512. Veterinary Neuro Anatomy

Summer. 2(2-0) First-term Veterinary Medicine students.

Gross anatomy of the central nervous system in animals emphasizing functional and dysfunctional aspects of pathways and nuclei in dogs as a foundation for clinical neurology.

513. Veterinary Microscopic Anatomy

(522.) Fall. 5(3-6) Second-term Veterinary Medicine students.

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

514. Veterinary Comparative Anatomy

(523.) Fall. 4(2-6) Second-term Veterinary Medicine students.

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(4-0) Admission to medical school or approval of Neuroscience Committee.

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

560. Medical Histology

Summer. 4(3-4) Admission to a college of medicine or approval of department.

Structural and functional characteristics of basic cells, tissues and organ systems. Emphasis on core concepts and visual discrimination.

565. Introduction to Human Gross Anatomy

Summer. 6(4-6) Admission to a college of medicine 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.

580. Special Problems

Fall, Winter, Spring, Summer. 1 to 5 credits. May re-enroll for a maximum of 15 credits. Admission to professional program in the College of Human Medicine, College of Osteopathic Medicine or the College of Veterinary Medicine, and approval of department.

Biomedical research, gross anatomy, histology, neurology, immunology or embryology.

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.

816. Developmental Anatomy

Fall. 4(3-3) Graduate students or approval of department.

Study of the normal and abnormal organogenesis of the human embryo and fetus.

899. Research

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

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)

Livestock utilization of renewable resources in producing products for man. Adaptation, economics of production and management systems of beef cattle, swine, sheep and horse enterprises. Evaluation of market livestock.

214. Horses and Man

Fall. 3(3-1)

The horse in today's world. Types, breeds and uses for recreation and therapy. Selection, development and maintenance of a healthy, well-trained horse.

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. 4(3-3) ANS 325 or approval of department.

Management of sheep enterprises. Using the tools of selection, reproduction, nutrition, flock health, housing and marketing to increase returns. Practice in trimming, showing, and management skills.

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, antivitamins, 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.) 4(3-2) 325.
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 Nonorthogonal Research 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.

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.

IDC. Continuing Revolution in China: Problems and Approaches
For course description, see **Interdisciplinary Courses.**

262. Status of Women in Culture and Society: A Comparative View
Winter. 3(3-0) 171 or approval of department.
Comparative analysis of the status of women emphasizing non-Western cultures and societies. Economic and domestic division of labor between the sexes as a factor underlying division of status, power and authority.

263. Origin of Civilization: Archaeology
Spring. 4(4-0) 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.