522. Veterinary Anatomy Fall. 4(2-3) 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(2-3) 521 or approval of department.
Lecture, dissection of embalmed specimens and the study of projections, 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 nervous systems, to related basic neurophysiologic concepts and to a problem-solving approach to the diagnosis of nervous system diseases.

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. Projection, discussion and lecture methods using audiovisual aids and frequent review.

581. 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.

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.

249. Meats, Poultry and Fishery Products I Fall, 3(2-3) Interdepartmental with and administered by Food Science.
Principles of evaluation and nutritive value. Identification of 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 3 credits subject to a maximum of 10 credits in 245 and 335 combined. 111.
Evaluation of productive merit of individual animals. Comparison of types in 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(3-5) 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(3-5) ANS 325 or approval of department.
History, breeds, housing, breeding, selection, nutrition and feeding, commercial systems of production, diseases and parasites. Visits to farm flocks. Practice in management skills.

453. Beef Production Fall of even-numbered years. 4(3-5) ANS 325 or approval of department.
History, breeds, housing, breeding, selection, nutrition and feeding, commercial systems of production, diseases and parasites. Visits to pastured 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 481.
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 453. A previous course on principles of nutrition. 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, development aspects of protein metabolism and growth.

928. Comparative Nutrition-Minerals Spring of even-numbered years. 3 credits. BCH 452, PSL 501. 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, antivitamins, deficiency and toxicity signs, requirements and factors affecting requirements.

963. Genetics of Breed Improvement
Winter, 3(3-0) ANS 461, STT 421.

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.

ANTHROPOLOGY

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

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(3-0) CEM 132, BCH 200 recommended.

491. Principles of Animal Breeding
Winter, 3(3-0) CSC 250.

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

526. 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.

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

ANIMAL SCIENCE

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(3-0) CEM 132, BCH 200 recommended.

491. Principles of Animal Breeding
Winter, 3(3-0) CSC 250.

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

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