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. (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. (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. (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 feedlots. Practice in management skills.

454. Horse Production
Fall of even-numbered years. (3-2) ANS 325 or approval of department.
Selection, breeding, feeding, management, marketing, diseases and parasites. Relationship of body structure to performance.

462. Meat Animal Breeding
Spring. (3-2) ANS 461.
Uses and effects of different breeding systems with beef cattle, sheep, and swine. Formulating breeding plans.

Winter. 3(4-0)
For course description, see Interdisciplinary Courses.

525. 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.

580. 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.

589. Research
Fall, Winter, Spring, Summer. Variable credit. Approval of department.

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

921. 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.

925. Comparative Nutrition II
Spring. 2 or 4 credits. BCH 452, PSL 502. Interdepartmental with Human Nutrition 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.

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 153; BCH 200 recommended.

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

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

626. Animal Nutrition
Spring. 4(4-0)
One course each: biochemistry, physiology, and nutrition and feeding. Application of chemistry and physiology to nutrition. Nutrient requirements for normal body functions. Techniques involved in nutrition research; readings in current literature.

584. Design of Animal Experiments
Spring. 4(4-0) STT 483.
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.

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 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 Interdisciplinary Courses.

211. Introduction to Social and Cultural Analysis
Fall, Spring. 4(3-1)
Basic theoretical framework of socio-cultural analysis; structural functionalism, evolutionism, and cultural ecology.

250. Culture, Environment and Adaptation
Fall. 4(3-1)
Culture as an adaptive process—as developed in the million years of human history and still influencing environments! quality, population control, and allocation of resources in primitive and modern societies.

263. Origin of Civilization: Archaeology
Fall, Spring. 4(3-1), 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)
Sophomore 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)
Sophomore or approval of department.
Racial and cultural problems confronting the African peoples.
Anthropology and the Modern World
Spring, 4(3-0) 171.

Ethnic minorities and the roles they play in fostering and/or hindering nation building processes in Third World countries. A theoretical framework utilized to compare systematically these roles in various areas of the world.

Survey of Subsaharan Africa
For course description, see Interdisciplinary Courses.

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For course description, see Interdisciplinary Courses.

Ethnographic survey. Part II: Sub-areas, special problems and approaches.

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833. Anthropological Problems of Prehistory
     Spring. 3(3-2) Approval of department.
     Relation of archaeology to the other fields of anthropology both in a theoretical and practical sense. Archaeological data are used to introduce problems of long-range cultural change and development.

835. Human Osteology and Osteometry
     Fall of even-numbered years. 5(3-4)
     Identification of human bones and fragments; aging, sexing and determining the race of skeletal remains; measuring techniques for cranial and postcranial remains; the more common forms of paleopathology.

836. Hominid Paleontology
     Winter of even-numbered years. 4(3-1)
     Seminar requiring student research of general and specific topics of hominid paleontology, events, trends, and processes in hominid evolution.

838. Interdisciplinary Seminar on Africa
     For course description, see Interdisciplinary Courses.

850. Archaeological Methods and Techniques
     Winter. 4(4-0) 833 or approval of department.
     Seminar outlining archaeological method and the role of technique in the strategy of archaeology. Techniques and problems of informational retrieval will be emphasized.

856. Methodology of Anthropological Research
     Spring. 1 to 12 credits. Approval of department.
     Seminar in problems of anthropological investigation considered in the framework of history and philosophy of science. Relevance of various field techniques, methods of data gathering and data handling, and strategies of analysis for various problems are treated.

857. Applied Anthropology
     Spring of odd-numbered years. 4(3-0)
     Approval of department.
     Theoretical and methodological problems involved in planned social change. Course will focus on field experience in the local community. Designed mainly for graduate students having professional interest in the application of social change.

872. Seminar in Special Subject Fields
     Fall, Winter, Spring, Summer. Variable credit. Approval of department.
     Special fields of study will include any area of anthropology selected.

