

# Course Bulletin

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

<b>100015</b>	<b>Graduate Research</b>
Subject: CMDB	Catalog Nbr: 0299
2016 SUMR	Primary Ira Herman ira.herman@tufts.edu
These courses provide guided research on a topic suitable for a doctoral thesis.	

<b>100025</b>	<b>Masters Degree Only</b>
Subject: CMDB	Catalog Nbr: 0402

<b>100047</b>	<b>PhD Degree Only</b>
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.	

<b>100060</b>	<b>PhD Degree Only</b>
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.	

<b>100078</b>	<b>PhD Degree Only</b>
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.	

<b>100257</b>	<b>Haz. Waste Treatmnt Tech</b>
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# Course Bulletin

Subject:	Catalog Nbr:
CARS	0138

<b>100871</b>	<b>General Nutrition</b>
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Subject:	Catalog Nbr:
CARS	0202

<b>101087</b>	<b>Nutrition</b>
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Subject:	Catalog Nbr:
CARS	0225

<b>101617</b>	<b>Intro To Health Services</b>
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Subject:	Catalog Nbr:
CRBU	0702

<b>101678</b>	<b>Org Of Med Care Svcs</b>
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Subject:	Catalog Nbr:
CRBU	0704

<b>101859</b>	<b>Soc &amp; Behav Sci In Ph</b>
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Subject:	Catalog Nbr:
CRBU	0720

<b>101915</b>	<b>Epidemiology</b>
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Subject:	Catalog Nbr:
CRBU	0721

<b>101978</b>	<b>Intro To Stat. Comput.</b>
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Subject:	Catalog Nbr:
CRBU	0723

# Course Bulletin

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<b>101999</b>	<b>Wmn Children &amp; Adolsc.</b>
Subject:	Catalog Nbr:
CRBU	0725

<b>102017</b>	<b>Health Care Marketing</b>
Subject:	Catalog Nbr:
CRBU	0733

<b>102037</b>	<b>Human Rights And Health</b>
Subject:	Catalog Nbr:
CRBU	0740

<b>102074</b>	<b>Consultation Techniques</b>
Subject:	Catalog Nbr:
CRBU	0741

<b>102330</b>	<b>Genetic Epidemiology</b>
Subject:	Catalog Nbr:
CRBU	0763

<b>102351</b>	<b>Int'l Health</b>
Subject:	Catalog Nbr:
CRBU	0771

<b>102392</b>	<b>Global Mat &amp; Chld Hlth</b>
Subject:	Catalog Nbr:
CRBU	0790

# Course Bulletin

<b>102598</b>	<b>Hlth Policy &amp; Mngt</b>	
Subject:	CRBU	Catalog Nbr: 0827

<b>102780</b>	<b>App Stat In Clin Trials</b>	
Subject:	CRBU	Catalog Nbr: 0851

<b>102798</b>	<b>Entrepreneurial Mngmnt.</b>	
Subject:	CRBU	Catalog Nbr: 0853

<b>102838</b>	<b>Stg For Intl Reprd Hlth</b>	
Subject:	CRBU	Catalog Nbr: 0881

<b>102889</b>	<b>Membranes &amp; Trafficking</b>			
Subject:	ISP	Catalog Nbr: 209A		
2016 FALL	Primary	Michael Forgac	michael.forgac@tufts.edu	
2016 FALL	Secondary	Garabed Sahagian	gary.sahagian@tufts.edu	
2016 FALL	Secondary	Laura Liscum	laura.liscum@tufts.edu	
2016 FALL	Secondary	John Castellot	john.castellot@tufts.edu	
2016 FALL	Secondary	Daniel Cox	dan.cox@tufts.edu	
2016 FALL	Secondary	Ralph Isberg	ralph.isberg@tufts.edu	
2016 FALL	Secondary	Peter Juo	Peter.Juo@tufts.edu	
2016 FALL	Secondary	Gerard Reijmers	Leon.Reijmers@tufts.edu	
2016 FALL	Secondary	Jamie Maguire	Jamie.Maguire@tufts.edu	
2016 FALL	Secondary	Christopher Dulla	Chris.Dulla@tufts.edu	
2016 FALL	Secondary	Alan Kopin	alan.kopin@tufts.edu	
2016 FALL	Secondary	Karl Munger	Karl.Munger@tufts.edu	
2016 FALL	Secondary	Malavika Raman	Malavika.Raman@tufts.edu	
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				

# Course Bulletin

biogenesis.

<b>102982</b>	<b>Cell &amp; Molecular Genetics</b>			
Subject:	Catalog Nbr:			
ISP	210A			
2016 SPRG	Primary	Brent Cochran	brent.cochran@tufts.edu	
2016 SPRG	Secondary	John Castellot	john.castellot@tufts.edu	
2016 SPRG	Secondary	Michael Forgac	michael.forgac@tufts.edu	
2016 SPRG	Secondary	Peter Juo	Peter.Juo@tufts.edu	
This course covers molecular genetics and basic concepts in developmental biology.				

<b>103003</b>	<b>Molecular Cell Biology of Development</b>			
Subject:	Catalog Nbr:			
ISP	210B			
2016 SPRG	Primary	John Castellot	john.castellot@tufts.edu	
2016 SPRG	Secondary	Michael Forgac	michael.forgac@tufts.edu	
2016 SPRG	Secondary	Peter Juo	Peter.Juo@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.				

<b>104392</b>	<b>Qualifying Exam</b>			
Subject:	Catalog Nbr:			
CTS	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.				

<b>104503</b>	<b>Study Design Seminar</b>			
Subject:	Catalog Nbr:			
CTS	0500			
2016 FALL	Primary	David Kent	No Email on file.	
2016 FALL	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.				

<b>104524</b>	<b>Translational &amp; Molecular Epidemiology</b>			
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# Course Bulletin

Subject:      Catalog Nbr:  
CTS            0501

This course aims to address some of the main challenges of current translational research in the interface of epidemiology and molecular medicine.

<b>104542</b>	<b>Bridging the Bench-To-Bedside Gap</b>			
	Subject:	Catalog Nbr:		
	CTS	0502		
<p>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 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.</p>				

<b>104602</b>	<b>Introduction to Biostatistical Methods I</b>			
	Subject:	Catalog Nbr:		
	CTS	0506		
	2016 SUMR	Primary	Sarah Pagni	Sarah.Pagni@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>				

<b>104617</b>	<b>Introduction To Biostatistics II</b>			
	Subject:	Catalog Nbr:		
	CTS	0507		
	2016 FALL	Primary	Sarah Pagni	Sarah.Pagni@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>				

<b>104658</b>	<b>Predictive Models</b>			
	Subject:	Catalog Nbr:		
	CTS	0510		
	2016 FALL	Primary	David Kent	No Email on file.
	2016 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>				

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<b>104676</b>	<b>Machine Learning in Predictive Medicine</b>		
Subject: CTS	Catalog Nbr: 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>			

<b>104693</b>	<b>Comparative Effectiveness Research Survey</b>		
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>			

<b>104708</b>	<b>Clinical Research Project-Certificate Candidates</b>		
Subject: CTS	Catalog Nbr: 0514		
2016 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>			

<b>104768</b>	<b>Clinical Research Project/Thesis Research- First Year</b>		
Subject: CTS	Catalog Nbr: 0515		
<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>			

<b>104826</b>	<b>Clinical Research Project/Thesis Research- Second Year</b>		
Subject: CTS	Catalog Nbr: 0516		

# Course Bulletin

2016 SUMR	Primary	David Kent	No Email on file.
<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>			

<b>104881</b>	<b>Clinical Research Project/Thesis Research- PhD Candidates</b>		
Subject: CTS	Catalog Nbr: 0517	2016 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>			

<b>104898</b>	<b>Advanced Thesis Research</b>		
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>			

<b>104915</b>	<b>Concentration Practicum</b>		
Subject: CTS	Catalog Nbr: 0519		
2016 FALL	Primary	John Wong	john_b.wong@tufts.edu
2016 SPRG	Primary	David Kent	No Email on file.
2016 SPRG	Primary	Jessica Paulus	Jessica.Paulus@tufts.edu
2016 SPRG	Primary	Raveendhara Bannuru	Raveendhara.Bannuru@tufts.edu
2016 SPRG	Primary	Gordon Huggins	No Email on file.
2016 SUMR	Primary	Karen Freund	Karen.Freund@tufts.edu
2016 SUMR	Primary	Paul Han	No Email on file.
<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>			

<b>104952</b>	<b>Introduction to Clinical Epidemiology</b>		
Subject: CTS	Catalog Nbr: 0523		
2016 FALL	Primary	Jessica Paulus	Jessica.Paulus@tufts.edu



# Course Bulletin

2016 FALL      Secondary      Radley Sheldrick      Radley.Sheldrick@tufts.edu

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.

