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FALL 2015

List of classes available

ANS 1- Domestic Animals and People

Lecture—3 hours; laboratory—3 hours. Animal domestication and factors affecting their characteristics and distribution. Animal use for food, fiber, work, drugs, research and recreation; present and future roles in society. Laboratory exercises with beef and dairy cattle, poultry, sheep, swine, laboratory animals, fish, horses, meat and dairy products. GE credit: SciEng, Wrt | SE, WE.—(I)

4 units

Prerequisites: None

Instructor: Famula

AVS 13-Birds, Humans, and the Environment

Lecture—2 hours; discussion—1 hour. Interrelationships of the worlds of birds and humans. Lectures, discussions, field trips and projects focus on ecology, avian evolution, physiology, reproduction, flight, behavior, folklore, identification, ecotoxicology and conservation. Current environmental issues are emphasized. Half-day field trip. GE credit: SciEng, Wrt | SE, SL. —(I)

3 units

Prerequisites: None

Instructor: King

ANS 18-Introductory Aquaculture

Lecture—3 hours; discussion—1 hour. Historical and contemporary aquacultural practices. Interaction between the aqueous culture environment and the biology of aquatic animals. Impact of economics and governmental policies on the development of aquaculture. Interaction of aquacultural practices with larger societal goals. GE credit: SciEng | SE, OL, QL, VL, WE. —(I)

4 units

Prerequisites: None

Instructor: Kueltz

ANS 22A- Animal Evaluation

Laboratory—3 hours; fieldwork—30 hours (total). Attendance at 3 one-day weekend field trips required. Domestic livestock species with emphasis on visual appraisal, carcass evaluation, and application of performance information. Emphasis on accurate written and oral descriptions of evaluations. Prerequisite to intercollegiate judging competition. Offered in alternate years. (P/NP grading only.) GE credit: OL, SE. —(I)

2 units

Prerequisites: ANS 21 or the equivalent.

Instructor: Van Liew

ANS 41- Domestic Animal Production

Lecture—2 hours. Principles of farm animal management, including dairy and beef cattle, sheep, and swine. Industry trends, care and management, nutrition, and reproduction. GE credit: SciEng | SE.—(I)

2 units

Prerequisites: None

Instructor: Mitloehner

ANS 41L- Domestic Animal Production Laboratory

Discussion—1 hour; laboratory—3 hours. Animal production principles and practices, including five field trips to dairy cattle, beef cattle, sheep, and swine operations and campus labs. (P/NP grading only.) GE credit: QL, SE, SL, VL, WE.—(I, II, III)

2 units

Prerequisites: ANS 41 (may be taken concurrently).

Instructor: Mitloehner

ANS 49 B, C, D, E, G, H, I, K- Animal Management Practices

Discussion—1 hour; laboratory—3 hours. The application of the principles of elementary biology to the management of a specific animal species. Up to four different topics may be taken. (P/NP grading only.)—(I, II, III)

Among the topics offered: (B) Beef, (C) Dairy, (D) Goats, (E) Horses, (G) Meats, (H) Poultry, (I) Sheep, (K) Captive and Companion Avian.

2 units

Prerequisites: None

Instructor: various

ANS 103- Animal Welfare

Lecture—2 hours; discussion—2 hours. The application of principles of animal behavior and physiology to assessment and improvement of the welfare of wild, captive, and domestic animals. Topics include animal pain, stress, cognition, motivation, emotions, and preferences, as well as environmental enrichment methods. GE credit: SciEng | SE, SL.—(I)

4 units

Prerequisites: ANS 104 or NPB 102 or the equivalent or consent of instructor.

Instructor: Mench, Lee

ANS 115- Advanced Horse Production

Lecture—3 hours; laboratory—3 hours. Feeding, breeding, and management of horses; application of the basic principles of animal science to problems of production of all types of horses. Designed for students who wish to become professionally involved in the horse industry. GE credit: SciEng | QL, SE, SL, WE.—(I)

4 units

Prerequisites: ANS 15; BIS 101; NUT 115; NPB 101; or consent of instructor.