875. Individual Research Projects
     Fall, Winter, Spring, Summer. Variable credit. Approval of department.

880. Individual Readings
     Fall, Winter, Spring, Summer. Variable credit. Approval of department.

889. Research
     Fall, Winter, Spring, Summer. Variable credit. Approval of department.

892. Dimensions of Culture
     Winter. 5(5-0) Approval of department.
     Intensive review of principles of cultural anthropology, ethnology, and cultural change with particular attention to systems theory and interconnections of cultural, social, personality, and ecological systems.

999. Research
     Fall, Winter, Spring, Summer. Variable credit. Approval of department.

ART

College of Arts and Letters

History of Art

205. Introduction to Art
     (ART 205.) Fall, Winter, Spring. 3(3-0) Not open to majors.
     Painting, sculpture and architecture from the time of the Greeks to the present. Individual works of art examined intensively, as regards both their formal qualities and the manner in which they exemplify the shifting patterns of Western culture.

206. History of Western Art
     (ART 266.) Fall. 4(4-0)
     Painting, sculpture, and decorative art from prehistoric to modern times. Provides acquaintance with the forms of art typical of each period and indicates the aesthetic qualities which give them artistic significance. Work in first term covers Prehistoric, Egyptian, Mesopotamian, Greek, Roman, Early Christian and Byzantine periods.

207. History of Western Art
     (ART 267.) Winter. 4(4-0)
     Continuation of 266. Early Medieval, Romanesque, Gothic, Renaissance and Mannerist periods.

208. History of Western Art
     (ART 268.) Spring. 4(4-0)
     Continuation of 267. Baroque, Rococo, Neoclassic and subsequent periods to contemporary art.

209. Non-European Art
     (ART 860.) Fall, Summer. 3(3-0) Introduction to non-European tradition as contrasted to the western world and exemplified in the primitive art of Africa, Oceania, the North American Indian, and in Islamic and Asian art.

400H. Honors Work
     (ART 660H.) Fall, Winter, Spring. Summer. 1 to 6 credits. Approval of department.

402. The Art of the Ancient Near East
     (ART 453.) Fall. 4(3-0) 206 or approval of department.
     A survey of the art and architecture of Egypt, Mesopotamia and Crete, through the end of the Hellenistic period.

405. Roman Art
     (ART 451.) Spring. 4(3-0) 206 or approval of department.
     The history of painting, sculpture and architecture of Ancient Rome with major emphasis on the Late Republic and Early Empire.

407. History of Western Art
     (ART 452A.) Fall of odd-numbered years. 4(4-0) 206 or approval of department.
     Ancient Greek and Roman painting, including Minoan Crete. Special emphasis is placed on Archael and Classical Greek painting on pottery and on Roman wall painting from Pompeii and elsewhere.

408. Ancient Architecture
     (ART 452B.) Spring of odd-numbered years. 4(4-0) 206 or approval of department.
     The sculpture of Ancient Greece and Rome, from the Bronze Age through Early Christian times.

410. Byzantine Art
     (ART 454.) Fall, Summer. 4(3-0) 206 or approval of department.
     Late antique painting, sculpture and architecture and their development in the East Christian Empire and Orthodox Russia.

411. Early Medieval Art
     (ART 455.) Winter. 4(3-0) 207 or approval of department.
     History of architecture, sculpture, and painting in the Latin West from Hiberno-Saxon art of the 7th century to the Romanesque Abbeys of the 12th century.

412. Later Medieval Art
     (ART 456.) Spring, Summer. 4(3-0) 207 or approval of department.
     Gothic painting, sculpture, and architecture with particular emphasis on the cathedrals of the 13th century.

420. Italian Renaissance Architecture
     (ART 465.) Spring. 4(3-0) 207 or approval of department.
     Important buildings of the 15th and 16th centuries, architectural theories, and architectural representations in drawings and paintings.

421. Italian Renaissance Sculpture
     (ART 464.) Winter. 4(3-0) 207 or approval of department.
     Major artists from circa 1250 to 1600.