**104969**

## Introduction to Clinical Care Research

Subject:      Catalog Nbr:  
CTS          0525

2015 SUMR	Secondary	Thomas Mackie	Thomas.Mackie@tufts.edu
2016 SUMR	Primary	David Kent	No Email on file.
2016 SUMR	Primary	Jessica Paulus	Jessica.Paulus@tufts.edu
2016 SUMR	Secondary	David Snyderman	david.snyderman@tufts.edu
2016 SUMR	Secondary	Susan Parsons	Susan.Parsons@tufts.edu
2016 SUMR	Secondary	Karen Freund	Karen.Freund@tufts.edu
2016 SUMR	Secondary	Robin Ruthazer	No Email on file.
2016 SUMR	Secondary	Thomas Concannon	No Email on file.
2016 SUMR	Secondary	John Wong	john_b.wong@tufts.edu
2016 SUMR	Secondary	Raveedhara Bannuru	Raveedhara.Bannuru@tufts.edu
2016 SUMR	Secondary	Robert Goldberg	Robert.Goldberg@umassmed.edu
2016 SUMR	Secondary	Gordon Huggins	No Email on file.
2016 SUMR	Secondary	Farzad Noubary	Farzad.Noubary@tufts.edu
2016 SUMR	Secondary	Denise Daudelin	No Email on file.
2016 SUMR	Secondary	Andreas Klein	No Email on file.
2016 SUMR	Secondary	James Chambers	James.Chambers@tufts.edu
2016 SUMR	Secondary	Pei-Jung Lin	No Email on file.

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 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

2016 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.

# Course Bulletin

<b>105046</b>	<b>Scientific Manuscript Writing</b>			
Subject:	Catalog Nbr:			
CTS	0537			
2016 FALL	Primary	Jessica Paulus	Jessica.Paulus@tufts.edu	
2016 SPRG	Primary	David Kent	No Email on file.	
2016 SPRG	Primary	Robert Goldberg	Robert.Goldberg@umassmed.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.				

<b>105065</b>	<b>Scientific Grant Writing</b>			
Subject:	Catalog Nbr:			
CTS	0538			
2016 FALL	Primary	David Kent	No Email on file.	
2016 FALL	Secondary	Robert Goldberg	Robert.Goldberg@umassmed.edu	
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.				

<b>105102</b>	<b>Scientific Writing, Peer Review &amp; Presentations</b>			
Subject:	Catalog Nbr:			
CTS	0539			
2016 FALL	Primary	David Kent	No Email on file.	
2016 FALL	Secondary	Robert Goldberg	Robert.Goldberg@umassmed.edu	
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.				

<b>105120</b>	<b>Ethics Of Clinical Investigation</b>			
Subject:	Catalog Nbr:			
CTS	0540			
2016 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.				

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105158	Principles Of Drug Development			
Subject: CTS	Catalog Nbr: 0555			
2016 FALL	Primary	Kenneth Kaitin	Kenneth.Kaitin@tufts.edu	
2016 FALL	Secondary	Christopher Milne	christopher.milne@tufts.edu	
2016 FALL	Secondary	Paul Beninger	Paul.Beninger@tufts.edu	
2016 FALL	Secondary	Joshua Cohen	Joshua_T.Cohen@tufts.edu	
2016 FALL	Secondary	Chandrasekhar Natarajan	Chandrasekhar.Natarajan@tufts.edu	
2016 FALL	Secondary	Laura Housman	Laura.Housman@tufts.edu	
2016 FALL	Secondary	Orest Hurko	Orest.Hurko@tufts.edu	
<p>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.</p>				

105178	Principles of Pharmacoeconomics			
Subject: CTS	Catalog Nbr: 0556			
2016 SPRG	Primary	James Chambers	James.Chambers@tufts.edu	
2016 SPRG	Secondary	Pei-Jung Lin	No Email on file.	
<p>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.</p>				

105251	Introduction To Clinical Trials			
Subject: CTS	Catalog Nbr: 0561			
2016 FALL	Primary	Anastassios Pittas	anastassios.pittas@tufts.edu	
2016 FALL	Secondary	Ellen Vickery	No Email on file.	
2016 FALL	Secondary	Patricia Sheehan	No Email on file.	
<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: CTS	Catalog Nbr: 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>				

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<b>105306</b>	<b>Introduction to Health Services Research</b>			
Subject:	Catalog Nbr:			
CTS	0566			
2016 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, pharmacoeconomics, access and payment for health services, healthcare quality and quality improvement.</p>				

<b>105457</b>	<b>Introduction to Evidence Based-Medicine</b>			
Subject:	Catalog Nbr:			
CTS	0581			
2016 SPRG	Primary	Norma Terrin		norma.terrin@tufts.edu
2016 SPRG	Primary	Raveedhara Bannuru		Raveendhara.Bannuru@tufts.edu
2016 SPRG	Primary	James Chambers		James.Chambers@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>				

<b>105474</b>	<b>Genetic Epidemiology</b>			
Subject:	Catalog Nbr:			
CTS	0582			
<p>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.</p>				

<b>105491</b>	<b>Introduction to Decision Analysis</b>			
Subject:	Catalog Nbr:			
CTS	0584			
2016 SPRG	Primary	John Wong		john_b.wong@tufts.edu
<p>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.</p>				

<b>105533</b>	<b>Special Topics</b>			
Subject:	Catalog Nbr:			
CTS	0593			
<p>In-depth information is provided on selected topics. Students may also pursue guided individual study of an approved topic.</p>				

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

<b>108388</b>	<b>Graduate Biochemistry</b>			
Subject:	Catalog Nbr:			
BCHM	0223			
2016 FALL	Primary	Alex Bohm	Andrew.Bohm@tufts.edu	
2016 FALL	Secondary	James Baleja	jim.baleja@tufts.edu	
2016 FALL	Secondary	Kurtz Paulson	eric.paulson@tufts.edu	
2016 FALL	Secondary	Peter Bullock	peter.bullock@tufts.edu	
2016 FALL	Secondary	Laura Liscum	laura.liscum@tufts.edu	
2016 FALL	Secondary	Brian Schaffhausen	brian.schaffhausen@tufts.edu	
2016 FALL	Secondary	William Bachovchin	william.bachovchin@tufts.edu	
2016 FALL	Secondary	Michael Forgac	michael.forgac@tufts.edu	
2016 FALL	Secondary	Alexei Degterev	Alexei.Degterev@tufts.edu	
2016 FALL	Secondary	Marta Gaglia	Marta.Gaglia@tufts.edu	
2016 FALL	Secondary	James Munro	James.Munro@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.				

<b>108410</b>	<b>Advanced Graduate Biochemistry</b>			
Subject:	Catalog Nbr:			
BCHM	0224			
2016 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.				

<b>108532</b>	<b>Biochemistry of Gene Expression &amp; Signal Transduction</b>			
Subject:	Catalog Nbr:			
BCHM	0230			
2016 SPRG	Primary	Amy Yee	amy.yee@tufts.edu	
2016 SPRG	Secondary	Kurtz Paulson	eric.paulson@tufts.edu	
2016 SPRG	Secondary	Larry Feig	larry.feig@tufts.edu	

# Course Bulletin

2016 SPRG	Secondary	Brian Schaffhausen	brian.schaffhausen@tufts.edu
2016 SPRG	Secondary	Brent Cochran	brent.cochran@tufts.edu
2016 SPRG	Secondary	Claire Moore	claire.moore@tufts.edu
<p>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.</p>			

<b>108657</b>	<b>Graduate Seminar</b>		
Subject:	Catalog Nbr:		
BCHM	0291		
2015 FALL	Primary	Larry Feig	larry.feig@tufts.edu
2016 FALL	Primary	Ira Herman	ira.berman@tufts.edu
<p>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.</p>			

<b>108697</b>	<b>Graduate Seminar</b>		
Subject:	Catalog Nbr:		
BCHM	0292		
2016 SPRG	Primary	Ira Herman	ira.berman@tufts.edu
<p>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.</p>			

<b>108770</b>	<b>Journal Club</b>		
Subject:	Catalog Nbr:		
BCHM	0295		
2015 FALL	Primary	Larry Feig	larry.feig@tufts.edu
2016 FALL	Primary	Ira Herman	ira.berman@tufts.edu
2016 FALL	Primary	Heber Nielsen	heber.nielsen@tufts.edu
2016 FALL	Primary	Gordon Huggins	No Email on file.
<p>Students select articles from the current literature, analyze their significance, and present them for discussion in a seminar group.</p>			

<b>108787</b>	<b>Journal Club</b>		
Subject:	Catalog Nbr:		
BCHM	0296		
2016 SPRG	Primary	Ira Herman	ira.berman@tufts.edu
2016 SPRG	Primary	Heber Nielsen	heber.nielsen@tufts.edu
2016 SPRG	Primary	Gordon Huggins	No Email on file.
<p>Students select articles from the current literature, analyze their significance, and present them for discussion</p>			

# Course Bulletin

in a seminar group.

