Course Bulletin

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

100015	Graduate Research
Subject: CMDB	Catalog Nbr: 0299
2017 SUMR Primary Ira Herman ira.herman@tufts.edu	
These courses provide guided research on a topic suitable for a doctoral thesis.	

100025	Masters Degree Only
Subject: CMDB	Catalog Nbr: 0402

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

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

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

102889	Membranes & Trafficking

Course Bulletin

Subject:	Catalog Nbr:			
ISP	209A			
2016 FALL		Secondary	Laura Liscum	laura.liscum@tufts.edu
2017 FALL		Primary	Michael Forgac	michael.forgac@tufts.edu
2017 FALL		Secondary	Garabed Sahagian	gary.sahagian@tufts.edu
2017 FALL		Secondary	John Castellot	john.castellot@tufts.edu
2017 FALL		Secondary	Daniel Cox	dan.cox@tufts.edu
2017 FALL		Secondary	Ralph Isberg	ralph.isberg@tufts.edu
2017 FALL		Secondary	Peter Juo	Peter.Juo@tufts.edu
2017 FALL		Secondary	Gerard Reijmers	Leon.Reijmers@tufts.edu
2017 FALL		Secondary	Jamie Maguire	Jamie.Maguire@tufts.edu
2017 FALL		Secondary	Christopher Dulla	Chris.Dulla@tufts.edu
2017 FALL		Secondary	Alan Kopin	alan.kopin@tufts.edu
2017 FALL		Secondary	Karl Munger	Karl.Munger@tufts.edu
2017 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 biogenesis.

102982	**Cell & Molecular Genetics**		
Subject:	Catalog Nbr:		
ISP	210A		
2018 SPRG	Primary	Brent Cochran	brent.cochran@tufts.edu
2018 SPRG	Secondary	John Castellot	john.castellot@tufts.edu
2018 SPRG	Secondary	Michael Forgac	michael.forgac@tufts.edu
2018 SPRG	Secondary	Victor Hatini	Victor.Hatini@tufts.edu
2018 SPRG	Secondary	Peter Juo	Peter.Juo@tufts.edu
2018 SPRG	Secondary	Pamela Yelick	Pamela.Yelick@tufts.edu
2018 SPRG	Secondary	Gordon Huggins	Gordon.Huggins@tufts.edu
2018 SPRG	Secondary	Lucy Liaw	No Email on file.

This course covers molecular genetics and basic concepts in developmental biology.

103003	**Molecular Cell Biology of Development**		
Subject:	Catalog Nbr:		
ISP	210B		
2018 SPRG	Primary	John Castellot	john.castellot@tufts.edu
2018 SPRG	Secondary	Michael Forgac	michael.forgac@tufts.edu
2018 SPRG	Secondary	James Schwob	jim.schwob@tufts.edu
2018 SPRG	Secondary	Victor Hatini	Victor.Hatini@tufts.edu
2018 SPRG	Secondary	Charlotte Kuperwasser	Charlotte.Kuperwasser@tufts.edu
2018 SPRG	Secondary	Li Zeng	Li.Zeng@tufts.edu
2018 SPRG	Secondary	Peter Juo	Peter.Juo@tufts.edu

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	2018 SPRG	Secondary	Heber Nielsen	heber.nielsen@tufts.edu
	2018 SPRG	Secondary	Gordon Huggins	Gordon.Huggins@tufts.edu

This course introduces students to the basic cellular and molecular mechanisms involved in gametogenesis, fertilization, early embryonic development, pattern formation, and organogenesis. The course emphasizes how human disease often recapitulates development.

104392	**Qualifying Exam**
Subject:	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.

104467	**PhD Degree Only**
Subject:	Catalog Nbr:
CTS	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.

104503	**Study Design Seminar**
Subject:	Catalog Nbr:
CTS	0500

2018 SPRG	Primary	David Kent	No Email on file.
2018 SPRG	Primary	Karen Freund	Karen.Freund@tufts.edu

These seminars use proposed and ongoing research projects to explore issues in study design. The course provides investigators and trainees the opportunity to present a research-related problem they are encountering and engages students in a discussion of the approach to the problem and an appropriate plan of action.

104524	**Translational & Molecular Epidemiology**
Subject:	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.

104542	**Bridging the Bench-To-Bedside Gap**
Subject:	Catalog Nbr:
CTS	0502

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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.

104602	Introduction to Biostatistical Methods I

Subject:	Catalog Nbr:			
CTS	0506			
	2017 SUMR	Primary	Sarah Pagni	Sarah.Pagni@tufts.edu

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.

104617	Introduction To Biostatistics II

Subject:	Catalog Nbr:			
CTS	0507			
	2017 FALL	Primary	Sarah Pagni	Sarah.Pagni@tufts.edu

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.

104658	Predictive Models

Subject:	Catalog Nbr:			
CTS	0510			
	2016 FALL	Secondary	Anselm Blumer	ablumer@cs.tufts.edu
	2017 FALL	Primary	David Kent	No Email on file.
	2017 FALL	Primary	Robin Ruthazer	No Email on file.

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.

104676	Machine Learning in Predictive Medicine

Subject:	Catalog Nbr:
CTS	0511

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

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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.

104693	**Comparative Effectiveness Research Survey**
Subject: CTS	Catalog Nbr: 0512
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.	

104708	**Clinical Research Project-Certificate Candidates**			
Subject: CTS	Catalog Nbr: 0514			
	2018 SPRG	Primary	David Kent	No Email on file.
	2018 SPRG	Primary	Jessica Paulus	Jessica.Paulus@tufts.edu
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.				

104768	**Clinical Research Project/Thesis Research- First Year**
Subject: CTS	Catalog Nbr: 0515
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.	

104826	**Clinical Research Project/Thesis Research- Second Year**			
Subject: CTS	Catalog Nbr: 0516			
	2017 SUMR	Primary	David Kent	No Email on file.
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.				

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104881	Clinical Research Project/Thesis Research- PhD Candidates			
Subject:	Catalog Nbr:			
CTS	0517			
2017 SUMR		Primary	David Kent	No Email on file.
PhD students 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.				

104898	Advanced Thesis Research			
Subject:	Catalog Nbr:			
CTS	0518			
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.				

104915	Concentration Practicum			
Subject:	Catalog Nbr:			
CTS	0519			
2016 FALL		Primary	John Wong	john_b.wong@tufts.edu
2017 FALL		Primary	Jessica Paulus	Jessica.Paulus@tufts.edu
2017 FALL		Primary	Peter Lindenauer	No Email on file.
2018 SPRG		Primary	Karen Freund	Karen.Freund@tufts.edu
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.				

104952	Introduction to Clinical Epidemiology			
Subject:	Catalog Nbr:			
CTS	0523			
2016 FALL		Secondary	Radley Sheldrick	Radley.Sheldrick@tufts.edu
2017 FALL		Primary	Jessica Paulus	Jessica.Paulus@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.				

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104969	Introduction to Clinical Care Research			
Subject:	Catalog Nbr:			
CTS	0525			
2017 SUMR		Primary	David Kent	No Email on file.
2017 SUMR		Secondary	David Snydman	david.snydman@tufts.edu
2017 SUMR		Secondary	Lori Price	No Email on file.
2017 SUMR		Secondary	Karen Freund	Karen.Freund@tufts.edu
2017 SUMR		Secondary	Robin Ruthazer	No Email on file.
2017 SUMR		Secondary	Thomas Concannon	No Email on file.
2017 SUMR		Secondary	Mihaela Stefan	Mihaela.Stefan@tufts.edu
2017 SUMR		Secondary	John Wong	john_b.wong@tufts.edu
2017 SUMR		Secondary	Raveedhara Bannuru	Raveendhara.Bannuru@tufts.edu
2017 SUMR		Secondary	Robert Goldberg	Robert.Goldberg@umassmed.edu
2017 SUMR		Secondary	Gordon Huggins	Gordon.Huggins@tufts.edu
2017 SUMR		Secondary	Farzad Noubary	Farzad.Noubary@tufts.edu
2017 SUMR		Secondary	Denise Daudelin	Denise.Daudelin@tufts.edu
2017 SUMR		Secondary	Andreas Klein	Andreas.Klein@tufts.edu
2017 SUMR		Secondary	James Chambers	James.Chambers@tufts.edu
2017 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			
2017 FALL		Primary	Angie Rodday	Angie.Rodday@tufts.edu
2017 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.

105046	Scientific Manuscript Writing			
Subject:	Catalog Nbr:			
CTS	0537			
2016 FALL		Secondary	Raveedhara Bannuru	Raveendhara.Bannuru@tufts.edu
2018 SPRG		Primary	David Kent	No Email on file.
2018 SPRG		Primary	Jessica Paulus	Jessica.Paulus@tufts.edu
2018 SPRG		Primary	Robert Goldberg	Robert.Goldberg@umassmed.edu

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This course focuses on principles of scientific manuscript writing. The student learns how to develop a manuscript by reviewing the specific issues of style, authorship and volume of information that should be incorporated into a research paper.

