Animal Genetics

(College of Agricultural and Environmental Sciences) Faculty. See under Department of Animal Science, on page 162.

Major Program. See the major in Animal Science, on page 162.

Related Courses. See Biological Sciences 101, 101D; Evolution and Ecology 102, 175; Genetics Graduate Group courses; Microbiology 150, 170, 215, 260, 274, 292; Molecular and Cellular Biology 121, 141, 161, 162, 163, 164, 178, 182, 221C, 257, 262, 263; Neurobiology, Physiology, and Behavior 131; Plant Biology 151, 152, 154, 161A, 161B; Plant Pathology 215X, 217; Plant Sciences 220, 221.

Courses in Animal Genetics (ANG)

Questions pertaining to the following courses should be directed to the instructor or to the Animal Science Advising Center in 1202 Meyer Hall 530/754-7915.

Upper Division

101. Animal Cyto genetics (3) Laboratory/discussion—1 hour; laboratory—6 hours. Prerequisite: Biological Sciences 101, 102 or the equivalent. Principles and techniques of cytogenetics applied to animal systems; chromosome harvest techniques, analysis of mitosis and meiosis, karyotyping, chromosome banding, cytogenetic mapping, chromosome structure and function, comparative cytogenetics. GE credit: SciEng|SE.

105. Horse Genetics (2) Lecture—2 hours. Prerequisite: Animal Science 15; Biological Sciences 101. Coat color, parentage testing, medical genetics, pedigrees, breeds, the gene map and 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.


111. Molecular Biology Laboratory Techniques (4) Lecture—2 hours; laboratory—6 hours. Prerequisite: Biological Sciences 1C, 101, 102, 103. 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, SI, VI, VE.—F, W, F, W, S, Su.

198. Directed Group Study (1-5) Prerequisite: consent of instructor. Selected topics or current trends in animal genetics. (P/NP grading only.)

199. Special Study for Advantaged Undergraduates (1-5) Prerequisite: consent of instructor. (P/NP grading only.)

Graduate

204. Theory of Quantitative Genetics (3) Lecture—3 hours. Prerequisite: course 107 or the equivalent. Theoretical basis of quantitative genetics and the consequences of Mendelian inheritance. Concepts used to estimate quantitative genetic differences and their basis for partitioning the phenotypic variance.

206. Advanced Domestic Animal Breeding (3) Lecture—3 hours. Prerequisite: course 107 and Animal Science 205; course 204 recommended. Procedures for the genetic evaluation of individuals to include selection indices and mixed model evaluation for single and multiple traits. Methods of estimating genetic trends. Offered in alternate years.

208. Estimation of Genetic Parameters (3) Lecture—3 hours. Prerequisite: course 107 and Animal Science 205; courses 204 and 108 recommended. General methods for the estimation of components of variance and covariance and their application to the estimation of heritability, repeatability and genetic correlations are considered. Specific emphasis is given to procedures applicable to livestock populations under selection.

211. Genetic Engineering of Animals (2) Lecture—1 hour; lecture/discussion—1 hour. Review of techniques for the genetic engineering of animals and their limitations and applications. Student-led discussions of recent papers in the field and possible future applications of genetically engineered animals in basic research and applied agricultural and medical research. (S/U grading only.)—Murray

212. Sequence Analysis in Molecular Genetics (2) Lecture/laboratory—2 hours. Prerequisite: Biological Sciences 101 or the equivalent; graduate standing or consent of instructor. Use of computer algorithms and online databases to analyze nucleic acid and protein sequences in molecular genetics research. (Medrano)

298. Group Study (1-5) Prerequisite: consent of instructor. Lectures and discussions of advanced topics in animal genetics. (S/U grading only.)

299. Research in Animal Genetics (1-12) Prerequisite: consent of instructor. (S/U grading only.)

Animal Physiology

See Animal Biology, on page 160; Animal Science, on page 162; Neurobiology, Physiology, and Behavior, on page 478; and Molecular, Cellular, and Integrative Physiology (A Graduate Group), on page 466.

Animal Science

(College of Agricultural and Environmental Sciences) Anita M. Oberbauer Ph.D., Chairperson of the Department

Department Office. 2223 Meyer Hall 530-752-1250; http://animalscience.ucdavis.edu/

Master Adviser. E.J. DePeters

Undergraduate Advising. 1202 Meyer Hall 530-754-7915; http://asuc.ucdavis.edu/

Advising Center for the major, minors, and course offerings (including peer advising) is located in the Animal Science Advising Center in 1202 Meyer Hall 530-754-7915. Each student will be assigned a faculty adviser through this office upon entering the major.

