

Course Bulletin

100005	Graduate Research
Subject: CMDB	Catalog Nbr: 0298
These courses provide guided research on a topic suitable for a doctoral thesis.	

100015	Graduate Research
Subject: CMDB	Catalog Nbr: 0299
2014 SUMR	Primary John Castellot
john.castellot@tufts.edu	
These courses provide guided research on a topic suitable for a doctoral thesis.	

100025	Masters Degree Only
Subject: CMDB	Catalog Nbr: 0402

100047	PhD Degree Only
Subject: CMDB	Catalog Nbr: 0403
Students are enrolled in this course when they receive permission to write from their thesis committee, and represents the effort in the final preparation and writing of the doctoral thesis. A grade of "S" is automatically awarded upon completion of the thesis.	

100060	PhD Degree Only
Subject: CMDB	Catalog Nbr: 0404
Students are enrolled in this course when they receive permission to write from their thesis committee, and represents the effort in the final preparation and writing of the doctoral thesis. A grade of "S" is automatically awarded upon completion of the thesis.	

100078	PhD Degree Only
Subject: CMDB	Catalog Nbr: 0405
Students are enrolled in this course when they receive permission to write from their thesis committee, and represents the effort in the final preparation and writing of the doctoral thesis. A grade of "S" is automatically awarded upon completion of the thesis.	

100257	Haz. Waste Treatmnt Tech
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Subject:	Catalog Nbr:
CARS	0138

100871	General Nutrition
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Subject:	Catalog Nbr:
CARS	0202

101087	Nutrition
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Subject:	Catalog Nbr:
CARS	0225

101617	Intro To Health Services
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Subject:	Catalog Nbr:
CRBU	0702

101678	Org Of Med Care Svcs
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Subject:	Catalog Nbr:
CRBU	0704

101859	Soc & Behav Sci In Ph
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Subject:	Catalog Nbr:
CRBU	0720

101915	Epidemiology
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Subject:	Catalog Nbr:
CRBU	0721

101978	Intro To Stat. Comput.
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Subject:	Catalog Nbr:
CRBU	0723

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101999	Wmn Children & Adolsc.
Subject: CRBU	Catalog Nbr: 0725

102017	Health Care Marketing
Subject: CRBU	Catalog Nbr: 0733

102037	Human Rights And Health
Subject: CRBU	Catalog Nbr: 0740

102074	Consultation Techniques
Subject: CRBU	Catalog Nbr: 0741

102330	Genetic Epidemiology
Subject: CRBU	Catalog Nbr: 0763

102351	Int'l Health
Subject: CRBU	Catalog Nbr: 0771

102392	Global Mat & Chld Hlth
Subject: CRBU	Catalog Nbr: 0790

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102598	Hlth Policy & Mngt			
	Subject:	Catalog Nbr:		
	CRBU	0827		

102780	App Stat In Clin Trials			
	Subject:	Catalog Nbr:		
	CRBU	0851		

102798	Entrepreneurial Mngmnt.			
	Subject:	Catalog Nbr:		
	CRBU	0853		

102838	Stg For Intl Reprd Hlth			
	Subject:	Catalog Nbr:		
	CRBU	0881		

102889	Membranes & Trafficking			
	Subject:	Catalog Nbr:		
	ISP	209A		
	2013 FALL	Primary	John Castellot	john.castellot@tufts.edu
	2013 FALL	Primary	Peter Juo	Peter.Juo@tufts.edu
	2014 FALL	Primary	Michael Forgac	michael.forgac@tufts.edu
<p>This course provides a thorough survey of major topics in cell biology, including membrane structure and function; transport systems, ion channels, and membrane excitability; protein trafficking and organelle biogenesis.</p>				

102982	Cell & Mol Genetics			
	Subject:	Catalog Nbr:		
	ISP	210A		
	2015 SPRG	Primary	Brent Cochran	brent.cochran@tufts.edu
<p>This course covers molecular genetics and basic concepts in developmental biology.</p>				

103003	Molecular Cell Biology of Development			
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Subject: ISP	Catalog Nbr: 210B	2015 SPRG	Primary	John Castellot	john.castellot@tufts.edu
This course introduces students to the basic cellular and molecular mechanisms involved in gametogenesis, fertilization, early embryonic development, pattern formation, and organogenesis. The course emphasizes how human disease often recapitulates development.					

104392	Qualifying Exam				
Subject: CTS	Catalog Nbr: 0000				
Students present and defend a proposal for research consisting of a statement of an original research problem in which a scientific question is asked and the experimental approach to answering the question is explained in a written proposal. The proposal is presented orally to the faculty.					

104430	Masters Degree Only				
Subject: CTS	Catalog Nbr: 0402				

104503	Study Design Seminar				
Subject: CTS	Catalog Nbr: 0500				
	2015 SPRG	Primary	David Kent	No Email on file.	
	2015 SPRG	Primary	Karen Freund	Karen.Freund@tufts.edu	
These seminars use proposed and ongoing research projects to explore issues in study design. The course provides investigators and trainees the opportunity to present a research-related problem they are encountering and engages students in a discussion of the approach to the problem and an appropriate plan of action.					

104524	Translational & Molecular Epidemiology				
Subject: CTS	Catalog Nbr: 0501				
This course aims to address some of the main challenges of current translational research in the interface of epidemiology and molecular medicine.					

104542	Bridging the Bench-To-Bedside Gap				
Subject: CTS	Catalog Nbr: 0502				
This course seeks to diminish the "bench-to-bedside" gap by exposing clinical graduate students to basic science research. Students focus on major questions that are ready for future scientific investigation, how					

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scientific discoveries have influenced clinical practice, and how clinical practice has affected basic research. Examination of active projects at Tufts Medical Center introduces students to translational science in action.

104602	Introduction to Biostatistical Methods I			
Subject:	Catalog Nbr:			
CTS	0506			
2014 SUMR	Primary	Matthew Finkelman		Matthew.Finkelman@tufts.edu
<p>This course is the first half of a two-part course which presents the practical application of biostatistical methods for exploring and analyzing health data. Methods for working with data and exploring basic associations are presented through case examples and clinical research projects. CTS 0506 and 0507 are considered equivalent to 0527.</p>				

104617	Introduction To Biostatistics II			
Subject:	Catalog Nbr:			
CTS	0507			
2013 FALL	Primary	Matthew Finkelman		Matthew.Finkelman@tufts.edu
<p>This course is the second half of a two-part course which presents the practical application of biostatistical methods for exploring and analyzing health data. Methods for working with data and exploring basic associations are presented through case examples and clinical research projects. CTS 0506 and 0507 are considered equivalent to 0527.</p>				

104658	Predictive Models			
Subject:	Catalog Nbr:			
CTS	0510			
2014 FALL	Primary	David Kent		No Email on file.
2014 FALL	Primary	Robin Ruthazer		No Email on file.
<p>This course explores the use of statistical models to predict clinical outcomes for retrospective review and as prospective decision aids. Emphasis is placed on integrating statistical and clinical thinking to construct models that are both statistically and clinically sound and that give accurate predictions when generalized to other populations.</p>				

104676	Machine Learning in Predictive Medicine			
Subject:	Catalog Nbr:			
CTS	0511			
<p>This course introduces computer science students and clinicians to practical applications of machine learning to solving problems in clinical medicine through creation of collaborative research teams working on unsolved problems with a clinical researcher. The short-term goal is for each team to produce a report presented at the end of the course. The long-term goal is to build collaborative relationships and the advancement of interdisciplinary work between computer scientists and clinical researchers.</p>				

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104693	Comparative Effectiveness Research Survey			
Subject: CTS	Catalog Nbr: 0512			
<p>The course describes the current state of CER and evidence-based medicine (EBM). The tools of this kind of work are defined including various forms of CER from clinical trials, registry and observational research, technology assessments, and evidence reports. Methodologies used are explained, for example effectiveness trials, decision analysis, cost-effectiveness analysis, systematic review, and meta-analysis.</p>				

104708	Clinical Research Project-Certificate Candidates			
Subject: CTS	Catalog Nbr: 0514			
	2015 SPRG	Primary	Laurel Leslie	No Email on file.
	2015 SPRG	Primary	David Kent	No Email on file.
<p>Students develop mentored research plans with mentors (or mentoring teams) that permits them to demonstrate these skills through the development of a protocol, a report, or research manuscript. The mentoring teams are required to have at least one member who is on the faculty of the Sackler CTS program. The project design is led by students, so they learn the role of principal investigator. This course is required for the Certificate Program, and is not available to non-certificate students.</p>				

104768	Clinical Research Project/Thesis Research- First Year			
Subject: CTS	Catalog Nbr: 0515			
	2013 FALL	Primary	David Kent	No Email on file.
	2013 FALL	Primary	Jessica Paulus	Jessica.Paulus@tufts.edu
<p>First year master's students begin to learn how to complete comprehensive independent clinical research project, which includes framing a research question and specific project aims, identifying useful data sources, developing appropriate methods, identifying and defending against sources of bias, implementing/managing a project, and writing up a thesis in the form of a publishable article or monograph.</p>				

104826	Clinical Research Project/Thesis Research- Second Year			
Subject: CTS	Catalog Nbr: 0516			
	2013 FALL	Primary	David Kent	No Email on file.
	2013 FALL	Primary	Jessica Paulus	Jessica.Paulus@tufts.edu
<p>Second year master's students continue and complete their independent clinical research projects. Students gain additional skills in framing a research question and specific project aims, identifying useful data sources, developing appropriate methods, identifying and defending against sources of bias, implementing/managing the project, and writing up the thesis in the form of a publishable article or monograph.</p>				

104881	Clinical Research Project/Thesis Research- PhD Candidates			
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Subject: CTS	Catalog Nbr: 0517			
2013 FALL	Primary	Jessica Paulus	Jessica.Paulus@tufts.edu	
2014 SUMR	Primary	David Kent	No Email on file.	
<p>PhD students to complete comprehensive independent clinical research doctoral-level project, which includes framing a research question and specific project aims, identifying useful data sources, developing appropriate methods, identifying and defending against sources of bias, implementing/managing the project and writing up the thesis in the form of a publishable article and PhD thesis.</p>				

104898	Advanced Thesis Research			
Subject: CTS	Catalog Nbr: 0518			
<p>The course is for students who do not complete their theses in the customary timeframe and wish to pursue further research. The Program Director, in consultation with the student's thesis committee and program mentor, determines the number of credits.</p>				

104915	Concentration Practicum			
Subject: CTS	Catalog Nbr: 0519			
<p>This course is an independent mentored experience for students interested in advanced study and skill development in a particular area. This course requires written approval of the Program Director in order to register.</p>				

104952	Introduction To Clinical Epidemiology			
Subject: CTS	Catalog Nbr: 0523			
2014 FALL	Primary	Jessica Paulus	Jessica.Paulus@tufts.edu	
<p>This course provides students with an overview of the epidemiologic approach to the study of disease causation, its natural history, and epidemiologic methods. This course reviews the application of various observational and experimental research designs and strategies utilized in clinical and epidemiological research. Didactic instruction, readings, and problem sets are used to create each module: investigation of disease outbreaks, sources of health information, observational studies, randomized clinical trials, measures of morbidity and mortality, sources of and controls for bias evaluation of diagnostic and screening tests, and development of surveillance studies.</p>				

104969	Introduction to Clinical Care Research			
Subject: CTS	Catalog Nbr: 0525			
2014 SUMR	Primary	David Kent	No Email on file.	
<p>This course, meeting three hours daily over a four-week summer session, teaches students how to formulate a clinical research hypothesis and to develop it into a clinical research project. Students acquire an</p>				

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understanding of basic and advanced principles of study design and issues in conducting biomedical research involving human subjects.

