

**Descriptions — American Thought and Language  
of  
Courses**

**192II. Honors Writing: The American Experience**  
Winter. 3(3-0) Satisfactory grade in the first term of any ATL sequence numbered ATL 121 or above.  
Writing course to improve composition and critical reading abilities. Writings based on analysis of selections from the late nineteenth and early twentieth centuries.

**193III. Honors Writing: The American Experience**  
Spring. 3(3-0) Satisfactory grade in the second term of any ATL sequence numbered ATL 121 or above.  
Writing course to improve composition and research abilities. Writings based on analysis of twentieth century materials reflecting American issues.

**205. Reading for University-Level Understanding**  
Fall, Winter, Spring. 2(0-4) May reenroll for a maximum of 4 credits.  
Individualized instruction in techniques for improving vocabulary, comprehension, rate, study skills and test taking skills in order to achieve a better understanding of university-level materials.

**300. Supervised Individual Study**  
Fall, Winter, Spring, Summer. 2 to 4 credits. May reenroll for a maximum of 12 credits. 9 credits in a composition course; approval of department.  
Selected students requesting individual study of interdisciplinary problems. Variable elective credit will be determined when the student secures instructor, adviser, and department approval.

**ANATOMY ANT**

**College of Human Medicine  
College of Osteopathic Medicine  
College of Veterinary Medicine**

**216. Applied Human Anatomy**  
Fall. 5(4-3) HPE major or coaching minor, approval of department. Interdepartmental with the Department of Health and Physical Education.  
Structural anatomy of the various systems of the human body. Concepts of kinesiological applications.

**316. General Anatomy**  
Fall, Spring. 5(5-0) B S 211 or B S 212 or approval of department.  
Designed to impart the basic concepts of the broad field of anatomy. Special requirements of the various disciplines will be met in their respective laboratories.

**420. Microscopic Anatomy**  
Winter. 5(2-8) Medical Technology students or approval of department.  
Microscopic study of the structure of cells, tissues and organs.

**480. Special Problems**  
Fall, Winter, Spring, Summer. 1 to 5 credits. May reenroll for a maximum of 15 credits. Approval of department.  
Individual study or project under the direction of a faculty member in biomedical research, gross anatomy, histology, neurology, or embryology.

**505A. Anatomy in Physical Diagnosis**  
Fall. 1 to 3 credits. H M 505 concurrently.  
Exercises in which students study systemic anatomy in a physical diagnosis context. Preparatory self-instruction precedes exercises.

**510. Veterinary Gross Anatomy**  
Fall. 6(3-9) First-term Veterinary Medicine students.  
Gross anatomy of a representative animal, the dog, is studied. Lecture, dissection of embalmed specimen, study of prosections, slides, models and living animals.

**511. Veterinary Histology**  
Fall. 5(3-6) First-term Veterinary Medicine students.  
A general histology course for veterinary students which includes a survey of the tissue of the animal body.

**512. Veterinary Neuro Anatomy**  
Winter. 2(2-0) Second-term Veterinary Medicine students.  
Gross anatomy of the central nervous system in animals emphasizing functional and dysfunctional aspects of pathways and nuclei in dogs as a foundation for clinical neurology.

**513. Veterinary Microscopic Anatomy**  
Winter. 4(2-4) Second-term Veterinary Medicine students.  
Microscopic anatomy of the digestive, urinary, respiratory, male and female reproductive systems, integumentary system, central nervous system and special sense organs of domesticated animals.

**514. Veterinary Comparative Anatomy (523.)**  
Winter. 5(4-4) Second-term Veterinary Medicine students.  
Lecture, dissection of embalmed specimens and the study of prosections, models and live animals related to the anatomy of the domestic animals.

**540. Gross Biomedical Structure**  
Winter. 1 to 15 credits. May reenroll for a maximum of 15 credits. Admission to a college of medicine; graduate students with approval of department.  
Regional gross anatomy of the back, thorax, abdomen, pelvis and perineum.

**541. Gross Biomedical Structure**  
Spring. 1 to 15 credits. Admission to a college of medicine; graduate students with approval of department.  
Regional gross anatomy of the head and neck.

**543. Human Histology**  
Fall. 4(2-4) Human Medicine students; approval of department for graduate students.  
The structure and function of human cells, tissues, and organs.

**544. Human Ontogenesis**  
Fall. 3(3-0) Admission to a college of medicine; graduate students with approval of department.  
Formal lectures, class conferences and student reports on the normal and abnormal organogenesis of the human embryo and fetus with emphasis on clinical correlations.

**545. Neuroanatomy**  
Winter. 3(4-0) Admission to medical school or approval of Neuroscience Committee.  
Introduction to gross and microscopic anatomy of the human nervous system, to related basic neurophysiologic concepts and to a problem-solving approach to the diagnosis of nervous system disease.

**560. Medical Histology**  
Fall. 4(3-4) Admission to a college of medicine or approval of department.  
Structural and functional characteristics of basic cells, tissues and organ systems. Emphasis on core concepts and visual discrimination.