Fall 2011 and on Revised General Education (GE) AIH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences, ACHG—American Cultures; DD—Domestic Diversity; QL—Oral Skills; QL—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; WE—Writing Experience Pre-Fall 2011 General Education (GE) AIH—Arts and Humanities; SCIE—Science and Engineering; SoSC—Social Sciences; Div—Domestic Diversity; Wrt—Writing Experience Quarter Offered: F=Fall; W=Winter; S=Spring; Su=Summer; 2017-2018 offering in parentheses
Animal Science

Graduate Advising. 1249 Meyer Hall 530-752-2382

Faculty

Trish J. Berger, Ph.D., Professor
Mary E. Delany, Ph.D., Professor and Executive Associate Dean CAFES
Edward J. DePeters, Ph.D., Professor, Academic Senate Distinguished Teaching Award, UC Davis Prize for Undergraduate Teaching and Scholarly Achievement
John M. Eadie, Ph.D., Professor (Wildlife, Fish & Conservation Biology; Animal Sciences)
Thomas R. Famula, Ph.D., Professor Emeritus
Douglas E. Conklin, Ph.D., Professor Emeritus
Ernest S. Chang, Ph.D., Professor Emeritus
C. Robert Ashmore, Ph.D., Professor Emeritus
Deanne Meyer, Ph.D., Specialist in Cooperative Extension and Lecturer
Elizabeth A. Maga, Ph.D., Adjunct Professor
Peng Ji, Ph.D., Assistant Adjunct Professor

Affiliated Faculty

Richard A. Blatchford, Ph.D., Assistant Poultry Extension Specialist
David A. Bunn, Ph.D., Assistant Adjunct Professor (Biological Sciences, Bodega Marine Laboratory)
Fred S. Conte, Ph.D., Specialist in Cooperative Extension and Lecturer (Biological Sciences, Bodega Marine Laboratory)
Joshua Hull, Ph.D., Assistant Adjunct Professor (Biological Sciences, Bodega Marine Laboratory)
Elizabeth A. Maga, Ph.D., Adjunct Professor (Biological Sciences, Bodega Marine Laboratory)
Deanne Meyer, Ph.D., Specialist in Cooperative Extension and Lecturer (Biological Sciences, Bodega Marine Laboratory)
James W. Ollsen, Ph.D., Specialist in Cooperative Extension and Lecturer (Biological Sciences, Bodega Marine Laboratory)

Area of Specialization

Choose one area of specialization below; the program of study must be approved in advance by your faculty adviser. Courses must be taken for a letter grade.

Animal Science with a Disciplinary Focus

Select 20 upper division units, with approval from your faculty adviser, to form a coherent series of courses in one of the following disciplines: animal behavior, biochemistry, genetics, nutrition, or physiology.

Aquatic Animals

Select Animal Science 18 and 131, Nutrition 124, and Animal Science 118 or 119.
Select additional upper division units from any Animal Genetics or Animal Science course, or other courses approved by your faculty adviser. Students in this specialization must take Animal Science 136 to meet their Laboratory Depth Subject Matter requirement.

Avian Sciences

Select 20 upper division units from any Animal Genetics, Animal Science, or Avian Sciences courses or other courses approved by your faculty adviser. Students in this specialization must substitute Avian Sciences 103, 121, and Neurobiology, Physiology, and Behavior 117 for the Animal Science 124 and Neurobiology, Physiology, and Behavior 121 and 1211 requirement under Integrative Animal Biology.

Comparative and Captive Animals

Select 20 upper division units from any Animal Genetics, Animal Science or Avian Sciences course, or from Nutrition 115, 122, 123, 123L or other courses approved by your faculty adviser.

Equine Science

Select 20 upper division units from any Animal Genetics, Animal Science or Avian Sciences course, or from Nutrition 115, 122, 123, 123L or other courses approved by your faculty adviser.

Laboratory Animals

Select 20 upper division units from any Animal Genetics, Animal Science or Avian Sciences course, or from Nutrition 122, 123, 123L or other courses approved by your faculty adviser.

Livestock and Dairy

Select 20 upper division units from any Animal Genetics, Animal Science or Avian Sciences course, or from Nutrition 122, 123, 123L or other courses approved by your faculty adviser.

Pre-Fall 2011 General Education (GE):

ArtHum=Arts and Humanities; SciEng=Science and Engineering; SocSci=Social Sciences; DomDiv=Dominant Diversity; Writing Experience

Quarter Offered: F-W, Winter, S-Spring, Su-Summer; 2017-2018 offering in parentheses
Variable unit courses (92, 99, 192, 197T, 121, 121L, Nutrition 115, 122, 123, 123L. Variable unit courses (92, 99, 192, 197T, 198, 199) are not allowed for the completion of this requirement.

