181. Women in America
(S1J) Fall. 3(3-0) Satisfactory grade on English proficiency examination or in Comprehensive English.
Aims to acquaint the student with women's experience in America, and to improve the student's ability at reading and writing. Selected readings and theme topics.

182. Women in America
(S1J) Winter. 3(3-0) Three credits in the first term of any ATL sequence numbered 121 or above; or satisfactory performance in Comprehensive English.
Aims to acquaint the student with women's experience in America, and to improve the student's ability at reading and writing. Selected readings and theme topics.

183. Women in America
(S1J) Spring. 3(3-0) Three credits in the second term of any ATL sequence numbered 121 or above; or satisfactory performance in Comprehensive English.
Aims to acquaint the student with women's experience in America, and to improve the student's ability at reading and writing. Selected readings and theme topics.

191H. Honors Work in American Experience
(S1H) Fall. 3(3-0) Satisfactory grade in entrance examination.
Students read and write on selected topics to improve their knowledge of the American heritage and their ability at reading and writing.

192H. Honors Work in American Experience
(S1H) Winter. 3(3-0) Satisfactory grade in the first term of any ATL sequence numbered 121 or above.
Students read and write on selected topics to improve their knowledge of the American heritage and their ability at reading and writing.

193H. Honors Work in American Experience
(S1H) Spring. 3(3-0) Satisfactory grade in the second term of any ATL sequence numbered 121 or above.
Students read and write on selected topics to improve their knowledge of the American heritage and their ability at reading and writing.

300. Supervised Individual Study
Fall, Winter, Spring. 2 to 4 credits. 9 credits in a composition course; approval of department.
Selected students requesting individual study of interdisciplinary problems will work under supervision of University College professors. Variable elective credit will be determined when the student has instructor, advisor, and department approval.

ANATOMY

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

316. General Anatomy
Fall. Spring. 5(5-0)
Designed for 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
Fall. 5(5-0) Medical Technology students or approval of department.
Microscopic study of the structure of cells, tissues and organs.

505. Anatomy in Physical Diagnosis
Fall. 2(2-0) The student will study independently to learn how anatomy is utilized in physical diagnosis by working with simulated patients. This will be supplemented by self-instructional, audio-visual cards on radiological anatomy and projections.

520. Veterinary Anatomy
Summer. 5(3-6) Admission to professional veterinary program.
A general histology course for veterinary students which includes a survey of the tissue of the animal body.

521. Veterinary Anatomy
Fall. 6(3-9) Admission to professional veterinary program.
Gross anatomy of a representative animal, the dog, is studied. Lectures, dissection of embalmed specimens, study of dissections, slides, models and living animals.

522. Veterinary Anatomy
Fall. 4(2-8) 550. Microscopic anatomy of the digestive, respiratory, male and female reproductive systems, central nervous system and special sense organs of domestic animals.

523. Veterinary Anatomy
Winter. 4(2-8) 531 or approval of department.
Lecture, dissection of embalmed specimens and the study of dissections, models and live animals related to the anatomy of the domestic animals.

540. Gross Biomedical Structure
Fall, Winter, Spring. Variable credit.
May re-enroll for a maximum of 15 credits. Human Medicine students: approval of department for graduate students.
Human structure, systemic and regional, is studied in self-instructional and dissection sequence. Application of this knowledge to recognition of normal and abnormal structure in appropriate medical contexts is accomplished through self-instructional and clinical sessions.

543. Microscopic Anatomy
Fall. 5(3-6) Human Medicine students; approval of department for graduate students.
The normal structure of cells, tissues and organs as they appear under the light and electron microscope.

560. Microbiomedical Structure
Fall. 2(1-3) Approval of department.
The purpose of this course is to assist the student in learning to better understand the various activities of the human body through interpretation of the microscopic structure of tissues.

585. Survey of Anatomy I
Fall. 5(3-9) Osteopathic freshmen, or approval of department.
Core concepts in regional, systemic and topographical human gross anatomy: Prosection, discussion and lecture methods using audio-visual aids and frequent review.

801. Seminar
Fall, Winter, Spring. 1(1-0) Approval of department.

813. Problems in Anatomy
Fall, Winter, Spring, Summer. Variable credit. May re-enroll 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.