**563. Osteopathic Medical Neuroanatomy**  
Spring. 4(3-4) Admission to a college of medicine; graduate students with approval of department.  
Medically oriented problem-solving neuroanatomy with laboratory. Structure of the human nervous system is correlated with normal function, clinical testing and classical lesions encountered in medical practice.

**565. Introduction to Human Cross Anatomy**  
Fall. 6(4-6) Admission to a college of medicine or approval of department.  
Core concepts in regional, systemic and topographical human gross anatomy: Prosection, discussion and lecture methods using audiovisual aids and frequent review.

**580. Special Problems**  
Fall, Winter, Spring, Summer. 1 to 5 credits. May reenroll for a maximum of 15 credits. Admission to professional program in the College of Human Medicine, College of Osteopathic Medicine or the College of Veterinary Medicine, and approval of department.  
Biomedical research, gross anatomy, histology, neurology, immunology or embryology.

**813. Problems in Anatomy**  
Fall, Winter, Spring, Summer. 1 to 5 credits. May reenroll for a maximum of 15 credits. Basic disciplines in various areas and approval of department.  
Various anatomical fields such as gross anatomy, histology, hematology, tissue culture, cytology, neurology and embryology will be studied.

**815. Anatomy of the Nervous System**  
Fall. 5(3-5) Approval of department.  
Developmental, gross and microscopic anatomy of the nervous system. Organizational and functional aspects of the peripheral and central nervous system are stressed. Gross demonstrations include brain and dog dissections.

**820. Advanced Neuroanatomy: Structure and Function of Cells of CNS**  
Spring. 3 credits. ANT 815 and approval of instructor.  
Correlated anatomy and physiology of CNS cells and their processes including current concepts and principles of cytology, ultrastructure, development and plasticity, axonal transport mechanisms, electrical properties and functional connections.

**839. Systems Neuroscience**  
Winter. 5(4-2) PSL 801 or approval of course coordinator. Interdepartmental with the departments of Pharmacology and Toxicology, and Physiology. Administered by the Department of Physiology.  
Physiology, anatomy and pharmacology of sensory, somatomotor and autonomic neural systems.

**865. Advanced Neurobiology**  
Spring. 4(4-0) ZOL 827. Interdepartmental with the departments of Physiology, Psychology, and Zoology.

Basic organization, structure and function of neural networks comprising sensory, motor, and autonomic systems including examples from invertebrates and vertebrates. Attendance at neuroscience seminar is required.

**885. Vertebrate Neural Systems I**  
(PSY 885.) Winter of even-numbered years. 5(3-4) ANT 815, ANT 865 recommended. Interdepartmental with the departments of Physiology, Psychology, and Zoology.

Structure and function of major component systems of vertebrate brains, their evolution, ontogeny and comparative analysis in mammals, birds, reptiles, amphibians and fish. Interrelation of behavioral, anatomical and physiological studies.

**886. Vertebrate Neural Systems II**  
(ZOL 886.) Spring of even-numbered years. 5(3-4) ANT 885. Interdepartmental with the departments of Physiology, Psychology, and Zoology.

Continuation of ANT 885. Major component systems of vertebrate brains, their evolution, ontogeny, and comparative analysis in mammals, birds, reptiles, amphibians and fish. Interrelation of behavioral, anatomical, and physiological studies.

**891. Concepts in Tumorigenesis**  
Winter of even-numbered years. 2(2-0) Approval of instructor.

In depth evaluation of the current concepts in tumorigenesis emphasizing the experimental results from which these concepts evolved.

**899. Master's Thesis Research**  
Fall, Winter, Spring, Summer. Variable credits. Majors.

**999. Doctoral Dissertation Research**  
Fall, Winter, Spring, Summer. Variable credit. Majors.

## **ANIMAL SCIENCE                      ANS**

### **College of Agriculture and Natural Resources**

**111. Animal Industries Colloquium**  
(213.) Fall. 1(2-0)

History of animal agriculture. Current activities, goals and limitations of animal industries and agribusiness. Professional responsibilities and utilization of academic and non-academic experiences.

**211. Principles of Animal Science**  
Spring. 5(5-0) B S 211.

Animal industries and species. Principles of genetics, reproduction, lactation, nutrition and management. Systems of production and marketing for farm animals.

**217. Evaluation of Animal and Carcass**  
(A H 235.) Fall. 3(1-4) ANS 211 or concurrently.

Evaluation of breeding stock, market animals, and carcasses. Emphasis on production records and soundness of breeding animals, quality grading, yield grading and pricing market animals and carcasses.

**232. Dairy Production Laboratory**  
Spring. 1(0-3) ANS 211 or concurrently.

Physical characteristics of cows and facilities. Anatomy. Experience in estrous detection, milking equipment, feeds and rations and records. Normal cow behavior.

**242. Introduction to Horse Management**  
(A H 214.) Fall. 3(3-1)

The horse industry in today's society. Relationship of form to function. Selection, breeding, feeding, foot care, health, and management of the pleasure horse.