Animal Science—Aquaculture + ArtHum ........... 20
Animal Science 18, 19 (f) ................................ 4
Animal Science 118, 119 ................................ 8
Additional upper division courses ........... 8
Select additional units to complete the 20-unit total from: upper division Animal Science courses, Animal Genetics courses, Applied Biological Systems Technology 161, Nutrition 124, Wildlife, Fish, and Conservation Biology 121. Variable unit courses (92, 99, 192, 197T, 198, 199) are not allowed for the completion of this requirement.

Animal Science—Dairy/Livestock + SciEng ........... 20
Animal Science 41 and 41L or 21 .......... 4
Animal Science 104 ................................ 4
Select four or eight units from Animal Science 143, 144, 146.
Select additional units to complete the 20-unit total from: upper division Animal Science courses, Animal Genetics courses, Applied Biological Systems Technology 161, Nutrition 124, Wildlife, Fish, and Conservation Biology 121. Variable unit courses (92, 99, 192, 197T, 198, 199) are not allowed for the completion of this requirement.

Animal Science—Equine + ArtHum ........... 21
Animal Science 15 ................................ 3
Animal Science 103 or 104 .................. 3-4
Animal Science 115, 141 .................... 8
Animal Science 125 or 126 ................. 3-4
One additional upper division course ....... 3
Select from upper division Animal Science courses, Animal Genetics courses, Applied Biological Systems Technology 161, Nutrition 115, 122, 123, 123L. Variable unit courses (92, 99, 192, 197T, 198, 199) are not allowed for the completion of this requirement.

Variable unit courses (92, 99, 192, 197T, 198, 199) are not allowed for the completion of this requirement.

Minor Adviser: E.J. DePeters
Graduate Study: The Animal Biology Graduate Group offers a program of study and research leading to the M.S. or Ph.D. degree in Animal Biology. See Animal Biology [A Graduate Group], on page 161; see also Graduate Studies, on page 120.

Courses in Animal Science (ANS)

Lower Division

1. Domestic Animals and People (4)
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, and other species used in aquaculture. GE credit: SciEng, Wrt|SE, WE—F (F) Hovey

2. Introductory Animal Science (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 1 recommended, Biological Sciences 2A recommended. Recommended to students in Animal Science and Management, Agricultural and Environmental Education, and Sustainable Agriculture and Food Systems majors. 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, VL, SL, WE—F (F) Hovey

12. Animal Science: Basic Principles and Application (3)
Lecture—3 hours. Overview of domestic and global animal industries. Exploration of production systems, animal biology, genetics, anatomy, physiology, reproduction, health, behavior, research, biotechnology and welfare. GE credit: SciEng|SE.

15. Introductory Horse Husbandry (3)
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, W—W (W) Mienaltowski

17. Canine Behavior: Learning and Cognition (3)
Lecture—3 hours. Domestic dog behavior from basic principles of learning to complex cognitive behaviors; interaction between learning and cognition including how they contribute to interactions with humans; basic genetic correlates of learning and cognition.

18. Introductory Aquaculture (4)
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, QL, QL, VL, WE—F (F) Kuelz

21. Livestock and Dairy Cattle Judging (2)
Laboratory—6 hours. Prerequisite: course 1 or 2 recommended. Emphasis is presently applied to light horses, meat animals and dairy cattle. Relation between form and function, form and carcass quality, and form and milk production. GE credit: SciEng|QL, SE—F (F) Liew

22A. Animal Evaluation (2)
Laboratory—3 hours; fieldwork—30 hours (total). Prerequisite: course 21 or the equivalent. Attendance at 3 one-day weekend field trips required. Domestic livestock interests 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: QL, SE. —F (F) Van Liew

41. Domestic Animal Production (2)

41L. Domestic Animal Production Laboratory (2)
Discussion—1 hour; laboratory—3 hours. Prerequisite: course 41 can be concurrent. 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—F, W. W, F, W, J Miltoehner, Petty

49A. Animal Management Practices: Aquaculture (2)
Discussion—1 hour; laboratory—3 hours. 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.)

49B. Animal Management Practices: Beef (2)
Discussion—1 hour; laboratory—3 hours. 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.)—F, S (F).

49C. Animal Management Practices: Dairy (2)
Discussion—1 hour; laboratory—3 hours. 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.)—F, W, S, F, W, S.

49D. Animal Management Practices: Goats (2)
Discussion—1 hour; laboratory—3 hours. 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.)—F, S (F).

49E. Animal Management Practices: Horses (2)
Discussion—1 hour; laboratory—3 hours. 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.)—F, W, W, F, W.