Instructor: Meyers-Brown

ANS 136A- Techniques and Practices of Fish Culture

Lecture—1 hour; laboratory—3 hours. Daily care and maintenance of fish in residential aquariums, research and commercial facilities. Biological and environmental factors important to sound management of fish. Laboratories focus on fish culture and include growth trials. Not open for credit to students who have completed course 136. GE credit: SciEng | QL, SE, SL, VL, WE.—(I)

2 units

Prerequisites: ANS 2

Instructor: Hung

ANS 140- Management of Laboratory Animals

Lecture—3 hours; laboratory—3 hours. Laboratory animal management procedures in view of animal physiology, health and welfare, government regulations, and experimental needs. Clinical techniques using rodents and rabbits as models. GE credit: SciEng | SE.—(I)

4 units

Prerequisites: NPB 101.

Instructor: Weisker

ANS 142- Companion Animal Care and Management

Lecture—3 hours; discussion—1 hour. Management and production of companion animals. Integration of the disciplinary principles of behavior, genetics, nutrition, and physiology as related to the care of companion animals. GE credit: SciEng | OL, QL, SE, SL, VL, WE.—(I)

4 units

Prerequisites: ANS 42, BIS 101, NPB 101; ABI 102 and 103 recommended.

Instructor: Oberbauer

ANS 143- Pig and Poultry Care and Management

Lecture—3 hours; laboratory—3 hours; Saturday field trips. Care and management of swine, broilers and turkeys as related to environmental physiology, nutrition and metabolism, disease management and reproduction. Offered in alternate years. GE credit: SciEng | SE, SL.—(I)

4 units

Prerequisites: NUT 115, NPB 101.

Instructor: King

ANS 198 (135)- Lab Animal Production

Lab—3 hours; Discussion—1 hour; Information and skills needed for developing and conducting research with production animals, and interpreting and presenting data. Laboratory focus course which uses sheep as a model. One or two all day Saturday field trips. Can fulfill ANS laboratory requirement —(I)

3 units

Prerequisites: ABI 102, 103 and either NPB 101 or ANS 100

Instructor: Sainz

Course Registration Number (CRN#): 41619

AVS 103- Avian Development and Genomics

Lecture—3 hours. Unique features of avian development and genomics: Incubation; Staging; Egg Structure/Function; Fertilization; Pre-oviposital; Oviposition, Cold Torpor; Post-oviposital Development; Organogenesis, Growth; Sexual Differentiation; Extraembryonic Membranes; Mortality/Hatching; Genome Organization; Comparative Avian Genomics; Telomere Biology; Sex Chromosomes/Sex Determination; Advanced Technologies; Genome Manipulation; Mutations. GE credit: SciEng | SE.—(I)

3 units

Prerequisites: BIS 2B

Instructor: Lee

ANG 107- Genetics and Animal Breeding

Lecture—4 hours; laboratory—3 hours. Principles of quantitative genetics applied to improvement of livestock and poultry. Effects of mating systems and selection methods are emphasized with illustration from current breeding practices. GE credit: SciEng | SE.—(I, II)

5 units

Prerequisite: BIS 101.

Instructor: Miller

ANG 111- Molecular Biology Laboratory Techniques

* + - Lecture—2 hours; laboratory—6 hours. Introduction to the concepts and techniques used in molecular biology; the role of this technology in both basic and applied animal research, and participation in laboratories using some of the most common techniques in molecular biology. GE credit: SciEng | SE, SL, VL, WE.—(I)

4 units

Prerequisites: BIS 2C, 101, 102, 103.

Instructor: Kueltz

ABI 102- Animal Biochemistry and Metabolism

Lecture—4 hours; discussion—1 hour. Water and biological buffers; thermodynamics of metabolism; structure and function of biomolecules; enzyme kinetics and function; membrane biology; digestion and absorption; carbohydrate metabolism. Not open for credit to students who have completed BIS 102.—(I)

5 units

Prerequisites: CHE 2A-2B; CHE 8A-8B recommended.

Instructor: Mienaltowski

WINTER 2016

List of classes available

ANS 15- Introductory Horse Husbandry

Lecture—3 hours. Introduction to care and use of light horses emphasizing the basic principles for selection of horses, responsibilities of ownership, recreational use and raising of foals. GE credit: SciEng | QL, SE, VL.—II

3 units

Prerequisites: ANS 2 recommended.

