813. Problems in Anatomy
Fall, Spring, Summer. 1 to 5 credits. A student may earn a maximum of 5 credits in all enrollments for this course.
R: Approval of department.
Fields such as gross anatomy, histology, tissue culture, cytology, neurology and embryology.

814. Graduate Seminar
Spring of even-numbered years. 1 to 3 credits.
R: Open only to graduate students in Anatomy. Supervised practice in evaluating abstracts and delivering oral presentations of anatomical sciences. Organization, timing and effective illustrations.

820. Advanced Neuroanatomy
Summer of odd-numbered years. 1 to 5 credits.
A student may earn a maximum of 12 credits in all enrollments for this course.
R: Approval of department.
Current topics in anatomy and physiology and processes of central nervous system cells.

839. Systems Neuroscience
Spring of odd-numbered years. 4(4-0) Interdepartmental with Pharmacology and Toxicology, and Physiology.
R: Open only to graduate students in the Colleges of Human Medicine, Osteopathic Medicine, Agriculture and Natural Resources, Natural Science, and Veterinary Medicine.
Anatomy, pharmacology, and physiology of multicellular neural systems. Sensory, motor, autonomic, and chemo-regulatory systems in vertebrate brains.

885. Vertebrate Neural Systems
Spring of odd-numbered years. 3(2-2) Interdepartmental with Physiology.
Comparative analysis of major component systems of vertebrate brains. Evolution, ontology, structure, and function in fish, amphibians, reptiles, birds and mammals.

899. Master's Thesis Research
Fall, Spring, Summer. 1 to 8 credits. A student may earn a maximum of 12 credits in all enrollments for this course.
R: Open only to graduate students in Anatomy.

999. Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 36 credits in all enrollments for this course.
R: Open only to graduate students in Anatomy.

ANIMAL SCIENCE

Department of Animal Science
College of Agriculture and Natural Resources

110. Introductory Animal Agriculture
Fall. 3(2-2)

112. Introductory Animal Management
Spring. 3(2-2)
Principles of managing beef and dairy cattle, horses, poultry, sheep and swine throughout their life cycles. Topics include genetics, nutrition, reproduction, health, care, and economically efficient production.
827. Integrated Risk Assessment of Environmental Hazards
Spring 3(0-0)
R: Open to graduate students in the colleges of Agriculture and Natural Resources, Engineering, Human Medicine, Natural Science, Osteopathic Medicine, or Veterinary Medicine.
Alternative approaches to assessing environmental and health risk. Analyzing, interpreting, and using scientific data from ecology, agriculture, environmental chemodynamics, biology, geological sciences, and toxicology in the risk assessment process.

841. Advanced Endocrine Physiology and Pharmacology
Fall, 4(4-5) Interdepartmental with Physiology, and Pharmacology and Toxicology, and Psychology. Administered by Physiology.
P: BC4 461, PS4 432. R: Open only to graduate students in the Colleges of Human Medicine, Osteopathic Medicine, Veterinary Medicine, Natural Science, and Agriculture and Natural Resources.
Basic and advanced concepts of endocrine and reproductive physiology and pharmacology.

890. Advanced Independent Study
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course. R: Approval of department; application required.
Investigation of topics of special interest.

898. Master's Research
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 10 credits in all enrollments for this course.
R: Open only to master's students in Animal Science. Approval of department. Application required. Scholarly project for non-thesis (Plan B) master's degree.

899. Master's Thesis Research
Fall, Spring, Summer. 1 to 6 credits. A student may earn a maximum of 99 credits in all enrollments for this course.
R: Open only to master's students in Animal Science. Approval of department.

935. Nutrition: Lipid and Carbohydrate Metabolism
Fall of even-numbered years. 3(3-0) Interdepartmental with Human Nutrition and Foods. Administered by Human Nutrition and Foods.
R: Open only to graduate students in Food Science, Human Nutrition, Animal Science, and Nursing, and to graduate-professional students.
Regulatory aspects of lipid and carbohydrate metabolism as influenced by nutritional status.

936. Protein Nutrition and Metabolism
Spring of even-numbered years. 3(3-0) Interdepartmental with Human Nutrition and Foods.

937. Mineral Nutrition and Metabolism
Fall of even-numbered years. 3(3-0) Interdepartmental with Human Nutrition and Foods.
Forms and locations of mineral elements in the body, metabolic functions, deficiencies, and toxicities, interrelationships and quantitative requirements.