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

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

<b>108863</b>	<b>Graduate Research</b>
Subject: BCHM	Catalog Nbr: 0299
2016 SUMR	Primary Larry Feig
larry.feig@tufts.edu	
These courses provide guided research on a topic suitable for a doctoral thesis.	

<b>108885</b>	<b>Masters Degree Only</b>
Subject: BCHM	Catalog Nbr: 0402

<b>108909</b>	<b>PhD Degree Only</b>
Subject: BCHM	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	

<b>108938</b>	<b>PhD Degree Only</b>
Subject: BCHM	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	

# Course Bulletin

<b>108962</b>	<b>PhD Degree Only</b>			
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				

<b>109050</b>	<b>Biochemistry of Gene Expression</b>			
Subject:	Catalog Nbr:			
BCHM	230A			
2016 SPRG	Primary	Amy Yee	amy.yee@tufts.edu	
2016 SPRG	Secondary	Claire Moore	claire.moore@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.				

<b>109079</b>	<b>Biochemistry of Signal Transduction</b>			
Subject:	Catalog Nbr:			
BCHM	230B			
2016 SPRG	Primary	Amy Yee	amy.yee@tufts.edu	
2016 SPRG	Secondary	Kurtz Paulson	eric.paulson@tufts.edu	
2016 SPRG	Secondary	Larry Feig	larry.feig@tufts.edu	
2016 SPRG	Secondary	Brian Schaffhausen	brian.schaffhausen@tufts.edu	
2016 SPRG	Secondary	Brent Cochran	brent.cochran@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.				

<b>109102</b>	<b>Molecular Recognition in Biology</b>			
Subject:	Catalog Nbr:			
BCHM	231A			
2016 SPRG	Primary	Alex Bohm	Andrew.Bohm@tufts.edu	
2016 SPRG	Secondary	James Baleja	jim.baleja@tufts.edu	
2016 SPRG	Secondary	Brian Schaffhausen	brian.schaffhausen@tufts.edu	
2016 SPRG	Secondary	Alexei Degterev	Alexei.Degterev@tufts.edu	
This course builds on graduate biochemistry, providing detailed instruction on how to design and interpret binding experiments, how to visualize and analyze macromolecular structures, and how to apply these techniques in laboratory research.				

<b>109123</b>	<b>Drug Design</b>			
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# Course Bulletin

Subject: BCHM	Catalog Nbr: 231B				
2016 SPRG	Primary	William Bachovchin		william.bachovchin@tufts.edu	
Survey and critical analysis of selected case histories of drug design, discovery, and development, including issues related to commercialization such as market size, patents, and licenses.					

<b>109312</b>	<b>Pathobiology</b>				
Subject: CMP	Catalog Nbr: 0230				
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.					

<b>109384</b>	<b>Graduate Seminar</b>				
Subject: CMP	Catalog Nbr: 0291				
2015 FALL	Primary	Brent Cochran		brent.cochran@tufts.edu	
2016 FALL	Primary	Ira Herman		ira.berman@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.					

<b>109405</b>	<b>Graduate Seminar</b>				
Subject: CMP	Catalog Nbr: 0292				
2016 SPRG	Primary	Ira Herman		ira.berman@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.					

<b>109497</b>	<b>Journal Club</b>				
Subject: CMP	Catalog Nbr: 0295				
2015 FALL	Primary	Brent Cochran		brent.cochran@tufts.edu	
2016 FALL	Primary	Ira Herman		ira.berman@tufts.edu	
2016 FALL	Primary	Heber Nielsen		heber.nielsen@tufts.edu	
2016 FALL	Primary	Gordon Huggins		No Email on file.	
Students select articles from the current literature, analyze their significance, and present them for discussion in a seminar group.					

<b>109519</b>	<b>Journal Club</b>				
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Subject:	Catalog Nbr:			
CMP	0296			
2016 SPRG	Primary	Ira Herman		ira.herman@tufts.edu
2016 SPRG	Primary	Heber Nielsen		heber.nielsen@tufts.edu
2016 SPRG	Primary	Gordon Huggins		No Email on file.
Students select articles from the current literature, analyze their significance, and present them for discussion in a seminar group.				

<b>109541</b>	<b>Graduate Research</b>			
Subject:	Catalog Nbr:			
CMP	0297			
2015 FALL	Primary	Brent Cochran		brent.cochran@tufts.edu
These courses provide guided research on a topic suitable for a doctoral thesis.				

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

<b>109587</b>	<b>Graduate Research</b>			
Subject:	Catalog Nbr:			
CMP	0299			
2016 SUMR	Primary	Brent Cochran		brent.cochran@tufts.edu
These courses provide guided research on a topic suitable for a doctoral thesis.				

<b>109603</b>	<b>Masters Degree Only</b>			
Subject:	Catalog Nbr:			
CMP	0402			

<b>109623</b>	<b>PhD Degree Only</b>			
Subject:	Catalog Nbr:			
CMP	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				

<b>109641</b>	<b>PhD Degree Only</b>			
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Subject: Catalog Nbr:  
CMP 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: Catalog Nbr:  
CMP 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

## 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

2016 FALL Primary Jeffrey Marchant jeffrey.marchant@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

2015 FALL	Primary	John Castellot	john.castellot@tufts.edu
2015 FALL	Secondary	James Schwob	jim.schwob@tufts.edu
2015 FALL	Secondary	Victor Hatini	Victor.Hatini@tufts.edu
2015 FALL	Secondary	Peter Juo	Peter.Juo@tufts.edu
2015 FALL	Secondary	Pamela Yelick	Pamela.Yelick@tufts.edu
2015 FALL	Secondary	Grace Gill	Grace.Gill@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

# Course Bulletin

of cell determination and differentiation, and cell-cell and cell-matrix interactions.

<b>110876</b>	<b>Graduate Seminar</b>			
Subject:	Catalog Nbr:			
CMDB	0291			
2016 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.				

<b>110897</b>	<b>Graduate Seminar</b>			
Subject:	Catalog Nbr:			
CMDB	0292			
2016 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.				

<b>110931</b>	<b>Journal Club</b>			
Subject:	Catalog Nbr:			
CMDB	0295			
2016 FALL	Primary	Ira Herman		ira.herman@tufts.edu
2016 FALL	Primary	Heber Nielsen		heber.nielsen@tufts.edu
2016 FALL	Primary	Gordon Huggins		No Email on file.
Subject:	Catalog Nbr:			
CMDB	0295			
Students select articles from the current literature, analyze their significance, and present them for discussion in a seminar group				

<b>110961</b>	<b>Journal Club</b>			
Subject:	Catalog Nbr:			
CMDB	0296			
2016 SPRG	Primary	Ira Herman		ira.herman@tufts.edu
2016 SPRG	Primary	Heber Nielsen		heber.nielsen@tufts.edu
2016 SPRG	Primary	Gordon Huggins		No Email on file.
Subject:	Catalog Nbr:			
CMDB	0296			
Students select articles from the current literature, analyze their significance, and present them for discussion in a seminar group				

<b>110981</b>	<b>Graduate Research</b>			
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# Course Bulletin

Subject:	Catalog Nbr:			
CMDB	0297			
2015 FALL	Primary	Ira Herman		ira.herman@tufts.edu

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

<b>120717</b>	<b>Probability and Statistics for Basic Sciences</b>			
Subject:	Catalog Nbr:			
ISP	0220			
2016 SPRG	Primary	Daniel Cox		dan.cox@tufts.edu
<p>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.</p>				

<b>120748</b>	<b>Laboratory Rotations</b>			
Subject:	Catalog Nbr:			
ISP	0234			
2016 FALL	Primary	Ira Herman		ira.herman@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>				

<b>120763</b>	<b>Laboratory Rotations</b>			
Subject:	Catalog Nbr:			
ISP	0235			
2016 SPRG	Primary	Ira Herman		ira.herman@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>				

<b>120784</b>	<b>Laboratory Rotations</b>			
Subject:	Catalog Nbr:			
ISP	0236			
2016 SUMR	Primary	Alex Bohm		Andrew.Bohm@tufts.edu
2016 SUMR	Primary	Dong Kong		Dong.Kong@tufts.edu
<p>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</p>				

<b>120859</b>	<b>Journal Club</b>			
Subject:	Catalog Nbr:			

# Course Bulletin

ISP	0295			
	2016 FALL	Primary	Ira Herman	ira.herman@tufts.edu
	2016 FALL	Primary	Brent Cochran	brent.cochran@tufts.edu
	2016 FALL	Primary	Amy Yee	amy.yee@tufts.edu
Students select articles from the current literature, analyze their significance, and present them for discussion in a seminar group.				

