

Descriptions — American Thought and Language of Courses

125. Writing: The American Ethnic and Racial Experience
Fall, Spring. 4(4-0)

P: Designated score on English placement test or ATL 1004. *R:* Not open to students with credit in MC 111 or MC 112 or LBS 133 or ATL 110 or ATL 115 or ATL 120 or ATL 130 or ATL 135 or ATL 140 or ATL 145 or ATL 150 or ATL 195H or AL 192 or AL 192H.

Drafting, revising, and editing compositions derived from readings on the experience of American ethnic and racial groups to develop skills in narration, persuasion, analysis, and documentation.

130. Writing: American Radical Thought
Fall, Spring. 4(4-0)

P: Designated score on English placement test or ATL 1004. *R:* Not open to students with credit in MC 111 or MC 112 or LBS 133 or ATL 110 or ATL 115 or ATL 120 or ATL 125 or ATL 135 or ATL 140 or ATL 145 or ATL 150 or ATL 195H or AL 192 or AL 192H.

Drafting, revising, and editing compositions derived from readings on American radical thought to develop skills in narration, persuasions, analysis, and documentation.

135. Writing: Public Life in America
Fall, Spring. 4(4-0)

P: Designated score on English placement test or ATL 1004. *R:* Not open to students with credit in MC 111 or MC 112 or LBS 133 or ATL 110 or ATL 115 or ATL 120 or ATL 125 or ATL 130 or ATL 140 or ATL 145 or ATL 150 or ATL 195H or AL 192 or AL 192H.

Drafting, revising, and editing compositions derived from readings on American civic tradition and community service-learning experiences to develop skills in narration, persuasion, analysis, and documentation.

140. Writing: Women in America
Fall, Spring. 4(4-0)

P: Designated score on English placement test or ATL 1004. *R:* Not open to students with credit in MC 111 or MC 112 or LBS 133 or ATL 110 or ATL 115 or ATL 120 or ATL 125 or ATL 130 or ATL 150 or ATL 145 or ATL 150 or AL 195H or AL 192 or AL 192H.

Drafting, revising, and editing compositions derived from readings on women in America to develop skills in narration, persuasion, analysis, and documentation.

145. Writing: Men in America
Fall, Spring. 4(4-0)

P: Designated score on English placement test or ATL 1004. *R:* Not open to students with credit in MC 111 or MC 112 or LBS 133 or ATL 110 or ATL 115 or ATL 120 or ATL 125 or ATL 130 or ATL 135 or ATL 140 or ATL 150 or ATL 195H or AL 192 or AL 192H.

Drafting, revising, and editing compositions derived from readings on men in America to develop skills in narration, persuasion, and analysis, and documentation.

150. Writing: The Evolution of American Thought
Fall, Spring. 4(4-0)

P: Designated score on English placement test or ATL 1004. *R:* Not open to students with credit in MC 111 or MC 112 or LBS 133 or ATL 110 or ATL 115 or ATL 120 or ATL 125 or ATL 130 or ATL 135 or ATL 140 or ATL 145 or ATL 195H or AL 192 or AL 192H.

Drafting, revising, and editing compositions derived from American historical, social, and cultural texts to develop skills in narration, persuasion, analysis, and documentation.

195H. Writing: Major Topics in American Thought
Fall, Spring. 4(4-0)

P: Designated score on English placement test. *R:* Not open to students with credit in MC 111 or MC 112 or LBS 133 or ATL 110 or ATL 115 or ATL 120 or ATL 125 or ATL 130 or ATL 135 or ATL 140 or ATL 145 or ATL 150 or AL 192 or AL 192H.

Drafting, revising, and editing compositions derived from readings on major topics in American thought to develop advanced skills in narration, persuasion, analysis, and documentation.

290. Independent Study
Fall, Spring, Summer. 1 to 4 credits.

R: Open only to freshmen and sophomores. Approval of department.

Special projects arranged by an individual student and a faculty member in areas supplementing regular course offerings.

ANATOMY

ANT

**Department of Anatomy
College of Human Medicine
College of Osteopathic Medicine
College of Veterinary Medicine**

316. General Human Anatomy
Spring. 3(3-0)

P: BS 110 or BS 111 or approval of department.