105065	Scientific Grant Writing

Subject:	Catalog Nbr:			
CTS	0538			
	2018 SPRG	Primary	David Kent	No Email on file.
	2018 SPRG	Primary	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.

105102	Scientific Writing, Peer Review & Presentations

Subject:	Catalog Nbr:			
CTS	0539			
	2018 SPRG	Primary	David Kent	No Email on file.
	2018 SPRG	Primary	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.

105120	Ethics Of Clinical Investigation

Subject:	Catalog Nbr:			
CTS	0540			
	2018 SPRG	Primary	Susan Parsons	Susan.Parsons@tufts.edu
	2018 SPRG	Secondary	Angie Rodday	Angie.Rodday@tufts.edu
	2018 SPRG	Secondary	Elizabeth Schoenfeld	Elizabeth.Schoenfeld@tufts.edu

The goal of this course is to increase awareness of research ethics and their practical applications by medical practitioners and researchers – specifically with regard to clinical investigations. The curriculum addresses the interrelationships between ethics, law and professional practice standards and explores the role and workings of Institutional Review Boards.

105158	Principles Of Drug Development

Subject:	Catalog Nbr:			
CTS	0555			
	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

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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

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.

105251 **Introduction To Clinical Trials**

Subject: CTS Catalog Nbr: 0561

2017 FALL	Primary	Anastassios Pittas	anastassios.pittas@tufts.edu
2017 FALL	Secondary	Paul Fuss	No Email on file.
2017 FALL	Secondary	Ellen Vickery	No Email on file.
2017 FALL	Secondary	Patricia Sheehan	No Email on file.

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.

105271 **Topics In Clinical Trials**

Subject: CTS Catalog Nbr: 0562

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.

105306 **Introduction to Health Services Research**

Subject: CTS Catalog Nbr: 0566

2018 SPRG	Primary	Karen Freund	Karen.Freund@tufts.edu
2018 SPRG	Secondary	Amy Almerico-LeClair	Amy.LeClair@tufts.edu

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.

105457 **Introduction to Evidence Based-Medicine**

Subject: CTS Catalog Nbr: 0581

2018 SPRG	Primary	Norma Terrin	norma.terrin@tufts.edu

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	2018 SPRG	Primary	Raveedhara Bannuru	Raveendhara.Bannuru@tufts.edu
	2018 SPRG	Primary	James Chambers	James.Chambers@tufts.edu

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.

105474	**Genetic Epidemiology**
Subject:	Catalog Nbr:
CTS	0582

This course is an introduction to the concepts and methodology of genetic epidemiology, including novel methods of molecular biology, quantitative genetics, study design for genetic traits, segregation analysis and linkage analysis.

105491	**Introduction to Decision Analysis**
Subject:	Catalog Nbr:
CTS	0584

2018 SPRG	Primary	John Wong	john_b.wong@tufts.edu

This course is a working overview of the principles of decision analysis as applied to medicine, making optimal choices in the face of uncertainty. Formal decision analysis has become a well-recognized and accepted research discipline for examining clinical options facing patients, physicians and policymakers.

105533	**Special Topics in Clinical and Translational Science**
Subject:	Catalog Nbr:
CTS	0593

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

105554	**Special Topics in Clinical and Translational Science**
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}

108388	**Graduate Biochemistry**
Subject:	Catalog Nbr:
BCHM	0223

2016 FALL	Secondary	Laura Liscum	laura.liscum@tufts.edu
2017 FALL	Primary	Alex Bohm	Andrew.Bohm@tufts.edu
2017 FALL	Secondary	James Baleja	jim.baleja@tufts.edu

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2017 FALL	Secondary	Kurtz Paulson	eric.paulson@tufts.edu
2017 FALL	Secondary	Peter Bullock	peter.bullock@tufts.edu
2017 FALL	Secondary	Brian Schaffhausen	brian.schaffhausen@tufts.edu
2017 FALL	Secondary	William Bachovchin	william.bachovchin@tufts.edu
2017 FALL	Secondary	Michael Forgac	michael.forgac@tufts.edu
2017 FALL	Secondary	Albert Tai	albert.tai@tufts.edu
2017 FALL	Secondary	Alexei Degterev	Alexei.Degterev@tufts.edu
2017 FALL	Secondary	Marta Gaglia	Marta.Gaglia@tufts.edu
2017 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.

108410	**Advanced Graduate Biochemistry**

Subject: BCHM Catalog Nbr: 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.

108532	**Biochemistry of Gene Expression & Signal Transduction**

Subject: BCHM Catalog Nbr: 0230

2017 SPRG	Secondary	Claire Moore	claire.moore@tufts.edu
2018 SPRG	Primary	Amy Yee	amy.yee@tufts.edu
2018 SPRG	Secondary	Kurtz Paulson	eric.paulson@tufts.edu
2018 SPRG	Secondary	Larry Feig	larry.feig@tufts.edu
2018 SPRG	Secondary	Brian Schaffhausen	brian.schaffhausen@tufts.edu
2018 SPRG	Secondary	Brent Cochran	brent.cochran@tufts.edu
2018 SPRG	Secondary	Marta Gaglia	Marta.Gaglia@tufts.edu
2018 SPRG	Secondary	Karl Munger	Karl.Munger@tufts.edu
2018 SPRG	Secondary	Christine Duarte	Chrsitine.Duate@tufts.edu

This course covers the molecular mechanisms of gene expression and signal transduction. The fundamental mechanisms underlying transcription, RNA processing, translation, and DNA replication are highlighted, and the integration of these fundamental mechanisms into molecular and cellular regulation of proliferation and signal transduction is discussed. Current literature is emphasized.

108657	**Graduate Seminar**

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Subject:	Catalog Nbr:			
BCHM	0291			
	2017 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.

108697	**Graduate Seminar**			
Subject:	Catalog Nbr:			
BCHM	0292			
	2018 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.

108770	**Journal Club**			
Subject:	Catalog Nbr:			
BCHM	0295			
	2017 FALL	Primary	Ira Herman	ira.herman@tufts.edu
	2017 FALL	Primary	Heber Nielsen	heber.nielsen@tufts.edu
	2017 FALL	Primary	Gordon Huggins	Gordon.Huggins@tufts.edu

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

108787	**Journal Club**			
Subject:	Catalog Nbr:			
BCHM	0296			
	2018 SPRG	Primary	Ira Herman	ira.herman@tufts.edu
	2018 SPRG	Primary	Heber Nielsen	heber.nielsen@tufts.edu
	2018 SPRG	Primary	Gordon Huggins	Gordon.Huggins@tufts.edu

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

108810	**Graduate Research**
Subject:	Catalog Nbr:
BCHM	0297

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

108837	**Graduate Research**
Subject:	Catalog Nbr:
BCHM	0298

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

108863	**Graduate Research**
Subject: BCHM	Catalog Nbr: 0299
2017 SUMR Primary Larry Feig larry.feig@tufts.edu	
These courses provide guided research on a topic suitable for a doctoral thesis.	

108885	**Masters Degree Only**
Subject: BCHM	Catalog Nbr: 0402

108909	**PhD Degree Only**
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	

108938	**PhD Degree Only**
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	

108962	**PhD Degree Only**
Subject: BCHM	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	

109050	**Biochemistry of Gene Expression**
Subject: BCHM	Catalog Nbr: 230A
2017 SPRG Secondary Claire Moore claire.moore@tufts.edu	

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2018 SPRG	Primary	Amy Yee	amy.yee@tufts.edu
2018 SPRG	Secondary	Marta Gaglia	Marta.Gaglia@tufts.edu
2018 SPRG	Secondary	Christine Duarte	Chrsitine.Duate@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.

109079	**Biochemistry of Signal Transduction**

Subject: BCHM Catalog Nbr: 230B

2018 SPRG	Primary	Amy Yee	amy.yee@tufts.edu
2018 SPRG	Secondary	Kurtz Paulson	eric.paulson@tufts.edu
2018 SPRG	Secondary	Larry Feig	larry.feig@tufts.edu
2018 SPRG	Secondary	Brian Schaffhausen	brian.schaffhausen@tufts.edu
2018 SPRG	Secondary	Brent Cochran	brent.cochran@tufts.edu
2018 SPRG	Secondary	Karl Munger	Karl.Munger@tufts.edu

The integration of fundamental mechanisms into molecular and cellular regulation of proliferation and signal transduction is discussed. Current literature is emphasized. This course represents the second part of Biochemistry 230 and may be taken as a separate course.