<b>120875</b>	<b>Journal Club</b>			
	Subject:	Catalog Nbr:		
	ISP	0296		
	2016 SPRG	Primary	Ira Herman	ira.herman@tufts.edu
	2016 SPRG	Primary	Brent Cochran	brent.cochran@tufts.edu
	2016 SPRG	Primary	Amy Yee	amy.yee@tufts.edu
Students select articles from the current literature, analyze their significance, and present them for discussion in a seminar group.				

<b>121168</b>	<b>Cell Behavior</b>			
	Subject:	Catalog Nbr:		
	ISP	209B		
	2016 SPRG	Primary	John Castellot	john.castellot@tufts.edu
	2016 SPRG	Secondary	Daniel Jay	daniel.jay@tufts.edu
	2016 SPRG	Secondary	Ira Herman	ira.herman@tufts.edu
	2016 SPRG	Secondary	Michael Forgac	michael.forgac@tufts.edu
	2016 SPRG	Secondary	Victor Hatini	Victor.Hatini@tufts.edu
	2016 SPRG	Secondary	Peter Juo	Peter.Juo@tufts.edu
	2016 SPRG	Secondary	Heber Nielsen	heber.nielsen@tufts.edu
This course covers major topics in cell biology, including cell motility and mitosis; cell-cell and cell-matrix interactions; and receptor-mediated endocytosis.				

<b>123526</b>	<b>Qualifying Exam</b>			
	Subject:	Catalog Nbr:		
	GENE	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.				

<b>123606</b>	<b>Introduction to Genetics</b>			
	Subject:	Catalog Nbr:		
	GENE	0201		
	2016 FALL	Primary	Erik Selsing	erik.selsing@tufts.edu

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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.

<b>123650</b>	<b>Cancer Genetics</b>			
	Subject:	Catalog Nbr:		
	GENE	0203		
	2016 FALL	Primary	Brent Cochran	brent.cochran@tufts.edu
	2016 FALL	Primary	Karl Munger	Karl.Munger@tufts.edu

<b>123785</b>	<b>Medical &amp; Experimental Mammalian Genetics</b>			
	Subject:	Catalog Nbr:		
	GENE	0208		
	2016 SUMR	Primary	Mary Handel	Mary_Ann.Handel@tufts.edu
<p>The course is an intensive, two-week immersion into mammalian genetics with presenters providing 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. Students in the Mammalian Genetics Track have priority for this course; a limited number of slots are available for other Sackler students with permission from the Genetics program and the Dean's Office.</p>				

<b>123914</b>	<b>Laboratory Rotations</b>			
	Subject:	Catalog Nbr:		
	GENE	0234		
	2016 FALL	Primary	Rajendra Kumar-Singh	Rajendra.Kumar-Singh@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>				

<b>123936</b>	<b>Laboratory Rotations</b>			
	Subject:	Catalog Nbr:		
	GENE	0235		
	2016 SPRG	Primary	Rajendra Kumar-Singh	Rajendra.Kumar-Singh@tufts.edu
	2016 SPRG	Primary	Mary Handel	Mary_Ann.Handel@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>				

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123953	Laboratory Rotations			
Subject: GENE	Catalog Nbr: 0236			
2016 SUMR	Primary	Rajendra Kumar-Singh	Rajendra.Kumar-Singh@tufts.edu	
Subject: GENE	Catalog Nbr: 0236			
2016 SUMR	Primary	Rajendra Kumar-Singh	Rajendra.Kumar-Singh@tufts.edu	
2016 SUMR	Primary	Mary Handel	Mary_Ann.Handel@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: GENE	Catalog Nbr: 0289			
2016 FALL	Primary	Erik Selsing	erik.selsing@tufts.edu	
2016 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: GENE	Catalog Nbr: 0290			
2016 SPRG	Primary	Erik Selsing	erik.selsing@tufts.edu	
2016 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: GENE	Catalog Nbr: 0291			
2016 FALL	Primary	Rajendra Kumar-Singh	Rajendra.Kumar-Singh@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.				

124097	Graduate Seminar			
Subject: GENE	Catalog Nbr: 0292			



# Course Bulletin

2016 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.			

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

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

<b>124194</b>	<b>Journal Club</b>		
Subject:	GENE	Catalog Nbr:	0295
2016 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.			

<b>124231</b>	<b>Journal Club</b>		
Subject:	GENE	Catalog Nbr:	0296
2016 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.			

<b>124255</b>	<b>Graduate Research</b>		
Subject:	GENE	Catalog Nbr:	0297
2016 FALL	Primary	Rajendra Kumar-Singh	Rajendra.Kumar-Singh@tufts.edu
These courses provide guided research on a topic suitable for a doctoral thesis.			

<b>124275</b>	<b>Graduate Research</b>		
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# Course Bulletin

Subject: Catalog Nbr:  
GENE 0298

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

**124293**

**Graduate Research**

Subject: Catalog Nbr:  
GENE 0299

2016 SUMR Primary 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: Catalog Nbr:  
GENE 0402

**124347**

**PhD Degree Only**

Subject: Catalog Nbr:  
GENE 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: Catalog Nbr:  
GENE 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.

**124386**

**PhD Degree Only**

Subject: Catalog Nbr:  
GENE 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**

# Course Bulletin

Subject:	Catalog Nbr:			
GENE	0410			
2016 FALL	Primary	Mary Handel		Mary_Ann.Handel@tufts.edu
2016 FALL	Primary	Gary Churchill		No Email on file.
<p>This one-week course covers computational and experimental approaches to genetic studies that utilize whole genome approaches. Individuals interested in statistical and computational methods as well as biological problems are welcome. Topics include genetic mapping, gene expression microarray analysis and computational modeling of complex systems. This course is offered at The Jackson Laboratory, Bar Harbor, ME. Students in the Mammalian Genetics Track have priority for this course; a limited number of slots are available for other Sackler students with permission from the program and the Dean's Office.</p>				

<b>124436</b>	<b>Experimental Models of Human Cancer</b>			
Subject:	Catalog Nbr:			
GENE	0450			
2016 SUMR	Primary	Mary Handel		Mary_Ann.Handel@tufts.edu
2016 SUMR	Primary	Kevin Mills		No Email on file.
<p>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. Students in the Mammalian Genetics Track have priority for this course; a limited number of slots are available for other Sackler students with permission from the Genetics program and the Dean's Office.</p>				

<b>124459</b>	<b>Mammalian Genetics I</b>			
Subject:	Catalog Nbr:			
GENE	205A			
2016 FALL	Primary	Erik Selsing		erik.selsing@tufts.edu
<p>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.</p>				

<b>124475</b>	<b>Mammalian Genetics II</b>			
Subject:	Catalog Nbr:			
GENE	205B			
2016 SPRG	Primary	Mary Handel		Mary_Ann.Handel@tufts.edu
<p>The course explores the methodologies that are currently used to perform genetic analysis of mammals.</p>				

<b>125165</b>	<b>Qualifying Exam</b>			
Subject:	Catalog Nbr:			
MMB	0000			
<p>Students present and defend a proposal for research consisting of a statement of an original research problem</p>				

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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.

<b>125333</b>	<b>Molecular Biology of Episomes &amp; Plasmids</b>		
Subject: MMB	Catalog Nbr: 0206		
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.			

<b>125406</b>	<b>Host Pathogen Interface</b>		
Subject: MMB	Catalog Nbr: 0210		
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.			

<b>125430</b>	<b>Bacterial-Host Cell Interaction</b>		
Subject: MMB	Catalog Nbr: 0211		
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.			

<b>125473</b>	<b>Animal Virology</b>		
Subject: MMB	Catalog Nbr: 0214		
2016 SPRG	Primary	John Coffin	john.coffin@tufts.edu
2016 SPRG	Primary	Ekaterina Heldwein	Katya.Heldwein@tufts.edu
2016 SPRG	Secondary	Marta Gaglia	Marta.Gaglia@tufts.edu
2016 SPRG	Secondary	Karl Munger	Karl.Munger@tufts.edu
2016 SPRG	Secondary	James Munro	James.Munro@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 viruses and tumor cells; and mechanisms of persistent and slow virus infections. Prerequisites: a course in molecular biology or working knowledge of molecular techniques.			

# Course Bulletin

<b>125630</b>	<b>Laboratory Rotations</b>			
Subject:	Catalog Nbr:			
MMB	0234			
2016 FALL	Primary	Michael Malamy		michael.malamy@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.				

