

Course Bulletin

001188	Pathology Mentor
Subject: VET	Catalog Nbr: 1188

133789	Animals in Society I
Subject: APP	Catalog Nbr: 501
2013 FALL	Primary
Emily McCobb	emily.mccobb@tufts.edu
<p>Animals in Society uses lectures, discussions and assignments to survey contemporary issues regarding animals and how those issues play out in public policy and community practices toward animals. This is done through a series of modules that examine the historical, social, ethical, political, legal, legislative and economic aspects of society's relationship to recognized categories of animals. The first module of Animals & Society I comprises an introduction to ethics, law, science, social marketing, and policy-making; this year, the second module focuses on wildlife and wildlife policy.</p>	

133807	Animals in Society II
Subject: APP	Catalog Nbr: 502
<p>Animals in Society II is centered around modules on farm animals, companion animals and the use of animals in research. Additional context is provided in the form of class sessions on humane education and the role of animals in literature and art.</p>	

133855	Qualitative Research
Subject: APP	Catalog Nbr: 504
<p>This course familiarizes the student with the academic research process and some of the most common qualitative research methodologies used to examine animal policy, community practices towards animals, and human-animal relationships. The student gains familiarity with the scope and limitation of various methods for gathering qualitative data, including the roles of bias, researcher vantage point, and ethics in research. The course also emphasizes how to critically review and synthesize existing literature when developing a research question. Students also develop, test, and evaluate their own qualitative study instruments.</p>	

133902	Quantitative Methods
Subject: APP	Catalog Nbr: 506
2013 FALL	Primary
Allen Rutberg	allen.rutberg@tufts.edu
<p>This course introduces students to statistical methods and research design, as well as how to critically evaluate the published literature that uses quantitative methods. Students learn to analyze hypotheses, inferences, data sets, sampling procedures, and statistical measures. In addition, the social and political factors affecting the formulation of research questions, design and presentation are addressed.</p>	

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133997	Public Policy			
	Subject:	Catalog Nbr:		
	APP	509		
<p>This course focuses on the theories, analytical approaches and techniques of public policy analysis and provides students with an opportunity to critically examine theoretical frameworks in the context of animal policy. The course will explore policy process, elements of policy design, and the relationship between social movements and political institutions. Through in-depth research in animal policy areas of interest to them, students will gain skills in policy analysis and familiarity with research resources, including laws, regulations, legislation, lobbying reports, and campaign finance records. For the course, students will write a policy analysis case study and policy memos among other assignments.</p>				

134027	Seminar: Human Animal Relationships			
	Subject:	Catalog Nbr:		
	APP	510		
	2013 FALL	Primary	Deborah Kochevar	Deborah.Kochevar@tufts.edu
<p>This lecture-discussion course, which is taken in conjunction with the first-year DVM students, explores the expanding horizon of our individual, community and professional relationships with other animals. Topics have included the human-animal bond, farm animal welfare, use of animals in research, conservation medicine, and others. The issues rotate from year to year, and are chosen for their importance, timeliness, and resonance with other issues. Overall, the seminar opens up conceptual space for exploring the contemporary intersection of veterinary medicine and human-animal studies.</p>				

134075	Wildlife Rehabilitation			
	Subject:	Catalog Nbr:		
	APP	511		
<p>Wildlife rehabilitation is the process of removing from the wild and caring for injured, orphaned, or sick wild animals. The goal of wildlife rehabilitation is to provide the food, housing and medical care of these animals, returning them to the wild after treatment.</p> <p>This elective will provide opportunities for students to learn more about wildlife rehabilitation, the regulatory framework in which it operates, the biological and educational goals, and the economic realities of the activity. Students will be expected to participate in discussions and spend a significant amount of exploring outside reading and resources. The elective will culminate with a written and oral presentation of each student's semester project.</p>				

134090	Elective			
	Subject:	Catalog Nbr:		
	APP	512		

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134108	Elective
Subject: APP	Catalog Nbr: 513

134153	Research Project
Subject: APP	Catalog Nbr: 515
<p>The research project focuses the student's accumulated learning on the planning and execution of a work of significant scholarship. This project may take many forms, including a research study using original or existing data, original policy analysis, curriculum development, or other novel work. While also learning about research ethics and funding mechanisms, students prepare a literature review in their area of interest, explore and develop an appropriate set of research methods, identify a research mentor, and formulate a study proposal.</p>	