109102	**Molecular Recognition in Biology**

Subject: BCHM Catalog Nbr: 231A

2018 SPRG	Primary	Alex Bohm	Andrew.Bohm@tufts.edu
2018 SPRG	Secondary	James Baleja	jim.baleja@tufts.edu
2018 SPRG	Secondary	Brian Schaffhausen	brian.schaffhausen@tufts.edu
2018 SPRG	Secondary	Alexei Degterev	Alexei.Degterev@tufts.edu
2018 SPRG	Secondary	Yu-Shan Lin	Yu-Shan.Lin@tufts.edu
2018 SPRG	Secondary	James Munro	James.Munro@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.

109123	**Drug Design**

Subject: BCHM Catalog Nbr: 231B

2018 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.

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109312	Pathobiology			
Subject:	Catalog Nbr:			
CMP	0230			
	2018 SPRG	Primary	Ira Herman	ira.herman@tufts.edu
	2018 SPRG	Secondary	Edward Saltzman	edward.saltzman@tufts.edu
	2018 SPRG	Secondary	Brent Cochran	brent.cochran@tufts.edu
	2018 SPRG	Secondary	Maribel Rios	Maribel.Rios@tufts.edu
	2018 SPRG	Secondary	Lisa Ceglia	Lisa.Ceglia@tufts.edu
	2018 SPRG	Secondary	Rajendra Kumar-Singh	Rajendra.Kumar-Singh@tufts.edu
	2018 SPRG	Secondary	Andrew Plaut	andrew.plaut@tufts.edu
	2018 SPRG	Secondary	Richard Dupee	richard.dupee@tufts.edu
	2018 SPRG	Secondary	Caroline Genco	Caroline.Genco@tufts.edu
This is a discussion-based course that introduces graduate students to human disease, familiarizes them with pathological specimens and patients, provides examples of how scientific discovery and clinical practice have influenced each other, and uses clinical problems as a starting point for hypothesis-driven research.				

109384	Graduate Seminar			
Subject:	Catalog Nbr:			
CMP	0291			
	2017 FALL	Primary	Ira Herman	ira.herman@tufts.edu
Visiting speakers from the Boston community and beyond present their scientific research to all members of the program, including faculty, students, and post-doctoral fellows.				

109405	Graduate Seminar			
Subject:	Catalog Nbr:			
CMP	0292			
	2018 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.				

109497	Journal Club			
Subject:	Catalog Nbr:			
CMP	0295			
	2017 FALL	Primary	Ira Herman	ira.herman@tufts.edu
	2017 FALL	Primary	Heber Nielsen	heber.nielsen@tufts.edu
	2017 FALL	Primary	Gordon Huggins	Gordon.Huggins@tufts.edu
Students select articles from the current literature, analyze their significance, and present them for discussion in a seminar group.				

109519	Journal Club

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Subject:	Catalog Nbr:			
CMP	0296			
2018 SPRG	Primary	Heber Nielsen	heber.nielsen@tufts.edu	
2018 SPRG	Primary	Gordon Huggins	Gordon.Huggins@tufts.edu	

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

109541	**Graduate Research**
Subject:	Catalog Nbr:
CMP	0297

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

109568	**Graduate Research**
Subject:	Catalog Nbr:
CMP	0298

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

109587	**Graduate Research**
Subject:	Catalog Nbr:
CMP	0299

2017 SUMR	Primary	Brent Cochran	brent.cochran@tufts.edu

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

109603	**Masters Degree Only**
Subject:	Catalog Nbr:
CMP	0402

109623	**PhD Degree Only**
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

109641	**PhD Degree Only**
Subject:	Catalog Nbr:
CMP	0404

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

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

2017 FALL	Primary	John Castellot	john.castellot@tufts.edu
2017 FALL	Secondary	James Schwob	jim.schwob@tufts.edu
2017 FALL	Secondary	Victor Hatini	Victor.Hatini@tufts.edu
2017 FALL	Secondary	Charlotte Kuperwasser	Charlotte.Kuperwasser@tufts.edu
2017 FALL	Secondary	Peter Juo	Peter.Juo@tufts.edu
2017 FALL	Secondary	Pamela Yelick	Pamela.Yelick@tufts.edu

This course introduces students to modern developmental biology with an emphasis on the cellular and molecular mechanisms involved. General topic areas include fertilization and early development, mechanisms of cell determination and differentiation, and cell-cell and cell-matrix interactions.

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110876	Graduate Seminar			
	Subject:	Catalog Nbr:		
	CMDB	0291		
	2017 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.				

110897	Graduate Seminar			
	Subject:	Catalog Nbr:		
	CMDB	0292		
	2018 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.				

110931	Journal Club			
	Subject:	Catalog Nbr:		
	CMDB	0295		
	2017 FALL	Primary	Ira Herman	ira.herman@tufts.edu
	2017 FALL	Primary	Heber Nielsen	heber.nielsen@tufts.edu
	2017 FALL	Primary	Gordon Huggins	Gordon.Huggins@tufts.edu
	Subject:	Catalog Nbr:		
	CMDB	0295		
Students select articles from the current literature, analyze their significance, and present them for discussion in a seminar group				

110961	Journal Club			
	Subject:	Catalog Nbr:		
	CMDB	0296		
	2018 SPRG	Primary	Ira Herman	ira.herman@tufts.edu
	2018 SPRG	Primary	Heber Nielsen	heber.nielsen@tufts.edu
	2018 SPRG	Primary	Gordon Huggins	Gordon.Huggins@tufts.edu
	Subject:	Catalog Nbr:		
	CMDB	0296		
Students select articles from the current literature, analyze their significance, and present them for discussion in a seminar group				

110981	Graduate Research
Subject:	Catalog Nbr:
CMDB	0297

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	2016 FALL	Primary	Ira Herman	ira.herman@tufts.edu
These courses provide guided research on a topic suitable for a doctoral thesis.				

120717	Probability and Statistics for Basic Sciences			
Subject:	Catalog Nbr:			
ISP	0220			
	2018 SPRG	Primary	Daniel Cox	dan.cox@tufts.edu
This course provides an introduction to the principles of probability and statistics and emphasizes the application of these disciplines to the analysis of basic science biomedical research data. Topics include: summarizing data, testing for differences between means, analysis of variance, laws of probability, common probability distributions, the analysis of categorical data, correlation, linear regression, nonlinear curve fitting, and exponential processes.				

120748	Laboratory Rotations			
Subject:	Catalog Nbr:			
ISP	0234			
	2017 FALL	Primary	Ira Herman	ira.herman@tufts.edu
8-10 week laboratory rotations for first-year students are designed to provide experience with experimental design and theoretical aspects of the diverse research problems under investigation in various laboratories				

120763	Laboratory Rotations			
Subject:	Catalog Nbr:			
ISP	0235			
	2018 SPRG	Primary	Ira Herman	ira.herman@tufts.edu
8-10 week laboratory rotations for first-year students are designed to provide experience with experimental design and theoretical aspects of the diverse research problems under investigation in various laboratories.				

120784	Laboratory Rotations			
Subject:	Catalog Nbr:			
ISP	0236			
	2017 SUMR	Primary	Ira Herman	ira.herman@tufts.edu
8-10 week laboratory rotation for first-year students are designed to provide experience with experimental design and theoretical aspects of the diverse research problems under investigation in various laboratories				

120859	Journal Club			
Subject:	Catalog Nbr:			
ISP	0295			
	2017 FALL	Primary	Ira Herman	ira.herman@tufts.edu
	2017 FALL	Primary	Brent Cochran	brent.cochran@tufts.edu

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	2017 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.				

120875	**Journal Club**			
Subject:	Catalog Nbr:			
ISP	0296			
	2018 SPRG	Primary	Ira Herman	ira.herman@tufts.edu
	2018 SPRG	Primary	Brent Cochran	brent.cochran@tufts.edu
	2018 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.				

121168	**Cell Behavior**			
Subject:	Catalog Nbr:			
ISP	209B			
	2018 SPRG	Primary	John Castellot	john.castellot@tufts.edu
	2018 SPRG	Secondary	Daniel Jay	daniel.jay@tufts.edu
	2018 SPRG	Secondary	Ira Herman	ira.herman@tufts.edu
	2018 SPRG	Secondary	Michael Forgac	michael.forgac@tufts.edu
	2018 SPRG	Secondary	Victor Hatini	Victor.Hatini@tufts.edu
	2018 SPRG	Secondary	Peter Juo	Peter.Juo@tufts.edu
	2018 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.				

123526	**Qualifying Exam**
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.	