Instructor: Mienaltowski

ANS 41L- Domestic Animal Production Laboratory

Discussion—1 hour; laboratory—3 hours. Animal production principles and practices, including five field trips to dairy cattle, beef cattle, sheep, and swine operations and campus labs. (P/NP grading only.) GE credit: QL, SE, SL, VL, WE.—(I, II, III)

3 units

Prerequisites: ANS 41.

Instructor: Pettey

ANS 42- Introductory Companion Animal Biology

Lecture—3 hours; discussion—1 hour. Companion animal domestication. Historical, contemporary perspectives. Legislation concerning companion animals. Selected topics in anatomy, physiology, genetics, nutrition, behavior and management. Scientific methods in studying the human-animal bond. Discussions: application of biological concepts to problems related to companion animals. GE credit: SciEng, Wrt | QL, SE, SL, WE.—(II)

4 units

Prerequisites: None

Instructor: Oberbauer

ANS 49 C, E, F, G, H, I, J, K- Animal Management Practices

Discussion—1 hour; laboratory—3 hours. The application of the principles of elementary biology to the management of a specific animal species. Up to four different topics may be taken. (P/NP grading only.)—(I, II, III)

Among the topics offered: (C) Dairy, (E) Horses, (F) Laboratory Animals, (G) Meats, (H) Poultry, (I) Sheep, (J) Swine, (K) Captive and Companion Avian.

2 units

Prerequisites: None

Instructor: various

ANS 104- Principles and Applications of Domestic Animal Behavior

Lecture—3 hours; discussion—1 hour. Basic principles of animal behavior as applied to domesticated species. Emphasis placed on application of the principles of animal behavior. GE credit: SciEng | SE.—(II)

4 units

Prerequisite: ANS 2 or BIS 2B.

Instructor: Tucker

ANS 124- Lactation

Lecture—3 hours; laboratory—3 hours. Consideration of the biochemical, genetic, physiological, nutritional, and structural factors relating to mammary gland development, the initiation of lactation, the composition of milk and lactational performance. GE credit: SciEng, Wrt | SE, SL.—(II)

4 units

Prerequisites: NPB 101; ABI 103 (may be taken concurrently); or the equivalent background knowledge.

Instructor: Hovey

ANS 128- Agricultural Applications of Linear Programming

Lecture—2 hours; laboratory—2 hours; discussion—1 hour. Applications of linear programming in agriculture, emphasizing resource allocation problems and decision making. Problems include crop production, ration formulation, and farm management. Hands-on experience in developing linear programs and interpreting the results. GE credit: SciEng | QL, SE, SL.—(II)

4 units

Prerequisites: upper division standing and Agricultural Systems and Environment 21 or the equivalent.

Instructor: Fadel

ANG 107- Genetics and Animal Breeding

Lecture—4 hours; laboratory—3 hours. Principles of quantitative genetics applied to improvement of livestock and poultry. Effects of mating systems and selection methods are emphasized with illustration from current breeding practices. GE credit: SciEng | SE.—(I, II)

5 units

Prerequisite: BIS 101.

Instructor: Medrano

ABI 103- Animal Biochemistry and Metabolism

Lecture—4 hours; discussion—1 hour. Physiological function and metabolism of lipids and amino acids; integrative metabolism; biochemical basis for nutrient requirements; structure and function of vitamins; mineral metabolism and requirements. Not open for credit to students who have completed Biological Sciences 103.—(II)

5 units

Prerequisites: ABI 102

Instructor: Hess

ANS 198 (133)- Animal Cell Culture Laboratory

Lecture—2 hours; Lab—6 hour. Techniques of cell culture, with emphases on cell physiology and the actions of drugs and toxicants on cultured somatic cells. Design, performance and interpretation of experiments with animal cells in vitro.

