

Description — American Thought and Language of Courses

182. Writing: Women in America
Winter. 3(3-0) Three credits in the first term of any ATL sequence numbered 121 or higher or approval of department.

Writing course to improve composition and critical reading abilities. Writings based on American women from pre-Colonial times through First Wave Feminism. Emphasis on style and development of essays.

183. Writing: Women in America
Spring. 3(3-0) Three credits in the second term of any ATL sequence numbered 121 or higher or approval of department.

Writing course to improve composition and critical reading abilities. Writings based on women in American life and literature from 1920 to the present. Research project required.

191H. Honors Writing: The American Experience
Fall. 3(3-0) Satisfactory performance on the placement test.

Writing course to improve composition and critical reading abilities. Writings based on analysis of selected material from Colonial to early nineteenth century topics.

192H. 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.

193H. 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.

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.

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.) Spring. 5(4-4) Third-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 Gross 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.

814. Graduate Student Seminar
Spring. 1 to 3 credits. May reenroll for a maximum of 6 credits. Admittance to Ph.D. program in Department of Anatomy.

Supervised practice in delivering and evaluating written abstracts and public oral presentations of anatomical science; techniques of organization, timing, and effective illustrations.

ANATOMY

ANT

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

216. Applied Human Anatomy
Fall. 5(4-3) HCP major or coaching minor, approval of department. Interdepartmental with the School of Health Education, Counseling Psychology and Human Performance.

Structural anatomy of the various systems of the human body. Concepts of kinesiological applications.

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

Summer. 1 to 5 credits. May reenroll for a maximum of 15 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

(PSL 839.) Winter of odd-numbered years. 5(4-2) Approval of department. Interdepartmental with the departments of Pharmacology and Toxicology, and 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 odd-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 odd-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.

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

110. Introductory Animal Science

Fall. 3(3-0)
History of breeds and their use, production techniques, marketing. Current goals and limitations affecting U.S. animal production.

132. Dairy Production Laboratory

(ANS 232.) Spring. 1(0-3) ANS 110.
Physical characteristics of cows and facilities. Anatomy. Experience in estrous detection, milking equipment, feeds and rations and records. Normal cow behavior.

142. Horse Production Laboratory

Spring. 1(0-3) ANS 110.
Handling and care of horses. Structural anatomy, reproduction, nutrition and management practices.

152. Livestock Production Laboratory

(ANS 252.) Fall. 1(0-3) ANS 110 or concurrently.
Anatomy, care, feeding, management, handling and slaughter of commercial livestock species. Evaluation of livestock relating skeletal structure to animal performance.

162. Poultry Production Laboratory

(ANS 262.) Winter. 1(0-3) ANS 110.
Breeds of poultry. Processing poultry and products. Anatomy and physiology. Facilities, feeds and rations. Evaluation and incubation of eggs. Managerial skills.

211. Principles of Animal Science

Spring. 3(3-0) ANS 110, B S 211.
Principles of nutrition, reproduction, lactation, genetics and meat science. Comparative anatomy and physiology of food animals.

217. Evaluation of Animal and Carcass

Fall. 3(1-4) ANS 110, ANS 152.
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.

256. Meats, Poultry and Fishery Products I

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

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

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.

310. Animal Science Seminar

Fall. 1(2-0) Juniors, ANS 110 or concurrently.
Current production and policy issues in animal science.

313A. Principles of Animal Nutrition

(ANS 313.) Fall. 4(4-0) BCH 200 or BCH 401, MPH 200, PSL 241.
Requirements for and metabolism of nutrients. Feeding practices and diets for beef and dairy cattle, horses, poultry, sheep and swine.

313B. Feeds and Diet Formulation

Winter. 2(1-2) ANS 313A.
Feed processing, premixes and feed additives. Feed manufacture. Net energy system. Diet and least cost formulation for cattle, sheep, horses, poultry and swine. Field trips required.

314. Principles of Animal Breeding

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.

315. Principles of Farm Animal Physiology

Spring. 4(3-2) ANS 211, PSL 241.
Anatomy and physiology emphasizing endocrine integration for homeostasis and homeorhesis. Regulatory interaction among growth, lactation and reproduction during different productive states of farm animals.

318. Merchandising Purebred Livestock

Spring of odd-numbered years. 2(1-2) ANS 132, ANS 142, or ANS 152; or approval of department.

Purebred livestock industry structure. Methods of merchandising breeding livestock including private treaty and auction sales. Advertising, sale selection, and budgeting of a purebred livestock sale.

337. Judging Dairy Cattle

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 showing procedures. Competitive judging. Teams selected to represent Michigan State University in national competition.

347A. Judging Horses

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

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

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.