123606	**Introduction to Genetics**			
Subject:	Catalog Nbr:			
GENE	0201			
	2016 FALL	Primary	Erik Selsing	erik.selsing@tufts.edu
Basic principles and current issues in genetics are the subject of the course. The focus will be on basic genetic principles. Topics will include Mendelian analysis, linkage, recombination/gene conversion, chromosomal abnormalities, crossover and segregation, developmental genetics and differentiation, chromosome structure,				

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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.

123650	Cancer Genetics			
Subject: GENE	Catalog Nbr: 0203			
2016 FALL		Primary	Brent Cochran	brent.cochran@tufts.edu
2016 FALL		Primary	Karl Munger	Karl.Munger@tufts.edu
2016 FALL		Secondary	Garabed Sahagian	gary.sahagian@tufts.edu
2016 FALL		Secondary	Ira Herman	ira.herman@tufts.edu
2016 FALL		Secondary	Amy Yee	amy.yee@tufts.edu
2016 FALL		Secondary	Stephen Bunnell	Stephen.Bunnell@tufts.edu
2016 FALL		Secondary	Charlotte Kuperwasser	Charlotte.Kuperwasser@tufts.edu
2016 FALL		Secondary	Alexei Degterev	Alexei.Degterev@tufts.edu
2016 FALL		Secondary	Philip Tsichlis	Philip.Tsichlis@tufts.edu
2016 FALL		Secondary	Rachel Buchsbaum	rachel.buchsbaum@tufts.edu
2016 FALL		Secondary	Philip Hinds	Phil.Hinds@tufts.edu

The course reviews widely-held ideas and current research on the genetic aspects of carcinogenesis. An introduction to cancer concepts is followed by a focus on specific mechanisms and models illustrating the ways in which normal cellular processes are disrupted in particular types of cancers. The course emphasizes problem solving and readings from the current literature.

123785	Medical & Experimental Mammalian Genetics			
Subject: GENE	Catalog Nbr: 0208			
2017 SUMR		Primary	Mary Handel	Mary_Ann.Handel@tufts.edu
2017 SUMR		Primary	Gareth Howell	Gareth.Howell@tufts.edu

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.

123914	Laboratory Rotations			
Subject: GENE	Catalog Nbr: 0234			
2017 FALL		Primary	Rajendra Kumar-Singh	Rajendra.Kumar-Singh@tufts.edu

8-10 week laboratory rotations for first-year students are designed to provide experience with experimental design and theoretical aspects of the diverse research problems under investigation in various laboratories.

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123936	Laboratory Rotations			
Subject:	Catalog Nbr:			
GENE	0235			
2018 SPRG		Primary	Rajendra Kumar-Singh	Rajendra.Kumar-Singh@tufts.edu
2018 SPRG		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.				

123953	Laboratory Rotations			
Subject:	Catalog Nbr:			
GENE	0236			
2017 SUMR		Primary	Rajendra Kumar-Singh	Rajendra.Kumar-Singh@tufts.edu
Subject:	Catalog Nbr:			
GENE	0236			
2017 SUMR		Primary	Rajendra Kumar-Singh	Rajendra.Kumar-Singh@tufts.edu
2017 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:	Catalog Nbr:			
GENE	0289			
2017 FALL		Primary	Erik Selsing	erik.selsing@tufts.edu
2017 FALL		Primary	Rajendra Kumar-Singh	Rajendra.Kumar-Singh@tufts.edu
Students present progress reports on their research for questions and constructive criticism as well as gain experience in presenting data and leading discussion.				

123991	Research Presentations			
Subject:	Catalog Nbr:			
GENE	0290			
2017 SPRG		Primary	Erik Selsing	erik.selsing@tufts.edu
2018 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

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Subject:	Catalog Nbr:			
GENE	0291			
2017 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:	Catalog Nbr:			
GENE	0292			
2018 SPRG		Primary	Rajendra Kumar-Singh	Rajendra.Kumar-Singh@tufts.edu

Visiting speakers present their scientific research to all members of the program, including faculty, students, and post-doctoral fellows. Fall and Spring.

124116	**Special Topics in Genetics**			
Subject:	Catalog Nbr:			
GENE	0293			
2017 FALL		Primary	Brent Cochran	brent.cochran@tufts.edu
2017 FALL		Primary	Alexander Poltorak	Alexander.Poltorak@tufts.edu
2017 FALL		Secondary	Michael Malamy	michael.malamy@tufts.edu
2017 FALL		Secondary	Andrew Camilli	andrew.camilli@tufts.edu
2017 FALL		Secondary	Claudette Gardel	Claudette.Gardel@tufts.edu

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

124144	**Special Topics in Genetics**
Subject:	Catalog Nbr:
GENE	0294

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

124194	**Journal Club**			
Subject:	Catalog Nbr:			
GENE	0295			
2016 FALL		Primary	Erik Selsing	erik.selsing@tufts.edu
2017 FALL		Primary	Karl Munger	Karl.Munger@tufts.edu

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

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124231	Journal Club			
Subject:	Catalog Nbr:			
GENE	0296			
2017 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.				

124255	Graduate Research		
Subject:	Catalog Nbr:		
GENE	0297		
2016 FALL	Primary	Naomi Rosenberg	naomi.rosenberg@tufts.edu
2017 FALL	Primary	Rajendra Kumar-Singh	Rajendra.Kumar-Singh@tufts.edu
These courses provide guided research on a topic suitable for a doctoral thesis.			

124275	Graduate Research
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		
2017 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.	

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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			
Subject:	Catalog Nbr:			
GENE	0410			
2016 FALL	Primary	Mary Handel	Mary_Ann.Handel@tufts.edu	
2016 FALL	Primary	Gary Churchill	No Email on file.	
This one-week course covers computational and experimental approaches to genetic studies that utilize whole genome approaches. Individuals 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.				

124436	Experimental Models of Human Cancer			
Subject:	Catalog Nbr:			
GENE	0450			
2017 SUMR	Primary	Mary Handel	Mary_Ann.Handel@tufts.edu	
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.				

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

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	2017 FALL	Primary	Mary Handel	Mary_Ann.Handel@tufts.edu
	2017 FALL	Secondary	Robert Burgess	No Email on file.
	2017 FALL	Secondary	Gareth Howell	Gareth.Howell@tufts.edu

The course reviews the genetic principles that apply to mammals, including genetic mechanisms of sex determination, genetic imprinting, and mitochondrial inheritance. Attention is focused on the ways in which mutation is manifested in disease phenotypes in humans.

124475	**Mammalian Genetics II**			
Subject: GENE	Catalog Nbr: 205B			
	2018 SPRG	Primary	Gareth Howell	Gareth.Howell@tufts.edu
	2018 SPRG	Secondary	Mary Handel	Mary_Ann.Handel@tufts.edu
	2018 SPRG	Secondary	Carol Bult	No Email on file.
	2018 SPRG	Secondary	Gregory Carter	Gregory.Carter@tufts.edu
	2018 SPRG	Secondary	Jennifer Trowbridge	Jennifer.Trowbridge@tufts.edu
	2018 SPRG	Secondary	Vivek Kumar	No Email on file.
	2018 SPRG	Secondary	Steven Munger	Steven.Munger@tufts.edu

The course explores the methodologies that are currently used to perform genetic analysis of mammals.

125165	**Qualifying Exam**
Subject: MMB	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.

125406	**Host Pathogen Interface**			
Subject: MMB	Catalog Nbr: 0210			
	2017 SPRG	Primary	Joan Mecsas	joan.mecsas@tufts.edu

The goal of this course is to critically read and evaluate the scientific literature on bacterial pathogens and host defenses, with particular but not exclusive emphasis on innate immune defenses. Students are required to read at least two papers per topic and discuss them in the group.

125430	**Bacterial-Host Cell Interaction**			
Subject: MMB	Catalog Nbr: 0211			
	2017 SPRG	Primary	Ralph Isberg	ralph.isberg@tufts.edu

The goal of this course is to critically read and evaluate the scientific literature on the cellular biology of bacterial pathogens, with particular emphasis on cultured cell models of microbial diseases. Students are

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required to read at least two papers per topic and discuss them in the group.

125473	Animal Virology			
Subject:	Catalog Nbr:			
MMB	0214			
2018 SPRG	Primary	John Coffin	john.coffin@tufts.edu	
2018 SPRG	Primary	Ekaterina Heldwein	Katya.Heldwein@tufts.edu	
Molecular aspects of viral replication and host-cell interactions are emphasized. Topics include virion structure; mechanisms of nucleic acid replication, transcription, and translation; virion assembly and release; genetics; mechanisms of transformation by oncogenic viruses; responses of the host to viral infection, tumor viruses and tumor cells; and mechanisms of persistent and slow virus infections. Prerequisites: a course in molecular biology or working knowledge of molecular techniques.				

125630	Laboratory Rotations			
Subject:	Catalog Nbr:			
MMB	0234			
2017 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.				

