

**Descriptions—Animal Husbandry  
of  
Courses**

**453. Beef Production**  
Spring. 4(3-3) ANS 325 or approval of department.

Feeding, breeding management, marketing. Emphasis on growth and development; costs and returns; feed requirements; reproduction, cross-breeding; performance testing; housing; diseases. Practice in management skills. One field trip.

**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.

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

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 802 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 802. 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**

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, antivitamin deficiencies, 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. Variable 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 history, economic geography, anatomy and physiology, nutrition and feed usage, and systems of commercial livestock and poultry production.

**213. Animal Science Seminar**  
Fall. 1(2-0)

Animal science industries. Industry representatives 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.

**433. Ruminant Nutrition**  
(DRY 433.) Winter. 4(3-2) 325. Interdepartmental with and administered by the Department of Dairy Science.

Principles of ruminant nutrition and application to actual feeding practices in commercial dairy and beef operations. Rumen fermentation as related to feed utilization, growth, milk production and milk composition.

**461. Principles of Animal Breeding**  
Winter. 3(3-0) CSS 250.

Quantitative inheritance. Gene frequency. Statistical tools used in animal breeding. Effect of selection and mating systems on animal population.

**525. Animal Nutrition**  
Winter. 5(4-2) BCH 401.

Principles of nutrition. Nutrients and their metabolism. Nutritive requirements for maintenance, 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 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.

**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.

**855. Analysis of Unbalanced Multifactor Data**  
Spring. 4(4-0) STT 423.

Applied analysis techniques of field or survey data with unbalanced subclass numbers in field of biological sciences: predictions utilizing several variables; estimation of effects of factors and their interactions.

**965. Biometrical Genetics**  
Fall of odd-numbered years. 4(4-0) 855 and one course in quantitative genetics.

Genetics models for quantitative traits: estimation of components of variance; correlation of relatives; Selection Index theory; multi-factor and multivariate responses in designed experiments.

**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 racial types among modern man, the anticipation of culture among other animals and the development of human culture, and culture as an adaptive mechanism.

**171. Introduction to Sociocultural 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.

**IDC. Resource Ecology and Man**  
For course description, see Interdisciplinary Courses.

**IDC. Introduction to Latin America I**  
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.