104985	Biostatistics I			
Subject:	Catalog Nbr:			
CTS	0527			
2014 FALL	Primary	Farzad Noubary		Farzad.Noubary@tufts.edu
This course introduces basic principles and applications of statistics to problems in clinical research. Topics covered include descriptive statistics, probability and random variation, sampling, hypothesis testing, proportions, measures of frequency, t-tests, chi-square tests, one-way analysis of variance, correlation, linear regression and nonparametric statistics.				

105006	Biostatistics III			
Subject:	Catalog Nbr:			
CTS	0530			
This seminar covers topics selected by the instructor based on the statistical research needs of students. Possible choices include factor and principal components analysis, longitudinal data models, neural networks, time-series analysis and advanced survival analytic methods. Prerequisite: CRES 0535.				

105026	Biostatistics II			
Subject:	Catalog Nbr:			
CTS	0535			
2015 SPRG	Primary	Farzad Noubary		Farzad.Noubary@tufts.edu
This course surveys regression techniques for outcomes common in public health data, including continuous, binary, count and survival data. Emphasis is on developing a conceptual understanding of the application of these techniques to solving problems and to cogently summarize the results, rather than numerical details. Prerequisite: CRES 0506 & 0507, or 0527.				

105046	Scientific Manuscript Writing			
Subject:	Catalog Nbr:			
CTS	0537			
2015 SPRG	Primary	Jessica Paulus		Jessica.Paulus@tufts.edu
This course focuses on principles of scientific manuscript writing. The student learns how to develop a manuscript by reviewing the specific issues of style, authorship and volume of information that should be incorporated into a research paper.				

105065	Scientific Grant Writing			
Subject:	Catalog Nbr:			
CTS	0538			
2014 FALL	Secondary	Robert Goldberg		No Email on file.

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2015 SPRG	Primary	David Kent	No Email on file.
The purpose of this course is to teach the principles of clinical research grant writing. Participants learn the importance of, and how to select, investigators and co-investigators as well as the identification of potential funding sources and other important aspects of grant writing.			

105102	Scientific Writing, Peer Review & Presentations		
Subject:	Catalog Nbr:		
CTS	0539		
2014 FALL	Secondary	Robert Goldberg	No Email on file.
2015 SPRG	Primary	David Kent	No Email on file.
Students focus on principals of scientific review and grant peer review. This involves critiquing manuscripts and reviewing research grants for mock study section meetings. Students are encouraged and given an opportunity to present their scientific writings and oral presentations for critique on an ongoing basis.			

105120	Ethics Of Clinical Investigation		
Subject:	Catalog Nbr:		
CTS	0540		
2015 SPRG	Primary	Susan Parsons	Susan.Parsons@tufts.edu
The goal of this course is to increase awareness of research ethics and their practical applications by medical practitioners and researchers – specifically with regard to clinical investigations. The curriculum addresses the interrelationships between ethics, law and professional practice standards and explores the role and workings of Institutional Review Boards.			

105158	Principles Of Drug Development		
Subject:	Catalog Nbr:		
CTS	0555		
2014 FALL	Primary	Kenneth Kaitin	Kenneth.Kaitin@tufts.edu
This course examines the important economic, political, legal and scientific issues that face academic clinical investigators who work in partnership with industry sponsors and government regulators to design and conduct clinical studies.			

105178	Principles of Pharmacoeconomics		
Subject:	Catalog Nbr:		
CTS	0556		
Pharmacoeconomics is the application of economic evaluation (i.e., cost analysis, cost-effectiveness, cost-benefit analysis, etc.) to pharmaceutical therapies. This is an elective course covers methods and uses of pharmacoeconomic analyses and other economic evaluations of medical technologies in health care.			

105251	Introduction To Clinical Trials		
Subject:	Catalog Nbr:		

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CTS	0561			
	2014 FALL	Primary	David Snyderman	david.snyderman@tufts.edu
<p>This course considers the various problems and options available in the design and conduct of clinical trials, including classical efficacy trials and "effectiveness trials." Issues to be covered include ethics, experimental design, coordination and operations, database development, interim analysis, safety monitoring and analysis, and reporting.</p>				

105271	Topics In Clinical Trials			
	Subject:	Catalog Nbr:		
	CTS	0562		
<p>This is a seminar course that explores special topics in clinical trials. Topics include internet-based clinical trials, N of 1 trials, trials in special populations and overseas, industry sponsored trials and multicenter trials.</p>				

105306	Introduction to Health Services Research			
	Subject:	Catalog Nbr:		
	CTS	0566		
	2015 SPRG	Primary	Karen Freund	Karen.Freund@tufts.edu
<p>This course introduces students to the concepts and methods that distinguish health services and health policy research from other fields. Faculty cover major topics in health services/health policy research including outcomes research design and methods, health economics, pharmacoconomics, access and payment for health services, healthcare quality and quality improvement.</p>				

105346	Advanced Epidemiology			
	Subject:	Catalog Nbr:		
	CTS	0571		
	2014 SPRG	Primary	Jessica Paulus	Jessica.Paulus@tufts.edu
<p>This course includes advanced topics in epidemiologic study design and analysis. The first module focuses on study design, beginning with the randomized clinical trial and proceeding to examine observational designs in depth, including prospective and retrospective cohorts, and those sampling from an underlying cohort. Design, sampling and analysis strategies and the biases that are specific to each study type are discussed. The second course module examines topics in study analysis, interpretation and bias, including confounding, matching, propensity scores, instrumental variables, effect modification, misclassification, and directed acyclic graphs for causal inference. A prior introductory course in epidemiology is required for enrollment.</p>				

105457	Introduction to Evidence Based-Medicine			
	Subject:	Catalog Nbr:		
	CTS	0581		
	2015 SPRG	Primary	Norma Terrin	norma.terrin@tufts.edu
<p>This course covers the principles of systematic review processes, evaluation of studies and bodies of evidence as used in the conduct of systematic reviews, meta-analyses and the development of evidence-based clinical practice guidelines. The course focuses on studies of treatment efficacy.</p>				

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105474	Genetic Epidemiology
Subject: CTS	Catalog Nbr: 0582
This course is an introduction to the concepts and methodology of genetic epidemiology, including novel methods of molecular biology, quantitative genetics, study design for genetic traits, segregation analysis and linkage analysis.	

105491	Introduction to Decision Analysis		
Subject: CTS	Catalog Nbr: 0584		
2015 SPRG	Primary	John Wong	john_b.wong@tufts.edu
2015 SPRG	Primary	Stephen Pauker	stephen.pauker@tufts.edu
This course is a working overview of the principles of decision analysis as applied to medicine, making optimal choices in the face of uncertainty. Formal decision analysis has become a well-recognized and accepted research discipline for examining clinical options facing patients, physicians and policymakers.			

105533	Special Topics		
Subject: CTS	Catalog Nbr: 0593		
2013 FALL	Primary	Norma Terrin	norma.terrin@tufts.edu
2013 FALL	Secondary	Farzad Noubary	Farzad.Noubary@tufts.edu
In-depth information is provided on selected topics. Students may also pursue guided individual study of an approved topic.			

105554	Special Topics		
Subject: CTS	Catalog Nbr: 0594		
In-depth information is provided on selected topics. Students may also pursue guided individual study of an approved topic. {COIRRECT CREDITS}			

107983	Qualifying Exam
Subject: BCHM	Catalog Nbr: 0000
Students present and defend a proposal for research consisting of a statement of an original research problem in which a scientific question is asked and the experimental approach to answering the question is explained in a written proposal. The proposal is presented orally to the faculty.	

108388	Graduate Biochemistry
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Subject:	Catalog Nbr:			
BCHM	0223			
2013 FALL	Primary	Brian Schaffhausen	brian.schaffhausen@tufts.edu	
2014 FALL	Primary	Alex Bohm	Andrew.Bohm@tufts.edu	
This course provides a graduate-level discussion of the structure and function of biologically important molecules. Problems of protein and nucleic acid biochemistry are emphasized.				

108410	Adv Grad Biochemistry			
Subject:	Catalog Nbr:			
BCHM	0224			
2013 FALL	Primary	Brian Schaffhausen	brian.schaffhausen@tufts.edu	
2014 FALL	Primary	Alex Bohm	Andrew.Bohm@tufts.edu	
Advanced Graduate Biochemistry is intended to allow students with strong biochemistry backgrounds to explore areas of biochemistry relevant to their interests in a more detailed way. It is offered in parallel with BCHM223 Graduate Biochemistry. It is intended for MD/PhD students who have taken Medical Foundations I and for PhD students coming to the Sackler School with a substantial background in biochemistry. PhD students are allowed to transfer to this course after the first BCHM223 examination if they meet the performance requirements set by the Course Director.				

108532	Biochemistry of Gene Expression & Signal Transduction			
Subject:	Catalog Nbr:			
BCHM	0230			
2015 SPRG	Primary	Amy Yee	amy.yee@tufts.edu	
This course covers the molecular mechanisms of gene expression and signal transduction. The fundamental mechanisms underlying transcription, RNA processing, translation, and DNA replication are highlighted, and the integration of these fundamental mechanisms into molecular and cellular regulation of proliferation and signal transduction is discussed. Current literature is emphasized.				

108657	Graduate Seminar			
Subject:	Catalog Nbr:			
BCHM	0291			
2014 FALL	Primary	Larry Feig	larry.feig@tufts.edu	
Visiting speakers from the Boston community and beyond present their scientific research to all members of the program, including faculty, students, and post-doctoral fellows.				

108697	Graduate Seminar			
Subject:	Catalog Nbr:			
BCHM	0292			
2015 SPRG	Primary	Larry Feig	larry.feig@tufts.edu	
Visiting speakers from the Boston community and beyond present their scientific research to all members of the program, including faculty, students, and post-doctoral fellows.				

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108726	Special Topics
Subject: BCHM	Catalog Nbr: 0293
In-depth information is provided on selected topics. Students may also pursue guided individual study of an approved topic.	

108750	Special Topics
Subject: BCHM	Catalog Nbr: 0294
In-depth information is provided on selected topics. Students may also pursue guided individual study of an approved topic.	

108770	Journal Club
Subject: BCHM	Catalog Nbr: 0295
2014 FALL	Primary Larry Feig larry.feig@tufts.edu
Students select articles from the current literature, analyze their significance, and present them for discussion in a seminar group.	