<b>125651</b>	<b>Laboratory Rotations</b>			
Subject:	Catalog Nbr:			
MMB	0235			
2016 SPRG	Primary	Michael Malamy		michael.malamy@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.				

<b>125665</b>	<b>Laboratory Rotations</b>			
Subject:	Catalog Nbr:			
MMB	0236			
2016 SUMR	Primary	Michael Malamy		michael.malamy@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.				

<b>125685</b>	<b>Microbial Genetics &amp; Microbiology I</b>			
Subject:	Catalog Nbr:			
MMB	0241			
2016 FALL	Primary	Andrew Camilli		andrew.camilli@tufts.edu
2016 FALL	Secondary	Michael Malamy		michael.malamy@tufts.edu
2016 FALL	Secondary	Claudette Gardel		Claudette.Gardel@tufts.edu
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 group.				

<b>125712</b>	<b>Applied Ethics for Scientists</b>			
Subject:	Catalog Nbr:			
MMB	0275			
2016 FALL	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.				

# Course Bulletin

<b>125727</b>	<b>Graduate Seminar</b>			
Subject:	Catalog Nbr:			
MMB	0291			
2016 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.				

<b>125748</b>	<b>Graduate Seminar</b>			
Subject:	Catalog Nbr:			
MMB	0292			
2016 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.				

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

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

<b>125805</b>	<b>Journal Club</b>			
Subject:	Catalog Nbr:			
MMB	0295			
2016 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.				

<b>125836</b>	<b>Journal Club</b>			
Subject:	Catalog Nbr:			
MMB	0296			

# Course Bulletin

2016 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

2016 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:  
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

# Course Bulletin

automatically awarded upon completion of the thesis.

<b>125976</b>	<b>PhD Degree Only</b>
Subject: MMB	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.	

<b>126020</b>	<b>Microbial Physiology &amp; Differentiation</b>		
Subject: MMB	Catalog Nbr: 207B		
2016 SPRG	Primary	Claudette Gardel	Claudette.Gardel@tufts.edu
2016 SPRG	Primary	Wai-Leung Ng	Wai-Leung.Ng@tufts.edu
2016 SPRG	Secondary	Michael Malamy	michael.malamy@tufts.edu
2016 SPRG	Secondary	Bree Aldridge	Bree.Aldridge@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.			

<b>126450</b>	<b>Qualifying Exam</b>
Subject: IMM	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.	

<b>126717</b>	<b>Intro to Immunology</b>		
Subject: IMM	Catalog Nbr: 0212		
2016 FALL	Primary	Peter Brodeur	peter.brodeur@tufts.edu
2016 FALL	Primary	Henry Wortis	henry.wortis@tufts.edu
2016 FALL	Primary	John Iacomini	John.Iacomini@tufts.edu
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.			

<b>126797</b>	<b>Imm Mechs of Disease I</b>
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# Course Bulletin

Subject: IMM	Catalog Nbr: 0215	2016 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.					

<b>126840</b>	<b>Imm Mechs In Disease II</b>				
Subject: IMM	Catalog Nbr: 0216	2016 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.					

<b>126857</b>	<b>1st Year Journal Club</b>				
Subject: IMM	Catalog Nbr: 0217	2016 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.					

<b>127114</b>	<b>Scientific &amp; Grant Wtng</b>				
Subject: IMM	Catalog Nbr: 0233	2016 SPRG	Primary	Amy Gantt	Amy.Gantt@tufts.edu
		2016 SPRG	Primary	Linden Hu	linden.hu@tufts.edu
		2016 SPRG	Secondary	Naomi Rosenberg	naomi.rosenberg@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 with feedback provided by the faculty.					

<b>127136</b>	<b>Laboratory Rotations</b>				
Subject: IMM	Catalog Nbr: 0234	2015 FALL	Primary	Henry Wortis	henry.wortis@tufts.edu
		2016 FALL	Primary	Brigitte Huber	brigitte.huber@tufts.edu
		2016 FALL	Primary	Honorine Ward	honorine.ward@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

<b>127165</b>	<b>Laboratory Rotations</b>			
Subject:	Catalog Nbr:			
IMM	0235			
2016 SPRG	Primary	Brigitte Huber		brigitte.huber@tufts.edu
2016 SPRG	Primary	Henry Wortis		henry.wortis@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.				

<b>127179</b>	<b>Laboratory Rotations</b>			
Subject:	Catalog Nbr:			
IMM	0236			
2016 SUMR	Primary	Henry Wortis		henry.wortis@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.				

<b>127217</b>	<b>Research Presentations</b>			
Subject:	Catalog Nbr:			
IMM	0289			
2016 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.				

<b>127238</b>	<b>Research Presentations</b>			
Subject:	Catalog Nbr:			
IMM	0290			
2016 SPRG	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.				

<b>127260</b>	<b>Graduate Seminar</b>			
Subject:	Catalog Nbr:			
IMM	0291			
2016 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.				

<b>127291</b>	<b>Graduate Seminar</b>			
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# Course Bulletin

Subject: IMM	Catalog Nbr: 0292	2016 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.					

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

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

<b>127347</b>	<b>Journal Club</b>		
Subject: IMM	Catalog Nbr: 0295		
2016 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.			

<b>127367</b>	<b>Journal Club</b>		
Subject: IMM	Catalog Nbr: 0296		
2016 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.			

<b>127391</b>	<b>Graduate Research</b>
Subject: IMM	Catalog Nbr: 0297
These courses provide guided research on a topic suitable for a doctoral thesis.	

<b>127403</b>	<b>Graduate Research</b>
Subject: IMM	Catalog Nbr: 0298

# Course Bulletin

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

<b>127430</b>	<b>Graduate Research</b>			
Subject:	Catalog Nbr:			
IMM	0299			
2016 SUMR	Primary	Brigitte Huber	brigitte.huber@tufts.edu	
2016 SUMR	Primary	Henry Wortis	henry.wortis@tufts.edu	
These courses provide guided research on a topic suitable for a doctoral thesis.				

<b>127436</b>	<b>Qualifying Exam</b>			
Subject:	Catalog Nbr:			
NRSC	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.				

<b>127448</b>	<b>Masters Degree Only</b>			
Subject:	Catalog Nbr:			
IMM	0402			

<b>127451</b>	<b>Cellular and Molecular Tutorials in Neuroscience</b>			
Subject:	Catalog Nbr:			
NRSC	0200			
2016 FALL	Primary	Christopher Dulla	Chris.Dulla@tufts.edu	
2016 FALL	Secondary	Michele Jacob	michele.jacob@tufts.edu	
2016 FALL	Secondary	F Jackson	rob.jackson@tufts.edu	
2016 FALL	Secondary	Daniel Cox	dan.cox@tufts.edu	
2016 FALL	Secondary	Paul Davies	Paul.Davies@tufts.edu	
2016 FALL	Secondary	Giuseppina Tesco	Giuseppina.Tesco@tufts.edu	
2016 FALL	Secondary	Gerard Reijmers	Leon.Reijmers@tufts.edu	
2016 FALL	Secondary	Jamie Maguire	Jamie.Maguire@tufts.edu	
2016 FALL	Secondary	Yongjie Yang	Yongjie.Yang@tufts.edu	
2016 FALL	Secondary	Dong Kong	Dong.Kong@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.				

<b>127475</b>	<b>PhD Degree Only</b>			
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# Course Bulletin

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.

<b>127491</b>	<b>PhD Degree Only</b>
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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.

<b>127512</b>	<b>Developmental Neurobiology</b>
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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.

<b>127521</b>	<b>PhD Degree Only</b>
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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.

<b>127621</b>	<b>Systems Neuroscience</b>
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Subject:      Catalog Nbr:  
NRSC          0310

2016 SPRG	Primary	Maribel Rios	Maribel.Rios@tufts.edu
2016 SPRG	Primary	Giuseppina Tesco	Giuseppina.Tesco@tufts.edu
2016 SPRG	Secondary	Daniel Jay	daniel.jay@tufts.edu
2016 SPRG	Secondary	Thomas Sabin	thomas.sabin@tufts.edu
2016 SPRG	Secondary	Bryan Ho	No Email on file.
2016 SPRG	Secondary	Beverly Rubin	beverly.rubin@tufts.edu
2016 SPRG	Secondary	Daniel Cox	dan.cox@tufts.edu
2016 SPRG	Secondary	Paul Abourjaily	Paul.Abourjaily@tufts.edu
2016 SPRG	Secondary	Lester Adelman	lester.adelman@tufts.edu
2016 SPRG	Secondary	Gerard Reijmers	Leon.Reijmers@tufts.edu

# Course Bulletin

2016 SPRG	Secondary	Yongjie Yang	Yongjie.Yang@tufts.edu
2016 SPRG	Secondary	Ron Riesenburger	No Email on file.
2016 SPRG	Secondary	Neel Madan	Neel.Madan@tufts.edu

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.