589. Research
Fall, Winter, Spring, Summer. Variable credit. Majors.

901. Seminar
Fall, Winter, Spring. 1(1-0) Approval of department.

999. Research
Fall, Winter, Spring, Summer. Variable credit. Majors.

ANIMAL HUSBANDRY

College of Agriculture and Natural Resources

111. Livestock and Meat Industry
Fall, Winter, Spring. 4(3-4)
Adaptation, distribution and numbers of livestock throughout the world; significance and economic importance. Trends in livestock production. Evaluating, grading, classifying and marketing of livestock and meat. Relationship of live animal conformation to carcass merit.

241. Meat Production
Winter. 4(2-6) 111.

242. Meats, Poultry and Fishery Products I
Fall. 3(2-2) Interdepartmental with and administered by Food Science.
Principles of evaluation and economic value. Identification of grades and cuts of beef, pork, lamb and poultry products.

245. Meat Evaluation and Grading
Fall, Spring. 1 to 3 credits. May re-enroll for a maximum of 4 credits subject to a maximum of 10 credits in 245 and 335 combined. 241.
Evaluation of carcasses and wholesale cuts of beef, pork, veal and lamb in accordance with federal and commercial grading standards. Inspection trips through large meat packing plants.

335. Livestock Selection
Fall, Winter, Spring. 1 to 3 credits. May re-enroll for a maximum of 4 credits subject to a maximum of 10 credits in 245 and 335 combined. 111.
Evaluation of productive merit of individual animals. Comparison of type with a standard. Relationships of form to function. Field trips to prominent livestock breeding establishments and to major livestock events.
415. Special Problems
Fall, Winter, Spring. 1 to 3 credits.
May re-enroll for a maximum of 5 credits. Seniors and approval of department.
Special studies in fields not covered by other animal husbandry courses.

451. Swine Production
Fall. 4(3-3) ANS 325 or approval of department.
Historical aspects with emphasis on current trends. Breeding, selection, nutrition requirements, management practices, marketing, housing and environmental needs, disease and parasite problems. Visits to representative farms.

452. Sheep Production
Winter of even-numbered years. 4(3-3) ANS 325 or approval of department.
History, modern breeds, selection, nutrition and feeding, management, marketing, housing, diseases and parasites, wool. Visits to farm flocks. Practice in management skills.

453. Beef Production
Spring. 4(3-3) ANS 325 or approval of department.
History, breeds, breeding, selection, nutrition and feeding, commercial systems of production, diseases and problems. Visits to purebred herds and to feedlots. Practice in management skills.

454. Horse Production
Fall of even-numbered years. 3(1-3) ANS 325 or approval of department by interdepartmental committee. Horse selection, breeding, feeding, management and merchandising. Arranged class hours to be spent at the Horse Farm.

462. Meat Animal Breeding
Spring. 3(2-0) ANS 461.
Uses and effects of different breeding systems with beef cattle, sheep, and swine. Formulating breeding plans.

Winter. 3(0-0) ANS 467 for course description, see Interdisciplinary Courses.

825. Techniques in Nutrition Research
Winter of odd-numbered years. 1 to 3 credits. CEM 333; approval of department. Interdepartmental with Human Nutrition and Foods.
Use of specialized instruments and techniques. Laboratory safety. Management of laboratory animals. Development of abilities in areas of particular interest to individual students.

890. Advanced Special Problems
Fall, Winter, Spring, Summer. 1 to 4 credits. May be taken a maximum of 8 credits. Approval of department.
Investigation of animal husbandry areas of special interest to individual graduate students.

899. Research
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

912. Seminar
Fall, Winter, Spring, Winter. 1 credit.

926. Comparative Nutrition-Lipids and Carbohydrates
Winter of odd-numbered years. 4(4-0) BCH 452 and a previous course on principles of nutrition. Interdepartmental with and administered by Human Nutrition and Foods. Regulatory aspects of carbohydrate and lipid metabolism as influenced by nutrition in man and animals. Emphasis on normal and abnormal physiological states such as obesity, ketosis and diabetes.