134170	Elective Course
Subject: MCM	Catalog Nbr: 517
<p>Students will be expected to select two elective courses during the program to augment their educational and professional goals. Choices may be made from a wide variety of course options offered across the University, including the Graduate School of Arts and Sciences, School of Engineering, The Center for Animals and Public Policy, The Fletcher School, Public Health & Professional Degree Programs at Tufts Medical School, The Sackler School of Graduate Biomedical Sciences, Friedman School of Nutrition Science and Policy and Cummings School of Veterinary Medicine. Selections must fit within the scheduled time allotted to complete these electives. Courses available for electives vary by semester and year.</p>	

134234	Elective
Subject: VET	Catalog Nbr: 521

134248	Elective
Subject: VET	Catalog Nbr: 522

134280	Research
Subject: APP	Catalog Nbr: 525

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Students in this course work independently with a mentor to complete their research project, with the expected outcome being an article that is potentially publishable in a peer-reviewed journal, or other product the dissemination of which will advance policy or practice.

134297	Preceptorship
Subject: APP	Catalog Nbr: 530
<p>During the four weeks of the January interim session, students are placed into a non-profit organization, government agency, or corporation whose work involves interaction with animals. While working in the externship, the student acquires insight into how human-animal relationships express themselves and how animal-related policies and programs are applied in a practical setting. In addition to acquiring practical experience, the student carries out an academic analysis of some issue in human-animal relationships or animal policy that is related to the externship experience.</p>	

134328	Intro to Lab Anml Med
Subject: LAM	Catalog Nbr: 551
<p>This course is an introduction to the use of animals in biomedical research and the role of the laboratory animal veterinarian. In the first half of the course, presentations from experts in the field cover regulatory control of research animal use, the role of the Institutional Animal Care and Use Committee (IACUC), animal models in biomedical research, and ethical use of animals. A laboratory animal anatomy module includes three dissection labs devoted to anatomy of rodents, lagomorphs, hamsters, ferrets, and gerbils. The second half of the course is focused on care of research animals and design of research animal facilities. The class tours a barrier rodent housing facility, a rodent facility using robotic technology, and a primate facility.</p> <p>Students are expected to attend all classes, labs, and tours. They are required to write one analysis paper on research animal ethical cases and to work in groups to create a design for a multi-species research animal facility. The class holds a mock Animal Care and Use Committee meeting. Two written assignments are required. Same basic PhD course as VET 657.</p>	

134345	Applied Learning Experience: Research Experience
Subject: LAM	Catalog Nbr: 554
<p>The summer Research Experience consists of an 8-week research experience involving animals. The following is a list of relevant clinical electives:</p>	

134376	Surgery & Anesthesiology In Research Facilities
Subject: LAM	Catalog Nbr: 556
2013 FALL	Primary Angeline Warner angie.warner@tufts.edu
<p>This course is designed to provide the students with additional training in anesthesia and surgery methods</p>	

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relevant to the laboratory animal setting. The first portion of the course focuses on principles of anesthesia in laboratory animals with special emphasis on rodents and non-traditional species that are not typically covered in the veterinary curriculum. Pain assessment; analgesic management; determination of humane endpoints and methods of euthanasia are also covered. A rodent anesthesia laboratory is conducted allowing students to gain experience with the following: injectable and inhalant anesthetic agents, various methods of inhalant drug delivery (chamber, mask, and manifold systems), intubation techniques and monitoring techniques. The second half of the class focuses on the principles of aseptic surgery in research facilities including sterilization methods, surgical pack preparation and issues specific to rodents, USDA covered species, amphibians and reptiles. Minimally invasive surgical techniques, microsurgical techniques, and pre and post-operative care and support are also discussed. There are also practical handling laboratories involving rodents, rabbits and fish. These laboratories provide an opportunity for the students to learn appropriate restraint and handling techniques as well as practice common procedures such as injections, oral administration of compounds, catheter placement and blood collection. There are laboratories designed to provide anesthesia experience for rodents and swine.

134393	Specialized Research Environments		
Subject: LAM	Catalog Nbr: 557	2014 SPRG	Primary
		Angeline Warner	angie.warner@tufts.edu
<p>This course provides advanced instruction in topics relating to specialized environments which are of particular concern to the laboratory animal veterinarian. The course is primarily composed of didactic sessions presented by specialists in the field and addresses a variety of broad topics. Biosafety in the laboratory animal facility is discussed with emphasis on zoonotic diseases, occupational health and safety programs, and biocontainment facility design and operation. Other subject matter includes: animal model development with emphasis placed on mouse genetics and nomenclature; behavioral studies including rodent and primate methodologies; statistics and experimental design; and imaging technologies such as ultrasound, magnetic resonance imaging (MRI) and computed tomography (CT). The course consists of didactic lectures, case studies, and facility tours which are designed to integrate the material discussed in lectures.</p>			

