Professional 390. Theory and Practice of Teaching University-Level Composition (4) Seminar—3 hours; extensive writing. Open to graduate students teaching course 1 in the fall quarter following this course. Examination of current theories and practices in teaching of writing. Practical application to undergraduate writing courses. Emphasis on designing assignments and class sequences, and responding to student writing. Examination of impact of cultural, technological and theoretical changes on composition pedagogy. —W. (W.) Ferris

392. Teaching Expository Writing (2) Discussion—2 hours. Prerequisite: graduate standing, appointment as Teaching Assistant in the Composition Program; completion of course 390 or the equivalent. Discussion of problems related to teaching expository writing at the university level, with special emphasis on teaching reading and writing skills and responding to student papers. (S/U grading only.)—F, W, S.

396. Teaching Assistant Training Practicum (1-4) Prerequisite: graduate standing; consent of instructor. May be repeated for credit. (S/U grading only.)—F, W, S, (F, W, S.)

Urban Planning See Environmental Science and Policy, on page 327.

Urology See Medicine, School of, on page 427.

Vegetable Crops See Plant Sciences, on page 514.

Veterinary Medicine, School of

Michel D. Laimore, D.V.M., Ph.D., Dean of the School Patricia A. Conrad, D.V.M., Ph.D., Associate Dean—Global Programs

Jan E. Ikiz, B.V.Sc., Ph.D., Associate Dean—Academic Programs

Sean D. Owens, D.V.M., Associate Dean—Admissions and Student Programs

John R. Pascoe, B.V.Sc., Ph.D., Executive Associate Dean

Isaac N. Pessah, Ph.D., Associate Dean—Research and Graduate Education Programs

Jane Sykes, B.V.Sc., Ph.D., Interim Associate Dean—Clinical Programs and Director—Veterinary Medical Teaching Hospital

School Office. 530.752.1360; http://www.vetmed.ucdavis.edu

Departmental Courses

Anatomy, Physiology and Cell Biology (APC)

Lower Division 92. Internship (1-12) Internship—3-36 hours. Prerequisite: lower division standing; consent of instructor. Internship experience off and on campus in all subject areas offered in the Department of Anatomy, Physiology & Cell Biology. Internships are supervised by a member of the faculty. Offered in fall, winter and spring quarters. (P/NP grading only.)

99. Special Study for Undergraduates (1-5) Prerequisite: consent of instructor. (P/NP grading only.)—F, W, S, Su. (F, W, S, Su.)

Upper Division 100. Comparative Vertebrate Organography (4) Lecture—3 hours; laboratory—3 hours. Prerequisite: Biological Science 1A and 1B or 2A and 2B. Functional anatomy of major organ systems in vertebrates. Each system examined from cellular to gross level in fish, birds, and mammals. Emphasis on how differentiated tissues are formed from cells and organs to produce diverse physiological functions. (Same course as Neurobiology, Physiology, and Behavior 123.)—F, W, S. (F, W, S.)

192. Internship (1-15) Internship—3-45 hours. Prerequisite: upper division standing; approval of internship. Internship experience off and on campus in all subject areas offered in the Department of Anatomy, Physiology and Cell Biology. Internships are supervised by a member of the faculty. May be repeated for credit if topic differs. (P/NP grading only.)

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

219. Special Study for Advanced Undergraduates (1-5) Prerequisite: consent of instructor. (P/NP grading only.)—F, W, S, (F, W, S.)

Graduate 286. Basics of Microscopy and Cellular Imaging (2) Lecture—1 hour; laboratory—2 hours. Prerequisite: graduate standing; consent of instructor. Class size limited to 20 students. Practical applications of basic microscope techniques used to image cells and tissues with the goal of using these techniques to generate publication quality images. Principles of light, epifluorescent, confocal and electron microscopy, their applications and limitations. Offered in alternate years.—S. Van Winkle

290. Seminar (1) Seminar—1 hour. Discussion and critical evaluation of advanced topics and current trends in research. (P/NP grading only.)—F, W, S, (F, W, S.) Van Winkle

291. Topics in Biology of Respiratory System (1) Seminar—1 hour. Prerequisite: graduate standing; consent of instructor. Topics concerning structure and function of respiratory system. Possible topics include: lung function, pulmonary reaction to toxicants, pulmonary inflammation, lung metabolism, biology of lung cells, tracheobronchial epithelium, nasal cavity structure and function. May be repeated for credit. (S/U grading only.)—F, W, S, (F, W, S.) Pinkerton, W.