4 units

Prerequisites: ABI 102

Instructor: Ross

Course Registration Number (CRN#): 11733

SPRING 2016

List of classes available

ANS 2- Introductory Animal Science

Lecture—3 hours; laboratory—3 hours. Growth, reproduction, lactation, inheritance, nutrition, and disease control in domesticated animals and species used in aquaculture; the application of sciences to animal production. GE credit: SciEng, Wrt | SE, SL, VL, WE.—(III).

4 units

Prerequisites: ANS 1 and BIS 1A recommended.

Instructor: Murray

ANS 21- Livestock and Dairy Judging

Laboratory—6 hours. Evaluation of type as presently applied to light horses, meat animals and dairy cattle. Relationship between form and function, form and carcass quality, and form and milk production. GE credit: SciEng | OL, SE.—(III)

2 units

Prerequisites: ANS 1 or 2 recommended.

Instructor: Van Liew

ANS 49 B, C, D, F, G, H, J- Animal Management Practices

Discussion—1 hour; laboratory—3 hours. The application of the principles of elementary biology to the management of a specific animal species. Up to four different topics may be taken. (P/NP grading only.)—(I, II, III)

Among the topics offered: (B) Beef, (C) Dairy, (D) Goats, (F) Laboratory Animals, (G) Meats, (H) Poultry, (J) Swine

2 units

Prerequisites: None

Instructor: various

ANS 98(30)- Topics and Careers in Animal Science

Laboratory—4 hours. Guest speakers and industry-career oriented field trips. The course will provide students with a perspective of career opportunities related to animal science. Students will establish personal contacts with industry leaders that could lead to future internships or jobs. (P/NP grading only.)—(III)

2 units

Prerequisites: None

Instructor: TBA

ANS 100- Animal Physiology

Lecture—4 hours; discussion—1 hour. Basic principles of animal physiology in domesticated and captive animals with a comparative approach. Molecular, biochemical, chemical, and physical aspects and their influences on function of physiological systems in animals.—(III)

Note: Can replace NPB 101 in fulfilling Depth Subject Matter requirement for ANS majors.

5 units

Prerequisites: BIS 2A, CHE 2B

Instructor: Todgham

ANS 112- Sustainable Animal Agriculture

Lecture/discussion—3 hours. Current applications of sustainable animal agriculture including the challenges of animal production, animal needs, animal well-being, and protection of the environment and resources for future food supply systems. Various scenarios for meeting sustainability objectives are evaluated using computing modeling. GE credit: SciEng or SocSci | OL, QL, SE or SS.—(III)

3 units

Prerequisites: BIS 2B or ANS 1; STA 100 or PLS 120 recommended.

Instructor: Kebreab

ANS 123- Animal Growth and Development

Lecture—3 hours; lecture/discussion—1 hour. Growth and development of animals from conception to maturity, viewed from practical and biological perspectives; includes genetic, metabolic, nutritional control of cell and organism function. GE credit: SciEng | OL, QL, SE, VL, WE.—(III)

4 units

Prerequisites: ABI 103 or BIS 103.

Instructor: Ross

ANS 126- Equine Nutrition

Lecture—3 hours. Equine digestion, digestive physiology, diet development and evaluation, and the relationship of the topics to recommended feeding practices and nutritional portfolios. Offered in alternate years. GE credit: SciEng | SE.—(III)

3 units

Prerequisites: ANS 15, NUT 115.

Instructor: Thunes

ANS 127- Advanced Equine Reproduction

Lecture—3 hours. Reproductive physiology, anatomy and endocrinology of the mare and stallion. Emphasis on structure/function relationships as they are applied to improving equine reproductive management and efficiency. GE credit: SciEng | SE, WE.—(III)

3 units

Prerequisites: an upper division physiology course (e.g., NPB 101 or ANS 100) and an advanced horse production and management course (e.g., ANS 115).

Instructor: Pettey

ANS 137- Techniques and Practices of Avian Culture

Lecture—1 hour; laboratory—6 hours. Daily care and maintenance of birds for research, commercial production, and companion or hobby uses. Biological and environmental factors important to sound management of birds. Laboratories focus on bird husbandry, management and care and include growth trials and biochemical assays. GE credit: SciEng | QL, SE, SL, VL, WE.—(III)

3 units

Prerequisites: basic understanding of general biology and chemistry; ANS 2.