108787	Journal Club
Subject: BCHM	Catalog Nbr: 0296
2015 SPRG	Primary Larry Feig larry.feig@tufts.edu
Students select articles from the current literature, analyze their significance, and present them for discussion in a seminar group.	

108810	Graduate Research
Subject: BCHM	Catalog Nbr: 0297
These courses provide guided research on a topic suitable for a doctoral thesis.	

108837	Graduate Research
Subject: BCHM	Catalog Nbr: 0298
These courses provide guided research on a topic suitable for a doctoral thesis.	

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108863	Graduate Research		
Subject:	Catalog Nbr:		
BCHM	0299		
2014 SUMR	Primary	Larry Feig	larry.feig@tufts.edu
These courses provide guided research on a topic suitable for a doctoral thesis.			

108885	Masters Degree Only		
Subject:	Catalog Nbr:		
BCHM	0402		

108909	PhD Degree Only		
Subject:	Catalog Nbr:		
BCHM	0403		
Students are enrolled in this course when they receive permission to write from their thesis committee, and represents the effort in the final preparation and writing of the doctoral thesis. A grade of "S" is automatically awarded upon completion of the thesis			

108938	PhD Degree Only		
Subject:	Catalog Nbr:		
BCHM	0404		
Students are enrolled in this course when they receive permission to write from their thesis committee, and represents the effort in the final preparation and writing of the doctoral thesis. A grade of "S" is automatically awarded upon completion of the thesis			

108962	PhD Degree Only		
Subject:	Catalog Nbr:		
BCHM	0405		
Students are enrolled in this course when they receive permission to write from their thesis committee, and represents the effort in the final preparation and writing of the doctoral thesis. A grade of "S" is automatically awarded upon completion of the thesis			

109050	Biochemistry Of Gene Expression		
Subject:	Catalog Nbr:		
BCHM	230A		
2015 SPRG	Primary	Amy Yee	amy.yee@tufts.edu
The fundamental mechanisms underlying transcription, RNA processing, translation, and DNA replication are highlighted in this course. Current literature is emphasized. This course represents the first part of Biochemistry 230 and may be taken as a separate course.			

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109079	Biochemistry of Signal Transduction
Subject: BCHM	Catalog Nbr: 230B
2015 SPRG	Primary Amy Yee amy.yee@tufts.edu
The integration of fundamental mechanisms into molecular and cellular regulation of proliferation and signal transduction is discussed. Current literature is emphasized. This course represents the second part of Biochemistry 230 and may be taken as a separate course.	

109102	Molecular Recognition in Biology
Subject: BCHM	Catalog Nbr: 231A
2015 SPRG	Primary Alex Bohm Andrew.Bohm@tufts.edu
This course represents the first part of a discussion of the association of biological molecules. Complexes of proteins with other proteins, with lipids, and with nucleic acids are emphasized.	

109123	Drug Design
Subject: BCHM	Catalog Nbr: 231B
2015 SPRG	Primary William Bachovchin william.bachovchin@tufts.edu
This course represents the second part of a discussion of drug screening and optimization techniques as they have been applied in a number of detailed, real-world cases.	

109131	Qualifying Examination
Subject: CMP	Catalog Nbr: 0000
Students present and defend a proposal for research consisting of a statement of an original research problem in which a scientific question is asked and the experimental approach to answering the question is explained in a written proposal. The proposal is presented orally to the faculty.	

109312	Pathobiology
Subject: CMP	Catalog Nbr: 0230
2014 FALL	Primary Ira Herman ira.herman@tufts.edu
This is a discussion-based course that introduces graduate students to human disease, familiarizes them with pathological specimens and patients, provides examples of how scientific discovery and clinical practice have influenced each other, and uses clinical problems as a starting point for hypothesis-driven research.	

109384	Graduate Seminar
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Subject: CMP	Catalog Nbr: 0291	2014 FALL	Primary	Ira Herman	ira.herman@tufts.edu
Visiting speakers from the Boston community and beyond present their scientific research to all members of the program, including faculty, students, and post-doctoral fellows.					

109405	Graduate Seminar				
Subject: CMP	Catalog Nbr: 0292	2014 SPRG	Primary	Ira Herman	ira.herman@tufts.edu
Visiting speakers from the Boston community and beyond present their scientific research to all members of the program, including faculty, students, and post-doctoral fellows.					

109423	Special Topics				
Subject: CMP	Catalog Nbr: 0293				
In-depth information is provided on selected topics. Students may also pursue guided individual study of an approved topic.					

109472	Special Topics				
Subject: CMP	Catalog Nbr: 0294				
In-depth information is provided on selected topics. Students may also pursue guided individual study of an approved topic.					

109497	Journal Club				
Subject: CMP	Catalog Nbr: 0295	2014 FALL	Primary	Jerry Faust	jerry.faust@tufts.edu
Students select articles from the current literature, analyze their significance, and present them for discussion in a seminar group.					

109519	Journal Club				
Subject: CMP	Catalog Nbr: 0296	2015 SPRG	Primary	Jerry Faust	jerry.faust@tufts.edu
Students select articles from the current literature, analyze their significance, and present them for discussion in a seminar group.					

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109541	Graduate Research
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109568	Graduate Research
Subject: CMP	Catalog Nbr: 0298
These courses provide guided research on a topic suitable for a doctoral thesis.	

109587	Graduate Research
Subject: CMP	Catalog Nbr: 0299
2014 SUMR	Primary
Ira Herman	ira.herman@tufts.edu
These courses provide guided research on a topic suitable for a doctoral thesis.	

109603	Masters Degree Only
Subject: CMP	Catalog Nbr: 0402

109623	PhD Degree Only
Subject: CMP	Catalog Nbr: 0403
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109641	PhD Degree Only
Subject: CMP	Catalog Nbr: 0404
Students are enrolled in this course when they receive permission to write from their thesis committee, and represents the effort in the final preparation and writing of the doctoral thesis. A grade of "S" is automatically awarded upon completion of the thesis.	

109661	PhD Degree Only
Subject: CMP	Catalog Nbr: 0405

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Students are enrolled in this course when they receive permission to write from their thesis committee, and represents the effort in the final preparation and writing of the doctoral thesis. A grade of "S" is automatically awarded upon completion of the thesis

110372	Qualifying Exam			
Subject:	Catalog Nbr:			
CMDB	0000			
Students present and defend a proposal for research consisting of a statement of an original research problem in which a scientific question is asked and the experimental approach to answering the question is explained in a written proposal. The proposal is presented orally to the faculty.				

110452	Medical Histology			
Subject:	Catalog Nbr:			
CMDB	0203			
2013 FALL	Primary	John Castellot		john.castellot@tufts.edu
2014 FALL	Primary	Ira Herman		ira.herman@tufts.edu
This elective Medical School course introduces the student to the organization of a variety of cells, tissues, and organ systems. The lectures present information on the relationships between structure and function (i.e., physiology, biochemistry, and development), while the laboratories involve tissue and organ identification, providing both a practical background in cell and tissue biology.				

110619	Developmental Biology			
Subject:	Catalog Nbr:			
CMDB	0235			
2013 FALL	Primary	Heber Nielsen		heber.nielsen@tufts.edu
This course introduces students to modern developmental biology with an emphasis on the cellular and molecular mechanisms involved. General topic areas include fertilization and early development, mechanisms of cell determination and differentiation, and cell-cell and cell-matrix interactions.				

110876	Graduate Seminar			
Subject:	Catalog Nbr:			
CMDB	0291			
2014 FALL	Primary	John Castellot		john.castellot@tufts.edu
Visiting speakers from the Boston community and beyond present their scientific research to all members of the program, including faculty, students, and post-doctoral fellows.				

110897	Graduate Seminar			
Subject:	Catalog Nbr:			
CMDB	0292			
2015 SPRG	Primary	John Castellot		john.castellot@tufts.edu

Course Bulletin

Visiting speakers from the Boston community and beyond present their scientific research to all members of the program, including faculty, students, and post-doctoral fellows.

110931	Journal Club			
Subject:	Catalog Nbr:			
CMDB	0295			
2013 FALL	Primary	John Castellot		john.castellot@tufts.edu
2014 FALL	Primary	Gordon Huggins		No Email on file.
2014 FALL	Primary	Heber Nielsen		heber.nielsen@tufts.edu
Subject:	Catalog Nbr:			
CMDB	0295			
2014 FALL	Primary	Ira Herman		ira.herman@tufts.edu
Students select articles from the current literature, analyze their significance, and present them for discussion in a seminar group				

110961	Journal Club			
Subject:	Catalog Nbr:			
CMDB	0296			
2015 SPRG	Primary	John Castellot		john.castellot@tufts.edu
2015 SPRG	Primary	Gordon Huggins		No Email on file.
2015 SPRG	Primary	Heber Nielsen		heber.nielsen@tufts.edu
Subject:	Catalog Nbr:			
CMDB	0296			
Students select articles from the current literature, analyze their significance, and present them for discussion in a seminar group				

110981	Graduate Research			
Subject:	Catalog Nbr:			
CMDB	0297			
2013 FALL	Primary	John Castellot		john.castellot@tufts.edu
These courses provide guided research on a topic suitable for a doctoral thesis.				

120717	Prob and Stats Basic Sci			
Subject:	Catalog Nbr:			
ISP	0220			
2015 SPRG	Primary	Daniel Cox		dan.cox@tufts.edu
This course provides an introduction to the principles of probability and statistics and emphasizes the application of these disciplines to the analysis of basic science biomedical research data. Topics include: summarizing data, testing for differences between means, analysis of variance, laws of probability, common probability distributions, the analysis of categorical data, correlation, linear regression, nonlinear curve fitting, and exponential processes.				

Course Bulletin

120748	Laboratory Rotations			
Subject:	Catalog Nbr:			
ISP	0234			
2014 FALL	Primary	Alex Bohm		Andrew.Bohm@tufts.edu
8-10 week laboratory rotations for first-year students are designed to provide experience with experimental design and theoretical aspects of the diverse research problems under investigation in various laboratories				

120763	Laboratory Rotations			
Subject:	Catalog Nbr:			
ISP	0235			
2015 SPRG	Primary	Alex Bohm		Andrew.Bohm@tufts.edu
8-10 week laboratory rotations for first-year students are designed to provide experience with experimental design and theoretical aspects of the diverse research problems under investigation in various laboratories.				

120784	Laboratory Rotations			
Subject:	Catalog Nbr:			
ISP	0236			
2013 SUMRB	Primary	Athan Kuliopulos		athan.kuliopulos@tufts.edu
2014 SUMR	Primary	Dong Kong		Dong.Kong@tufts.edu
8-10 week laboratory rotation for first-year students are designed to provide experience with experimental design and theoretical aspects of the diverse research problems under investigation in various laboratories				

120800	Graduate Seminar			
Subject:	Catalog Nbr:			
ISP	0291			
2014 FALL	Primary	Alex Bohm		Andrew.Bohm@tufts.edu
Visiting speakers from the Boston community and beyond present their scientific research to all members of the program, including faculty, students, and post-doctoral fellows.				