298. Group Study (1-5) Laboratory—6-15 hours. Prerequisite: consent of instructor. —F, W, S, (F, W, S.) Genetos, Meyers

299. Research (1-12) Laboratory—6-36 hours. Prerequisite: consent of instructor. (S/U grading only.)—F, W, S, (F, W, S.)

300. Medicine and Epidemiology (VME) Upper Division 158. Infectious Disease in Ecology and Conservation (3) Lecture—2 hours. Prerequisite: Evolution and Ecology 101 or Environmental Science and Policy 100 or Veterinary Medicine 409 or equivalent. Introduction to the dynamics and control of infectious disease in wildlife, including zoonotic diseases and those threatening endangered species. Multidisciplinary approach combines perspectives of ecology and veterinary medicine. (S/U grading only.)—W (W.) Foley

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

199. Special Study for Advanced Undergraduates (1-5) (P/NP grading only.)—F, W, S, (F, W, S.)

Graduate 201. Emerging Issues at the Interface of Ecosystem, Animal and Human Health (3) Lecture—1 hour; discussion—2 hours. Prerequisite: Active student status in MPVM, Master of Public Health programs or graduate groups in Epidemiology, Ecology, Public Health, Comparative Pathology, or consent of instructor. Restricted to 20 students. Principles of one health with emphasis on the relationships and interdependencies of environmental, animal and human health. Exploration of critical data gaps needed to achieve sustainability in ecosystems and disease prevention.—F. (F.) Johnson

217. Evaluation and Use of Diagnostic Tests (2) Lecture—14 sessions; laboratory—6 sessions; discussion—3 sessions. Prerequisite: Preventive Veterinary Medicine 205 or Epidemiology 205; consent of instructor. Class size limited to 30 students. Clinical and epidemiologic properties and application of diagnostic tests for disease, with emphasis on selecting tests, validating, evaluating, and interpreting new tests individually or in aggregate; determining cutoff values; and developing testing strategies. Offered in alternate years.—S. Hill

225. Retroviral Pathogenesis Seminar/Journal Club (1) Discussion—1 hour. Prerequisite: graduate student status in the Comparative Pathology, Microbiology or Immunology graduate groups. Participatory seminar addressing the mechanisms of retroviral pathogenesis in a journal club format. Focus on the review of current scientific journal papers concerning viral pathogenesis, immunology and virology with a special focus on retroviruses. May be repeated 12 times for credit. (S/U grading only.)—F, W, S, (F, W, S.) Murphy, Sparger

258. Infectious Disease in Ecology and Conservation (1) Discussion—2 hours. Prerequisite: course 158 (must be taken concurrently). Presentation, analysis and discussion of primary literature on the dynamics and control of infectious diseases in wildlife, including zoonotic diseases and those threatening endangered species. Multidisciplinary approach combines perspectives of ecology and veterinary medicine. (S/U grading only.)—W (W.) Foley

298. Group Study (1-5) Laboratory—5-15 hours. Prerequisite: student in School of Veterinary Medicine. Consent of instructor. Group study in selected areas of the clinical sciences. (S/U grading only.)—F, W, S, (F, W, S.) Martinez

299. Research (1-12) Laboratory—6-36 hours. Prerequisite: consent of instructor. (S/U grading only.)—F, W, S, (F, W, S.)

Molecular Biosciences (VMB) Lower Division 92. Internship (1-12) Internship—3-36 hours. Prerequisite: lower division standing; consent of instructor. Work experience off and on campus in all subject areas offered in the Department of Molecular Biosciences. Internships supervised by a member of the faculty. (P/NP grading only.)—F, W, S, Su. (F, W, S, Su.)

101Y. Principles of Pharmacology and Toxicology (3) Laboratory/discussion—1.5 hours; web virtual lecture—1.5 hours; web electronic discussion—0.5 hour; autotutorial—5 hours. Prerequisite: upper division standing in a science major; Chemistry through organic chemistry and general biology, or consent from instructor; good standing with university; computing capability using MS Word, Excel, and PowerPoint, menu driven software programs, SmartSite, computer, or ready access to a computer, with

Fall 2011 and on Revised General Education (GE) AAH—Arts and Humanities; SE—Science and Engineering; SS—Social Sciences; ACGH—American Cultures; DD—Diverse Domesticity; OL—Oral Skills; QL—Quantitative; SL—Scientific; VL—Visual; WC—World Cultures; WE—Writing Experience Pre-Fall 2011 General Education (GE): AhHum—Arts and Humanities; SciEng—Science and Engineering; SocSci—Social Sciences; Div—Domesticity; Writ—Writing Experience Quarter Offered: F=Fall, W=Winter, S=Spring, Su=Summer; 2017/2018 offering in parentheses
broadband Internet access. Restricted to upper divi-
sion undergraduate students in good standing with school and fulfills course prerequisites. Hybrid course provides training in core concepts of pharmacologi-
cal and toxicological sciences. Develop higher-order problem solving and critical thinking skills. GE credit: OL, SE, SL. —S. (S.) Puschner

Upper Division

192. Internship (1-12) Internship—3–26 hours. Prerequisite: completion of 84 units; consent of instructor. Work experience off and on campus in all subject areas offered in the Department of Molecular Biosciences. Internships supervised by a member of the faculty. May be repeated for credit. (P/NP grading only.)—F, W, S. Su. (F, W, S, Su.)

