

**522. Veterinary Anatomy**

Fall. 4(2-6) 520.

Microscopic anatomy of the digestive, urinary, respiratory, male and female reproductive systems, integumentary system, central nervous system and special sense organs of domesticated animals.

**523. Veterinary Anatomy**

Winter. 4(2-6) 521 or approval of department.

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**

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 sequences. 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**

Winter. 3(1-3) Human Medicine students; approval of department for graduate students.

The principles of microscopic anatomy, utilizing self-instructional units and laboratory experience with organ sections viewed through the light microscope.

**545. Neuroanatomy**

Spring. 3(3-0) Admission to medical school or approval of Neuroscience Committee.

Introduction to gross and microscopic anatomy of the human nervous system, to related basic neurophysiological concepts and to a problem-solving approach to the diagnosis of nervous system disease.

**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.

**565. Survey of Anatomy I**

Fall. 5(5-0) Osteopathic Freshmen, 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.

**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.

**899. 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.

**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 parasites. Visits to purebred herds and to feed lots. Practice in management skills.

**454. Horse Production**

Fall of even-numbered years. 3(1-3) ANS 325 or approval of department by interview.

Horse selection, breeding, feeding, management and merchandising. Arranged class hours to be spent at the Horse Farm.

**462. Meat Animal Breeding**

Spring. 3(2-2) ANS 461.

Uses and effects of different breeding systems with beef cattle, sheep, and swine. Formulating breeding plans.

**488. The Impact of Animal Resource Management Upon the World's Developing Nations**

Winter. 3(4-0)

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 re-enroll for 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. 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 mammals. 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 502 or concurrently. Interdepartmental with and administered by Human Nutrition and Foods.

Protein quality assessment, protein status, protein calorie 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 502. Interdepartmental with Human Nutrition and Foods.

Forms and location in body, metabolic roles, deficiency and toxicity signs, interrelationships, requirements and biological availability of sources.

**ANIMAL HUSBANDRY A H**

**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. 5(3-6) 111.

Principles of meat evaluation and selection. Carcass certification programs. Influence of production factors on carcass desirability. Practice in slaughtering, cutting and meat processing.

**242. 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.

**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 9 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. Relationship 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. Breeds, 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, breeding, selection, nutrition and feeding, management, marketing, housing, diseases and parasites, wool. Visits to farm flocks. Practice in management skills.

**929. Comparative Nutrition-Vitamins**  
Spring of odd-numbered years. 3(3-0)  
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, antivita-  
mins, deficiency and toxicity signs, requirements  
and factors affecting requirements.

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

**964. Breeding Systems and Plans**  
Spring. 3(3-0) 963.  
Biometric relations between related animals.  
Role of selection in changing populations. The  
effects of different mating systems.

**999. Research**  
Fall, Winter, Spring, Summer. Varia-  
ble credit. Approval of department.

**ANIMAL SCIENCE                      ANS**  
**College of Agriculture and  
Natural Resources**

**101. Animal Science**  
Fall. 5(4-2)  
Survey of the animal industries including his-  
tory, economic geography, anatomy and physi-  
ology, nutrition and feed usage, and systems of  
commercial livestock and poultry production.

**213. Animal Science Seminar**  
Fall. 1(2-0)  
Animal science industries. Industry representa-  
tives will be utilized to discuss particular areas.

**325. Principles of Animal Nutrition**  
Spring. 5(5-0) CEM 132; BCH 200  
recommended.  
Livestock feeds and their 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.

**461. Principles of Animal Breeding**  
Winter. 3(3-0) CSC 250.  
Quantitative inheritance. Gene frequency. Sta-  
tistical tools used in animal breeding. Effect of  
selection and mating systems on animal popu-  
lation.

**525. Animal Nutrition**  
Winter, Summer. 5(4-2) BCH 401.  
Principles of nutrition. Nutrients and their me-  
tabolism. Nutritive requirements for mainte-  
nance, growth, reproduction, lactation and work.  
Nutrient sources and their use in preparing diets  
for domestic animals.