125651	Laboratory Rotations			
Subject:	Catalog Nbr:			
MMB	0235			
2018 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.				

125665	Laboratory Rotations			
Subject:	Catalog Nbr:			
MMB	0236			
2017 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.				

125685	Microbial Genetics & Microbiology			
Subject:	Catalog Nbr:			
MMB	0241			
2017 FALL	Primary	Andrew Camilli	andrew.camilli@tufts.edu	
2017 FALL	Secondary	Michael Malamy	michael.malamy@tufts.edu	

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	2017 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.				

125712	**Applied Ethics for Scientists**			
Subject: MMB	Catalog Nbr: 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.				

125727	**Graduate Seminar**			
Subject: MMB	Catalog Nbr: 0291			
	2017 FALL	Primary	John Coffin	john.coffin@tufts.edu
Visiting speakers present their scientific research to all members of the program, including faculty, students, and post-doctoral fellows.				

125748	**Graduate Seminar**			
Subject: MMB	Catalog Nbr: 0292			
	2018 SPRG	Primary	John Coffin	john.coffin@tufts.edu
Visiting speakers present their scientific research to all members of the program, including faculty, students, and post-doctoral fellows.				

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

125789	**Special Topics in Molecular Microbiology**			
Subject: MMB	Catalog Nbr: 0294			
	2018 SPRG	Primary	Andrew Camilli	andrew.camilli@tufts.edu

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2018 SPRG	Secondary	Ralph Isberg	ralph.isberg@tufts.edu
2018 SPRG	Secondary	Bree Aldridge	Bree.Aldridge@tufts.edu
2018 SPRG	Secondary	Wai-Leung Ng	Wai-Leung.Ng@tufts.edu
2018 SPRG	Secondary	Aimee Shen	Aimee.Shen@tufts.edu

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

125805	**Journal Club**

Subject: MMB Catalog Nbr: 0295

2017 FALL	Primary	John Coffin	john.coffin@tufts.edu

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

125836	**Journal Club**

Subject: MMB Catalog Nbr: 0296

2018 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: MMB Catalog Nbr: 0297

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

125868	**Graduate Research**

Subject: MMB Catalog Nbr: 0298

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

125887	**Graduate Research**

Subject: MMB Catalog Nbr: 0299

2017 SUMR	Primary	Michael Malamy	michael.malamy@tufts.edu

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

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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 automatically awarded upon completion of the thesis.	

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

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

126717	Intro to Immunology			
Subject:	Catalog Nbr:			
IMM	0212			
	2017 FALL	Primary	Peter Brodeur	peter.brodeur@tufts.edu
	2017 FALL	Primary	Henry Wortis	henry.wortis@tufts.edu

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	2017 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.

126797	**Imm Mechs of Disease I**			
Subject:	Catalog Nbr:			
IMM	0215			
	2016 FALL	Primary	Mercio Perrin	mercio.perrin@tufts.edu
	2016 FALL	Secondary	Jeffrey Griffiths	jeffrey.griffiths@tufts.edu
	2016 FALL	Secondary	Henry Wortis	henry.wortis@tufts.edu
	2016 FALL	Secondary	Berri Jacque	Berri.Jacque@tufts.edu
	2016 FALL	Secondary	Jonathan Davis	Jonathan.Davis@tufts.edu
	2016 FALL	Secondary	Maria Alcaide Alonso	Pilar.Alcaide@tufts.edu
	2016 FALL	Secondary	Jessamyn Bagley	Jessamyn.Bagley@tufts.edu

The course covers the pathogenesis of major infectious diseases including current knowledge of immune responses and approaches to prevention, diagnosis and treatment. Current studies of autoimmunity, hypersensitivity, leukemia and lymphoma are also covered.

126840	**Immunological Mechanisms In Disease**			
Subject:	Catalog Nbr:			
IMM	0216			
	2017 SPRG	Primary	Mercio Perrin	mercio.perrin@tufts.edu
	2017 SPRG	Secondary	Andrew Camilli	andrew.camilli@tufts.edu
	2017 SPRG	Secondary	Honorine Ward	honorine.ward@tufts.edu
	2017 SPRG	Secondary	Andrew Plaut	andrew.plaut@tufts.edu
	2017 SPRG	Secondary	Athar Chishti	Athar.Chishti@tufts.edu
	2017 SPRG	Secondary	John Leong	John.Leong@tufts.edu
	2017 SPRG	Secondary	Marta Gaglia	Marta.Gaglia@tufts.edu
	2017 SPRG	Secondary	Parisa Kalantari	Parisa.Kalantari@tufts.edu
	2017 SPRG	Secondary	Caroline Genco	Caroline.Genco@tufts.edu

The course covers the pathogenesis of major infectious diseases including current knowledge of immune responses and approaches to prevention, diagnosis and treatment. Current studies of autoimmunity, hypersensitivity, leukemia and lymphoma are also covered.

126857	**1st Year Journal Club**			
Subject:	Catalog Nbr:			
IMM	0217			
	2016 FALL	Primary	Erik Selsing	erik.selsing@tufts.edu
	2017 FALL	Primary	Peter Brodeur	peter.brodeur@tufts.edu
	2017 FALL	Primary	Henry Wortis	henry.wortis@tufts.edu

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2017 FALL	Primary	Xudong Li	Xudong.Li@tufts.edu
2017 FALL	Secondary	John Iacomini	John.Iacomini@tufts.edu

First-year students meet with the course director to discuss articles essential for an understanding of contemporary immunology. The development of analytic skills is emphasized.

127114	**Scientific & Grant Wtng**
Subject: IMM	Catalog Nbr: 0233

This course provides graduate students with the opportunity to develop the basic skills essential to the effective oral and written communication of scientific findings and research proposals. The course is a combination of lectures, writing assignments, and oral communication practice sessions with feedback provided by the faculty.

127136	**Laboratory Rotations**
Subject: IMM	Catalog Nbr: 0234

2017 FALL	Primary	Brigitte Huber	brigitte.huber@tufts.edu
2017 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.

127165	**Laboratory Rotations**
Subject: IMM	Catalog Nbr: 0235

2018 SPRG	Primary	Brigitte Huber	brigitte.huber@tufts.edu
2018 SPRG	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.

127179	**Laboratory Rotations**
Subject: IMM	Catalog Nbr: 0236

2017 SUMR	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.

127217	**Research Presentations**
Subject: IMM	Catalog Nbr: 0289

Course Bulletin

	2017 FALL	Primary	Honorine Ward	honorine.ward@tufts.edu
Students present progress reports on their research for questions and constructive criticism as well as gain experience in presenting data and leading discussion.				

127238	Research Presentations			
Subject: IMM	Catalog Nbr: 0290			
	2018 SPRG	Primary	Honorine Ward	honorine.ward@tufts.edu
Students present progress reports on their research for questions and constructive criticism as well as gain experience in presenting data and leading discussion.				

127260	Graduate Seminar			
Subject: IMM	Catalog Nbr: 0291			
	2017 FALL	Primary	Honorine Ward	honorine.ward@tufts.edu
Visiting speakers present their scientific research to all members of the program, including faculty, students, and post-doctoral fellows.				

127291	Graduate Seminar			
Subject: IMM	Catalog Nbr: 0292			
	2018 SPRG	Primary	Honorine Ward	honorine.ward@tufts.edu
Visiting speakers present their scientific research to all members of the program, including faculty, students, and post-doctoral fellows.				

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

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

127347	Journal Club

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Subject:	Catalog Nbr:			
IMM	0295			
	2017 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.				

127367	Journal Club			
Subject:	Catalog Nbr:			
IMM	0296			
	2018 SPRG	Primary	Stephen Bunnell	Stephen.Bunnell@tufts.edu
Students in the research portion of their training meet to present and discuss recent papers of importance.				

127391	Graduate Research			
Subject:	Catalog Nbr:			
IMM	0297			
	2016 FALL	Primary	Naomi Rosenberg	naomi.rosenberg@tufts.edu
These courses provide guided research on a topic suitable for a doctoral thesis.				

127403	Graduate Research			
Subject:	Catalog Nbr:			
IMM	0298			
These courses provide guided research on a topic suitable for a doctoral thesis.				

127430	Graduate Research			
Subject:	Catalog Nbr:			
IMM	0299			
	2017 SUMR	Primary	Brigitte Huber	brigitte.huber@tufts.edu
	2017 SUMR	Primary	Henry Wortis	henry.wortis@tufts.edu
	2017 SUMR	Primary	Honorine Ward	honorine.ward@tufts.edu
These courses provide guided research on a topic suitable for a doctoral thesis.				