Human structure. Major systems of the human body.

480. Special Problems in Anatomy

Fall, Spring, Summer. 1 to 5 credits. A student may earn a maximum of 15 credits in all enrollments for this course.

R: Approval of department.

Topics from an anatomical field such as gross anatomy, histology, tissue culture, cytology, neurology, or embryology.

515. Comparative Veterinary Gross Anatomy
Fall. 6(2-10)

R: Open only to graduate-professional students in the College of Veterinary Medicine.

Canine anatomy. Comparisons with ruminant, porcine, and equine anatomy.

516. Veterinary Histology and Cell Biology
Fall. 4(3-2)

R: Open only to graduate-professional students in the College of Veterinary Medicine.

Principles of developmental, cellular, and molecular biology as related to veterinary medicine.

517. Veterinary Neuroanatomy
Spring. 1(1-0)

R: Completion of 1 semester of the graduate-professional program in the College of Veterinary Medicine. Introduction to the anatomy of the nervous system using the canine species as a model.

551. Medical Gross Anatomy
Fall. 6(4-6)

R: Graduate-professional students in colleges of Human and Osteopathic Medicine.

Gross anatomy of the human body using prosections, medical imaging, clinical correlations, case studies, video tapes, and computer aided instruction.

552. Medical Neuroscience

Spring. 4(3-2) Interdepartmental with Physiology and Radiology.

R: Graduate-professional students in colleges of Human and Osteopathic Medicine.

Correlation of normal structure and function of the human nervous system with clinical testing, classical lesions, and common diseases.

562. Medical Histology
Spring. 3(2-2)

R: Graduate-professional students in colleges of Human and Osteopathic Medicine. Histology of the human body.

585. Human Gross Anatomy Dissection

Fall, Spring, Summer. 2 to 7 credits. A student may earn a maximum of 15 credits in all enrollments for this course.

P: ANT 551. *R:* Graduate-professional students in colleges of Human and Osteopathic Medicine.

Dissection of selected regions of the human body.

610. Veterinary Gross Anatomy Dissection

Spring. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course.

P: ANT 515. *R:* Open only to graduate-professional students in College of Veterinary Medicine.

Dissection and prosection of selected regions of domestic animals.

611. Research Problems in Veterinary Anatomy

Fall, Spring, Summer. 1 to 3 credits. A student may earn a maximum of 6 credits in all enrollments for this course.

R: Open only to graduate-professional students in the College of Veterinary Medicine. Approval of department.

Veterinary gross anatomy, cell biology, histology, or neurobiology.

802. Clinical Surgical Anatomy

Spring. 4(2-4) Interdepartmental with Surgery. Administered by Surgery.

R: Open only to Master's students in Surgery.

Review of surgical anatomy. Detailed anatomical information through lecture and dissection sessions. Clinical interpretation of anatomy and surgical approaches.

813. Problems in Anatomy

Fall, Spring, Summer. 1 to 5 credits. A student may earn a maximum of 5 credits in all enrollments for this course.

R: Approval of department.

Fields such as gross anatomy, histology, tissue culture, cytology, neurology and embryology.

814. Graduate Seminar

Spring of even-numbered years. 1 to 3 credits.

R: Open only to graduate students in Anatomy.

Supervised practice in evaluating abstracts and delivering oral presentations of anatomical sciences. Organization, timing and effective illustrations.

820. Advanced Neuroanatomy

Summer of odd-numbered years. 1 to 5 credits.

A student may earn a maximum of 12 credits in all enrollments for this course.

R: Approval of department.

Current topics in anatomy and physiology and processes of central nervous system cells.

839. Systems Neuroscience

Spring of odd-numbered years. 4(4-0) Interdepartmental with Pharmacology and Toxicology, and Physiology.

R: Open only to graduate students in the Colleges of Human Medicine, Osteopathic Medicine, Agriculture and Natural Resources, Natural Science, and Veterinary Medicine.

Anatomy, pharmacology, and physiology of multicellular neural systems. Sensory, motor, autonomic, and chemo-regulatory systems in vertebrate brains.