120821	Graduate Seminar			
Subject:	Catalog Nbr:			
ISP	0292			
2015 SPRG	Primary	Alex Bohm		Andrew.Bohm@tufts.edu
Visiting speakers from the Boston community and beyond present their scientific research to all members of the program, including faculty, students, and post-doctoral fellows.				

120835	Special Topics			
Subject:	Catalog Nbr:			

Course Bulletin

ISP 0293

In-depth information is provided on selected topics. Students may also pursue guided individual study of an approved topic. Fall and Spring.

120848

Special Topics

Subject: Catalog Nbr:
ISP 0294

In-depth information is provided on selected topics. Students may also pursue guided individual study of an approved topic. Fall and Spring.

120859

Journal Club

Subject: Catalog Nbr:
ISP 0295

2014 FALL Primary Brent Cochran brent.cochran@tufts.edu

Students select articles from the current literature, analyze their significance, and present them for discussion in a seminar group.

120875

Journal Club

Subject: Catalog Nbr:
ISP 0296

2015 SPRG Primary Brent Cochran brent.cochran@tufts.edu

Students select articles from the current literature, analyze their significance, and present them for discussion in a seminar group.

120887

Graduate Research

Subject: Catalog Nbr:
ISP 0297

120905

Graduate Research

Subject: Catalog Nbr:
ISP 0299

These courses provide guided research on a topic suitable for a doctoral thesis.

121168

Cell Behavior

Subject: Catalog Nbr:
ISP 209B

2015 SPRG Primary John Castellot john.castellot@tufts.edu

Course Bulletin

This course covers major topics in cell biology, including cell motility and mitosis; cell-cell and cell-matrix interactions; and receptor-mediated endocytosis.

123526	Qualifying Exam
Subject: GENE	Catalog Nbr: 0000
Students present and defend a proposal for research consisting of a statement of an original research problem in which a scientific question is asked and the experimental approach to answering the question is explained in a written proposal. The proposal is presented orally to the faculty.	

123606	Intro to Genetics
Subject: GENE	Catalog Nbr: 0201
2014 FALL	Primary Erik Selsing erik.selsing@tufts.edu
Basic principles and current issues in genetics are the subject of the course. The focus will be on basic genetic principles. Topics will include Mendelian analysis, linkage, recombination/gene conversion, chromosomal abnormalities, crossover and segregation, developmental genetics and differentiation, chromosome structure, chromatin, position effects, meiosis and mitosis. Student presentations of research papers are used to familiarize the class with the manner in which genetic approaches can be applied experimentally.	

123785	Med & Exp Mammalian Gene
Subject: GENE	Catalog Nbr: 0208
2014 SUMR	Primary Mary Handel Mary_Ann.Handel@tufts.edu
The course is an intensive workshop-style immersion into mammalian genetics over a period of approximately two weeks. The faculty presents background and current research in important areas of mammalian genetics and its impact on health and disease. This course is offered at The Jackson Laboratory, Bar Harbor, ME.	

123914	Laboratory Rotations
Subject: GENE	Catalog Nbr: 0234
2013 FALL	Primary Thereza Imanishi-Kari thereza.imanishi-kari@tufts.edu
2013 FALL	Primary Erik Selsing erik.selsing@tufts.edu
2014 FALL	Primary Rajendra Kumar-Singh Rajendra.Kumar-Singh@tufts.edu
8-10 week laboratory rotations for first-year students are designed to provide experience with experimental design and theoretical aspects of the diverse research problems under investigation in various laboratories.	

123936	Laboratory Rotations
Subject:	Catalog Nbr:

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GENE	0235				
	2015 SPRG	Primary	Thereza Imanishi-Kari	thereza.imanishi-kari@tufts.edu	
	2015 SPRG	Primary	Rajendra Kumar-Singh	Rajendra.Kumar-Singh@tufts.edu	
8-10 week laboratory rotations for first-year students are designed to provide experience with experimental design and theoretical aspects of the diverse research problems under investigation in various laboratories.					

123953	Laboratory Rotations				
	Subject:	Catalog Nbr:			
	GENE	0236			
	2014 SUMR	Primary	James Schwob	jim.schwob@tufts.edu	
	Subject:	Catalog Nbr:			
	GENE	0236			
	2014 SUMR	Primary	Thereza Imanishi-Kari	thereza.imanishi-kari@tufts.edu	
	2014 SUMR	Primary	Rajendra Kumar-Singh	Rajendra.Kumar-Singh@tufts.edu	
8-10 week laboratory rotations for first-year students are designed to provide experience with experimental design and theoretical aspects of the diverse research problems under investigation in various laboratories.					

123972	Research Presentations				
	Subject:	Catalog Nbr:			
	GENE	0289			
	2013 FALL	Primary	Erik Selsing	erik.selsing@tufts.edu	
	2014 FALL	Primary	Rajendra Kumar-Singh	Rajendra.Kumar-Singh@tufts.edu	
Students present progress reports on their research for questions and constructive criticism as well as gain experience in presenting data and leading discussion.					

123991	Research Presentations				
	Subject:	Catalog Nbr:			
	GENE	0290			
	2015 SPRG	Primary	Erik Selsing	erik.selsing@tufts.edu	
	2015 SPRG	Primary	Rajendra Kumar-Singh	Rajendra.Kumar-Singh@tufts.edu	
Students present progress reports on their research for questions and constructive criticism as well as gain experience in presenting data and leading discussion.					

124062	Graduate Seminar				
	Subject:	Catalog Nbr:			
	GENE	0291			
	2013 FALL	Primary	Erik Selsing	erik.selsing@tufts.edu	
	2014 FALL	Primary	Rajendra Kumar-Singh	Rajendra.Kumar-Singh@tufts.edu	

Course Bulletin

edu

Visiting speakers from the Boston community and beyond present their scientific research to all members of the program, including faculty, students, and post-doctoral fellows.

124097	Graduate Seminar				
Subject:	Catalog Nbr:				
GENE	0292				
2015 SPRG	Primary	Erik Selsing	erik.selsing@tufts.edu		
2015 SPRG	Primary	Rajendra Kumar-Singh	Rajendra.Kumar-Singh@tufts.edu		
Visiting speakers present their scientific research to all members of the program, including faculty, students, and post-doctoral fellows. Fall and Spring.					

124116	Special Topics				
Subject:	Catalog Nbr:				
GENE	0293				
In-depth information is provided on selected topics. Students may also pursue guided individual study of an approved topic.					

124144	Special Topics				
Subject:	Catalog Nbr:				
GENE	0294				
In-depth information is provided on selected topics. Students may also pursue guided individual study of an approved topic.					

124194	Journal Club				
Subject:	Catalog Nbr:				
GENE	0295				
2014 FALL	Primary	Erik Selsing	erik.selsing@tufts.edu		
Students select articles from the current literature, analyze their significance, and present them for discussion in a seminar group.					

124231	Journal Club				
Subject:	Catalog Nbr:				
GENE	0296				
2015 SPRG	Primary	Erik Selsing	erik.selsing@tufts.edu		
Students select articles from the current literature, analyze their significance, and present them for discussion in a seminar group.					

Course Bulletin

124255	Graduate Research
Subject: GENE	Catalog Nbr: 0297
These courses provide guided research on a topic suitable for a doctoral thesis.	

124275	Graduate Research
Subject: GENE	Catalog Nbr: 0298
2015 SPRG	Primary
Rajendra Kumar-Singh	Rajendra.Kumar-Singh@tufts.edu
These courses provide guided research on a topic suitable for a doctoral thesis.	

124293	Graduate Research
Subject: GENE	Catalog Nbr: 0299
2013 SUMRB	Primary
2014 SUMR	Primary
Erik Selsing	erik.selsing@tufts.edu
Rajendra Kumar-Singh	Rajendra.Kumar-Singh@tufts.edu
These courses provide guided research on a topic suitable for a doctoral thesis.	

124323	Masters Degree Only
Subject: GENE	Catalog Nbr: 0402

124347	PhD Degree Only
Subject: GENE	Catalog Nbr: 0403
Students enroll in this course when they receive permission to write and defend their theses from their thesis committees. This course represents the effort in the final preparation of the doctoral thesis. A grade of "S" is automatically awarded upon completion of the thesis.	

124365	PhD Degree Only
Subject: GENE	Catalog Nbr: 0404
Students enroll in this course when they receive permission to write and defend their theses from their thesis committees. This course represents the effort in the final preparation of the doctoral thesis. A grade of "S" is automatically awarded upon completion of the thesis.	

Course Bulletin

124386	PhD Degree Only			
Subject: GENE	Catalog Nbr: 0405			
Students enroll in this course when they receive permission to write and defend their theses from their thesis committees. This course represents the effort in the final preparation of the doctoral thesis. A grade of "S" is automatically awarded upon completion of the thesis.				

124411	Systems Genetics			
Subject: GENE	Catalog Nbr: 0410			
	2013 FALL	Primary	Mary Handel	Mary_Ann.Handel@tufts.edu
	2014 FALL	Primary	Gary Churchill	No Email on file.
This one-week course covers computational and experimental approaches to genetic studies that utilize whole genome approaches. Individuals seeking to gain a deeper understanding of statistical and computational methods as well as biological problems are welcome. Topics to be covered include genetic mapping, gene expression microarray analysis and computational modeling of complex systems. This course is offered at The Jackson Laboratory, Bar Harbor, ME. Permission of the Genetics program director required.				

124436	Exp Models of Hum Cancer			
Subject: GENE	Catalog Nbr: 0450			
	2013 SUMRB	Primary	Mary Handel	Mary_Ann.Handel@tufts.edu
	2014 SUMR	Primary	Kevin Mills	No Email on file.
This ten-day graduate-level genetics course is designed for individuals entering the field of mouse genetics. The course focuses on the mouse as an experimental tool in cancer research. This course is offered at The Jackson Laboratory, Bar Harbor, ME. Permission of the Genetics program director required.				

124459	Mammalian Genetics I			
Subject: GENE	Catalog Nbr: 205A			
	2014 FALL	Primary	Erik Selsing	erik.selsing@tufts.edu
The course reviews the genetic principles that apply to mammals, including genetic mechanisms of sex determination, genetic imprinting, and mitochondrial inheritance. Attention is focused on the ways in which mutation is manifested in disease phenotypes in humans.				

124475	Mammalian Genetics II			
Subject: GENE	Catalog Nbr: 205B			
	2015 SPRG	Primary	Mary Handel	Mary_Ann.Handel@tufts.edu
The course explores the methodologies that are currently used to perform genetic analysis of mammals.				

Course Bulletin

125165	Qualifying Exam			
Subject:	Catalog Nbr:			
MMB	0000			
Students present and defend a proposal for research consisting of a statement of an original research problem in which a scientific question is asked and the experimental approach to answering the question is explained in a written proposal. The proposal is presented orally to the faculty.				

125333	Microbio of Episomes, Plasmids			
Subject:	Catalog Nbr:			
MMB	0206			
2015 SPRG	Primary	Michael Malamy	michael.malamy@tufts.edu	
This course covers fundamental properties of F-factors and drug resistance factors; roles of transposons in antibiotic resistance and plasmid evolution; detailed examinations of DNA processing for transfer in prokaryotic systems; regulatory mechanisms for fertility, replication, and incompatibility; and use of plasmids in genetic engineering.				