49F. Animal Management Practices: Laboratory Animals (2)
Discussion—1 hour; laboratory—3 hours. 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.)—F, S (F).
49G. Animal Management Practices: Meats (2)
Lecture—3 hours; laboratory—3 hours. 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.)—F, W, S, J

49H. Animal Management Practices: Poultry (2)
Discussion—1 hour; laboratory—3 hours. 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.)—F, W, S, J

49I. Animal Management Practices: Sheep (2)
Discussion—1 hour; laboratory—3 hours. 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.)—F, W, S, J

49J. Animal Management Practices: Swine (2)
Discussion—1 hour; laboratory—3 hours. 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.)—F, W, S, J

49K. Animal Management Practices: Captive and Companion Avian (2)
Discussion—1 hour; laboratory—3 hours. 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.)—F, W, S, J

90C. Research Group Conference (1-5)
Discussion—1 hour. Prerequisite: lower division standing, consent of instructor. Restricted to lower division standing. Weekly conference on research problems, progress and techniques in the animal sciences. May be repeated for credit. (P/NP grading only.)—F, W, S, J

92. Internship in Animal Science (1-12)
Internship—3-18 hours. Prerequisite: consent of instructor. Restricted to lower division standing. Internship off and on campus in dairy, livestock, and aquaculture production, research and management; or in a business, industry, or agency associated with these or other animal enterprises. All requirements of Internship Approval form must be met. (P/NP grading only.)—F, W, S, J

98. Directed Group Study (1-5)
Prerequisite: consent of instructor. Restricted to lower division standing. (P/NP grading only.)

99. Special Study for Undergraduates (1-5)
Prerequisite: consent of instructor. Restricted to lower division standing. (P/NP grading only.)

Upper Division
100. Animal Physiology (5)
Lecture—4 hours; discussion—1 hour. Prerequisite: Biological Sciences 2A, Chemistry 2B. Pass One restricted to students in the Animal Science and Animal Science and Management majors. Basic principles of animal physiology in domesticated and captive animals with a comparative approach. Molecular, biochemical, chemical and physical aspects and their impact on function of physiological systems in animals. Not open to credit to students who have taken Neurobiology, Physiology, and Behavior 101. GE credit: SciEng | SE. (S.)—Todgham

103. Animal Welfare (4)
Lecture—2 hours; discussion—2 hours. Prerequisite: course 104 or Neurobiology, Physiology, and Behavior 102 or Wildlife, Fish, and Conservation Biology 120 recommended. Restricted to upper division standing. 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, TL, VL, WE. (S.)—Ross

104. Principles and Applications of Domestic Animal Behavior (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2 or Biological Sciences 2B. Basic principles of animal behavior in domesticated species. Emphasis placed on application of the principles of animal behavior. GE credit: SciEng | SE. (F.)—Tucker

106. Domestic Animal Behavior Laboratory (2)
Laboratory—6 hours. Prerequisite: course 104 or Neurobiology, Physiology, and Behavior 102 or consent of instructor. Research experience with the behavior of large domestic animals. Experimental design, methods of data collection and analysis, and reporting of experimental results. GE credit: SciEng, Wrt 1 | QL, SE, SL, VL, WE. (S.)—Tucker

112. Sustainable Animal Agriculture (3)
Lecture/discussion—3 hours. Prerequisite: course 1 or Biological Sciences 2B, Statistics 10 or Plant Sciences 120 recommended. Current applications of sustainable animal agriculture including the challenges of animal production, animal nutrition, animal well-being, and protection of the environment and resources for future food supply systems. Various scenarios for meeting sustainability objectives are evaluated using computer modeling. GE credit: SciEng, SocSci | QL, OL, SE or SS. (S.)—Krebear

115. Advanced Horse Production (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 15, 100 or Neurobiology, Physiology, and Behavior 101. Principles and practices of equine reproductive management and efficiency. Offered in alternate years. GE credit: SciEng | SE. (S.)—Fadel

119. Invertebrate Aquaculture (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: Biological Sciences 101 or equivalent. Breeding and feeding of aquatic invertebrates; application of basic principles of physiology, reproduction, and nutrition to production of mollusks and crustaceans for human food. Emphasis on species currently reared in California. GE credit: SciEng | SE.

120. Principles of Meat Science (3)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 2. Restricted to upper division students. Anatomical, physiological, developmental, and biochemical aspects of muscle underlying the conversion of muscle to meat. Includes meat processing, preservation, microbiology, and public health aspects related to meat products. (Same course as Food Science and Technology 120.) GE credit: SciEng | SE.