885. Vertebrate Neural Systems

Spring of odd-numbered years. 3(2-2) Interdepartmental with Physiology.

Comparative analysis of major component systems of vertebrate brains. Evolution, ontogeny, structure, and function in fish, amphibians, reptiles, birds and mammals.

899. Master's Thesis Research
Fall, Spring, Summer. 1 to 8 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
R: Open only to graduate students in Anatomy.

999. Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 36 credits in all enrollments for this course.
R: Open only to graduate students in Anatomy.

ANIMAL SCIENCE ANS

Department of Animal Science College of Agriculture and Natural Resources

110. Introductory Animal Agriculture
Fall. 3(2-2)

History of animal agriculture and its relationship to human needs, production systems, marketing, environmental considerations. Current goals of and limitations affecting U.S. animal production.

112. Introductory Animal Management
Spring. 3(2-2)

Principles of managing beef and dairy cattle, horses, poultry, sheep and swine throughout their life cycles. Topics include genetics, nutrition, reproduction, health, care, and economically efficient production.

200A. Introductory Judging of Livestock or Carcasses

Spring. 1 to 2 credits. A student may earn a maximum of 3 credits in all enrollments for this course. P: ANS 211. R: A student may earn a maximum of 8 credits from ANS 200A, ANS 200B, ANS 300A, ANS 300B, ANS 300C and ANS 300D.

Evaluation of functional conformation of beef cattle, sheep and swine and their carcasses. Preparation for intercollegiate competition. Field trips required.

200B. Introductory Judging of Dairy Cattle or Horses

Spring. 1 to 2 credits. A student may earn a maximum of 3 credits in all enrollments for this course. R: A student may earn a maximum of 8 credits from ANS 200A, ANS 200B, ANS 300A, ANS 300B, ANS 300C and ANS 300D.

Evaluation of functional conformation of dairy cattle or horses. Preparation for intercollegiate competition. Field trips required.

210. Animal Products
Fall. 4(3-3)

P: ANS 112. R: Not open to freshmen.

Edible animal products. Processing, preservation, storage and distribution of dairy, meat, and egg products.

211. Animal and Product Evaluation
Fall of odd-numbered years. 3(1-4)

Evaluation of breeding stock, market animals and carcasses. Production records and soundness of breeding animals. Quality grading, yield grading and pricing of market animals and carcasses.

212. Merchandising Purebred Livestock
Spring of odd-numbered years. 2(1-2)

R: Open only to sophomores, juniors, and seniors.

Purebred livestock industry. Private treaty and auction sales. Advertising, animal selection and budgeting of purebred livestock sales. Field trips required.

242. Introductory Horse Management
Fall. 3(2-2)

Principles of horse management. Reproduction, nutrition, herd health, genetics, economics, marketing. Field trips required.

262. Sheep Management
Spring. 3(2-2)

R: Open only to sophomores, juniors, and seniors.

Principles of sheep management: genetics, reproduction, nutrition, marketing, and economics. Field trips required.

275. Seafood Systems Management

Spring. 3(3-0) Interdepartmental with Food Science and Fisheries and Wildlife. Administered by Fisheries and Wildlife.

Domestic and international perspectives on major aquatic foods. Cultural and nutritional value; wild harvest; aquaculture; processing technology; food handling and food safety.

300A. Advanced Livestock Judging

Fall of even-numbered years. 2 credits.

P: ANS 200A. R: Not open to freshmen. A student may earn a maximum of 8 credits from ANS 200A, ANS 200B, ANS 300A, ANS 300B, ANS 300C and ANS 300D.

Evaluation of conformation and performance records of beef cattle, swine and sheep. Represent MSU in intercollegiate competition. Field trips required.

300B. Advanced Meat Evaluation and Grading

Fall of odd-numbered years. 2 credits.

P: ANS 200A. R: Not open to freshmen. A student may earn a maximum of 8 credits from ANS 200A, ANS 200B, ANS 300A, ANS 300B, ANS 300C and ANS 300D.

Evaluation of beef, pork, and lamb carcasses and wholesale cuts according to industry standards. Federal grading standards. Field trips to meat packing operations required. Represent MSU in intercollegiate competition.