**252. Livestock Production Laboratory**  
Spring. 1(0-3) ANS 211 or concurrently.

Species and classification of livestock. Anatomy. Feeds and rations. Determining market value. Managerial skills.

**256. Meats, Poultry and Fishery Products I**

(A H 242.) Fall. 3(2-2) Interdepartmental with and administered by Food Science. Principles of evaluation and nutritive value. Identification of grades and cuts of beef, pork, lamb and poultry products.

**257A. Meat Evaluation and Grading**

(A H 245.) Winter. 1(0-3) ANS 217. Students may not earn more than 10 credits from the following courses: ANS 257A, ANS 257B, ANS 337, ANS 347A, ANS 347B, ANS 357A, ANS 357B, ANS 357C.

Evaluation of beef, pork and lamb carcasses and wholesale cuts according to industry and consumer demands. Federal grading standards. Field trips to meat packing operations required.

**257B. Meat Evaluation and Grading**

(A H 245.) Fall. 1 to 3 credits. ANS 257A. Students may not earn more than 10 credits from the following courses: ANS 257A, ANS 257B, ANS 337, ANS 347A, ANS 347B, ANS 357A, ANS 357B, ANS 357C.

Evaluation of beef, pork and lamb carcasses and wholesale cuts according to industry and consumer demands. Federal grading standards. Field trips to meat packing operations required.

**261. Introduction to Poultry Production**  
(P S 224.) Winter, Spring. 3(3-0)

Poultry in the agricultural economy. Fundamental principles of anatomy and physiology. Management practices. Prevention and control of disease.

**262. Poultry Production Laboratory**  
Winter, Spring. 1(0-3) ANS 261 or concurrently or approval of department.

Breeds of poultry. Processing poultry and products. Anatomy and physiology. Facilities, feeds and rations. Evaluation and incubation of eggs. Managerial skills.

**312A. Intensive Livestock Systems**  
Fall. 3(1-4) Juniors, FSM 330 recommended.

Systems study of intensive livestock projects. Enterprise planning and analysis. Feeding and purchasing strategies. Production techniques. Students manage livestock. Field trips required.

**312B. Intensive Livestock Systems**  
Winter. 3(1-4) ANS 312A.

Continuation of ANS 312A. Computer based surveillance and evaluation of livestock project. Marketing concepts and practices. Students manage livestock. Field trips required.

**313. Principles of Animal Nutrition**  
(325.) Fall. 5(5-0) PSL 241, CEM 143; BCH 200 recommended.

Livestock feeds and nutrients. Functions of and requirements for nutrients. Evaluation of feeds. Feeding practices. Formulation of rations for beef and dairy cattle, horses, poultry, sheep and swine.

**314. Principles of Animal Breeding**  
(361.) Winter. 3(3-0) B S 211 or a course in Mendelian genetics.

Quantitative inheritance. Gene frequency. Statistical tools used in animal breeding. Effect of selection and mating systems on animal population.

**337. Judging Dairy Cattle**

(DRY 323.) Spring. 3(0-6) Students may not earn more than 10 credits from the following courses: ANS 257A, ANS 257B, ANS 337, ANS 347A, ANS 347B, ANS 357A, ANS 357B, ANS 357C.

Desired type in dairy cattle. Judging and show ring procedures. Competitive judging. Teams selected to represent Michigan State University in national competition.

**347A. Judging Horses**

(A H 335.) Spring. 2(0-6) ANS 217. Students may not earn more than 10 credits from the following courses: ANS 257A, ANS 257B, ANS 337, ANS 347A, ANS 347B, ANS 357A, ANS 357B, ANS 357C.

Evaluation of conformation. Productive and functional merits of individual horses. Field trips to prominent equine establishments and events required.

**347B. Judging Horses**

(A H 335.) Fall. 1(0-6) ANS 347A. Students may not earn more than 10 credits from the following courses: ANS 257A, ANS 257B, ANS 337, ANS 347A, ANS 347B, ANS 357A, ANS 357B, ANS 357C.

Course to be completed in the first half of the quarter. Evaluation of conformation. Productive and functional merits of individual horses. Field trips to prominent equine establishments and events required.

**357A. Judging Livestock**

(A H 335.) Winter. 1 to 3 credits. ANS 217 or approval of department. Students may not earn more than 10 credits from the following courses: ANS 257A, ANS 257B, ANS 337, ANS 347A, ANS 347B, ANS 357A, ANS 357B, ANS 357C.

Evaluation of conformation of cattle, pigs and sheep. Productive and functional merits of individual food animals. Field trips to prominent livestock establishments required.

**357B. Judging Livestock**

(A H 335.) Spring. 1 to 3 credits. ANS 357A. Students may not earn more than 10 credits from the following courses: ANS 257A, ANS 257B, ANS 337, ANS 347A, ANS 347B, ANS 357A, ANS 357B, ANS 357C.

Evaluation of conformation of cattle, pigs and sheep. Productive and functional merits of individual food animals. Field trips to prominent livestock establishments and to major livestock events required.