<b>127641</b>	<b>Synapse Neurobiology</b>			
Subject:	Catalog Nbr:			
NRSC	0213			
2016 FALL	Primary	Michele Jacob	michele.jacob@tufts.edu	
2016 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.				

<b>127741</b>	<b>Scientific Writing Principles</b>			
Subject:	Catalog Nbr:			
NRSC	0220			
2016 FALL	Primary	Paul Davies	Paul.Davies@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.				

<b>127752</b>	<b>Neuroscience Laboratory Techniques</b>			
Subject:	Catalog Nbr:			
NRSC	0233			
2015 FALL	Secondary	Lakshmanan Iyer	Lax.Iyer@tufts.edu	
2015 FALL	Secondary	Alenka Lovy	Alenka.Lovy@tufts.edu	
2016 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. Restricted to first-year Neuroscience students.				

<b>127776</b>	<b>Laboratory Rotation</b>			
Subject:	Catalog Nbr:			
NRSC	0234			
2016 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.				

# Course Bulletin

<b>127803</b>	<b>Laboratory Rotations</b>			
Subject:	Catalog Nbr:			
NRSC	0235			
2016 SPRG	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.				

<b>127822</b>	<b>Laboratory Rotation</b>			
Subject:	Catalog Nbr:			
NRSC	0236			
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.				

<b>127830</b>	<b>Biochemical Foundations in Neuroscience</b>			
Subject:	Catalog Nbr:			
NRSC	0251			
2016 FALL	Primary	Thomas Biederer	Thomas.Biederer@tufts.edu	
2016 FALL	Secondary	James Baleja	jim.baleja@tufts.edu	
2016 FALL	Secondary	Larry Feig	larry.feig@tufts.edu	
2016 FALL	Secondary	Laura Liscum	laura.liscum@tufts.edu	
2016 FALL	Secondary	Brian Schaffhausen	brian.schaffhausen@tufts.edu	
2016 FALL	Secondary	Michael Forgac	michael.forgac@tufts.edu	
2016 FALL	Secondary	Daniel Cox	dan.cox@tufts.edu	
2016 FALL	Secondary	Alex Bohm	Andrew.Bohm@tufts.edu	
2016 FALL	Secondary	Peter Juo	Peter.Juo@tufts.edu	
2016 FALL	Secondary	Stephen Moss	Stephen.Moss@tufts.edu	
2016 FALL	Secondary	Paul Davies	Paul.Davies@tufts.edu	
2016 FALL	Secondary	Gerard Reijmers	Leon.Reijmers@tufts.edu	
2016 FALL	Secondary	Yongjie Yang	Yongjie.Yang@tufts.edu	
2016 FALL	Secondary	James Munro	James.Munro@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.				

<b>127868</b>	<b>Neurogenetics</b>			
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.				

# Course Bulletin

<b>127898</b>	<b>Research Presentations</b>			
Subject:	Catalog Nbr:			
NRSC	0289			
2016 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.				

<b>127942</b>	<b>Research Presentations</b>			
Subject:	Catalog Nbr:			
NRSC	0290			
2016 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.				

<b>127981</b>	<b>Graduate Seminar</b>			
Subject:	Catalog Nbr:			
NRSC	0291			
2016 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.				

<b>128024</b>	<b>Graduate Seminar</b>			
Subject:	Catalog Nbr:			
NRSC	0292			
2016 SPRG	Primary	Michele Jacob		michele.jacob@tufts.edu
2016 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.				

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

<b>128101</b>	<b>Special Topics</b>			
Subject:	Catalog Nbr:			



# Course Bulletin

NRSC 0294

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

<b>128157</b>	<b>Journal Club</b>			
Subject:	Catalog Nbr:			
NRSC	0295			
2016 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.				

<b>128193</b>	<b>Journal Club</b>			
Subject:	Catalog Nbr:			
NRSC	0296			
2016 SPRG	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.				

<b>128216</b>	<b>Graduate Research</b>			
Subject:	Catalog Nbr:			
NRSC	0297			
These courses provide guided research on a topic suitable for a doctoral thesis.				

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

<b>128248</b>	<b>Graduate Research</b>			
Subject:	Catalog Nbr:			
NRSC	0299			
2016 SUMR	Primary	F Jackson	rob.jackson@tufts.edu	
These courses provide guided research on a topic suitable for a doctoral thesis.				

<b>128272</b>	<b>Masters Degree Only</b>			
Subject:	Catalog Nbr:			
NRSC	0402			

# Course Bulletin

<b>128290</b>	<b>PhD Degree Only</b>
Subject: NRSC	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 awarded upon completion of the thesis.	

<b>128311</b>	<b>PhD Degree Only</b>
Subject: NRSC	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 awarded upon completion of the thesis.	

<b>128330</b>	<b>PhD Degree Only</b>
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.	

<b>128378</b>	<b>Biochemical Foundations in Neuroscience Receptor/Channel Mechanisms</b>			
Subject: NRSC	Catalog Nbr: 251B			
2016 FALL	Primary	Thomas Biederer	Thomas.Biederer@tufts.edu	
2016 FALL	Secondary	Larry Feig	larry.feig@tufts.edu	
2016 FALL	Secondary	Daniel Cox	dan.cox@tufts.edu	
2016 FALL	Secondary	Peter Juo	Peter.Juo@tufts.edu	
2016 FALL	Secondary	Stephen Moss	Stephen.Moss@tufts.edu	
2016 FALL	Secondary	Paul Davies	Paul.Davies@tufts.edu	
2016 FALL	Secondary	Gerard Reijmers	Leon.Reijmers@tufts.edu	
2016 FALL	Secondary	Yongjie Yang	Yongjie.Yang@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.				

<b>130459</b>	<b>Clinical Implications of Basic Research</b>
Subject: SKMD	Catalog Nbr: 0210

# Course Bulletin

2016 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: Catalog Nbr:  
SK 0202

2016 SUMR

Primary

James Baleja

jim.baleja@tufts.edu

2016 SUMR

Primary

Alex Bohm

Andrew.Bohm@tufts.edu

This course covers the basic theory and practice of Macromolecular Crystallography and NMR

**136175****Tissue Engineering**

Subject: Catalog Nbr:  
SK 0203

This course covers Stem Cell Biology and Tissue Scaffolds, the Principles of Bioreactor Design and Integrative Approaches to Tissue Engineering.

**136203****Imaging Techniques**

Subject: Catalog Nbr:  
SK 0204

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.

**136219****Mentored Undergrad Teaching**

Subject: Catalog Nbr:  
SK 0205

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.

**136275****Applied Ethics for Scientists**

Subject: Catalog Nbr:

# Course Bulletin

SK	0275				
	2016 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>					

<b>136292</b>	<b>Biomedical Techniques &amp; Research</b>				
	Subject:	Catalog Nbr:			
	SK	0299			
	2016 FALL	Primary	Caroline Genco		Caroline.Genco@tufts.edu
	2016 SUMR	Primary	Maria Alcaide Alonso		Pilar.Alcaide@tufts.edu
<p>This course includes research with selected advisor. Visiting Students Only.</p>					

<b>136304</b>	<b>Clinical Implications of Basic Research</b>				
	Subject:	Catalog Nbr:			
	SKMD	0209			
	2016 FALL	Primary	James Schwob		jim.schwob@tufts.edu
<p>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) and discuss the work. The primary goal of this required course, 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.</p>					

<b>136336</b>	<b>Laboratory Rotations</b>				
	Subject:	Catalog Nbr:			
	SKMD	0299			
	2016 SUMR	Primary	Naomi Rosenberg		naomi.rosenberg@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. Fall, Spring, Summer.</p>					

<b>137576</b>	<b>Qualifying Exam</b>				
	Subject:	Catalog Nbr:			
	PPET	0000			
	2016 SPRG	Primary	Emmanuel Pothos		emmanuel.pothos@tufts.edu
<p>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.</p>					