300C. Advanced Dairy Cattle Judging
Fall. 2 credits.

P: ANS 200B. R: Not open to freshmen. A student may earn a maximum of 8 credits from ANS 200A, ANS 200B, ANS 300A, ANS 300B, ANS 300C and ANS 300D.

Evaluation of conformation of various breeds of dairy cattle. Represent MSU in intercollegiate competition. Field trips required.

300D. Advanced Horse Judging
Fall. 2 credits.

P: ANS 200B. R: Not open to freshmen. A student may earn a maximum of 8 credits from ANS 200A, ANS 200B, ANS 300A, ANS 300B, ANS 300C and ANS 300D.

Evaluation of functional characteristics of horses. Represent MSU in intercollegiate competition. Field trips required.

310. Livestock and Product Marketing
Fall. 3(2-2) Interdepartmental with Food Systems Economics and Management.

P: ANS 112. R: Not open to freshmen.

Movement of livestock and products into and through market channels. Market structures, futures, options. Current issues. Field trip required.

313. Principles of Animal Feeding and Nutrition

Fall. 4(3-2)

P: CEM 143, BS 111. R: Completion of Tier I writing requirement.

Principles and practices of nutrition for cattle, horses, poultry, sheep and swine. Metabolism of protein, minerals, and vitamins. Diet formulation. Performance prediction. Nutritional maladies. Field trip required.

314. Genetic Improvement of Farm Animals
Fall. 4(3-2)

P: BS 111 and MTH 110 or MTH 116. R: Completion of Tier I writing requirement.

Qualitative and quantitative inheritance in domestic farm animals. Statistical concepts and probability related to animal breeding. Improvement of dairy cattle, livestock, and horses through genetics and mating systems.

315. Anatomy and Physiology of Farm Animals

Spring. 4(3-2)

P: BS 111. R: Completion of Tier I writing requirement.

Gross and microanatomy of farm animals. Structure directed function of tissues. Endocrine integration for homeostasis. Regulation of growth, lactation, and reproduction. Homeorhesis.

401. Issues in Animal Agriculture
Spring. 1(2-0)

P: ANS 313 or ANS 314 or ANS 315. R: Open only to juniors and seniors.

Societal issues related to local, national and international animal agriculture.

405. Endocrinology of Reproduction
Fall. 3(3-0)

P: ANS 315. R: Not open to freshmen and sophomores.

Endocrine regulation of reproduction. Cellular and molecular aspects of gametogenesis, folliculogenesis, sexual cycles, fertilization, sex differentiation, gestation, and parturition. Technology to regulate reproduction.

407. Food and Animal Toxicology
Fall. 3(3-0) Interdepartmental with Food Science.

P: BCH 200 or BCH 401. R: Not open to freshmen and sophomores.

Fate and effects of chemicals in the food chain. Impact on animal production. Residues in food products. Food safety assessment. Control methods.

407L. Toxicology Methods Laboratory
Fall. 2 credits. Interdepartmental with Food Science.

P: ANS 407 or concurrently. R: Not open to freshmen and sophomores.

Laboratory techniques for evaluating potential toxicity of chemicals to living systems. Field trip to industrial toxicology laboratory required.

413. Non-Ruminant Nutrition
Spring. 4(3-2)

P: ANS 313. R: Not open to freshmen and sophomores.

Nutrition of horses, swine and poultry. Digestive and metabolic development and nutrient requirements. Relationships of genetics, endocrinology, immunology, and environment to nutrition.

414. Advanced Animal Breeding and Genetics

Spring. 3(3-0)

P: ANS 314. R: Not open to freshmen and sophomores.

Application of genetics to animal breeding. Current and potential selection programs and crossbreeding systems of dairy cattle, horse and livestock populations. Expected response to selection methods.

415. Biology of Growth and Lactation
Spring. 3(3-0)

P: ANS 315. R: Not open to freshmen and sophomores.

Principles of growth and lactation in food-producing species. Endocrine regulation of bone, muscle, fat, and mammary tissue. Bioenergetic, nutritional, and metabolic aspects of growth and lactation.