134409	Applied Learning Experience: Animal Facility Experience		
Subject: LAM	Catalog Nbr: 558		
<p>Charles River Labs, Wyeth Laboratories, TMC, U. of Massachusetts Medical Center, Genzyme, and Massachusetts General Hospital and New England Primate Research Center agreed to accept students in their facilities during summers for either Animal Facility or Research Experiences, as well as their clinical electives. Options are available at other facilities as well.</p> <p>ALE: Animal Facility Experience</p> <p>The summer Animal Facility Experience consists of two 4-week in-depth training experiences at industry or academic laboratory animal facilities during the first or second summer after matriculation into the program. Students can apply to take the laboratory animal experience part of the program at any institution with an AAALAC- accredited laboratory animal program. New sites must be approved by the Laboratory Animal</p>			

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Medicine Graduate Program Committee. A student can arrange the two 4-week programs at one or two separate institutions the first summer.

During the summer, students work closely with veterinary staff and animal care staff for hands on experience with the animal care, enrichment and veterinary programs and are required to write a paper on ethical use of animals in research or environmental enrichment programs based on their didactic training and summer experience. Students are evaluated by the veterinary staff at the training institutions.

134423	Applied Learning Experience: Research Experience	
	Subject: LAM	Catalog Nbr: 559
<p>Charles River Labs, Wyeth Laboratories, TMC, U. of Massachusetts Medical Center, Genzyme, and Massachusetts General Hospital and New England Primate Research Center agreed to accept students in their facilities during summers for either Animal Facility or Research Experiences, as well as their clinical electives. Options are available at other facilities as well.</p> <p>The summer Research Experience consists of an 8-week research experience involving animals. This research experience must take place during the first or second summer of the program and be an 8-week in depth laboratory research experience, preferably an independent project, in an established research laboratory.</p> <p>Students are required to work with an established biomedical research investigator and write a research report on the summer project. They are evaluated by the principle investigator of the laboratory.</p>		

134470	Research: Planning and Techniques (mentor)	
	Subject: CBS	Catalog Nbr: 561
<p>Students spend the majority of their training time working in the laboratory, conducting research studies relevant to their research project. Data is analyzed and interpreted in light of the test hypotheses. One objective of the research is to have students present their findings at scientific meetings and prepare their studies for publication</p>		

134488	Fundamentals of Animal Research-Biostatistics	
	Subject: CBS	Catalog Nbr: 570
<p>This is an elementary course in statistics, designed to give an overview of the basics of statistical analyses, including probability theory, distributions, and hypothesis testing. It is a core course in the graduate curriculum, and as such the prerequisites are those for entry into the graduate program. Topics to be covered include probability and sampling theory, frequency distributions, and hypothesis testing. Some hands-on exercises using statistical software are also offered, but it is anticipated that more advanced applications will require additional instruction. It is the instructor's objective to familiarize students with central concepts and to save in depth discussion of methodologies for advanced courses, however when it is practical, students are encouraged to suggest topics for discussion and review.</p>		

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134520	Fundamentals of Animal Research II: Ethics
Subject: CBS	Catalog Nbr: 571
<p>The aim of the course is to discuss acceptable, unacceptable and controversial aspects of research ethics and responsibilities of a researcher. Students enrolled in the course participate in the discussions of topics using a case-based approach. The course topics include: (1) Experimental techniques and the treatment of data, (2) Conflict of interest, (3) Publication policies and openness in research, (4) Allocation of credits and authorship practices, (5) Error and negligence in science, (6) Misconduct in science, and (7) Responding to violations of ethical standards. The course meets weekly for 2 hours during November-December.</p>	

134537	Journal Club/Seminars
Subject: CBS	Catalog Nbr: 572
<p>The emphasis is on critical analysis, identifying the reasons that the research is significant, and understanding how the findings extend current knowledge. Students take this course both semesters of the MS program and give presentations each semester. In addition, students are required to attend department seminar series. These seminars take place throughout the year and are part of the training experience, providing an opportunity to develop communication skills and present ideas.</p>	

134568	Lab Meetings
Subject: CBS	Catalog Nbr: 573
<p>All students will attend and participate in weekly laboratory meetings scheduled by their mentor or research groups. Students are expected to present plans or results of projects to laboratory members at these meetings.</p>	