120L. Meat Science Laboratory (2)
Discussion—1 hour; laboratory—3 hours. Prerequisite: course 2, 1B. Restricted to upper division standing. Laboratory exercises and student participation in transformation of live animal to carcass and meat, structural and biochemical changes related to meat quality, chemical and sensory evaluation of meat, and field trips to packing plant and processing plant. GE credit: SciEng | SE.

123. Animal Growth and Development (4)
Lecture—3 hours; lecture/discussion—1 hour. Prerequisite: course 1 or Neurobiology, Physiology, and Behavior 101. Principles and applications of mammalian growth, development, and maintenance of a specific animal species. GE credit: SciEng, Wrt 1 | QL, SE, SL, VL, WE. (F.)—Fadel

127. Advanced Equine Reproduction (3)
Lecture—3 hours. Prerequisite: course 15, 100 or Neurobiology, Physiology, and Behavior 101. 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. (S.)—Meyer

129. Environmental Stewardship in Animal Production Systems (3)
Lecture—2 hours; laboratory—2 hours; discussion—1 hour. Prerequisite: Plant Sciences 21 or Engineering Computer Science 15 or consent of instructor. Restricted to upper division standing. 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 to interpret results. GE credit: SciEng | QL, SE, SL, WE. (W.)—Meyer

131. Reproduction and Early Development in Aquatic Animals (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: Molecular and Cellular Biology 150 and Wildlife, Fish and Conservation Biology 120; or consent of instructor. Physiological and developmental functions related to reproduction, breeding efficiency and fertility of animals commonly used in aquaculture. GE credit: SciEng | SE, WE.

136. Techniques and Practices of Fish Culture (3)
Lecture—1 hour; laboratory—6 hours. Prerequisite: general biology and chemistry courses are recommended. Growth 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 including growth trials and biochemical assays. Not open for credit to students who have previously completed course 136A or 137. GE credit: SciEng, Wrt 1 | QL, SL, VL, WE. (F.)—Fadel

137. Techniques and Practices of Avian Culture (3)
Lecture—1 hour; laboratory—6 hours. Prerequisite: basic understanding of general biology and chemistry; course 2. Not open for credit to students who

Fall 2011 and on Revised General Education (GE): AH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences; AC—American Cultures; DD—Diverse Discourse; OL—Oral Skills; QA—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; WE—Writing Experience
Pre-Fall 2011 General Education (GE): AH&—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; Div—Diverse Diversity; Wrt—Writing Experience
Quarter Offered: F=Fall, W=Winter, S=Spring, D=Summer; 2017/2018 offering in parentheses
have previously completed course 136B or 137. Daily care and maintenance of birds for research, commercial production, or companion or hobby uses. Biological and environmental factors important to sound management of birds. Laboratories focus on bird husbandry, management and care and include practical bird biology. GE credit: SciEng|SE.

139. Experimental Animal Physiology (3)
Lecture—1 hour; laboratory—3 hours; fieldwork—3 hours. Prerequisite: Animal Biology 102, Biological Sciences 101, or consent of instructor. Restricted to seniors in the Animal Science and Animal Science and Management majors. Combination of theory and hands-on experiences in animal physiology using various animal species. Practical laboratory skill development from cellular level to whole animal, in areas such as genetics, endocrinology, histology and physiological function. GE credit: SciEng|SE, WRT|SS.

140. Management of Laboratory Animals (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 100 or Neurobiology, Physiology & Behavior 101. 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|OL, WRT|OL, QL, SE, SL, VL.

141. Equine Enterprise Management (4)
Lecture/discussion—4 hours. Prerequisite: course 115; Economics 1A, 1B recommended. Examination of the concepts and principles involved in the operation of a horse business. Essential aspects of equine enterprise management, including equine law, marketing, cash flow analysis, and impact of state and federal regulations. Offered in alternate years. GE credit: SciEng|OL, QL, SS, WRT|SS, SE—F. (F.) Oberbauer

142. Companion Animal Care and Management (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: course 42, Biological Sciences 101, course 100 or Neurobiology, Physiology, and Behavior 101; Animal Biology 102 or Biological Sciences 102 and Animal Biology 103 or Biological Sciences 103 recommended. 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, SS, VL, WRT|WE—F. (F.) Oberbauer

143. Pig and Poultry Care and Management (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 41, Nutrition 115, course 100 or Neurobiology, Physiology, and Behavior 101 or consent of instructor. Care and management of swine, broilers and turkeys as related to environmental physiology, nutrition and metabolism, disease management and reproduction. Saturday field trips. Offered in alternate years. GE credit: SciEng|SE, SL —F. (F.) King, Pelley

