

*Winter. 5(2-9) Approval of instructor.*

An integrated series of selected experiments in topics of cell biology, embryology and genetics.

**407. Experiments in Zoology III**

*Spring. 3(0-9) ZOL 405 or ZOL 406, approval of instructor.*

Special problems.

**408. Freshwater Ecology**

*Summer. 6 Credits. B S 212 or approval of department. Given at W. K. Kellogg Biological Station. Interdepartmental with Biological Science and the Department of Botany and Plant Pathology and administered by Biological Science.*

The ecology of freshwater ecosytems, their biotic structure and the functional interrelationships of environmental variables regulating population dynamics, productivity and community structure. Extensive field investigations.

**410. Terrestrial Ecology**

*Summer. 6 credits. B S 212 or approval of department. Given at W. K. Kellogg Biological Station. Interdepartmental with Biological Science and the Department of Botany and Plant Pathology and administered by Biological Science.*

Factors determining distribution and abundance. Interrelationship of plants, animals, and environment. Extensive field investigations of several types of terrestrial communities in light of current theory.

**413. Animal Behavior**

*Spring. 4(4-0) B S 212.*

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.