125406	Host Pathogen Interface			
Subject:	Catalog Nbr:			
MMB	0210			
2015 SPRG	Primary	Joan Mecsas	joan.mecsas@tufts.edu	
The goal of this course is to critically read and evaluate the scientific literature on bacterial pathogens and host defenses, with particular but not exclusive emphasis on innate immune defenses. Students are required to read at least two papers per topic and discuss them in the group.				

125430	Bacterial-Host Cell Int			
Subject:	Catalog Nbr:			
MMB	0211			
2015 SPRG	Primary	Ralph Isberg	ralph.isberg@tufts.edu	
The goal of this course is to critically read and evaluate the scientific literature on the cellular biology of bacterial pathogens, with particular emphasis on cultured cell models of microbial diseases. Students are required to read at least two papers per topic and discuss them in the group.				

125473	Animal Virology			
Subject:	Catalog Nbr:			
MMB	0214			
2014 SPRG	Primary	John Coffin	john.coffin@tufts.edu	
2014 SPRG	Primary	Ekaterina Heldwein	Katya.Heldwein@tufts.edu	
Molecular aspects of viral replication and host-cell interactions are emphasized. Topics include virion structure; mechanisms of nucleic acid replication, transcription, and translation; virion assembly and release; genetics; mechanisms of transformation by oncogenic viruses; responses of the host to viral infection, tumor				

Course Bulletin

viruses and tumor cells; and mechanisms of persistent and slow virus infections. Prerequisites: a course in molecular biology or working knowledge of molecular techniques. Spring-alternate years.

125598	Intro to Infect Diseases			
Subject:	Catalog Nbr:			
MMB	0223			
2014 SUMR	Primary	Andrew Camilli	andrew.camilli@tufts.edu	
2014 SUMR	Primary	Linden Hu	linden.hu@tufts.edu	
<p>This course is comprised of three integrated components; a Medical Microbiology Tutorial designed to introduce students to pathogens and pathophysiology of infectious diseases, Infectious Diseases Problem-Based Learning designed to introduce students to clinical cases, and a Teaching Clinic designed to expose students to real clinical cases and treatment options.</p>				

125630	Laboratory Rotations			
Subject:	Catalog Nbr:			
MMB	0234			
2014 FALL	Primary	Michael Malamy	michael.malamy@tufts.edu	
<p>8-10 week laboratory rotations for first-year students are designed to provide experience with experimental design and theoretical aspects of the diverse research problems under investigation in various laboratories.</p>				

125651	Laboratory Rotations			
Subject:	Catalog Nbr:			
MMB	0235			
2015 SPRG	Primary	Michael Malamy	michael.malamy@tufts.edu	
<p>8-10 week laboratory rotations for first-year students are designed to provide experience with experimental design and theoretical aspects of the diverse research problems under investigation in various laboratories.</p>				

125665	Laboratory Rotations			
Subject:	Catalog Nbr:			
MMB	0236			
<p>8-10 week laboratory rotations for first-year students are designed to provide experience with experimental design and theoretical aspects of the diverse research problems under investigation in various laboratories.</p>				

125685	Micro Gene & Microbio I			
Subject:	Catalog Nbr:			
MMB	0241			
2014 FALL	Primary	Andrew Camilli	andrew.camilli@tufts.edu	
<p>The goal of this course is to learn about the structure, growth, and genetics of bacteria and lambda bacteriophage. This course consists of text book reading, lectures and presentation and discussion of journal articles. Students are required to read one or two papers per topic and be prepared to discuss them in the</p>				

Course Bulletin

group.

125712	Applied Ethics For Sci		
Subject: MMB	Catalog Nbr: 0275		
2015 SPRG	Primary	Ralph Isberg	ralph.isberg@tufts.edu
This course is a discussion/seminar course that treats selected topics related to ethical behavior in scientific work. Topics covered include fraud, plagiarism, data selection and analysis, record keeping, animal welfare, personnel issues, genetic screening and gene therapy, and conflict of interest. Enrollment is restricted to third and fourth year graduate students.			

125727	Graduate Seminar		
Subject: MMB	Catalog Nbr: 0291		
2014 FALL	Primary	John Coffin	john.coffin@tufts.edu
Visiting speakers present their scientific research to all members of the program, including faculty, students, and post-doctoral fellows.			

125748	Graduate Seminar		
Subject: MMB	Catalog Nbr: 0292		
2015 SPRG	Primary	John Coffin	john.coffin@tufts.edu
Visiting speakers present their scientific research to all members of the program, including faculty, students, and post-doctoral fellows.			

125769	Special Topics		
Subject: MMB	Catalog Nbr: 0293		
In-depth information is provided on selected topics. Students may also pursue guided individual study of an approved topic.			

125789	Special Topics		
Subject: MMB	Catalog Nbr: 0294		
In-depth information is provided on selected topics. Students may also pursue guided individual study of an approved topic.			

125805	Journal Club		
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Course Bulletin

Subject:	Catalog Nbr:			
MMB	0295			
	2014 FALL	Primary	John Coffin	john.coffin@tufts.edu

These courses provide in-depth study and discussion of specific topics involving the critical review of current literature in a small group format. Given by faculty and graduate students (years two through four) and attended by all program members.

125836**Journal Club**

Subject:	Catalog Nbr:			
MMB	0296			
	2015 SPRG	Primary	John Coffin	john.coffin@tufts.edu

These courses provide in-depth study and discussion of specific topics involving the critical review of current literature in a small group format. Given by faculty and graduate students (years two through four) and attended by all program members.

125856**Graduate Research**

Subject:	Catalog Nbr:
MMB	0297

These courses provide guided research on a topic suitable for a doctoral thesis.

125868**Graduate Research**

Subject:	Catalog Nbr:
MMB	0298

These courses provide guided research on a topic suitable for a doctoral thesis.

125887**Graduate Research**

Subject:	Catalog Nbr:			
MMB	0299			
	2014 SUMR	Primary	Michael Malamy	michael.malamy@tufts.edu

These courses provide guided research on a topic suitable for a doctoral thesis.

125908**Masters Degree Only**

Subject:	Catalog Nbr:
MMB	0402

125927**PhD Degree Only**

Subject:	Catalog Nbr:
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MMB 0403
Students enroll in this course when they receive permission to write and defend their theses from their thesis committees. This course represents the effort in the final preparation of the doctoral thesis. A grade of "S" is automatically awarded upon completion of the thesis.

125955	PhD Degree Only
Subject: Catalog Nbr: MMB 0404	
Students enroll in this course when they receive permission to write and defend their theses from their thesis committees. This course represents the effort in the final preparation of the doctoral thesis. A grade of "S" is automatically awarded upon completion of the thesis.	

125976	PhD Degree Only
Subject: Catalog Nbr: MMB 0405	
Students enroll in this course when they receive permission to write and defend their theses from their thesis committees. This course represents the effort in the final preparation of the doctoral thesis. A grade of "S" is automatically awarded upon completion of the thesis.	

126020	Microbial Physiology
Subject: Catalog Nbr: MMB 207B	
2014 SPRG	Primary Abraham Sonenshein linc.sonenshein@tufts.edu
2014 SPRG	Primary Claudette Gardel Claudette.Gardel@tufts.edu
2014 SPRG	Primary Wai-Leung Ng Wai-Leung.Ng@tufts.edu
This course covers cellular controls of biosynthesis of DNA, RNA, and proteins; kinetics of cell division in bacteria; regulation of metabolism; and bacterial differentiation as a model system for development in higher organisms. Global regulatory mechanisms responsible for the control of gene expression are emphasized.	

126450	Qualifying Exam
Subject: Catalog Nbr: IMM 0000	
Students present and defend a proposal for research consisting of a statement of an original research problem in which a scientific question is asked and the experimental approach to answering the question is explained in a written proposal. The proposal is presented orally to the faculty.	

126717	Intro to Immunology
Subject: Catalog Nbr: IMM 0212	
2014 FALL	Primary John Iacomini John.Iacomini@tufts.edu

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This is a survey based on lectures, texts, problem-solving and small group tutorials. Topics include the cellular basis of innate and adaptive immune responses, the mechanism of antigen receptor gene rearrangement, principles of tissue transplantation and the genetic and mechanistic problems underlying autoimmune and hypersensitivity diseases.

126797	Imm Mechs of Disease I			
Subject: IMM	Catalog Nbr: 0215	2013 FALL	Primary	Mercio Perrin
				mercio.perrin@tufts.edu
The course covers the pathogenesis of major infectious diseases including current knowledge of immune responses and approaches to prevention, diagnosis and treatment. Current studies of autoimmunity, hypersensitivity, leukemia and lymphoma are also covered.				

126840	Imm Mechs In Disease II			
Subject: IMM	Catalog Nbr: 0216	2014 SPRG	Primary	Mercio Perrin
				mercio.perrin@tufts.edu
The course covers the pathogenesis of major infectious diseases including current knowledge of immune responses and approaches to prevention, diagnosis and treatment. Current studies of autoimmunity, hypersensitivity, leukemia and lymphoma are also covered.				

126857	1st Year Journal Club			
Subject: IMM	Catalog Nbr: 0217	2014 FALL	Primary	Erik Selsing
				erik.selsing@tufts.edu
First-year students meet with the course director to discuss articles essential for an understanding of contemporary immunology. The development of analytic skills is emphasized.				

126881	1st Year Journal Club			
Subject: IMM	Catalog Nbr: 0218	2014 SPRG	Primary	Erik Selsing
				erik.selsing@tufts.edu
		2015 SPRG	Primary	Henry Wortis
				henry.wortis@tufts.edu
First-year students meet with the course director to discuss articles essential for an understanding of contemporary immunology. The development of analytic skills is emphasized.				

127114	Scientific & Grant Wtng			
Subject: IMM	Catalog Nbr: 0233			
This course provides graduate students with the opportunity to develop the basic skills essential to the				

Course Bulletin

effective oral and written communication of scientific findings and research proposals. The course is a combination of lectures, writing assignments, and oral communication practice sessions with feedback provided by the faculty.

127136	Laboratory Rotations			
Subject: IMM	Catalog Nbr: 0234			
2013 FALL	Primary	Henry Wortis	henry.wortis@tufts.edu	
2014 FALL	Primary	Brigitte Huber	brigitte.huber@tufts.edu	
8-10 week laboratory rotations for first-year students are designed to provide experience with experimental design and theoretical aspects of the diverse research problems under investigation in various laboratories.				

127165	Laboratory Rotations			
Subject: IMM	Catalog Nbr: 0235			
2014 SPRG	Primary	Henry Wortis	henry.wortis@tufts.edu	
2015 SPRG	Primary	Brigitte Huber	brigitte.huber@tufts.edu	
8-10 week laboratory rotations for first-year students are designed to provide experience with experimental design and theoretical aspects of the diverse research problems under investigation in various laboratories.				