134584	Readings In Special Topics
Subject: CBS	Catalog Nbr: 574
<p>This course focuses on important topics within the field of research study. Each student meets weekly with their mentor to discuss relevant research papers in their area of study.</p>	

134599	Research
Subject: CBS	Catalog Nbr: 575
<p>Students spend the majority of their training time working in the laboratory, conducting research studies relevant to their research project. Data is analyzed and interpreted in light of the test hypotheses. One objective of the research is to have students present their findings at scientific meetings and prepare their studies for publication.</p>	

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134612	Thesis Preparation
Subject: CBS	Catalog Nbr: 576
<p>Students write their thesis during June and July and defend it orally by August 15.</p> <p>Students in the DVM/MS-CBS program must complete a thesis. The thesis must contain a title page that includes the project title, the student's name, the names of the mentor, and members of the advisory committee, a statement that the thesis is submitted in partial fulfillment of the requirement for a Master of Science in Comparative Biomedical Sciences, and the month and year of submission. The thesis itself must consist of an abstract of the project (one page), a general introduction to the research problem within the field of study (current and pertinent references should be included in this section), and a body of the thesis that consists of specific experiments, methods, results, a general discussion that relates the experimental finding to existing literature and the state of the field, references, and acknowledgement. Submitted or published work can be included as a component of the body of the thesis.</p> <p>The thesis should be submitted in final form to the thesis examination committee a minimum of 2 weeks prior to the thesis defense. The Thesis Examination Committee consists of the student's SAC plus one outside examiner (Tufts program faculty or faculty from another academic institution). The name of the outside examiner is submitted to the program director for approval at least one month prior to the scheduled thesis defense. The thesis defense should occur in July or early August in time to permit any final revisions. The Thesis Examination Committee can approve the thesis as is, approve it with revisions, or reject the thesis. It must then be approved by the Advanced Education Committee (AEC). Two copies of the final version of the approved thesis are submitted to the program director by August 15.</p>	

134641	Thesis Preparation (mentor)
Subject: CBS	Catalog Nbr: 579
<p>The resident trainees will have an extended period in which to complete and defend their theses. Specifically, during the first year of training, the residents will complete all required course work as required in this MS program except that the research credits and participation will be reduced to a single credit commensurate with the trainee's efforts. At the end of the first year, residents will participate in a research planning and techniques seminar (1 credit) offered by the mentor and related faculty. Research will be conducted for a total of 8 months during the first and second year of residency to fulfill the thesis research requirements, VET 560 and VET 561. The candidate is expected to devote two months during year 1 defining their research project and acquiring relevant laboratory techniques needed for the proposed research. During year 2 the candidate would conduct full-time research from January through June.</p>	

134656	Ecology & Conservation Biology
Subject: MCM	Catalog Nbr: 580

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The concept that the health of the environment influences the health of humans and animals means that all practitioners of conservation medicine must understand fundamental principles of ecology and conservation biology. This course will ensure all students possess foundational knowledge, including: an understanding of ecosystems, community, population ecology, demography, population genetics, population viability and conservation of biodiversity.

134669	Health, Disease and Environment
Subject: MCM	Catalog Nbr: 581
<p>In this course, students will acquire a basic understanding of disease mechanisms, host defenses against disease, the role of vectors in spreading and maintaining disease, and basic principles of disease ecology. This class will also review the diseases of major concern for conservation medicine and ecosystem health. Emphasis will be placed on the integration of animal, human, and environmental health, and the environmental, economic, and anthropogenic factors promoting the emergence or persistence of infectious diseases and other major health threats.</p>	

134683	Research Skills I - Systematic Review and Analysis
Subject: MCM	Catalog Nbr: 582
<p>This course will familiarize students with how to access, organize, analyze, interpret and communicate data from existing sources, including published research, databases of electronic medical records, bioinformatics and gene banks. Students will also have a chance to refresh their skills in biostatistics, with an emphasis on applications in population health.</p>	

134695	Field and Laboratory Techniques
Subject: MCM	Catalog Nbr: 583
<p>Conservation medicine requires empirical health assessments of individuals and populations. Through this course students will become familiar with commonly used field and laboratory methods. This hands-on course covers methods for estimating the size of populations, sample collection and handling, field capture, restraint and anesthesia (including animal welfare considerations). In addition, student will participate in practical session on laboratory diagnostics and commonly used laboratory research techniques (including PCR, ELISA, microarrays and applications of molecular genetics).</p>	

134710	Journal Club
Subject: MCM	Catalog Nbr: 584
<p>Journal club will familiarize students with topical scientific papers relevant to conservation medicine, help students become conversant in the language of different contributing disciplines and enhance the skills of analytical reading and critique. Papers will be coordinated with course material. Students take Journal Club in both the Fall and Spring semesters.</p>	