127436	Qualifying Exam
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.	

127448	Masters Degree Only

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Subject:	Catalog Nbr:
IMM	0402

127451	Cellular and Molecular Tutorials in Neuroscience			
Subject:	Catalog Nbr:			
NRSC	0200			
2016 FALL	Secondary	Paul Davies	Paul.Davies@tufts.edu	
2017 FALL	Primary	Christopher Dulla	Chris.Dulla@tufts.edu	
2017 FALL	Secondary	Michele Jacob	michele.jacob@tufts.edu	
2017 FALL	Secondary	F Jackson	rob.jackson@tufts.edu	
2017 FALL	Secondary	Daniel Cox	dan.cox@tufts.edu	
2017 FALL	Secondary	Giuseppina Tesco	Giuseppina.Tesco@tufts.edu	
2017 FALL	Secondary	Gerard Reijmers	Leon.Reijmers@tufts.edu	
2017 FALL	Secondary	Jamie Maguire	Jamie.Maguire@tufts.edu	
2017 FALL	Secondary	Yongjie Yang	Yongjie.Yang@tufts.edu	
2017 FALL	Secondary	Thomas Biederer	Thomas.Biederer@tufts.edu	
2017 FALL	Secondary	Dong Kong	Dong.Kong@tufts.edu	
2017 FALL	Secondary	Jayashree Chadchankar	Jayashree.Chadchankar@tufts.edu	

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

127475	PhD Degree Only
Subject:	Catalog Nbr:
IMM	0403

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

127491	PhD Degree Only
Subject:	Catalog Nbr:
IMM	0404

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

127512	Developmental Neurobiology
Subject:	Catalog Nbr:
NRSC	0205

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

127521	PhD Degree Only
Subject: IMM	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.

127621	Systems Neuroscience
Subject: NRSC	Catalog Nbr: 0310

2018 SPRG	Primary	Maribel Rios	Maribel.Rios@tufts.edu
2018 SPRG	Primary	Giuseppina Tesco	Giuseppina.Tesco@tufts.edu
2018 SPRG	Secondary	Daniel Jay	daniel.jay@tufts.edu
2018 SPRG	Secondary	Thomas Sabin	thomas.sabin@tufts.edu
2018 SPRG	Secondary	Bryan Ho	No Email on file.
2018 SPRG	Secondary	Beverly Rubin	beverly.rubin@tufts.edu
2018 SPRG	Secondary	Daniel Cox	dan.cox@tufts.edu
2018 SPRG	Secondary	Paul Abourjaily	Paul.Abourjaily@tufts.edu
2018 SPRG	Secondary	Lester Adelman	lester.adelman@tufts.edu
2018 SPRG	Secondary	Gerard Reijmers	Leon.Reijmers@tufts.edu
2018 SPRG	Secondary	Yongjie Yang	Yongjie.Yang@tufts.edu
2018 SPRG	Secondary	Josh Katz	No Email on file.
2018 SPRG	Secondary	Ron Riesenburger	No Email on file.
2018 SPRG	Secondary	Neel Madan	Neel.Madan@tufts.edu
2018 SPRG	Secondary	David Weinberg	david.weinberg@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.

127641	Synapse Neurobiology
Subject: NRSC	Catalog Nbr: 0213

2016 FALL	Primary	Michele Jacob	michele.jacob@tufts.edu
2016 FALL	Primary	Gerard Reijmers	Leon.Reijmers@tufts.edu
2016 FALL	Secondary	Daniel Cox	dan.cox@tufts.edu
2016 FALL	Secondary	Peter Juo	Peter.Juo@tufts.edu
2016 FALL	Secondary	Jamie Maguire	Jamie.Maguire@tufts.edu
2016 FALL	Secondary	Christopher Dulla	Chris.Dulla@tufts.edu
2016 FALL	Secondary	Yongjie Yang	Yongjie.Yang@tufts.edu

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	2016 FALL	Secondary	Alan Kopin	alan.kopin@tufts.edu
	2016 FALL	Secondary	Thomas Biederer	Thomas.Biederer@tufts.edu
This small group discussion course provides students with an in-depth understanding of how synapses function, how activity modulates function, and how synaptic ensembles coordinate simple behaviors.				

127741	**Scientific Writing Principles**			
	Subject:	Catalog Nbr:		
	NRSC	0220		
	2017 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.				

127752	**Neuroscience Laboratory Techniques**			
	Subject:	Catalog Nbr:		
	NRSC	0233		
	2017 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.				

127776	**Laboratory Rotation**			
	Subject:	Catalog Nbr:		
	NRSC	0234		
	2016 FALL	Primary	F Jackson	rob.jackson@tufts.edu
	2017 FALL	Primary	Thomas Biederer	Thomas.Biederer@tufts.edu
8-10 week laboratory rotations for first-year students are designed to provide experience with experimental design and theoretical aspects of the diverse research problems under investigation in various laboratories.				

127803	**Laboratory Rotations**			
	Subject:	Catalog Nbr:		
	NRSC	0235		
	2018 SPRG	Primary	Thomas Biederer	Thomas.Biederer@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.				

127822	**Laboratory Rotation**
Subject:	Catalog Nbr:
NRSC	0236

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8-10 week laboratory rotations for first-year students are designed to provide experience with experimental design and theoretical aspects of the diverse research problems under investigation in various laboratories.

127830	Biochemical Foundations in Neuroscience

Subject: NRSC | Catalog Nbr: 0251

2016 FALL	Secondary	Laura Liscum	laura.liscum@tufts.edu
2016 FALL	Secondary	Paul Davies	Paul.Davies@tufts.edu
2017 FALL	Primary	Thomas Biederer	Thomas.Biederer@tufts.edu
2017 FALL	Secondary	James Baleja	jim.baleja@tufts.edu
2017 FALL	Secondary	Kurtz Paulson	eric.paulson@tufts.edu
2017 FALL	Secondary	Peter Bullock	peter.bullock@tufts.edu
2017 FALL	Secondary	Larry Feig	larry.feig@tufts.edu
2017 FALL	Secondary	Brian Schaffhausen	brian.schaffhausen@tufts.edu
2017 FALL	Secondary	William Bachovchin	william.bachovchin@tufts.edu
2017 FALL	Secondary	Michael Forgac	michael.forgac@tufts.edu
2017 FALL	Secondary	Daniel Cox	dan.cox@tufts.edu
2017 FALL	Secondary	Albert Tai	albert.tai@tufts.edu
2017 FALL	Secondary	Alex Bohm	Andrew.Bohm@tufts.edu
2017 FALL	Secondary	Peter Juo	Peter.Juo@tufts.edu
2017 FALL	Secondary	Alexei Degterev	Alexei.Degterev@tufts.edu
2017 FALL	Secondary	Stephen Moss	Stephen.Moss@tufts.edu
2017 FALL	Secondary	Gerard Reijmers	Leon.Reijmers@tufts.edu
2017 FALL	Secondary	Yongjie Yang	Yongjie.Yang@tufts.edu
2017 FALL	Secondary	Marta Gaglia	Marta.Gaglia@tufts.edu
2017 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.

127868	Neurogenetics

Subject: NRSC | Catalog Nbr: 0263

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

127898	Research Presentations

Subject: NRSC | Catalog Nbr: 0289

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	2017 FALL	Primary	Michele Jacob	michele.jacob@tufts.edu
Students present progress reports on their research for questions and constructive criticism as well as gain experience in presenting data and leading discussion.				

127942	Research Presentations			
Subject: NRSC	Catalog Nbr: 0290			
	2018 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.				

127981	Graduate Seminar			
Subject: NRSC	Catalog Nbr: 0291			
	2016 FALL	Primary	F Jackson	rob.jackson@tufts.edu
	2017 FALL	Primary	Michele Jacob	michele.jacob@tufts.edu
	2017 FALL	Primary	Thomas Biederer	Thomas.Biederer@tufts.edu
Visiting speakers present their scientific research to all members of the program, including faculty, students, and post-doctoral fellows.				

128024	Graduate Seminar			
Subject: NRSC	Catalog Nbr: 0292			
	2018 SPRG	Primary	Michele Jacob	michele.jacob@tufts.edu
	2018 SPRG	Primary	Thomas Biederer	Thomas.Biederer@tufts.edu
Visiting speakers present their scientific research to all members of the program, including faculty, students, and post-doctoral fellows.				

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

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

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128157	Journal Club			
Subject:	Catalog Nbr:			
NRSC	0295			
2016 FALL	Primary	F Jackson	rob.jackson@tufts.edu	
2017 FALL	Primary	Thomas Biederer	Thomas.Biederer@tufts.edu	
Students select articles from the current literature, analyze their significance, and present them for discussion in a seminar group.				

128193	Journal Club		
Subject:	Catalog Nbr:		
NRSC	0296		
2018 SPRG	Primary	Thomas Biederer	Thomas.Biederer@tufts.edu
Students select articles from the current literature, analyze their significance, and present them for discussion in a seminar group.			