127179	Laboratory Rotations			
Subject: IMM	Catalog Nbr: 0236			
2013 SUMRB	Primary	Maria Alcaide Alonso	Maria_Pilar.Alcaide_Alonso@tufts.edu	
2014 SUMR	Primary	David Thorley-Lawson	david.thorley-lawson@tufts.edu	
8-10 week laboratory rotations for first-year students are designed to provide experience with experimental design and theoretical aspects of the diverse research problems under investigation in various laboratories.				

127217	Research Presentations			
Subject: IMM	Catalog Nbr: 0289			
2013 FALL	Primary	Thereza Imanishi-Kari	thereza.imanishi-kari@tufts.edu	
2014 FALL	Primary	Henry Wortis	henry.wortis@tufts.edu	
Students present progress reports on their research for questions and constructive criticism as well as gain experience in presenting data and leading discussion.				

127238	Research Presentations			
Subject:	Catalog Nbr:			

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IMM	0290				
	2015 SPRG	Primary	Thereza Imanishi-Kari	thereza.imanishi-kari@tufts.edu	
Students present progress reports on their research for questions and constructive criticism as well as gain experience in presenting data and leading discussion.					

127260	Graduate Seminar				
	Subject:	Catalog Nbr:			
	IMM	0291			
	2013 FALL	Primary	Thereza Imanishi-Kari	thereza.imanishi-kari@tufts.edu	
	2014 FALL	Primary	Henry Wortis	henry.wortis@tufts.edu	
Visiting speakers present their scientific research to all members of the program, including faculty, students, and post-doctoral fellows.					

127291	Graduate Seminar				
	Subject:	Catalog Nbr:			
	IMM	0292			
	2015 SPRG	Primary	Henry Wortis	henry.wortis@tufts.edu	
Visiting speakers present their scientific research to all members of the program, including faculty, students, and post-doctoral fellows.					

127310	Special Topics				
	Subject:	Catalog Nbr:			
	IMM	0293			
In-depth information is provided on selected topics. Students may also pursue guided individual study of an approved topic.					

127329	Special Topics				
	Subject:	Catalog Nbr:			
	IMM	0294			
In-depth information is provided on selected topics. Students may also pursue guided individual study of an approved topic.					

127347	Journal Club				
	Subject:	Catalog Nbr:			
	IMM	0295			
	2014 FALL	Primary	Stephen Bunnell	Stephen.Bunnell@tufts.edu	
Students in the research portion of their training meet to present and discuss recent papers of importance.					

Course Bulletin

127367	Journal Club			
Subject: IMM	Catalog Nbr: 0296			
	2015 SPRG	Primary	Stephen Bunnell	Stephen.Bunnell@tufts.edu
Students in the research portion of their training meet to present and discuss recent papers of importance.				

127391	Graduate Research			
Subject: IMM	Catalog Nbr: 0297			
	2013 FALL	Primary	Henry Wortis	henry.wortis@tufts.edu
These courses provide guided research on a topic suitable for a doctoral thesis.				

127403	Graduate Research			
Subject: IMM	Catalog Nbr: 0298			
	2015 SPRG	Primary	Henry Wortis	henry.wortis@tufts.edu
These courses provide guided research on a topic suitable for a doctoral thesis.				

127430	Graduate Research			
Subject: IMM	Catalog Nbr: 0299			
	2014 SUMR	Primary	Henry Wortis	henry.wortis@tufts.edu
These courses provide guided research on a topic suitable for a doctoral thesis.				

127436	Qualifying Exam			
Subject: NRSC	Catalog Nbr: 0000			
Students present and defend a proposal for research consisting of a statement of an original research problem in which a scientific question is asked and the experimental approach to answering the question is explained in a written proposal. The proposal is presented orally to the faculty.				

127448	Masters Degree Only			
Subject: IMM	Catalog Nbr: 0402			

127451	Cell Molecular Tutorials			
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Course Bulletin

Subject:	Catalog Nbr:			
NRSC	0200			
	2014 FALL	Primary	Michele Jacob	michele.jacob@tufts.edu

These small group tutorial sessions will introduce students to key principles in cellular and molecular neuroscience, provide students with the historical context in which key advances have been made, and engage students and faculty in informal, one-on-one discussions to deepen understanding of the material.

127475	PhD Degree Only
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Subject:	Catalog Nbr:
IMM	0403

Students enroll in this course when they receive permission to write and defend their theses from their thesis committees. This course represents the effort in the final preparation of the doctoral thesis. A grade of "S" is automatically awarded upon completion of the thesis.

127491	PhD Degree Only
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Subject:	Catalog Nbr:
IMM	0404

Students enroll in this course when they receive permission to write and defend their theses from their thesis committees. This course represents the effort in the final preparation of the doctoral thesis. A grade of "S" is automatically awarded upon completion of the thesis.

127512	Developmental Neurobio
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Subject:	Catalog Nbr:
NRSC	0205

This is a small group, interactive course exploring the mechanisms underlying the formation of the differentiated nervous system. Morphological, biochemical, immunological, and molecular approaches are examined, with an emphasis on the utility of experimental model systems.

127521	PhD Degree Only
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Subject:	Catalog Nbr:
IMM	0405

Students enroll in this course when they receive permission to write and defend their theses from their thesis committees. This course represents the effort in the final preparation of the doctoral thesis. A grade of "S" is automatically awarded upon completion of the thesis.

127621	Systems Neuroscience
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Subject:	Catalog Nbr:			
NRSC	0310			
	2015 SPRG	Primary	Maribel Rios	Maribel.Rios@tufts.edu
	2015 SPRG	Primary	Giuseppina Tesco	Giuseppina.Tesco@tufts.edu

Course Bulletin

This course, a cross-listing with Tufts University School of Medicine, focuses on the structural and functional organization of the integrated nervous system with significant exposure to neurological disease processes.

127641	Synapse Neurobiology			
Subject:	Catalog Nbr:			
NRSC	0213			
2014 FALL	Primary	Michele Jacob	michele.jacob@tufts.edu	
2014 FALL	Primary	Gerard Reijmers	Leon.Reijmers@tufts.edu	
This small group discussion course provides students with an in-depth understanding of how synapses function, how activity modulates function, and how synaptic ensembles coordinate simple behaviors.				

127741	Scientific Writing Princ			
Subject:	Catalog Nbr:			
NRSC	0220			
2013 FALL	Primary	Kathleen Dunlap	kathleen.dunlap@tufts.edu	
2014 FALL	Primary	F Jackson	rob.jackson@tufts.edu	
A discussion and workshop-style course underscoring the fundamental principles underlying expository writing. This course centers on the improvement of each student's existing skills through interactive writing exercises. Enrollment is limited to 10 students.				

127752	Neurosci Lab Techniques			
Subject:	Catalog Nbr:			
NRSC	0233			
2014 FALL	Primary	Jamie Maguire	Jamie.Maguire@tufts.edu	
The series of workshops exposes student to fundamental laboratory techniques, including tissue culture, genotyping, microscopy, immunohistochemistry, rodent handling, protein quantification, and experimental design.				

127776	Laboratory Rotation			
Subject:	Catalog Nbr:			
NRSC	0234			
2014 FALL	Primary	F Jackson	rob.jackson@tufts.edu	
8-10 week laboratory rotations for first-year students are designed to provide experience with experimental design and theoretical aspects of the diverse research problems under investigation in various laboratories.				

127803	Laboratory Rotations			
Subject:	Catalog Nbr:			
NRSC	0235			
2015 SPRG	Primary	F Jackson	rob.jackson@tufts.edu	
8-10 week laboratory rotations for first-year students are designed to provide experience with experimental				

Course Bulletin

design and theoretical aspects of the diverse research problems under investigation in various laboratories.

127822	Laboratory Rotation			
Subject:	Catalog Nbr:			
NRSC	0236			
2013 SUMRB	Primary	Stephen Moss		Stephen.Moss@tufts.edu
8-10 week laboratory rotations for first-year students are designed to provide experience with experimental design and theoretical aspects of the diverse research problems under investigation in various laboratories.				

127830	Biochem Found Neuroscience			
Subject:	Catalog Nbr:			
NRSC	0251			
2013 FALL	Primary	Stephen Moss		Stephen.Moss@tufts.edu
2014 FALL	Primary	Thomas Biederer		Thomas.Biederer@tufts.edu
This course covers fundamental biochemical principles, with special emphasis on mechanisms of particular importance to nervous system function, including neural signaling and non-equilibrium processes. Students will also be exposed to quantitative molecular approaches to studying the nervous system.				

127868	Neurogenetics			
Subject:	Catalog Nbr:			
NRSC	0263			
The course reviews principles of forward and reverse genetics, presents several animal model systems that are employed in neurogenetics research, and provides examples of genetic approaches that are used to study the molecules and neural circuits that regulate distinct neurobiological processes or are known to be altered in neurological disease states.				

127898	Research Presentations			
Subject:	Catalog Nbr:			
NRSC	0289			
2014 FALL	Primary	Michele Jacob		michele.jacob@tufts.edu
Students present progress reports on their research for questions and constructive criticism as well as gain experience in presenting data and leading discussion.				

127942	Research Presentations			
Subject:	Catalog Nbr:			
NRSC	0290			
2015 SPRG	Primary	Michele Jacob		michele.jacob@tufts.edu
Students present progress reports on their research for questions and constructive criticism as well as gain experience in presenting data and leading discussion.				

Course Bulletin

127981	Graduate Seminar				
	Subject:	Catalog Nbr:			
	NRSC	0291			
	2013 FALL	Primary	F Jackson		rob.jackson@tufts.edu
	2014 FALL	Primary	Michele Jacob		michele.jacob@tufts.edu
Visiting speakers present their scientific research to all members of the program, including faculty, students, and post-doctoral fellows.					

128024	Graduate Seminar				
	Subject:	Catalog Nbr:			
	NRSC	0292			
	2015 SPRG	Primary	F Jackson		rob.jackson@tufts.edu
Visiting speakers present their scientific research to all members of the program, including faculty, students, and post-doctoral fellows.					

128062	Special Topics				
	Subject:	Catalog Nbr:			
	NRSC	0293			
In-depth information is provided on selected topics. Students may also pursue guided individual study of an approved topic.					

128101	Special Topics				
	Subject:	Catalog Nbr:			
	NRSC	0294			
In-depth information is provided on selected topics. Students may also pursue guided individual study of an approved topic.					

128157	Journal Club				
	Subject:	Catalog Nbr:			
	NRSC	0295			
	2014 FALL	Primary	F Jackson		rob.jackson@tufts.edu
Students select articles from the current literature, analyze their significance, and present them for discussion in a seminar group.					

128193	Journal Club				
	Subject:	Catalog Nbr:			
	NRSC	0296			
	2015 SPRG	Primary	F Jackson		rob.jackson@tufts.edu

Course Bulletin

Students select articles from the current literature, analyze their significance, and present them for discussion in a seminar group.