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134723	Case Study
Subject: MCM	Catalog Nbr: 585
<p>The case study will provide a capstone exercise that builds on a student's knowledge and skills to produce a comprehensive conservation medicine analysis of a current health problem and recommend strategies to address identified challenges. Each student will identify an issue and will be charged with leading a collaborative team involving other students and appropriate faculty. Cases will undergo a peer-review evaluation through our network of conservation medicine partners. At the end of the year, case studies will be compiled and submitted for publication. Students register for the Case Study during the fall and spring semesters, and are expected to complete their Case Study during the summer</p>	

134736	Human Dimensions of Conservation Medicine
Subject: MCM	Catalog Nbr: 586
<p>Human political, economic, and cultural considerations help create the conditions that govern animal, human, and environmental health, and establish the context in which conservation medicine solutions are implemented. This course will examine the roles of economics, local, national and international governmental regulations, treaties and policies. It will also explore the influences that communities and local culture have on agriculture, trade, conservation, environment, land use, and public health.</p>	

134750	Engineered Solutions
Subject: MCM	Catalog Nbr: 587
<p>Innovation and applied technology will play an increasingly significant role in developing sustainable solutions for many conservation medicine issues. Conservation professionals need to understand the options and potential of engineered solutions in both natural and built environments. In this course students will work within the context of systems engineering as a basis for problem solving. Applied topics will include: ecological engineering, hydrology, remote sensing (satellite, biological and chemical), engineered natural systems and environmental impact assessment methodologies.</p>	

134762	Research Skills II - Surveillance Methods and Techniques
Subject: MCM	Catalog Nbr: 588
<p>This course will familiarize students with methods for collecting data on health events, disease incidence and prevalence, including participatory methodologies. Students will be introduced to modeling of disease dynamics and processes and disease mapping using GIS technologies. Students will also acquire familiarity with the use of telemetry for monitoring wildlife populations, and the analysis of wildlife data using GPS and GIS and emerging web-based technologies such as Google Earth.</p>	

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134777	Project Management And Communication		
Subject:	Catalog Nbr:		
MCM	589		
<p>This course will cover important communication skills that will enhance collaboration and dissemination of information to stakeholders (scientific community, public and government agencies) as well as the practical skills needed to initiate, fund, and manage research projects. Style and strategies for publication in scientific and lay journals, delivery of legislative briefings, and use of other media will be explored. Project development topics will include team building, seeking funders, grant writing, project development and management, and program and policy evaluation. Sessions on collaborative writing, data visualization, team management and leadership will be included.</p>			

134789	Journal Club/Seminar		
Subject:	Catalog Nbr:		
LAM	592		
2013 FALL	Primary	Angeline Warner	angie.warner@tufts.edu
<p>Students, along with faculty members, participate in a monthly journal club for discussion of current literature in the field. The emphasis is on critical analysis, identifying significance of the research, and understanding how the findings extend current knowledge.</p>			

134829	Research		
Subject:	Catalog Nbr:		
BMS	603		
<p>Guided research on a topic suitable for a doctoral dissertation.</p>			

134842	Research		
Subject:	Catalog Nbr:		
BMS	604		
<p>Guided research on a topic suitable for a doctoral dissertation.</p>			

134869	Research		
Subject:	Catalog Nbr:		
BMS	605		
<p>Guided research on a topic suitable for a doctoral dissertation.</p>			

134897	Journal Club and Seminar Series		
Subject:	Catalog Nbr:		
BMS	607		
<p>Students, post-doctoral fellows, scientific staff, and faculty members participate in a weekly Journal Club and regular seminars. The emphasis in Journal Club is on critical analysis of the data and how the research</p>			

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extends current knowledge. Seminars include both campus Work-in-Progress presentations and research presentations given by scientists from the campus or invited from outside. Students take this course throughout their PhD program and are required to regularly attend both Journal Club and seminars. In addition students lead Journal Club twice per year and present one Work-in-Progress seminar per year beginning in the second year.

