

**101B. Comprehensive English**

(I S 095; 100.) Fall, Winter, Spring, Summer. 3(4-0) No student may earn credit in both 101A and 101B. Admission by examination or approval of department.

Instruction and practice in reading and writing. Instruction in reading is emphasized.

**102. Comprehensive English**

Fall, Winter, Spring, Summer. 3(4-0) 101A or 101B.

Continuation of 101 with emphasis on writing and reading.

**103. Comprehensive English**

Fall, Winter, Spring, Summer. 3(4-0) 102.

Continuation of 102 with emphasis on reading and writing on American cultural topics.

**111. American Thought and Language**

Fall, Winter, Spring, Summer. 3(3-0) Students may not receive credit for 111 and 102. Admission by examination or approval of department.

A. Aims to improve the student's ability to read and write and to acquaint him with his American heritage. Reading is in selected historical, social, and literary documents.

B. Whole books approach to regular program.

C. Emphasizes American humanities approach to regular program.

D. American minorities track. Subject matter for writing will be accounts of the experience of blacks, Indians and immigrants during the nineteenth and twentieth centuries.

E. American Radical Thought and Literature. Subject matter for writing will be radical literary and social documents of the seventeenth and eighteenth centuries.

F. Film track. Written exposition is based on both cinematic and fictional versions of literary and historical documents.

H. Adaptation of the regular program for honors students.

**112. American Thought and Language**

Fall, Winter, Spring, Summer. 3(3-0) Students may not receive credit for 112 and 103. 111 or 102.

A. Aims to improve the student's ability to read and write and to acquaint him with his American heritage. Reading is in selected historical, social, and literary documents.

B. Whole books approach to regular program.

C. Emphasizes American humanities approach to regular program.

D. American minorities track. Subject matter for writing will be accounts of the experience of blacks, Indians and immigrants during the nineteenth and twentieth centuries.

E. American Radical Thought and Literature. Subject matter for writing will be radical literary and social documents of nineteenth and early twentieth century.

F. Film track. Written exposition is based on both cinematic and fictional versions of literary and historical documents.

H. Adaptation of regular program for honors students.

**113. American Thought and Language**

Fall, Winter, Spring, Summer. 3(3-0) 112 or 103.

A. Aims to improve the student's ability to read and write and to acquaint him with his American heritage. Reading is in selected historical, social, and literary documents.

B. Whole books approach to the regular program.

C. American humanities approach to the regular program.

D. American minorities track. Subject matter for writing will be accounts of the experience of blacks, Indians and immigrants

during the nineteenth and twentieth centuries.

E. American Radical Thought and Literature. Subject matter for writing will be radical literary and social documents of the twentieth century.

F. Film track. Written exposition is based on both cinematic and fictional versions of literary and historical documents.

H. Adaptation of regular program for honors students.

**300. Supervised Individual Study**

Fall, Winter, Spring. 1 to 4 credits. 113; 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 secures instructor, adviser, and department approval.

**ANATOMY**

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

**316. General Anatomy**

Fall, Spring. 5(5-0) N S 193.

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**

Fall. 5(2-8) Medical Technology students or approval of department.

Microscopic study of the structure of cells, tissues and organs.

**521. Gross and Microscopic Anatomy**

Fall, Spring. 9(4-14) First-term Veterinary Medicine students; approval of department for graduate students.

Gross anatomy of a representative animal, the dog, is studied. Cytology, embryology, comparative histology, neuroanatomy and organology are combined with dissection, demonstration and practical applications to give complete coverage.

**522. Gross and Microscopic Anatomy**

Winter, Summer. 9(5-11) 521. Continuation of 521.

**523. Anatomy of Areas of Surgical and Clinical Importance in Domestic Animals**

Winter, Summer. 8(3-14) Sixth-term Veterinary Medicine students.

Lectures, dissection of fresh material and the study of prosections, models, radiographs and reprints related to areas of surgical and clinical importance in 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**

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.

**ANT**

**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**

(415.) 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.

**ANIMAL HUSBANDRY A H**

College of Agriculture and  
Natural Resources

**111. Livestock and Meat Industry**

Fall, 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. 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**  
Spring. 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.

**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(2-2)  
ANS 325 or approval of department.

Selection, breeding, feeding, management, mar-  
keting, diseases and parasites. Relationship of  
body structure to performance.

**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 Interdisci-  
plinary 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 spe-  
cial interest to individual graduate students.

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

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

**927. Comparative Nutrition I**  
Winter. 2 or 4 credits. BCH 452,  
PSL 502 or concurrently. Interdepartmental  
with and administered by Human Nutrition  
and Foods.

Mammalian nutrition based on biochemical and  
physiological phenomena. Proteins are studied  
in the first half of the term; carbohydrates, fats  
and macro-minerals in the last half.

**928. Comparative Nutrition II**  
Spring. 2 or 4 credits. BCH 452,  
PSL 502. Interdepartmental with Human Nu-  
trition and Foods.

Mammalian nutrition based on biochemical and  
physiological phenomena. Micro-minerals are  
studied in the first half of the term; vitamins in  
the last half.

**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 histo-  
ry, 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 mainten-  
ance, 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 ge-  
netic 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 or 171.

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.