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

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

128248	Graduate Research		
Subject:	Catalog Nbr:		
NRSC	0299		
2017 SUMR	Primary	Thomas Biederer	Thomas.Biederer@tufts.edu
These courses provide guided research on a topic suitable for a doctoral thesis.			

128272	Masters Degree Only
Subject:	Catalog Nbr:
NRSC	0402

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

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

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

128378	Biochemical Foundations in Neuroscience Receptor/Channel Mechanisms			
Subject:	Catalog Nbr:			
NRSC	251B			
	2016 FALL	Secondary	Paul Davies	Paul.Davies@tufts.edu
	2017 FALL	Primary	Thomas Biederer	Thomas.Biederer@tufts.edu
	2017 FALL	Secondary	Larry Feig	larry.feig@tufts.edu
	2017 FALL	Secondary	Daniel Cox	dan.cox@tufts.edu
	2017 FALL	Secondary	Peter Juo	Peter.Juo@tufts.edu
	2017 FALL	Secondary	Stephen Moss	Stephen.Moss@tufts.edu
	2017 FALL	Secondary	Gerard Reijmers	Leon.Reijmers@tufts.edu
	2017 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.				

130459	Clinical Implications of Basic Research			
Subject:	Catalog Nbr:			
SKMD	0210			
	2018 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"				

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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
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 obtained 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:			
SK	0275			
	2017 FALL	Primary	Daniel Jay	daniel.jay@tufts.edu
	2017 FALL	Primary	Jamie Maguire	Jamie.Maguire@tufts.edu
	2017 FALL	Secondary	Henry Wortis	henry.wortis@tufts.edu

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2017 FALL	Secondary	Alex Bohm	Andrew.Bohm@tufts.edu
2017 FALL	Secondary	Najla Fiaturi	Najla.Fiaturi@tufts.edu
2017 FALL	Secondary	Marta Gaglia	Marta.Gaglia@tufts.edu

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.

136292 **Biomedical Techniques & Research**

Subject: SK Catalog Nbr: 0299

2017 FALL	Primary	Alexei Degterev	Alexei.Degterev@tufts.edu
2017 SUMR	Primary	Claire Moore	claire.moore@tufts.edu
2017 SUMR	Primary	Gail Sonenshein	Gail.Sonenshein@tufts.edu
2017 SUMR	Primary	Christopher Dulla	Chris.Dulla@tufts.edu
2017 SUMR	Primary	John Leong	John.Leong@tufts.edu
2017 SUMR	Primary	Aimee Shen	Aimee.Shen@tufts.edu
2018 SPRG	Primary	Brian Schaffhausen	brian.schaffhausen@tufts.edu
2018 SPRG	Primary	Maria Alcaide Alonso	Pilar.Alcaide@tufts.edu
2018 SPRG	Primary	Karl Munger	Karl.Munger@tufts.edu
2018 SPRG	Primary	Caroline Genco	Caroline.Genco@tufts.edu

This course includes research with selected advisor. Visiting Students Only.

136304 **Clinical Implications of Basic Research**

Subject: SKMD Catalog Nbr: 0209

2017 FALL	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) 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.

136336 **Laboratory Rotations**

Subject: SKMD Catalog Nbr: 0299

2017 SUMR	Primary	Daniel Jay	daniel.jay@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. Fall, Spring, Summer.

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137576	Qualifying Exam			
Subject:	Catalog Nbr:			
PPET	0000			
2017 SPRG		Primary	Emmanuel Pothos	emmanuel.pothos@tufts.edu
Students present and defend a proposal for research consisting of a statement of an original research problem in which a scientific question is asked and the experimental approach to answering the question is explained in a written proposal. The proposal is presented orally to the faculty.				

137616	Translational Pharmacology I		
Subject:	Catalog Nbr:		
PPET	0211		
2017 FALL	Primary	Najla Fiaturi	Najla.Fiaturi@tufts.edu
2017 FALL	Primary	Martin Beinborn	martin.beinborn@tufts.edu
2017 FALL	Secondary	David Greenblatt	dj.greenblatt@tufts.edu
2017 FALL	Secondary	Margery Beinfeld	margery.beinfeld@tufts.edu
2017 FALL	Secondary	Richard Shader	richard.shader@tufts.edu
2017 FALL	Secondary	Michael Forgac	michael.forgac@tufts.edu
2017 FALL	Secondary	Jerold Harmatz	jerold.harmatz@tufts.edu
2017 FALL	Secondary	Karina Meiri	karina.meiri@tufts.edu
2017 FALL	Secondary	Emmanuel Pothos	emmanuel.pothos@tufts.edu
2017 FALL	Secondary	Alexei Degterev	Alexei.Degterev@tufts.edu
2017 FALL	Secondary	Paul Abourjaily	Paul.Abourjaily@tufts.edu
This course is a survey of some of the major classes of drugs, with particular emphasis on mechanisms of action and relevant organ systems and cellular physiology. Students are introduced to the central concepts, models and techniques in pharmacology.			

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

137645	Addiction Medicine			
Subject:	Catalog Nbr:			
PPET	0213			
2018 SPRG		Primary	Emmanuel Pothos	emmanuel.pothos@tufts.edu

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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.

137683	Principles of Immunopharmacology

Subject:	Catalog Nbr:			
PPET	0218			
	2018 SPRG	Primary	Theoharis Theoharides	theoharis.theoharides@tufts.edu

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.

137698	Behavioral Pharmacology

Subject:	Catalog Nbr:
PPET	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.

137710	Advances in Neurochem

Subject:	Catalog Nbr:
PPET	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.

137724	Pharmokinetics in Biological Systems

Subject:	Catalog Nbr:			
PPET	0221			
	2016 FALL	Secondary	Karthik Venkatakrishnan	No Email on file.
	2017 FALL	Primary	David Greenblatt	dj.greenblatt@tufts.edu
	2017 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

137735	Toxicology

Subject:	Catalog Nbr:
PPET	0222

This course is an in-depth examination of the basic principles of toxicology based on discussion and

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presentation of selected examples. Subjects considered include apoptosis/necrosis, molecular mechanisms of neurotoxicities, species difference in toxicities, and chemical mutagenesis.

137756	Neuropeptides
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 clinical uses of neuropeptides.

137777	Introduction to Drug Metabolism
Subject: PPET	Catalog Nbr: 0225

This is a readings and presentation course designed to illustrate the processes involved with drug metabolism, to describe the non-drug (non-substrate) factors influencing drug metabolism, and to review and critique methods used for the study of drug metabolism.

137850	Translational Pharmacology II
Subject: PPET	Catalog Nbr: 0232

2018 SPRG	Primary	Najla Fiaturi	Najla.Fiaturi@tufts.edu
2018 SPRG	Primary	Martin Beinborn	martin.beinborn@tufts.edu
2018 SPRG	Secondary	Ana Soto	ana.soto@tufts.edu
2018 SPRG	Secondary	John Castellot	john.castellot@tufts.edu
2018 SPRG	Secondary	Margery Beinfeld	margery.beinfeld@tufts.edu
2018 SPRG	Secondary	Emmanuel Pothos	emmanuel.pothos@tufts.edu
2018 SPRG	Secondary	Athar Chishti	Athar.Chishti@tufts.edu
2018 SPRG	Secondary	Gretchen Volpe	Gretchen.Volpe@tufts.edu
2018 SPRG	Secondary	Jonathan Davis	Jonathan.Davis@tufts.edu
2018 SPRG	Secondary	Tine Vindenes	Tine.Vindenes@tufts.edu
2018 SPRG	Secondary	David Stone	david.stone@tufts.edu
2018 SPRG	Secondary	James Hellinger	No Email on file.

This course continues with the topics covered in Translational Pharmacology I. It covers major classes of drugs and the concepts, models and techniques in pharmacology.

137860	Scientific Writing and Presentation Skills
Subject: PPET	Catalog Nbr: 0233

2016 FALL	Secondary	Richard Shader	richard.shader@tufts.edu
2017 FALL	Primary	Emmanuel Pothos	emmanuel.pothos@tufts.edu

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	2017 FALL	Secondary	David Greenblatt	dj.greenblatt@tufts.edu
This course provides graduate students with the opportunity to develop the basic skills essential to the effective oral and written communication of scientific findings and research proposals. The course is a combination of lectures, writing assignments, and oral communication practice sessions.				

137871	**Laboratory Rotations**			
Subject:	Catalog Nbr:			
PPET	0234			
	2017 FALL	Primary	Emmanuel Pothos	emmanuel.pothos@tufts.edu
8-10 week laboratory rotations for first-year students are designed to provide experience with experimental design and theoretical aspects of the diverse research problems under investigation in various laboratories.				