144. Beef Cattle and Sheep Production (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 41, Nutrition 115 or consent of instructor; Animal Genetics 107 recommended. Genetics, physiology, nutrition, economics and business in beef cattle and sheep production. Resources used, special diets, wool and feedlot operations. Emphasis on integration and information needed in methods for management of livestock enterprises. One or two Saturday field trips. GE credit: SciEng|OL, QL, SE, SS, VL, WRT|WE—S. (S.) Sainz, Zinn

145. Meat Processing and Marketing (4)
Lecture—3 hours; laboratory—3 hours. Prerequisite: course 2; consent of instructor. Distribution, processing and marketing of meat and meat products. Meat and meat animal grading and pricing. Government regulations and social/consumer concerns. Future trends and impact on production management practices. Includes poultry. GE credit: SciEng|SE.

146. Dairy Cattle Production (5)
Lecture—3 hours; laboratory—3 hours; fieldwork—1 hour discussion—1 hour. Prerequisite: Nutrition 115 or consent of instructor; Animal Genetics 107 recommended. 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 fieldwork. GE credit: SciEng|OL, QL, SE, SS, VL, WRT|WE—S. (S.) DePeters

147. Dairy Processing and Marketing (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: course 146 or consent of instructor. Examination of dairy systems, processing practices, product quality, impact of government policy (domestic and foreign), marketing alternatives, and product development. GE credit: SciEng|SE.

148. Enterprise Analysis in Animal Industries (5)
Lecture/discussion—4 hours. Restricted to students with upper division standing. Examination and application of decision making and problem solving in the production of animal enterprises. The areas of productivity, analysis, problem solving, profit analysis and cost-benefit analysis will be examined in terms of the total enterprise. GE credit: SocSci, WRT|OL, QL, SS, WRT|WE—S. (S.) Pettey

149. Farrier Science (3)
Lecture—3 hours. Prerequisite: course 115. In-depth examination of the structure/function relationship of the equine hoof and how it relates to conformation, injury and performance. Offered irregularly. GE credit: SciEng|SE.

149L. Farrier Science Laboratory (1)
Laboratory—3 hours. Prerequisite: course 149 (may be taken concurrently) or consent of instructor. Art and science of horseshoeing in equine related fields. Proper use of the tools, materials and techniques in the fabrication of shoes and safe preparation of the hoof for application of shoes. (P/NP grading only.)

170. Ethics of Animal Use (4)
Lecture—3 hours; discussion—1 hour. Prerequisite: any basic course in animal behavior, ethics, or completion of college English requirement. 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 environment. GE credit: SocSci, WRT|OL, QL, SS, VL, WRT|WE—S. (S.) Makagon

190C. Research Group Conference (1)
Discussion—1 hour. Prerequisite: advanced standing; consent of instructor. Weekly conference on research problems, progress and techniques in the animal sciences. May be repeated for credit. (P/NP grading only.)—F. W. S. (F., W. S.)

192. Internship in Animal Science (1-12)
Internship—3.6 hours. Prerequisite: completion of 84 units and consent of instructor. Internship off and on campus in dairy, livestock and aquaculture production, research and management; or in a business, industry, or agency associated with these or other animal enterprises. All requirements of Internship Approval Form must be met. (P/NP grading only.)—F. W. S. (F., W. S.)

194. Research in Animal Science (3)
Laboratory—6 hours; discussion—1 hour. Prerequisite: course 106 or 133 or 135 or 136 or 137 or 139 or Animal Genetics 111 and consent of instructor. Research with a faculty mentor. Weekly discussion and laboratory on specific research topic. May include a seminar to research group. Choose from sections: (1) Animal Genetics; (2) Animal Nutrition; (3) Animal Nutrition; (4) Animal Physiology. May be repeated for credit for a total of four times.—F. W. S. (F., W. S.)

194HA. Undergraduate Honors Thesis in Animal Science (4)
Lecture—1 hour; laboratory—9 hours. Prerequisite: course 100 or Neurobiology, Physiology and Behavior 101, Animal Biology 103 or Biological Sciences 103; minimum cumulative GPA of 3.200 and selection by the Honors Selection Committee; consent of instructor. Students will carry out a research project (chosen from faculty-suggested or approved proposals) during the academic year under the guidance of a faculty member. Upon completion, student will write a thesis and present a public seminar describing his/her research. (Deferred grading only, pending completion of sequence.) GE credit: SciEng|OL, SS, VL.