Instructor: Hung

ANS 139- Experiments in Animal Physiology

Lecture—1 hour; laboratory—3 hours. Class will involve a mixture of theory and hands-on experiences, and will expose students to a variety of approaches that will have relevance to any ANS or ANM student, particularly for those that are headed to graduate school or to jobs in biotech or any laboratory setting. Involves the application of animal science skills to the study of various physiological systems using different experimental techniques —(III)

3 units

Prerequisites: ABI 102, BIS 101

Instructor: Staff

ANS 144- Beef Cattle and Sheep Production

Lecture—3 hours; laboratory—3 hours; one or two Saturday field trips. Genetics, physiology, nutrition, economics and business in beef cattle and sheep production. Resources used, species differences, range and feedlot operations. Emphasis on integration and information needed in methods for management of livestock enterprises. GE credit: SciEng | OL, QL, SE, SL, VL, WE.—(III)

4 units

Prerequisites: ANS 41, ANG 107, NUT 115, or consent of instructor; a course in Range Science and a course in microcomputing are recommended.

Instructor: Sainz

ANS 146- Dairy Cattle Production

Lecture—3 hours; laboratory—3 hours; fieldwork—1 hour; discussion—1 hour. Scientific principles from genetics, nutrition, physiology, and related fields applied to conversion of animal feed to human food through dairy animals. Management and economic decisions are related to animal biology considering the environment and animal well-being. Mandatory Saturday field-trip. GE credit: SciEng, Wrt | OL, QL, SE, SL, VL, WE.—(III)

5 units

Prerequisites: ANS 124, ANG 107, and NUT 115, or consent of instructor.

Instructor: DePeters

ANS 148- Enterprise Analysis in Animal Industries

Lecture/discussion—4 hours. Examination and application of decision making and problem solving in the production enterprise. The areas of production analysis, problem solving, risk analysis and cost-benefit analysis will be examined in terms of the total enterprise. GE credit: SocSci, Wrt | OL, QL, SS, WE.—(III)

4 units

Prerequisites: ANS 141 or 145 or 147 or consent of instructor.

Instructor: Kebreab

ANS 170- Ethics of Animal Use

Lecture—3 hours; discussion—1 hour. Ethical issues relating to animal use in contemporary society. Integration of philosophical theories with scientific evidence relating to animal behavior, mentality, and welfare. Uses of animals in agriculture, research, and as companions. Ethical responsibilities regarding wildlife and the environment. GE credit: SocSci, Wrt | SL, SS, WE.—(III)

4 units

Prerequisites: any basic course in composition or speech.

Instructor: Mench, Lee

ANS 198 (150)- Animal Health and Disease

Lecture—3 hours; discussion—1 hour. Health and disease issues relevant to various species, including sheep, cattle, pigs, poultry, fish and companion animals. Develop an understanding of the relationship between the host, agent and environment in the disease process. Explore epidemiological and population health principals as they relate to disease transmission. Explore common disease conditions and processes in domestic agricultural animals, and approaches to their control and prevention through environmental and nutritional management, and interventional techniques such as vaccination programs—(III)

4 units

Prerequisites: ANS 2 preferred

Instructor: Zhou

ANG 105- Horse Genetics

Lecture—2 hours. Coat color, parentage testing, medical genetics, pedigrees, breeds, the gene map and genus Equus. Emphasis on understanding horse genetics based on the unity of mammalian genetics and making breeding decisions based on fundamental genetic concepts. GE credit: SciEng | SE, SL.—(III)

2 units

Prerequisites: ANS 15 and BIS 101.

Instructor: Bellone

ANG 198- The Science of Captive Breeding and Reintroduction

More information to come!

ANG 198- Animal Conservation Genetics

More information to come!!

AVS 100- Avian Biology

Lecture—3 hours. This course will provide students with basic biology of domestic avian species in the areas associated with poultry production, including avian genetics, avian immunology, reproduction, growth and development, and broiler and layer managements. GE credit: SciEng | SE.

3 units

Prerequisites: BIS 2A, 2B; ANS 2 preferred

Instructor: Zhou