927. Comparative Nutrition-Protein Metabolism and Developmental Biology
Winter of even-numbered years. 4(4-0) BCH 452, PSL 302 or concurrently, Interdepartmental with and administered by Human Nutrition and Foods. Protein quality assessment, protein status, protein caloric malnutrition, amino acid metabolism, protein turnover, digestion and absorption, hormonal control of protein metabolism, developmental aspects of protein metabolism and growth.

928. Comparative Nutrition-Minerals
Spring of even-numbered years. 3 credits. BCH 452, PSL 302. Interdepartmental with Human Nutrition and Foods. Forms and location in body, metabolic roles, deficiency and toxicity signs, interrelationships, requirements and biological availability of sources.

929. Comparative Nutrition-Vitamins
Winter of odd-numbered years. 3(2-0) BCH 452 and a previous course on principles of nutrition. Interdepartmental with Human Nutrition and Foods. Chemical and physical properties, standards of activity, occurrence, metabolic roles, vitamins, deficiency and toxicity signs, requirements and factors affecting requirements.

963. Genetics of Breed Improvement
Winter. 3(0-0) ANS 461, STT 421. Breed improvement. Changing gene frequency. Genetic and environmental subdivision of phenotypic variance.

964. Breeding Systems and Plans
Spring. 3(0-0) 463. Biometric relations between related animals. Role of selection in changing populations. The effects of different mating systems.

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

ANIMAL SCIENCE

College of Agriculture and Natural Resources

101. Animal Science
Fall. 6 credits. Survey of the animal industries including history, economic geography, anatomy and physiology, nutrition and feed usage, and systems of commercial livestock and poultry production.

213. Animal Science Seminar
Fall. 1(0-0) Animal science industries. Industry representatives will be utilized to discuss particular areas.

325. Principles of Animal Nutrition
Spring. 3(3-0) CEM 132; BCH 100 recommended. Livestock feeds and their nutrients. Functions and requirements for nutrients. Evaluation of feeds. Feeding standards. Formulation rations for beef and dairy cattle, hogs, poultry, sheep and swine.

461. Principles of Animal Breeding
Winter. 3(0-0) CSE 250. Quantitative inheritance. Gene frequency. Statistical tools used in animal breeding. Effect of selection and mating systems on animal populations.

525. Animal Nutrition

826. Animal Nutrition
Spring. 4(4-0) One course each: biochemistry, physiology and approval of department. Nutrition basic to animal feeding. Application of chemistry and physiology to nutrition. Nutrient requirements for normal body functions. Techniques involved in nutrition research, readings in current literature.

554. Design of Animal Experiments
Spring. 4(4-0) STT 433. Choice, implementation and statistical analysis of experimental plant for research with animals. Designs for reduction of experimental error. Analysis of experiments with complex structure or unequal subclass numbers.

965. Biometrical Genetics
Fall. 4(4-0) One course in quantitative or population genetics. Genetic expectations in random mating and inbreed populations. Estimation of genetic parameters. Relation of gene frequency to population mean and variance. Components of genetic variance. Correlation of relatives. Selection theory.

ANTHROPOLOGY

ANP

College of Human Medicine
College of Osteopathic Medicine
College of Social Science

100. The Origin of Man and Culture
Fall, Winter, Spring, Summer. 4(3-1) Introduction to physical anthropology: the position of man in the animal kingdom, the genetic mechanisms of evolution, human beginnings and the fossil record, racial evolution and cultural changes among modern man, the satisfaction of culture among other animals and the development of human culture, and culture as an adaptive mechanism.

171. Introduction to Anthropology
Fall, Winter, Spring, Summer. 4(3-1) Introduction to human biology, man's place in the animal kingdom, the evolution of man and his cultural behavior in general and exotic cultures in particular.

200. Resource Ecology and Man
Fall. 3 credits. For course description, see Interdisciplinary Courses.

221. Introduction to Social and Cultural Analysis
Fall, Spring. 4(3-1) 171. Basic theoretical framework of socio-cultural analysis, structural functionalism, evolutionism, and cultural ecology.

250. Culture, Environment and Adaptation
Fall. 3(3-1) 100. Culture as an adaptive process—as developed in the million years of human history and still influencing environmental quality, population control, and allocation of resources in primitive and modern societies.