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

**854. Design of Animal Experiments**  
Spring. 4(4-0) STT 423.  
Choice, implementation and statistical analysis  
of experimental plans 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 quanti-  
tative or population genetics.  
Genetic expectations in random mating and in-  
bred populations. Estimation of genetic param-  
eters. 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 po-  
sition of man in the animal kingdom, the  
genetic mechanisms of evolution, human begin-  
nings and the fossil record, racial evolution and  
racial types among modern man, the anticipation  
of culture among other animals and the devel-  
opment of human culture, and culture as an  
adaptive mechanism.

**171. Introduction to Anthropology**  
Fall, Winter, Spring, Summer. 4(3-1)  
Comparison of ways of life among primitive,  
peasant and civilized peoples. Implications of  
these styles of life for understanding of human  
behavior in general and exotic cultures in  
particular.

**200. Resource Ecology and Man**  
For course description, see Interdisci-  
plinary 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. 4(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.

**263. Origin of Civilization:  
Archaeology**  
Spring. 4(3-0) 100.  
The rise, development and spread of culture in  
the period before written history. Archaeological  
evidence is used to trace the evolution of culture  
as it has been reconstructed from the excavation  
of pre-historic sites in the Old and New World.

**275. The Anthropology of Asia**  
Fall. 4(3-0) Sophomores or approval  
of department.  
Several cultural complexes and cultures types—  
from hunting and gathering through complex  
civilization—of East, Southeast, and South Asia.  
The cultures and nature of their development  
will be examined. Past and present significance  
of cultural stability and change will be seen  
in a comparative framework.

**281. The Africans and Their Cultures**  
Fall, Spring. 4(3-0) Sophomores or  
approval of department.  
Racial and cultural problems confronting the  
African peoples.

**285. Anthropology and the Modern  
World**  
Spring. 4(2-2) 171.  
Interwoven nature of cultural traditions in the  
modern world. Consideration of how people of  
developing nations respond to the dominant  
cultural forces of industrialized nations.

**350. Peasant Society**  
Fall. 4(3-1) 171.  
Anthropological study of peasantry. Compar-  
ative examination of the rural societies and  
cultures of Asia, Europe, and Latin America.

**356. Culture, Health and Illness**  
Spring. 4(3-1) 171.  
Anthropological study of health behavior. Com-  
parative view of primitive, folk and scientific  
medical systems and their effect on the in-  
dividual and the community in the illness situa-  
tion.

**381. Anthropology and Education**  
Winter. 4(3-1) 171 or other Social  
Science. For Education and Anthropology  
majors.  
Maturation and socialization in various societies  
of Asia, Africa, and Latin America. These will  
be compared with educational institutions in the  
U.S. and Europe. It is expected to be a con-  
tribution to the broader cross-cultural investi-  
gation of the teaching/learning process.

**384. Contemporary Problems of Japan**  
For course description, see Interdisci-  
plinary Courses.

**387. Ethnicity and Nation Building**  
Spring. 4(2-2) 171.  
Ethnic minorities and the roles they play in  
fostering and/or hindering nation building  
processes in Third World countries. A theo-  
retical framework is utilized to compare sys-  
tematically these roles in various areas of the  
world.

**389. Continuing Revolution in China:  
Problems and Approaches**  
For course description, see Interdisci-  
plinary Courses.

**390. Survey of Subsaharan Africa**  
For course description, see Interdisci-  
plinary Courses.

**391. Survey of Subsaharan Africa**  
For course description, see Interdisci-  
plinary Courses.

**400H. Honors Work**  
Fall, Winter, Spring, Summer. 1 to  
16 credits. May re-enroll for a maximum of 20  
credits. Approval of department.

**411. Studies in the Anthropology of  
Asia**  
Fall, Winter, Spring. 4(3-0) May re-  
enroll for credit for Part II in an area and/or  
for another area. 171; 275 or approval of de-  
partment.  
Separate courses in Asian cultures: China; Ja-  
pan; Southeast Asia; South Asia; Central Asia.  
A two part course sequence is usually given.  
Part I: Ethnographic survey. Part II: Sub-areas,  
special problems and approaches.