194HB. Undergraduate Honors Thesis in Animal Science (4)
Lecture—1 hour; laboratory—9 hours. Prerequisite: course 100 or Neurobiology, Physiology and Behavior 101, Animal Biology 103 or Biological Sciences 103; minimum cumulative GPA of 3.200 and selection by the Honors Selection Committee; consent of instructor. Students will carry out a research project (chosen from faculty-suggested or approved proposals) during the academic year under the guidance of a faculty member. Upon completion, student will write a thesis and present a public seminar describing his/her research. (Deferred grading only, pending completion of sequence.) GE credit: SciEng|OL, SS, VL.

194HC. Undergraduate Honors Thesis in Animal Science (4)
Lecture—1 hour; laboratory—9 hours. Prerequisite: course 100 or Neurobiology, Physiology and Behavior 101, Animal Biology 103 or Biological Sciences 103; minimum cumulative GPA of 3.200 and selection by the Honors Selection Committee; consent of instructor. Students will carry out a research project (chosen from faculty-suggested or approved proposals) during the academic year under the guidance of a faculty member. Upon completion, student will write a thesis and present a public seminar describing his/her research. (Deferred grading only, pending completion of sequence.) GE credit: SciEng|OL, SS, VL.

197. Tutoring in Animal Science (1-2)
Tutorial—1.2 hours. Prerequisite: Animal Science or related major; upper division standing; consent of instructor. Tutoring of students in lower division animal science courses; weekly conference with instructors in charge of courses and practices of teaching procedures. May be repeated one time for credit. (P/NP grading only.)

198. Directed Group Study (1-5)
Prerequisite: consent of instructor. (P/NP grading only.)

199. Special Study for Advanced Undergraduates (1-5)
Prerequisite: consent of instructor. Restricted to students with upper division standing. (P/NP grading only.)

Graduate

200. Strategies in Animal Production (4)
Lecture/discussion—4 hours. Prerequisite: consent of instructor. Examines the forces and issues in animal agriculture through the strategic management process.

206. Models in Agriculture and Nutrition (3)
Lecture—2 hours; laboratory—3 hours. Prerequisite: Mathematics 168; Statistics 108. Basic model building principles and techniques for statistical and systems simulation models. Optimization techniques for non-linear experimental designs and management models are presented. Quantitative analysis and evaluation of linear and non-linear equations used in agriculture and nutrition.

259. Literature in Animal Science (1)
Seminar—1 hour. Prerequisite: graduate standing. Critical presentation and analysis of recent journal articles in animal science. May be repeated for credit up to nine times. (S/U grading only.)
Animal Science and Management

[College of Agricultural and Environmental Sciences]

Master Adviser, J.G. Fadel

Advising Center for the major (including peer advising) is located in 1202 Meyer Hall 530-754-7915. Each student will be assigned a faculty adviser through this office upon entering the major. http://asac.ucdavis.edu

The Major Program

The Animal Science and Management major combines a thorough education in the basic biology of domestic animal species with a strong background in agricultural economics. Graduates of this interdisciplinary major will be well positioned to adjust to our rapidly changing world and job market.

The Program. The interdisciplinary program in Animal Science and Management combines a fundamental background in the natural sciences (chemistry, biology, physiology, nutrition, genetics, microbiology, and behavior), with an understanding of economics and humanities. After completing preparatory courses, students focus on both the animal species that interest them (horses, cattle, sheep, companion animals, goats, fish, crustaceans or mollusks, among others) and principles of managerial economics (marketing, finance, business organization and systems analysis). Students preparing for medical or veterinary school can meet professional entrance requirements with those of this major if they plan ahead.

Career Alternatives. Job opportunities for successful graduates are plentiful and include positions with banking and financial institutions, agribusiness, Peace Corps, and farms of all scales. Most Animal Science and Management graduates are well prepared for professional study (medical, law, veterinary, and graduate business schools) as well as graduate research programs leading to the M.S. or Ph.D. degrees. Advanced degrees open doors to work as extension specialists, farm advisors, and teachers, and prepare students for international service.

B.S. Major Requirements:

UNITS

Written and Oral Expression .................. 8

Select two courses (if not selected for English college requirement from: Communication 130, 134, 135, 140, 150; University Writing Program 101, 102A, 102B, 102C, 102D, 102E, 102F, 102G, 104A, 104B, 104C, 104D, 104E, 104F

Preparatory Subject Matter .................. 69-75

Animal Science 1 and 2 .................. 8

Biological Sciences 2A, 2B, and 2C .... 15

Chemistry 2A, 2B, 8A, 8B .................. 16

Plant Sciences or Computer Science Engineering 15 .................. 3-4

Economics 1A, 1B; Management 11A, 118 .......................... 16

Mathematics 1A, 1B, 16B, or 17A-B-C or 21A-B-C .................. 9-12

Plant Sciences 120, Statistics 100 or 103, or other courses in quantitative skills with prior approval of the Master Adviser .................. 4