128216	Graduate Research			
Subject:	Catalog Nbr:			
NRSC	0297			
2013 FALL	Primary	F Jackson		rob.jackson@tufts.edu
These courses provide guided research on a topic suitable for a doctoral thesis.				

128237	Graduate Research			
Subject:	Catalog Nbr:			
NRSC	0298			
These courses provide guided research on a topic suitable for a doctoral thesis.				

128248	Graduate Research			
Subject:	Catalog Nbr:			
NRSC	0299			
2013 SUMRB	Primary	Kathleen Dunlap		kathleen.dunlap@tufts.edu
2014 SUMR	Primary	F Jackson		rob.jackson@tufts.edu
These courses provide guided research on a topic suitable for a doctoral thesis.				

128272	Masters Degree Only			
Subject:	Catalog Nbr:			
NRSC	0402			

128290	PhD Degree Only			
Subject:	Catalog Nbr:			
NRSC	0403			
Students enroll in this course when they receive permission to write and defend their theses from their thesis committees. This course represents the effort in the final preparation of the doctoral thesis. A grade of "S" is awarded upon completion of the thesis.				

128311	PhD Degree Only			
Subject:	Catalog Nbr:			
NRSC	0404			
Students enroll in this course when they receive permission to write and defend their theses from their thesis committees. This course represents the effort in the final preparation of the doctoral thesis. A grade of "S" is				

Course Bulletin

awarded upon completion of the thesis.

128330	PhD Degree Only		
Subject: NRSC	Catalog Nbr: 0405		
Students enroll in this course when they receive permission to write and defend their theses from their thesis committees. This course represents the effort in the final preparation of the doctoral thesis. A grade of "S" is awarded upon completion of the thesis.			

128378	BFN Receptor/Channel Mechanisms		
Subject: NRSC	Catalog Nbr: 251B		
2013 FALL	Primary	Stephen Moss	Stephen.Moss@tufts.edu
2014 FALL	Primary	Thomas Biederer	Thomas.Biederer@tufts.edu
This course is the middle section of the Biochemical Foundations in Neuroscience course, focusing predominantly on mechanisms of enzyme, receptor, and channel function in the nervous system.			

130459	Clinical Implications of Basic Research		
Subject: SKMD	Catalog Nbr: 0210		
2015 SPRG	Primary	James Schwob	jim.schwob@tufts.edu
This journal club course for MD/PhD students is organized around the "Clinical Implications of Basic Research" column published in the New England Journal of Medicine. Students read a primary paper(s) highlighted in the column or one that is similar to those highlighted and discuss the work. The primary goal of this required course, which meets for one hour every other week, is to encourage and teach students to continually ask how basic research can impact clinical medicine. The format also encourages students to sharpen their communication skills in a relaxed atmosphere.			

136161	Structural Biology		
Subject: SK	Catalog Nbr: 0202		
2013 SUMRB	Primary	Alex Bohm	Andrew.Bohm@tufts.edu
This course covers the basic theory and practice of Macromolecular Crystallography and NMR			

136175	Tissue Engineering		
Subject: SK	Catalog Nbr: 0203		
This course covers Stem Cell Biology and Tissue Scaffolds, the Principles of Bioreactor Design and Integrative Approaches to Tissue Engineering.			

Course Bulletin

136203	Imaging Techniques			
Subject:	Catalog Nbr:			
SK	0204			
<p>This course covers Light Microscopy/Immunofluorescence, Confocal Microscopy and Electron Microscopy. Computer-based image analysis is incorporated into these modules. The samples generated during the Tissue Engineering module are used.</p>				

136219	Mentored Undergrad Teaching			
Subject:	Catalog Nbr:			
SK	0205			
<p>This course offers an opportunity for Sackler students to obtain mentored teaching experience. Each Sackler student collaborates with a TUSM and a Friedman student to develop a syllabus and three lectures on one of five disease topics (osteoporosis, breast cancer, asthma, metabolic syndrome, heart disease). Lectures are delivered to undergraduate Biology majors at Pine Manor College, Chestnut Hill, MA. Prerequisites: Year 3 or above.</p>				

136275	Applied Ethics for Scientists			
Subject:	Catalog Nbr:			
SK	0275			
2014 FALL	Primary	Daniel Jay	daniel.jay@tufts.edu	
<p>The course is built around case study reading material and requires highly interactive discussion in which students analyze specific scenarios of ethical issues encountered in a research environment. Topics include: academic integrity issues/ fraud and misconduct/plagiarism/ data handling/notebooks, mentoring and conflict resolution and ethical use of animals and human subjects.</p>				

136292	Biomedical Techniques & Research			
Subject:	Catalog Nbr:			
SK	0299			
2013 SUMRB	Primary	David Thorley-Lawson	david.thorley-lawson@tufts.edu	
2015 SPRG	Primary	Michael Malamy	michael.malamy@tufts.edu	
2015 SPRG	Primary	Abraham Sonenshein	linc.sonenshein@tufts.edu	
<p>This course includes research with selected advisor. Visiting Students Only.</p>				

136304	Clin Impl Basic Research			
Subject:	Catalog Nbr:			
SKMD	0209			

Course Bulletin

136336	Laboratory Rotations		
Subject:	Catalog Nbr:		
SKMD	0299		
8-10 week laboratory rotations for first-year students are designed to provide experience with experimental design and theoretical aspects of the diverse research problems under investigation in various laboratories. Fall, Spring, Summer.			

137576	Qualifying Exam		
Subject:	Catalog Nbr:		
PPET	0000		
Students present and defend a proposal for research consisting of a statement of an original research problem in which a scientific question is asked and the experimental approach to answering the question is explained in a written proposal. The proposal is presented orally to the faculty.			

137616	Translational Pharm I		
Subject:	Catalog Nbr:		
PPET	0211		
2014 FALL	Primary	Margery Beinfeld	margery.beinfeld@tufts.edu
2014 FALL	Primary	Martin Beinborn	martin.beinborn@tufts.edu
This course is a survey of some of the major classes of drugs, with particular emphasis on mechanisms of action and relevant organ systems and cellular physiology. Students are introduced to the central concepts, models and techniques in pharmacology.			

137629	Clinical Pharmacology		
Subject:	Catalog Nbr:		
PPET	0212		
This course is devoted to the discussion and presentation of therapeutic topics and the basic principles of therapeutic pharmacology. Subjects that are highlighted include: therapeutic drug monitoring, evaluation of side effects and toxicity, critical evaluation of clinical trial data, pharmacokinetic design of dose regimens, drugs in special populations and medical and legal issues in clinical pharmacology. A mixture of lecture, readings and clinical case-oriented problem-solving is used. Extensive independent study and reading is required.			

137645	Addiction Medicine		
Subject:	Catalog Nbr:		
PPET	0213		
2015 SPRG	Primary	Emmanuel Pothos	emmanuel.pothos@tufts.edu
This course is offered in conjunction with the Medical School. It provides an overview of the mechanisms of action of drugs of abuse and their treatment, as well as the fundamentals of treatment of addiction in clinical practice.			

Course Bulletin

137683	Principles Of Immunopharmacology
Subject: PPET	Catalog Nbr: 0218
<p>This course investigates the appraisal of molecular mechanisms by which drugs can affect cellular processes underlying clinical syndromes such as hypersensitivity, rejection, autoimmunity and neuroimmune disorders. Emphasis is placed on select cases of how certain compounds were chosen for drug development and why many such promising drugs failed.</p>	

137698	Behavioral Pharmacology
Subject: PPET	Catalog Nbr: 0219
<p>This course is an in-depth examination of the mechanisms by which selected psychoactive agents alter mood and behavior with emphasis on the role of neurotransmitters and their receptors.</p>	

137710	Advances in Neurochem
Subject: PPET	Catalog Nbr: 0220
<p>This course focuses on the problem-based approach to the actions of neurotransmitters and neuromodulators and related drugs at the molecular and cellular level.</p>	

137724	Pharmokinetics in Biological Systems
Subject: PPET	Catalog Nbr: 0221
<p>This course focuses on the uptake and clearance of drugs, using problem-solving exercises and computer modeling to analyze data from original experiments</p>	

137735	Toxicology
Subject: PPET	Catalog Nbr: 0222
<p>This course is an in-depth examination of the basic principles of toxicology based on discussion and presentation of selected examples. Subjects considered include apoptosis/necrosis, molecular mechanisms of neurotoxicities, species difference in toxicities, and chemical mutagenesis.</p>	

137756	Neuropeptides
Subject: PPET	Catalog Nbr: 0224
<p>This course entails detailed reading and critical review of the classical and modern literature on the discovery, chemistry, anatomical distribution, biosynthesis, physiology, pharmacology and current and possible future</p>	

Course Bulletin

clinical uses of neuropeptides.

137777	Intro to Drug Metabolism			
Subject:	PPET	Catalog Nbr:	0225	
This is a readings and presentation course designed to illustrate the processes involved with drug metabolism, to describe the non-drug (non-substrate) factors influencing drug metabolism, and to review and critique methods used for the study of drug metabolism.				

137850	Translational Pharmacology II			
Subject:	PPET	Catalog Nbr:	0232	
	2015 SPRG	Primary	Margery Beinfeld	margery.beinfeld@tufts.edu
	2015 SPRG	Primary	Martin Beinborn	martin.beinborn@tufts.edu
This course continues with the topics covered in Translational Pharmacology I. It covers major classes of drugs and the concepts, models and techniques in pharmacology.				

137860	Sci Writing and Presentation Skills			
Subject:	PPET	Catalog Nbr:	0233	
	2014 FALL	Primary	Emmanuel Pothos	emmanuel.pothos@tufts.edu
This course provides graduate students with the opportunity to develop the basic skills essential to the effective oral and written communication of scientific findings and research proposals. The course is a combination of lectures, writing assignments, and oral communication practice sessions.				

137871	Laboratory Rotations			
Subject:	PPET	Catalog Nbr:	0234	
	2014 FALL	Primary	Emmanuel Pothos	emmanuel.pothos@tufts.edu
8-10 week laboratory rotations for first-year students are designed to provide experience with experimental design and theoretical aspects of the diverse research problems under investigation in various laboratories.				

137881	Laboratory Rotations			
Subject:	PPET	Catalog Nbr:	0235	
	2015 SPRG	Primary	Emmanuel Pothos	emmanuel.pothos@tufts.edu
8-10 week laboratory rotations for first-year students are designed to provide experience with experimental design and theoretical aspects of the diverse research problems under investigation in various laboratories.				

Course Bulletin

137889	Laboratory Rotations			
Subject: PPET	Catalog Nbr: 0236			
	2013 SUMRB	Primary	Emmanuel Pothos	emmanuel.pothos@tufts.edu
	2014 SUMR	Primary	Mercio Perrin	mercio.perrin@tufts.edu
	2014 SUMR	Primary	John Coffin	john.coffin@tufts.edu
8-10 week laboratory rotations for first-year students are designed to provide experience with experimental design and theoretical aspects of the diverse research problems under investigation in various laboratories.				