134912	Research
Subject: BMS	Catalog Nbr: 608
Guided research on a topic suitable for a doctoral Dissertation.	

134940	Research
Subject: VET	Catalog Nbr: 616

134982	Parasite Biology
Subject: BMS	Catalog Nbr: 652
<p>Parasites are extraordinarily pervasive. This graduate course explores globally important parasites including hookworms, tapeworms, blood flukes, and those that cause malaria, sleeping sickness, and Chagas' disease. Students examine the morphology, development, and distribution of these pathogens and consider the mechanisms they use to infect their hosts and survive within. Topics include the mechanisms of infection and immunity, intracellular survival strategies, vector biology, drug resistance, vaccines, and the economics and public health impact of parasitic disease. Each class centers on interactive discussions and an examination of the primary scientific literature.</p> <p>Course offered every other year.</p>	

134998	Fundamentals of Animal Research I: Biostatistics		
Subject: BMS	Catalog Nbr: 653		
2013 FALL	Primary	Phyllis Mann	phyllis.mann@tufts.edu
<p>Basic statistics will be taught using an active approach, emphasizing practical applications of statistical concepts such as hypothesis testing, sampling and, statistical inference. Students will gain experience in analyzing data sets and presenting data. In addition, students will become familiar with using Excel for basic statistical analyses and more specialized programs for more advanced statistics. It is the instructor's objective to familiarize students with central concepts and to save in depth discussion of methodologies for advanced courses, however when it is practical, students are encouraged to suggest topics for discussion and review. Laptop computers are required.</p>			

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135016	Fundamental Of Animal Research II: Ethics			
Subject: BMS	Catalog Nbr: 654	2013 FALL	Primary	Robert Bridges
				robert.bridges@tufts.edu
<p>The aim of the course is to discuss acceptable, unacceptable and controversial aspects of research ethics and responsibilities of a researcher. Students enrolled in the course participate in the discussions of topics using a case-based approach. The course topics include: (1) Experimental techniques and the treatment of data; (2) Conflict of interest; (3) Publication and openness; (4) Allocation of credit and authorship practices; (5) Error and negligence in science; (6) Misconduct in science; (7) Use of animals in research; and (8) Responding to violations of ethical standards. The course meets weekly for 2 hours during November-December.</p>				

135033	Epidemiology of Zoonotic Infections			
Subject: BMS	Catalog Nbr: 655			
<p>This course seeks to provide health professionals with the basis for evaluating risks and formulating prevention and intervention strategies for outbreaks or endemic transmission of zoonotic infections. Each session is structured with a “vertical” component comprising general principles, and a “horizontal” component comprising a case study of a specific agent that illustrates the general principles. Course offered every other year</p>				

135049	Advanced Molecular Biology			
Subject: BMS	Catalog Nbr: 656			
<p>This course introduces students to molecular biology of both prokaryotes and eukaryotes including (1) DNA replication, repair, and recombination; (2) Bacterial genetics; (3) Chromosome structure and function; (4) Protein biosynthesis and transportation; and (5) Phages and viruses. Course offered every other year.</p>				

135081	Introduction to Lab Animal Medicine			
Subject: BMS	Catalog Nbr: 657			
<p>This course is an introduction to the use of animals in biomedical research and the role of the laboratory animal veterinarian. In the first half of the course, presentations from experts in the field cover regulatory control of research animal use, the role of the Institutional Animal Care and Use Committee (IACUC), animal models in biomedical research, and ethical use of animals. A laboratory animal anatomy module includes three dissection labs devoted to anatomy of rodents, lagomorphs, hamsters, ferrets, and gerbils. The second half of the course is focused on care of research animals and design of research animal facilities. The class will tour a barrier rodent housing facility, a rodent facility using robotic technology, and a primate facility. Students are expected to attend all classes, labs, and tours. They will be required to write one analysis paper on research animal ethical cases and to work in groups to create a design for a multi-species research animal facility. The class holds a mock IACUC meeting. Same basic course as MS-LAM course 551</p>				

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135123	Principles of Biodefense	
	Subject: BMS	Catalog Nbr: 659
<p>The recent increase in terrorist attacks in many parts of the world has focused attention on the possibility that pathogens and toxins may be used as weapons targeting humans or economically important animals and plants. The issues surrounding bioterrorism and its critical complement, biodefense, are complex and require an understanding of sociopolitical factors as well as those of biology. This course seeks to provide the basis for (1) evaluating the risks associated with bioterrorism and (2) developing strategies for defending against as well as responding to the illegitimate use of biological agents. Each of the sessions are structured into a didactic introductory, "horizontal" hour designed to explore general concepts, with the second hour dedicated to a "vertical" participatory discussion: specific case studies or literature review of the biology and other issues related to specific agents that illustrate important aspects of the horizontal topics. The grade for the course is determined by class participation and a term paper. Course offered every other year</p>		