Depth Subject Matter .......................... 27-30

Biological Sciences 101 .................. 4

Nutrition 115 .................. 4

Neurobiology, Physiology, and Behavior 160 .......................... 5

Business Management .................. 14-17

Agricultural and Resource Economics 100A

One course from: Agricultural and Resource Economics 113, 130, 136, 138; One course from: Agricultural and Resource Economics 120, 132, 140, 145, 157; Plus one course from: Animal Science 128 or Agricultural and Resource Economics 155

Area of Specializations .................. 14-16

Choose one area of specialization below:

Aquatic Animals .......................... 16

Animal Science 18, 118 or 119, 131, and 148.

Companion Animals .......................... 16

Animal Science 42, 140, 142, and 148.

Dairy .......................... 15

Animal Science 41, 41L, 41G, 147, and 148.

Equine .......................... 15


Livestock .......................... 16

Animal Science 41, 41L, 43 or 144, 145, and 148.

Poultry .......................... 15

Avian Sciences 11, Animal Science 143, 145, and 148.

Individualized .......................... 14-16

Students are required to gain approval of their adviser and the Master Adviser, design their own individualized specialization within the major. The specialization will consist of 4 to 6 courses with one of the courses being Animal Science 148.

Restricted Electives .................. 8-10


Avian Sciences 100, 103, 105, 121, 123, 149, 150; Animal Genetics 101, 105, 107, 111; Nutrition 122, 123, 123L, 124; Animal Biology 102 (strongly recommended), 103;

Computer Science Engineering 124; Management 100; Neurobiology, Physiology, and Behavior 117, 121, 131, 132, 130, Wildlife, Fish, and Conservation Biology 120, 120L, 130.

Total Units for the Major .................. 126-139

Anthropology

[College of Letters and Science]

James H. Smith, Ph.D., Chairperson of the Department

Department Office. 328 Young Hall 530-752-0745; http://www.anthropology.ucdavis.edu

Faculty

Monique Barberger-Mulder, Ph.D., Professor

Tim K. C. Choy, Ph.D., Associate Professor (Science and Technology Studies)

Damien Caillaud, Ph.D., Assistant Professor

Margaret C. Crockford, Ph.D., Assistant Professor

Christyann M. Darwent, Ph.D., Associate Professor

Marisol de la Cadena, Ph.D., Professor

Donald L. Donham, Ph.D., Distinguished Professor

Joseph Dumit, Ph.D., Professor (Science and Technology Studies)

Selmer E. Eerkens, Ph.D., Professor

Tarek Elhaik, Ph.D., Assistant Professor

Suzanna M. Sawyer, Ph.D., Associate Professor

Lynne Isbell, Ph.D., Ph.D., Professor

Academic Senate Distinguished Teaching Award

Jeffrey S. Kahn, Ph.D., Assistant Professor

Suad Joseph, Ph.D., Distinguished Professor (Women and Gender Studies)

Alan Klima, Ph.D., Professor

Sarah B. Hrdy, Ph.D., Professor Emerita

William W. Ogburn, Ph.D., Distinguished Professor

Teresa E. Steele, Ph.D., Associate Professor

Timothy D. Weaver, Ph.D., Associate Professor

Richard T. Curley, Ph.D., Senior Lecturer Emeritus

William G. Davis, Ph.D., Professor Emeritus

James H. Smith, M.D., Professor

Smita Srivastava, Ph.D., Professor Emerita

Member, National Academy of Sciences

Lynne M. Henry, Ph.D., Professor Emeritus

UC Davis Prize for Undergraduate Teaching and Scholarly Achievement

David L. Olmedo, Ph.D., Professor Emeritus

Peter S. Rodman, Ph.D., Professor Emeritus

Janet S. Shimamoto-Smith, Ph.D., Professor

David Glenn Smith, Ph.D., Professor

Carol A. Smith, Ph.D., Professor Emerita

Tarek Elhaik, Ph.D., Professor Emeritus

Aram A. Yengoyan, Ph.D., Distinguished Professor Emeritus

The Major Program

Anthropology is the systematic study of human beings. The student of anthropology learns about human biology, ecology, and social life—past and present—and gains a broad understanding of humans and societies. It is a diverse field, and the courses, faculty, and degree programs at UC Davis are sub-divided into two wings—Evolutionary and Sociocultural.

Evolutionary. Evolutionary anthropologists are united by their common application of science and by their understanding of the human condition. It is an understanding of the biology, ecology, human behavioral ecology, molecular anthropology, paleoanthropology, primatology, genetics, biogeography, and conservation biology. Archaeo-