199. Special Study for Advanced Undergraduates (1-5) (P/NP grading only.)—F, W, S. (F, W, S.)

Graduate

234. Current Topics in Neurotoxicology (3) Lecture—3 hours. Prerequisite: core courses in one of the following graduate programs: Pharmacology and Toxicology, Agricultural and Environmental Chemistry, Biochemistry and Molecular Biology, Cell and Developmental Biology, Immunology, Molecular Cellular and Molecular Chemistry, or Neuroscience. Restricted to upper level undergraduate students must obtain permission from the course coordinator. General principles of neurotoxicology, the cell and molecular mechanisms and health impacts of specific neurotoxins and the contribu-
ttion of neurotoxic compounds to complex neurode-
velopmental disorders and neurodegenerative diseases. Seminar course. Environmental Toxicology 234 and Molecular, Cellular, and Integrative Physiology 234.—S. (S.) Lein

253. Metabolism of Toxins and Drugs (2) Lecture—2 hours. Prerequisite: Pharmacology and Toxicology 201, 202, 203, general biochemistry or consent of instructor. Significance/chemical path-
ways of toxicants and drug metabolism, enzymology and molecular aspects of P450 and flavin monooxy-
genases, hydrolyses and phase 2 transferases and exper-
imental approaches for metabolism studies. Offered in alternate years.—W. (W.) Yu

254. Toxicology of the Respiratory System (3) Lecture—3 hours; discussion. Prerequisite: Pharma-
cology and Toxicology 201, 202, 203, or consent of instructor. Survey of structure and function of the respiratory system, the pathophysiology of major lung diseases, and actions of toxicants with the lung and response of this organ to injury. Offered in alternate years.—W. (W.) Pinkerton

255. Pharmacokinetics and Biopharmaceutics (2) Lecture—16 sessions; discussion—4 sessions. In-
depth study of pharmacokinetics, including the fun-
damentals of pharmacokinetics, how to design a phar-
caceutical study and how to use both compartmental and non-compartmental analysis to inter-
pret the data. Offered in alternate years.—W. Krnych

290. Seminar (1) Seminar—1 hour. Prerequisite: graduate standing; consent of instructor. Topics in nutrition, pharmacol-
yogy/toxicology, and biochemistry. May be repeated for credit. (S/U grading only.)—F, W, S. (F, W, S.)

297T. Tutoring in Graduate Molecular Biosciences (1-5) Prerequisite: graduate or professional student stand-
ing and consent of instructor. Assist in preparation and teaching of courses in Nutrition, Pharmacology and Toxicology, or other courses offered by the department under direct supervision of the instructor. Designate for graduate or professional students who desire teaching experience in graduate courses. May be repeated up to 5 units of credit. (S/U grading only.)—F, W, S. (F, W, S.)

298. Group Study (1-5) (S/U grading only.)—F, W, S, Su. (F, W, S, Su.)

299. Research (1-12) (S/U grading only.)—F, W, S. (F, W, S.)

Professional

397T. Tutoring in Molecular Biosciences (1-5) Discussion—1.5 hours. Prerequisite: graduate or pro-
fessional standing; consent of instructor. Experience in professional curriculum for graduate or profes-
sional students, not teaching assistants, under direct supervision of instructor. May be repeated up to 5 units of credit (S/U grading only.)—F, W, S. (F, W, S.)

Pathology, Microbiology, and Immunology (PMI) Lower Division

99. Special Study for Undergraduates (1-5) Prerequisite: consent of instructor. (P/NP grading only.)—F, W, S. Su. (F, W, S, Su.)

126. Fundamentals of Immunology (3) Lecture—3 hours. Prerequisite: Biological Sciences 102 or the equivalent or consent of instructor. Overview of immune system function, the immune system, initiation and regulation of the immune response, infection and immunity, hypersen-
sitivity and immune dysfunction. Clinical immuno-
ology techniques, immunodeficiency and vaccinology.—W. (W.) Stott

126L. Immunology Laboratory (2) Laboratory—6 hours. Prerequisite: course 126 or the equivalent [may be taken concurrently]. Laboratory procedures and experimental approaches. Introduction to innate and adaptive systems. Quantitative and quali-
tative characterization of the immune response.—W. (W.) Stott

127. Medical Bacteria and Fungi (5) Lecture—3 hours; laboratory—6 hours. Prerequisite: any Microbiology course with lab. Introduction to the immune system. Focus on microbial pathogens of animals and diseases. May be repeated for credit. (S/U grading only.)—S. (S.) LeFebvre