# Course Bulletin

<b>137616</b>		<b>Translational Pharmacology I</b>			
Subject:	Catalog Nbr:				
PPET	0211				
	2015 FALL	Primary	Margery Beinfeld	margery.beinfeld@tufts.edu	
	2015 FALL	Secondary	Theoharis Theoharides	theoharis.theoharides@tufts.edu	
	2016 FALL	Primary	Najla Fiaturi	Najla.Fiaturi@tufts.edu	
	2016 FALL	Primary	Martin Beinborn	martin.beinborn@tufts.edu	
	2016 FALL	Secondary	David Greenblatt	dj.greenblatt@tufts.edu	
	2016 FALL	Secondary	Richard Shader	richard.shader@tufts.edu	
	2016 FALL	Secondary	Michael Forgac	michael.forgac@tufts.edu	
	2016 FALL	Secondary	Jerold Harmatz	jerold.harmatz@tufts.edu	
	2016 FALL	Secondary	Karina Meiri	karina.meiri@tufts.edu	
	2016 FALL	Secondary	Emmanuel Pothos	emmanuel.pothos@tufts.edu	
	2016 FALL	Secondary	Alexei Degterev	Alexei.Degterev@tufts.edu	
<p>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.</p>					

<b>137629</b>		<b>Clinical Pharmacology</b>			
Subject:	Catalog Nbr:				
PPET	0212				
<p>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.</p>					

<b>137645</b>		<b>Addiction Medicine</b>			
Subject:	Catalog Nbr:				
PPET	0213				
	2016 SPRG	Primary	Emmanuel Pothos	emmanuel.pothos@tufts.edu	
<p>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.</p>					

<b>137683</b>		<b>Principles of Immunopharmacology</b>			
Subject:	Catalog Nbr:				
PPET	0218				
	2016 FALL	Primary	Theoharis Theoharides	theoharis.theoharides@tufts.edu	

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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.

<b>137698</b>	<b>Behavioral Pharmacology</b>
Subject: PPET	Catalog Nbr: 0219
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.	

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

<b>137724</b>	<b>Pharmokinetics in Biological Systems</b>		
Subject: PPET	Catalog Nbr: 0221		
2016 FALL	Primary	David Greenblatt	dj.greenblatt@tufts.edu
2016 FALL	Secondary	Karthik Venkatakrisnan	No Email on file.
2016 FALL	Secondary	Jerold Harmatz	jerold.harmatz@tufts.edu
This course focuses on the uptake and clearance of drugs, using problem-solving exercises and computer modeling to analyze data from original experiments			

<b>137735</b>	<b>Toxicology</b>
Subject: PPET	Catalog Nbr: 0222
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.	

<b>137756</b>	<b>Neuropeptides</b>
Subject: PPET	Catalog Nbr: 0224
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	

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clinical uses of neuropeptides.

<b>137777</b>	<b>Introduction to Drug Metabolism</b>			
Subject:	Catalog Nbr:			
PPET	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.				

<b>137850</b>	<b>Translational Pharmacology II</b>			
Subject:	Catalog Nbr:			
PPET	0232			
2016 SPRG	Primary	Margery Beinfeld	margery.beinfeld@tufts.edu	
2016 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.				

<b>137860</b>	<b>Scientific Writing and Presentation Skills</b>			
Subject:	Catalog Nbr:			
PPET	0233			
2016 FALL	Primary	Jeanne Fahey	jeanne.fahey@tufts.edu	
2016 FALL	Secondary	David Greenblatt	dj.greenblatt@tufts.edu	
2016 FALL	Secondary	Richard Shader	richard.shader@tufts.edu	
2016 FALL	Secondary	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.				

<b>137871</b>	<b>Laboratory Rotations</b>			
Subject:	Catalog Nbr:			
PPET	0234			
2016 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.				

<b>137881</b>	<b>Laboratory Rotations</b>			
Subject:	Catalog Nbr:			
PPET	0235			
2016 SPRG	Primary	Emmanuel Pothos	emmanuel.pothos@tufts.edu	

# Course Bulletin

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.

<b>137889</b>	<b>Laboratory Rotations</b>
Subject: PPET	Catalog Nbr: 0236
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.	

<b>137918</b>	<b>Graduate Seminar</b>
Subject: PPET	Catalog Nbr: 0291
2015 FALL	Primary David Greenblatt dj.greenblatt@tufts.edu
2016 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.	

<b>137928</b>	<b>Graduate Seminar</b>
Subject: PPET	Catalog Nbr: 0292
2016 SPRG	Primary David Greenblatt dj.greenblatt@tufts.edu
2016 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.	

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

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

<b>137978</b>	<b>Journal Club</b>
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Subject:	Catalog Nbr:			
PPET	0295			
2015 FALL	Primary	Margery Beinfeld		margery.beinfeld@tufts.edu
2015 FALL	Primary	Emmanuel Pothos		emmanuel.pothos@tufts.edu
2016 FALL	Primary	Najla Fiaturi		Najla.Fiaturi@tufts.edu
2016 FALL	Secondary	Jerold Harmatz		jerold.harmatz@tufts.edu
Students select articles from the current literature, analyze their significance, and present them for discussion in a seminar group.				

<b>137989</b>	<b>Journal Club</b>			
Subject:	Catalog Nbr:			
PPET	0296			
2016 SPRG	Primary	Margery Beinfeld		margery.beinfeld@tufts.edu
2016 SPRG	Secondary	Jerold Harmatz		jerold.harmatz@tufts.edu
2016 SPRG	Secondary	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.				

<b>138000</b>	<b>Graduate Research</b>			
Subject:	Catalog Nbr:			
PPET	0297			
2016 FALL	Primary	Emmanuel Pothos		emmanuel.pothos@tufts.edu
These courses provide guided research on a topic suitable for a doctoral thesis.				

<b>138007</b>	<b>Graduate Research</b>			
Subject:	Catalog Nbr:			
PPET	0298			
2016 SPRG	Primary	Emmanuel Pothos		emmanuel.pothos@tufts.edu
These courses provide guided research on a topic suitable for a doctoral thesis.				

<b>138017</b>	<b>Graduate Research</b>			
Subject:	Catalog Nbr:			
PPET	0299			
2016 SUMR	Primary	Emmanuel Pothos		emmanuel.pothos@tufts.edu
These courses provide guided research on a topic suitable for a doctoral thesis.				

<b>138026</b>	<b>Masters Degree Only</b>			
Subject:	Catalog Nbr:			
PPET	0402			

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<b>138033</b>	<b>PhD Degree Only</b>
Subject: PPET	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 awarded upon completion of the thesis.	

<b>138043</b>	<b>PhD Degree Only</b>
Subject: PPET	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 awarded upon completion of the thesis.	

<b>138052</b>	<b>PhD Degree Only</b>
Subject: PPET	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.	

<b>138644</b>	<b>Transfer Credit</b>
Subject: TRAN	Catalog Nbr: 9999

<b>138674</b>	<b>Micro Gene &amp; Microbio II</b>			
Subject: MMB	Catalog Nbr: 0242			
2016 SPRG	Primary	Andrew Camilli	andrew.camilli@tufts.edu	
2016 SPRG	Secondary	Michael Malamy	michael.malamy@tufts.edu	
2016 SPRG	Secondary	Carol Kumamoto	carol.kumamoto@tufts.edu	
2016 SPRG	Secondary	Ekaterina Heldwein	Katya.Heldwein@tufts.edu	
2016 SPRG	Secondary	Honorine Ward	honorine.ward@tufts.edu	
2016 SPRG	Secondary	Athar Chishti	Athar.Chishti@tufts.edu	
2016 SPRG	Secondary	Wai-Leung Ng	Wai-Leung.Ng@tufts.edu	

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<b>138797</b>	<b>Tutorial in Neural Systems and Disease Mechanisms</b>			
Subject: NRSC	Catalog Nbr: 0312			
2016 SPRG	Primary	Maribel Rios	Maribel.Rios@tufts.edu	
2016 SPRG	Primary	Giuseppina Tesco	Giuseppina.Tesco@tufts.edu	
2016 SPRG	Secondary	Larry Feig	larry.feig@tufts.edu	
2016 SPRG	Secondary	Michele Jacob	michele.jacob@tufts.edu	
2016 SPRG	Secondary	F Jackson	rob.jackson@tufts.edu	
2016 SPRG	Secondary	Klaus Miczek	klaus.miczek@tufts.edu	
2016 SPRG	Secondary	Gerard Reijmers	Leon.Reijmers@tufts.edu	
2016 SPRG	Secondary	Jamie Maguire	Jamie.Maguire@tufts.edu	
2016 SPRG	Secondary	Christopher Dulla	Chris.Dulla@tufts.edu	
2016 SPRG	Secondary	Yongjie Yang	Yongjie.Yang@tufts.edu	
2016 SPRG	Secondary	Alain Charest	Alain.Charest@tufts.edu	
2016 SPRG	Secondary	Dong Kong	Dong.Kong@tufts.edu	
<p>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.</p>				

<b>139088</b>	<b>Advanced Cellular Immunology</b>			
Subject: IMM	Catalog Nbr: 0245			
2016 FALL	Primary	Brigitte Huber	brigitte.huber@tufts.edu	
<p>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.</p>				

<b>139091</b>	<b>System Approaches to Immunology</b>			
Subject: IMM	Catalog Nbr: 0252			
2016 SPRG	Primary	Alexander Poltorak	Alexander.Poltorak@tufts.edu	
<p>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.</p>				

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<b>139092</b>	<b>Immunochemistry- Signaling and Dynamics</b>			
Subject: IMM	Catalog Nbr: 0250			
2016 SPRG	Primary	Stephen Bunnell	Stephen.Bunnell@tufts.edu	
2016 SPRG	Secondary	Marta Gaglia	Marta.Gaglia@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.				