938. Nutrition: Metabolism and Function of Vitamins
Spring of odd-numbered years. 3(0-0) Interdepartmental with Human Nutrition and Foods. Administered by Human Nutrition and Foods.
R: Open only to graduate students in Food Science, Human Nutrition, Animal Science, and Nursing, and to graduate-professional students.
Regulatory roles of vitamins at cellular and molecular levels.

943. Techniques of Analyzing Unbalanced Research Data
Spring. 4(4-0) Interdepartmental with Forestry, Crop and Soil Sciences, Horticulture, and Fisheries and Wildlife.
P: STT 484. R: Open only to graduate students in the College of Agriculture and Natural Resources.
Linear model techniques to analyze research data characterized by missing and unequal number of observations in classes. Simultaneous consideration of multiple factors. Estimable comparisons. Hypothesis testing. Computational strategies. Variance and co-variance components. Breeding values.

976. Multivariate Methods in Agriculture and Natural Resources
Spring. 4(4-0) Interdepartmental with Forestry, and Fishes and Wildlife. Administered by Forestry.
P: STT 422, MTH 314. R: Open only to graduate students in the College of Agriculture and Natural Resources and in the Interdepartmental Graduate Specializations in Ecology and Evolutionary Biology. Application of multivariate methods to research problems. Hotelling's T-test, profile analysis, discriminant analysis, canonical correlation, principal components, principal coordinates, correspondence analysis, and cluster analysis.

999. Doctoral Dissertation Research
Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 99 credits in all enrollments for this course.
R: Open only to doctoral students in Animal Science. Approval of department.

ANTHROPOLOGY

ANP Department of Anthropology
College of Social Science

101. Introduction to Anthropology
Fall, Spring, Summer. 3(0-0)

201. Sociocultural Diversity
Fall, Spring, Summer. 3(3-0)
Origins and diversity of cultural systems. Theories of culture. Patterns of kinship. Religious, economic, and political institutions.

202. Biocultural Evolution
Fall, Spring, Summer. 3(3-0)

220. Gender Relations in Comparative Perspective
Fall. 3(0-0)
Gender relations in different cultures. Economic and domestic division of labor between the sexes as a factor underlying power differentials.

264. Great Discoveries in Archaeology
Spring. 3(0-0)
Great discoveries in archaeology that have captured the public's imagination and shaped Western thought, from Olduvai Gorge and Stonehenge to Machu Pichu.

270. Women and Health: Anthropological and Historical Perspectives
Fall. 3(0-0)

280. The Anthropological Film
Spring. 3(0-0)
Ethnographic film as a record of vanishing cultures, as a tool for ethnological analysis, and as a source of perspectives on different cultures and variability within cultures.

320. Social and Cultural Analysis
Fall, Spring. 4(4-0)
P: ANP 101 or ANP 201. R: Completion of Tier I writing requirement.
Major theoretical traditions of cultural anthropology. Functionalism, symbolism, structuralism, and contemporary developments.

321. Anthropology of Social Movements
Fall. 3(0-0)
P: ANP 101 or ANP 201.
How social movements within different cultures around the world organize, create or impede change on the basis of class, religion, race, ethnicity, language, and territory.

322. Peasants and Social Change in the Developing World
Spring. 3(0-0)
P: ANP 101 or ANP 201.
Cross-cultural perspective on patterns and variations in peasant systems worldwide. Social mechanisms with which they respond to change.

340. Introduction to Physical Anthropology
Spring. 4(3-2)
P: ANP 101 or ANP 202.
Problems, data, and methods of physical anthropology. Human genetics, hominid evolution, primate studies, human osteology, and human diversity. Field trips at the student's expense may be required.

360. Introduction to Archaeology
Fall. 3(0-0)
Theory, methodology, and techniques of archaeology. Applications to questions about past human behavior. History and concepts of archaeology as an anthropological subdiscipline.

361. Paleolithic Archaeology
Fall. 3(0-0)
P: ANP 101 or ANP 264 or ANP 360.
Stone Age archaeology from the dawn of tool making to the specialized hunters and car artists of the late Ice Age.

362. Evolution of Agrarian Society
Spring. 3(0-0)
P: ANP 101 or ANP 202 or ANP 264 or ANP 360. R: Not open to freshmen and sophomores.
Food production as adaptive strategy. Archaeological evidence for the appearance and development of food production in prehistory. Theories, problems, and issues in the study of food production evolution.