135181	Molecular & Cellular Biology-Umass Bbs-821	
	Subject: VET	Catalog Nbr: 698

138644	Transfer Credit	
	Subject: TRAN	Catalog Nbr: 9999

138660	Toxicological Pathology	
	Subject: BMS	Catalog Nbr: 609
<p>Focuses on toxicant/drug-induced pathophysiology and histopathological responses of the cardiovascular, pulmonary, gastrointestinal, renal, neurological, musculoskeletal, immune, endocrine and reproductive systems in animals. The course integrates into each organ system studied a review of standard techniques used in toxicity studies including principles of Good Laboratory Practices (GLP), the use of animal necropsy, histology/pathology, various tissue molecular biological techniques, methods in evaluating or testing lesions, genetics of rodent strains, and transgenic mice. Special emphasis is placed on mechanisms of action, defining histopathologic changes of significance compared to common background/incidental lesions, and the use of nomenclature, data bases and statistical analysis in overall interpretation of histopathology studies. (Course offered every other year.</p>		

138661	Preceptorship	
	Subject: MCM	Catalog Nbr: 590

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Students will have the opportunity to immerse themselves in conservation medicine work in a wide variety of settings for four weeks during the program year. The preceptorship will provide students with insight into how conservation medicine issues are addressed and how interdisciplinary approaches can be applied in a real world setting. Students will be able to select from field experiences, clinical experiences, analytical experiences, laboratory-focused experiences, and project management or policy experiences. The preceptorship will be completed either during the winter break or summer semester, depending upon the opportunity.

138669	Preventive Medicine in Research Animal Facilities			
Subject: LAM	Catalog Nbr: 553	2013 FALL	Primary	Angeline Warner angie.warner@tufts.edu
<p>This course is designed to complement the second year of the veterinary curriculum which is mainly concerned with the pathophysiology of disease. This course focuses on viral, bacterial and parasitic pathogens of concern in the laboratory animal and research settings. Pathogens of importance to traditional laboratory animal species are covered with special emphasis on rodent diseases. In addition, diseases of concern to nontraditional laboratory animals such as swine, small ruminants, fish, amphibians, reptiles and birds are also discussed. The course also provides instruction in the diagnosis, treatment, control and prevention of disease in the laboratory animal facility. The development and implementation of health surveillance and preventative health programs in a laboratory animal setting is discussed including the use of sentinels for routine health monitoring of colonies. This course consists of didactic lectures and tutorial sessions with assigned readings, case studies and interactive discussions.</p>				

138670	Laboratory Animal Medicine and Pathology			
Subject: LAM	Catalog Nbr: 555	2014 SPRG	Primary	Angeline Warner angie.warner@tufts.edu
<p>This course is designed to complement the third year of the veterinary curriculum which integrates the pathophysiological aspects of disease with a comprehensive discussion of the presenting clinical signs, diagnostic criteria, and the treatment of these entities. The lectures provided in this course are designed to provide students with a sound basis in clinical laboratory animal medicine with emphasis on diagnosis, prognosis, and management. A rodent surgery laboratory is offered at Charles River Labs in which students gain practical experience in rodent surgical methods by performing common procedures such as splenectomy, adrenalectomy, ovariectomy, embryo transfer, ovarian transplant and jugular vein cannulation.</p>				

138672	Applied Learning Experience: Animal Facility Experience			
Subject: LAM	Catalog Nbr: 550			
<p>The summer Animal Facility Experience consists of two 4-week in-depth training experiences at industry or academic laboratory animal facilities during the first or second summer after matriculation into the program.</p>				

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138673	Toxicological Pathology	
	Subject: VET	Catalog Nbr: 609

139123	Parasite Biology	
	Subject: MCM	Catalog Nbr: 1001

139212	Journal Club/Seminar	
	Subject: VET	Catalog Nbr: 592
	2014 SPRG	Primary Angeline Warner angie.warner@tufts.edu
<p>Students, along with faculty members, participate in a monthly journal club for discussion of current literature in the field. The emphasis is on critical analysis, identifying significance of the research, and understanding how the findings extend current knowledge.</p>		

139232	Animal Law	
	Subject: APP	Catalog Nbr: 1001

139235	Applied Learning Experience: Animal Facility	
	Subject: VET	Catalog Nbr: 550

139236	Laboratory Animal Medicine and Pathology	
	Subject: LAM	Catalog Nbr: 555

139237	Applied Learning Experience-Research Facility	
	Subject: VET	Catalog Nbr: 554

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139244	Research
Subject: BMS	Catalog Nbr: 616
Guided research on a topic suitable for a doctoral Dissertation.	