137918	Graduate Seminar			
Subject: PPET	Catalog Nbr: 0291			
	2014 FALL	Primary	David Greenblatt	dj.greenblatt@tufts.edu
	2014 FALL	Primary	Emmanuel Pothos	emmanuel.pothos@tufts.edu
Visiting speakers present their scientific research to all members of the program, including faculty, students, and post-doctoral fellows.				

137928	Graduate Seminar			
Subject: PPET	Catalog Nbr: 0292			
	2015 SPRG	Primary	David Greenblatt	dj.greenblatt@tufts.edu
	2015 SPRG	Primary	Emmanuel Pothos	emmanuel.pothos@tufts.edu
Visiting speakers present their scientific research to all members of the program, including faculty, students, and post-doctoral fellows.				

137939	Special Topics			
Subject: PPET	Catalog Nbr: 0293			
In-depth information is provided on selected topics. Students may also pursue guided individual study of an approved topic.				

137959	Special Topics			
Subject: PPET	Catalog Nbr: 0294			
In-depth information is provided on selected topics. Students may also pursue guided individual study of an approved topic.				

137978	Journal Club			
Subject: PPET	Catalog Nbr: 0295			

Course Bulletin

2013 FALL	Primary	Jerold Harmatz	jerold.harmatz@tufts.edu
2014 FALL	Primary	Margery Beinfeld	margery.beinfeld@tufts.edu
2014 FALL	Primary	Emmanuel Pothos	emmanuel.pothos@tufts.edu
Students select articles from the current literature, analyze their significance, and present them for discussion in a seminar group.			

137989	Journal Club		
Subject:	Catalog Nbr:		
PPET	0296		
2015 SPRG	Primary	Margery Beinfeld	margery.beinfeld@tufts.edu
2015 SPRG	Primary	Jerold Harmatz	jerold.harmatz@tufts.edu
2015 SPRG	Primary	Emmanuel Pothos	emmanuel.pothos@tufts.edu
Students select articles from the current literature, analyze their significance, and present them for discussion in a seminar group.			

138000	Graduate Research		
Subject:	Catalog Nbr:		
PPET	0297		
2014 FALL	Primary	Emmanuel Pothos	emmanuel.pothos@tufts.edu
These courses provide guided research on a topic suitable for a doctoral thesis.			

138007	Graduate Research		
Subject:	Catalog Nbr:		
PPET	0298		
These courses provide guided research on a topic suitable for a doctoral thesis.			

138017	Graduate Research		
Subject:	Catalog Nbr:		
PPET	0299		
2014 SUMR	Primary	Emmanuel Pothos	emmanuel.pothos@tufts.edu
These courses provide guided research on a topic suitable for a doctoral thesis.			

138026	Masters Degree Only		
Subject:	Catalog Nbr:		
PPET	0402		

138033	PhD Degree Only		
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Course Bulletin

Subject:	Catalog Nbr:
PPET	0403

Students enroll in this course when they receive permission to write and defend their theses from their thesis committees. This course represents the effort in the final preparation of the doctoral thesis. A grade of "S" is awarded upon completion of the thesis.

138043	PhD Degree Only
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Subject:	Catalog Nbr:
PPET	0404

Students enroll in this course when they receive permission to write and defend their theses from their thesis committees. This course represents the effort in the final preparation of the doctoral thesis. A grade of "S" is awarded upon completion of the thesis.

138052	PhD Degree Only
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Subject:	Catalog Nbr:
PPET	0405

Students enroll in this course when they receive permission to write and defend their theses from their thesis committees. This course represents the effort in the final preparation of the doctoral thesis. A grade of "S" is awarded upon completion of the thesis.

138644	Transfer Credit
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Subject:	Catalog Nbr:
TRAN	9999

138674	Micro Gene & Microbio II
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Subject:	Catalog Nbr:
MMB	0242

2015 SPRG	Primary	Andrew Camilli	andrew.camilli@tufts.edu
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138797	Tutorial in Neural Systems and Disease Mechanisms
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Subject:	Catalog Nbr:
NRSC	0312

2015 SPRG	Primary	Maribel Rios	Maribel.Rios@tufts.edu
2015 SPRG	Primary	Giuseppina Tesco	Giuseppina.Tesco@tufts.edu

This tutorial is designed as a companion course to NRSC 0310, in order to expand students' understanding of research approaches to common neurological diseases. In preparation for each discussion, students will read historical and recent publications relevant to the class topic, followed by critical discussions of past research advances made and future approaches that might prove most effective in translational research efforts.

Course Bulletin

139088	Advanced Cellular Immunology			
Subject: IMM	Catalog Nbr: 0245	2014 FALL	Primary	Brigitte Huber brigitte.huber@tufts.edu
This course is designed to give students a solid background in contemporary Cellular Immunology. The course will be based on a lecture series supplemented by extensive readings from the current literature. Thirty minutes of each course is dedicated to discuss the assigned reading material, which is two papers per lecture. Prerequisite: IMM 0212 or equivalent.				

139091	System Approaches to Immunology			
Subject: IMM	Catalog Nbr: 0252	2015 SPRG	Primary	Alexander Poltorak Alexander.Poltorak@tufts.edu
The course introduces mouse as the main model for studies of human biology. It starts with the mouse genetics, continues with classical genetic analysis in the mouse, and moves to genetic basis of immunological phenomena such as receptor editing, B-cell tolerance and autoimmunity. At the end, two lectures and hands-on workshops familiarize students with the basics of microarray analysis and next generation sequencing.				

139092	Immunochemistry- Signaling and Dynamics			
Subject: IMM	Catalog Nbr: 0250	2015 SPRG	Primary	Stephen Bunnell Stephen.Bunnell@tufts.edu
The course covers the genetic basis for lymphocyte differentiation, receptor gene rearrangement, T and B cell antigen-receptor diversity and selection, tolerance, autoimmunity and gene expression.				

139171	Laboratory Research Experience			
Subject: PPET	Catalog Nbr: 0134	2014 FALL	Primary	Emmanuel Pothos emmanuel.pothos@tufts.edu
16-20 week laboratory rotations for Master's students are designed to provide experience with experimental design and theoretical aspects of the diverse research problems under investigation in various laboratories.				

139172	Laboratory Research Experience			
Subject: PPET	Catalog Nbr: 0135	2014 SPRG	Primary	Emmanuel Pothos emmanuel.pothos@tufts.edu
16-20 week laboratory rotations for Master's students are designed to provide experience with experimental design and theoretical aspects of the diverse research problems under investigation in various laboratories.				

Course Bulletin

139204	Teaching Infectious Diseases			
Subject: SK	Catalog Nbr: 0115			
2014 SUMR	Primary	Karina Meiri		karina.meiri@tufts.edu
2014 SUMR	Primary	Berri Jacque		Berri.Jacque@tufts.edu
<p>The course provides the background to teach about infectious disease in high school classrooms. The course is based on a 10th – 12th grade (Biology II) curriculum that has been developed by a partnership between a group of Boston teachers and infectious disease specialists from Tufts Medical School. The goal of the course is to teach the key scientific concepts underlying the curriculum - how bacteria, viruses, and parasites cause infectious diseases and how the immune system defends the body against the attack, as well as the pedagogical strategies to deliver the content in the classroom using a variety of inquiry-based constructivist approaches.</p>				

139290	Rotation			
Subject: SK	Catalog Nbr: 0236			
2013 SUMRB	Primary	Alexander Poltorak		Alexander.Poltorak@tufts.edu
2014 SUMR	Primary	David Thorley-Lawson		david.thorley-lawson@tufts.edu

139373	Applying Quality Improvement Methods in Healthcare and Public Health			
Subject: CTS	Catalog Nbr: 0231			
2015 SPRG	Primary	Laurel Leslie		No Email on file.
2015 SPRG	Primary	Denise Daudelin		No Email on file.
<p>This course aims to provide a broad overview of current trends, core concepts, and methods in quality improvement (QI) and demonstrate their application to healthcare and public health. The course focuses on application, and includes didactic instruction, group discussions, and individual and group projects.</p>				

139452	Special Topics			
Subject: CMP	Catalog Nbr: 0293			
2014 SUMR	Primary	John Castellot		john.castellot@tufts.edu
<p>In-depth information is provided on selected topics. Students may also pursue guided individual study of an approved topic.</p>				

139453	Special Topics			
Subject:	Catalog Nbr:			

Course Bulletin

CMDB 0293

In-depth information is provided on selected topics. Students may also pursue guided individual study of an approved topic. Fall and Spring.

139454	Special Topics
Subject: CMDB	Catalog Nbr: 0294

139463	Macromolecular Structural Determination
Subject: BCHM	Catalog Nbr: 0202
This is an intensive workshop covering the basic theory and practice of modern protein crystallography and NMR. The course alternates between lectures, hands-on demos, and computer exercises.	

139466	Post-placement Rotation		
Subject: SK	Catalog Nbr: 0234		
2014 FALL	Primary	Stephen Bunnell	Stephen.Bunnell@tufts.edu

139467	Post-placement Rotation		
Subject: SK	Catalog Nbr: 0235		
2015 SPRG	Primary	William Bachovchin	william.bachovchin@tufts.edu
2015 SPRG	Primary	Pamela Yelick	Pamela.Yelick@tufts.edu

139826	Advanced Scientific Ethics		
Subject: SK	Catalog Nbr: 0375		
2014 FALL	Primary	Daniel Jay	daniel.jay@tufts.edu
: Advanced Scientific Ethics is a course for Sackler students in the fifth year as a refresher course for responsible conduct of research (RCR). It builds on SK 0275, Scientific Ethics and is mandated by NIH. Students will work in teams to develop a new case study addressing an RCR issue, provide a written in depth analysis and teach the case study to a small group of students enrolled in SK 0275 under the supervision of the course director. Grading will be based on the quality of case study and analysis, teaching, effort and participation. Thus the class will provide value beyond refreshing RCR awareness providing opportunities for team building, writing, ethical analysis and teaching.			

Course Bulletin

140064	Advanced Topics in Biostatistics			
Subject: CTS	Catalog Nbr: 0533			
<p>This course provides background in advanced applied statistical methods in clinical research. Topics in the course include Poisson, multinomial, and ordinal regression, competing risk survival models, longitudinal data analysis, and hierarchical mixed models. The course provides students with the statistical foundations of these methods and their applications in clinical research. The seminar allows participants to explore advanced statistical topics and provides clinical and translational scientists with exposure to methods that may be applicable in their own research.</p>				

140127	Advanced Epidemiology & Regression Methods: An Integrated Approach			
Subject: CTS	Catalog Nbr: 0575			
	2015 SPRG	Primary	Jessica Paulus	Jessica.Paulus@tufts.edu
	2015 SPRG	Primary	Farzad Noubary	Farzad.Noubary@tufts.edu

140320	Design and Analysis of Bioequivalence Studies			
Subject: PPET	Catalog Nbr: 0281			
<p>A generic drug is bioequivalent to a brand name drug when their bioavailabilities (assessed by the respective plasma concentration time curves) after administration in the same molar dose are essentially the same. The comparison of the bioavailabilities is examined by conducting a bioequivalence study. The course will train the students in the design and data analysis of bioequivalence studies.</p>				