128. Biology of Animal Viruses (3) Lecture—3 hours. Prerequisite: Biological Sciences 102. Fundamental physical and chemical properties of animal viruses; methods of propagation, purifica-
tion and assay. Mechanisms of viral replication and pathogenesis of viral infections in man and animals. Immunity to virus diseases and oncogenic properties of animal viruses. Two units of credit to students who have completed Microbiology 162.—S. (S.) Miller

129Y. One Health: Human, Animal & Environmental Interfaces (3) Lecture/discussion—3 hours; web electronic discus-
sion. Class size limited to upper division undergrad-
ate students in good standing with the school and who fulfill the course prerequisites below; enrollment limited to 100 students/term. Introduction to funda-
mentals, challenges, and opportunities in One Health. Focus on local and global health studies. Animal, human, and environmental health problems, along with tools and transdisciplinary approaches, will be introduced to foster innovative thinking that addresses complex issues. GE credit: SciEng or SocSci | OL, SE or SS, SL. —S. (S.) Smith

198. Directed Group Study (1-5) Prerequisite: consent of instructor. (P/NP grading only.)—F, W, S. Su. (F, W, S, Su.)

199. Special Study for Advanced Undergraduates (1-5) (P/NP grading only.)—F, W, S. Su. (F, W, S, Su.)

Graduate

201. Integrative Pathobiology Core I (5) Lecture—3 hours; discussion—2 hours. Overview of molecular biology techniques, tissue structure and function, cell membrane pathology and cellular mechanisms of disease including cellular responses and adaptations to stress, cell cycle, cell death, cellular proteins, vascular disturbances, and mecha-
nisms of neoplasia and tumorogenesis.—W. (W.)

202. Integrative Pathobiology Core II (4) Lecture—2 hours; discussion—2 hours. The second required course in the graduate group with topics in immunology, host-pathogen interaction, regenerative medicine and population and ecosystem health.—S. (S.) Foley

203. Experimental Design and Data Analysis in Pathobiology (2) Lecture—1 hour, lecture/laboratory—2 hours. Follows two required core courses in courses 201 and 202, for Ph.D. and M.S. students. Goal is to bridge gap between statistics and real-world pathobiology to increase students’ skills and independence in experiment design and data analysis.—F. (F.)
241. Advanced Topics in Canine Genetics and Genomics (2)
Lecture—2 hours. Prerequisite: Genetics 201A, 201C (or equivalents, with consent of instructor). Limited enrollment. In-depth study of topics in canine genomics and genetics. Topics will vary annually, but can include positional cloning, whole genome association, complex traits and linkage disequilibrium. Students will lead discussions on assigned readings. May be repeated for credit when topic differs.—F (W) Ernest

Lecture—2 hours; discussion—0.5 hours. Prerequisite: undergraduate genetics and ecology or conservation biology courses recommended. Class size limited to 20 students; graduate students, 2nd or 3rd year veterinary students; advanced undergraduate students with consent of instructor. Introduction to the field of applied ecological genetics to include applications in conservation ecology, population genetics, population biology, wildlife health and disease ecology. (Same course as Ecology 242.)—F (F) Sacks

243. Advanced Topics in Conservation Genetics (2)
Lecture—2 hours; laboratory—2 hours. Prerequisite: Preventive Veterinary Medicine 404 or consent of instructor. Principles and applications in analysis of epidemiologic data. Methods of analyzing stratified and matched data, logistic regression for cohort and case-control studies, Poisson regression, survival/time methods. (Same course as Master of Public Health 266.)—S (S) Kass

277. Mathematical Models in Epidemiology (3)
Lecture/discussion—2 hours; laboratory—2 hours. Prerequisite: Preventive Veterinary Medicine 403 and Medicine & Epidemiology 405; consent of instructor; although not required, students are encouraged to refresh their knowledge of high school calculus and differential equations. Class size limited to 30 students. Theory of epidemics and mathematical modeling concepts for infectious diseases to include discrete and continuous time models, their use to explore disease dynamics and investigate control strategies for human and veterinary infectious diseases. (Same course as Epidemiology 277.)—S (S) Aly

290. Seminar (1)
Seminar—1 hour. Presentation and discussion of advanced and current topics in population health and reproduction. (S/U grading only.)—F, W, S, F, W, S, W

298. Group Study (1-5)
Prerequisite: consent of instructor.—F, W, S, Su, F, W, S, Su

299. Research (1-12)
Prerequisite: consent of instructor. (S/U grading only.)—F, W, S, Su, F, W, S, Su

Surgical and Radiological Sciences (VSR)

Lower Division

99. Special Study for Undergraduates (1-5)
(P/N grading only.)—F, W, S, Su, F, W, S, Su