<b>139171</b>	<b>Laboratory Research Experience</b>			
Subject: PPET	Catalog Nbr: 0134			
2016 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.				

<b>139172</b>	<b>Laboratory Research Experience</b>			
Subject: PPET	Catalog Nbr: 0135			
2016 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.				

<b>139204</b>	<b>Teaching Infectious Diseases</b>			
Subject: SK	Catalog Nbr: 0115			
2016 SUMR	Primary	Berri Jacque	Berri.Jacque@tufts.edu	
2016 SUMR	Primary	Desislava Raytcheva	No Email on file.	
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.				

<b>139290</b>	<b>Rotation</b>			
Subject: SK	Catalog Nbr: 0236			
2015 SUMR	Primary	Peter Juo	Peter.Juo@tufts.edu	
2016 SUMR	Primary	Pedram Hamrah	No Email on file.	

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<b>139373</b>	<b>Applying Quality Improvement Methods in Healthcare and Public Health</b>
Subject: CTS 2016 SPRG	Catalog Nbr: 0231 Primary Denise Daudelin No Email on file.
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.	

<b>139453</b>	<b>Special Topics</b>
Subject: CMDB	Catalog Nbr: 0293
In-depth information is provided on selected topics. Students may also pursue guided individual study of an approved topic. Fall and Spring.	

<b>139454</b>	<b>Special Topics</b>
Subject: CMDB	Catalog Nbr: 0294

<b>139463</b>	<b>Macromolecular Structural Determination</b>
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.	

<b>139466</b>	<b>Post-placement Rotation</b>
Subject: SK	Catalog Nbr: 0234

<b>139467</b>	<b>Post-placement Rotation</b>
Subject: SK	Catalog Nbr: 0235
Subject: SK	Catalog Nbr: 0235

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<b>139826</b>	<b>Advanced Scientific Ethics</b>			
Subject:	Catalog Nbr:			
SK	0375			
2016 FALL	Primary	Daniel Jay		daniel.jay@tufts.edu
<p>This is an NIH-mandated refresher course for responsible conduct of research (RCR) for 5th year students. It builds on SK 0275, Scientific Ethics; 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. The class provides opportunities for team building, writing, ethical analysis and teaching; grading will be based on the quality of case study and analysis, teaching, effort and participation.</p>				

<b>140064</b>	<b>Advanced Topics in Biostatistics</b>			
Subject:	Catalog Nbr:			
CTS	0533			
2016 FALL	Primary	Norma Terrin		norma.terrin@tufts.edu
2016 FALL	Primary	Farzad Noubary		Farzad.Noubary@tufts.edu
<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.</p>				

<b>140127</b>	<b>Advanced Epidemiology &amp; Regression Methods: An Integrated Approach</b>			
Subject:	Catalog Nbr:			
CTS	0575			
2016 SPRG	Primary	Jessica Paulus		Jessica.Paulus@tufts.edu
2016 SPRG	Primary	Farzad Noubary		Farzad.Noubary@tufts.edu
<p>This course serves as an introduction to more advanced topics in epidemiologic study design and biostatistical modeling with a focus on multivariate regression methods. It begins with the randomized clinical trial as a paradigm, and proceed to examine observational designs in depth, including prospective and retrospective cohorts, and those sampling from an underlying cohort (i.e. case-control). Design, sampling and analysis strategies and the biases that are specific to each study design will be discussed.</p>				

<b>140320</b>	<b>Design and Analysis of Bioequivalence Studies</b>			
Subject:	Catalog Nbr:			
PPET	0281			
2016 SPRG	Primary	Emmanuel Pothos		emmanuel.pothos@tufts.edu
<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</p>				

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students in the design and data analysis of bioequivalence studies.

<b>140762</b>	<b>Basic Skills for Scientists I</b>
Subject: SK	Catalog Nbr: 0101
This three-module course is designed to give trainees basic skills in oral and written presentation, in approaches to the reading of the scientific literature, and designing experiments and interpreting quantitative data.	

<b>140763</b>	<b>Basic Skills for Scientists II</b>
Subject: SK	Catalog Nbr: 0102
This three module course is designed to give trainees basic skills in in presenting data and in writing grant applications.	

<b>141543</b>	<b>Translational Medicine - Drug Discovery to Clinical Development</b>
Subject: PPET	Catalog Nbr: 0205
2016 FALL	Primary Emmanuel Pothos emmanuel.pothos@tufts.edu
2016 FALL	Primary Chandrasekhar Natarajan Chandrasekhar.Natarajan@tufts.edu
This comprehensive course covers key processes from drug discovery to development, including the progression and translation of scientific information through different development stages and the transition to clinical studies, to increase the probability of creating a successful therapeutic product The goal is to impart sufficient background to provide an overall understanding of Translational Medicine that is integral to scientific rationale in Drug Research and Development.	

<b>141547</b>	<b>Mouse Transgenic Model</b>
Subject: CMDB	Catalog Nbr: 0350
This course is designed to give an overview of using the mouse to develop transgenic models of gene expression and gene targeting. In the first half of this course, students will discuss basic transgenic and gene targeting construct design, methods to generate transgenic mice by microinjection methods, and conditional and inducible systems. In the second half of the course, the focus will be on genome editing techniques such as CRISPR/Cas9, zinc finger nucleases, and TALENs, as well as their applications.	

<b>141552</b>	<b>Introduction to Infectious and Inflammatory Diseases</b>
Subject: IMM	Catalog Nbr: 0223
2016 SUMR	Primary Miguel Stadecker miguel.stadecker@tufts.edu

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2016 SUMR	Primary	Ralph Isberg	ralph.isberg@tufts.edu
2016 SUMR	Primary	Andrew Plaut	andrew.plaut@tufts.edu
2016 SUMR	Primary	Linden Hu	linden.hu@tufts.edu

This course is comprised of three integrated components; 1) a Medical Microbiology and Inflammation/Immunology Tutorial designed to introduce students to pathogens and pathophysiology of infectious and inflammatory diseases, 2) Infectious and Inflammatory Diseases Problem-Based Learning designed to introduce students to clinical cases, and 3) Teaching Clinics designed to expose students to real clinical cases and treatment options.

<b>141613</b>	<b>Survey of Clinical Care Research</b>		
Subject:	CTS	Catalog Nbr:	0125
<p>This course offers an introduction to contemporary topics and instruments in clinical care research, with a focus on the role of outcomes research, health economics, systematic reviews and clinical decision making in clinical and translational science. Foundational concepts in clinical trial design (pragmatic and explanatory), meta-analysis and systematic review, health services research, bench-to-bedside translational research, decision analysis, pharmaco-economics and prediction models are surveyed by program faculty. This course also reinforces and applies core concepts in biostatistics and epidemiology by illustrating how study designs and statistical approaches may be applied in the context of these designs and analytic approaches, as well as highlighting pitfalls to certain applications.</p>			

<b>141614</b>	<b>Principles of Biostatistics for Clinical Research</b>		
Subject:	CTS	Catalog Nbr:	0127
<p>This course introduces the basic principles and applications of statistics, as they are applied to problems in clinical research. The emphasis is on developing an understanding of the assumptions, limitations, practical considerations and critical thinking in the use of statistical methods in data arising from continuous, binary, and time-to-event data. This course will also introduce biostatistical modeling with a focus on multivariate regression methods. Through webinars, the course will include data exercises and class discussion of articles from the scientific literature that apply methods covered in lectures.</p>			

<b>141615</b>	<b>Elements of Epidemiology for Clinical Research</b>		
Subject:	CTS	Catalog Nbr:	0123
<p>This course serves as an introduction to topics in epidemiologic study design and analysis, with a focus on those relevant to clinical epidemiology and comparative effectiveness research. After examining the randomized clinical trial as a paradigm, the course proceeds to review the major observational designs, including ecologic, cross-sectional, cohort, and case-control studies. For each study design, relevant sampling and analytical strategies, measures of association and the attendant biases will be covered. Principles and methods will be illustrated through several interactive webinars that include discussion of articles from the literature, data analytic exercises, and causal diagrams.</p>			



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