139245	Applied Learning Experience: Research Experience
Subject: LAM	Catalog Nbr: 559
<p>Charles River Labs, Wyeth Laboratories, TMC, U. of Massachusetts Medical Center, Genzyme, and Massachusetts General Hospital and New England Primate Research Center agreed to accept students in their facilities during summers for either Animal Facility or Research Experiences, as well as their clinical electives. Options are available at other facilities as well.</p> <p>The summer Research Experience consists of an 8-week research experience involving animals. This research experience must take place during the first or second summer of the program and be an 8-week in depth laboratory research experience, preferably an independent project, in an established research laboratory.</p> <p>Students are required to work with an established biomedical research investigator and write a research report on the summer project. They are evaluated by the principle investigator of the laboratory.</p>	

139249	JAX-Mammalian Genetics
Subject: BMS	Catalog Nbr: 1001
In collaboration with Jackson Laboratories, TCSVM is offering a live video presentation of a series of topics on Mammalian Genetics. Faculty as well as graduate students have the opportunity to refresh/learn mammalian genetics.	

139261	UMass-Principles of Light & Electron Microscopy
Subject: BMS	Catalog Nbr: 1003

139264	Understanding Human Psychopathology
Subject: VET	Catalog Nbr: 514

139265	Disruption of Cellular Architecture and Human disease
Subject:	Catalog Nbr:

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139481**Shelter Visitations**

Subject:	Catalog Nbr:
APP	1002

2013 FALL

Primary

Emily McCobb

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139482**Farm Animal Welfare**

Subject:	Catalog Nbr:
APP	1003

139483**Wildlife Rehabilitation**

Subject:	Catalog Nbr:
APP	1004

139484**Feral Cat Clinic**

Subject:	Catalog Nbr:
APP	1005

139601**GIS for Natural Resources and Conservation Application**

Subject:	Catalog Nbr:
MCM	1002

139857**Humanitarian Studies In The Field**

Subject:	Catalog Nbr:
MCM	1003

This course will offer a practical and in-depth analysis of the complex issues and skills needed to engage in humanitarian work in field settings. Through presentations offered by the faculty of the Humanitarian Studies Initiative and guest speakers who are experts in their topic areas, students will gain familiarity with the primary frameworks in the humanitarian field (human rights, livelihoods, Sphere standards, international humanitarian law) and will focus on practical issues that arise in the field, such as rapid public health assessments, field cluster sampling techniques, application of minimum standards for food security, and

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operational approaches to relations with the military in humanitarian settings.

139893	Molecular and Cellular Immunology
Subject: BMS	Catalog Nbr: 1004
This course is offered through the University of Massachusetts Medical School.	

139894	Advanced Epidemiology and Research Methods
Subject: BMS	Catalog Nbr: 1005
This course is offered through the University of Massachusetts Medical School.	

139895	Cell and Molecular Genetics
Subject: BMS	Catalog Nbr: 1006
This course is offered through the University of Massachusetts Medical School.	

139904	Introduction to Clinical Epidemiology
Subject: BMS	Catalog Nbr: 1007
This course taken through the University of Massachusetts Medical School.	

139964	Understanding Human Psychopathology
Subject: APP	Catalog Nbr: 1006

139965	Wildlife in Captivity
Subject: APP	Catalog Nbr: 1007

139972	Introduction to Animal Welfare
Subject: APP	Catalog Nbr: 1008

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140030	Global Information Systems-Independent Study	
	Subject: MCM	Catalog Nbr: 1004

140065	JAX Medical and Experimental Mammalian Genetics	
	Subject: BMS	Catalog Nbr: 1008

140096	Feral Cat Clinic	
	Subject: APP	Catalog Nbr: 1005

140216	International Environmental Law	
	Subject: MCM	Catalog Nbr: 1005
<p>This course addresses the nature, content, and structure of international environmental law. The course commences with an introduction to international environmental problems, together with basic principles of international law and environmental regulation. Specific topics include global warming, stratospheric ozone depletion, and exports of hazardous substances. Other topics may include marine pollution, transboundary pollution, trade and environment, and development and environment. The course evaluates the role of international and non-governmental organizations; the interrelationship between international legal process and domestic law; and the negotiation, conclusion, and implementation of international environmental agreements. Students take this course at The Fletcher School.</p>		

140250	Immunology Seminar	
	Subject: BMS	Catalog Nbr: 1009

140255	Infection and Immune Response	
	Subject: BMS	Catalog Nbr: 1010

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140256	Advanced Molecular Biology Seminar	
	Subject:	Catalog Nbr:
	BMS	1011