137881	**Laboratory Rotations**			
Subject:	Catalog Nbr:			
PPET	0235			
	2018 SPRG	Primary	Emmanuel Pothos	emmanuel.pothos@tufts.edu
8-10 week laboratory rotations for first-year students are designed to provide experience with experimental design and theoretical aspects of the diverse research problems under investigation in various laboratories.				

137889	**Laboratory Rotations**
Subject:	Catalog Nbr:
PPET	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.	

137918	**Graduate Seminar**			
Subject:	Catalog Nbr:			
PPET	0291			
	2017 FALL	Primary	Emmanuel Pothos	emmanuel.pothos@tufts.edu
Visiting speakers present their scientific research to all members of the program, including faculty, students, and post-doctoral fellows.				

137928	**Graduate Seminar**			
Subject:	Catalog Nbr:			
PPET	0292			
	2018 SPRG	Primary	David Greenblatt	dj.greenblatt@tufts.edu
	2018 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.				

Course Bulletin

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

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

137978	Journal Club			
Subject: PPET	Catalog Nbr: 0295			
	2017 FALL	Primary	Najla Fiaturi	Najla.Fiaturi@tufts.edu
	2017 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.				

137989	Journal Club			
Subject: PPET	Catalog Nbr: 0296			
	2018 SPRG	Primary	Najla Fiaturi	Najla.Fiaturi@tufts.edu
	2018 SPRG	Secondary	Jerold Harmatz	jerold.harmatz@tufts.edu
	2018 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.				

138000	Graduate Research			
Subject: PPET	Catalog Nbr: 0297			
	2017 FALL	Primary	Emmanuel Pothos	emmanuel.pothos@tufts.edu
These courses provide guided research on a topic suitable for a doctoral thesis.				

138007	Graduate Research
Subject:	Catalog Nbr:

Course Bulletin

PPET	0298			
2018 SPRG	Primary	Emmanuel Pothos		emmanuel.pothos@tufts.edu
These courses provide guided research on a topic suitable for a doctoral thesis.				

138017	**Graduate Research**			
Subject:	Catalog Nbr:			
PPET	0299			
2017 SUMR	Primary	Emmanuel Pothos		emmanuel.pothos@tufts.edu
These courses provide guided research on a topic suitable for a doctoral thesis.				

138026	**Masters Degree Only**
Subject:	Catalog Nbr:
PPET	0402

138033	**PhD Degree Only**
Subject:	Catalog Nbr:
PPET	0403
Students enroll in this course when they receive permission to write and defend their theses from their thesis committees. This course represents the effort in the final preparation of the doctoral thesis. A grade of “S” is awarded upon completion of the thesis.	

138043	**PhD Degree Only**
Subject:	Catalog Nbr:
PPET	0404
Students enroll in this course when they receive permission to write and defend their theses from their thesis committees. This course represents the effort in the final preparation of the doctoral thesis. A grade of “S” is awarded upon completion of the thesis.	

138052	**PhD Degree Only**
Subject:	Catalog Nbr:
PPET	0405
Students enroll in this course when they receive permission to write and defend their theses from their thesis committees. This course represents the effort in the final preparation of the doctoral thesis. A grade of “S” is awarded upon completion of the thesis.	

138644	**Transfer Credit**
Subject:	Catalog Nbr:

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TRAN	9999			

138797	Tutorial in Neural Systems and Disease Mechanisms			
Subject:	Catalog Nbr:			
NRSC	0312			
2017 SPRG		Secondary	Alain Charest	No Email on file.
2018 SPRG		Primary	Maribel Rios	Maribel.Rios@tufts.edu
2018 SPRG		Primary	Giuseppina Tesco	Giuseppina.Tesco@tufts.edu
2018 SPRG		Secondary	Larry Feig	larry.feig@tufts.edu
2018 SPRG		Secondary	Michele Jacob	michele.jacob@tufts.edu
2018 SPRG		Secondary	F Jackson	rob.jackson@tufts.edu
2018 SPRG		Secondary	Klaus Miczek	klaus.miczek@tufts.edu
2018 SPRG		Secondary	Gerard Reijmers	Leon.Reijmers@tufts.edu
2018 SPRG		Secondary	Jamie Maguire	Jamie.Maguire@tufts.edu
2018 SPRG		Secondary	Christopher Dulla	Chris.Dulla@tufts.edu
2018 SPRG		Secondary	Yongjie Yang	Yongjie.Yang@tufts.edu
2018 SPRG		Secondary	Dong Kong	Dong.Kong@tufts.edu

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

139088	Advanced Cellular Immunology			
Subject:	Catalog Nbr:			
IMM	0245			
2017 FALL		Primary	Brigitte Huber	brigitte.huber@tufts.edu

This course is designed to give students a solid background in contemporary Cellular Immunology. The course will be based on a lecture series supplemented by extensive readings from the current literature. Thirty minutes of each course is dedicated to discuss the assigned reading material, which is two papers per lecture. Prerequisite: IMM 0212 or equivalent.

139091	System Approaches to Immunology			
Subject:	Catalog Nbr:			
IMM	0252			
2018 SPRG		Primary	Alexander Poltorak	Alexander.Poltorak@tufts.edu
2018 SPRG		Secondary	Albert Tai	albert.tai@tufts.edu
2018 SPRG		Secondary	Michael Shapiro	No Email on file.

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

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sequencing.

139092	Immunochemistry- Signaling and Dynamics			
Subject:	Catalog Nbr:			
IMM	0250			
2018 SPRG	Primary	Stephen Bunnell	Stephen.Bunnell@tufts.edu	
2018 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.				

139171	Laboratory Research Experience			
Subject:	Catalog Nbr:			
PPET	0134			
2017 FALL	Primary	Emmanuel Pothos	emmanuel.pothos@tufts.edu	
16-20 week laboratory rotations for Master's students are designed to provide experience with experimental design and theoretical aspects of the diverse research problems under investigation in various laboratories.				

139172	Laboratory Research Experience			
Subject:	Catalog Nbr:			
PPET	0135			
2018 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.				

139204	Teaching Infectious Diseases
Subject:	Catalog Nbr:
SK	0115
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.	

139290	Rotation			
Subject:	Catalog Nbr:			
SK	0236			
2017 SUMR	Primary	Pedram Hamrah	No Email on file.	

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139373	Applying Quality Improvement Methods in Healthcare and Public Health			
Subject:	Catalog Nbr:			
CTS	0231			
2017 SPRG	Secondary	Laurel Leslie	No Email on file.	
2017 SPRG	Secondary	Saul Weingart	Saul.Weingart@tufts.edu	
2017 SPRG	Secondary	Ruben Azocar	Ruben.Azocar@tufts.edu	
2018 SPRG	Primary	Denise Daudelin	Denise.Daudelin@tufts.edu	
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.				

139453	Special Topics in Cell, Molecular, and Developmental Biology
Subject:	Catalog Nbr:
CMDB	0293
In-depth information is provided on selected topics. Students may also pursue guided individual study of an approved topic. Fall and Spring.	

139454	Special Topics in Cell, Molecular, and Developmental Biology
Subject:	Catalog Nbr:
CMDB	0294

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

139466	Post-placement Rotation
Subject:	Catalog Nbr:
SK	0234

139467	Post-placement Rotation
Subject:	Catalog Nbr:
SK	0235

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Subject:	Catalog Nbr:
SK	0235

139826	Advanced Scientific Ethics			
Subject:	Catalog Nbr:			
SK	0375			
2017 FALL		Primary	Daniel Jay	daniel.jay@tufts.edu
2017 FALL		Primary	Jamie Maguire	Jamie.Maguire@tufts.edu

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.

140064	Advanced Topics in Biostatistics			
Subject:	Catalog Nbr:			
CTS	0533			
2017 FALL		Primary	Angie Rodday	Angie.Rodday@tufts.edu
2017 FALL		Primary	Norma Terrin	norma.terrin@tufts.edu
2017 FALL		Primary	Farzad Noubary	Farzad.Noubary@tufts.edu

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.

140127	Advanced Epidemiology & Regression Methods: An Integrated Approach			
Subject:	Catalog Nbr:			
CTS	0575			
2018 SPRG		Primary	Jessica Paulus	Jessica.Paulus@tufts.edu
2018 SPRG		Primary	Farzad Noubary	Farzad.Noubary@tufts.edu

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.

140320	Design and Analysis of Bioequivalence Studies
Subject:	Catalog Nbr:

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PPET	0281			
2018 SPRG		Primary	Emmanuel Pothos	emmanuel.pothos@tufts.edu

A generic drug is bioequivalent to a brand name drug when their bioavailabilities (assessed by the respective plasma concentration time curves) after administration in the same molar dose are essentially the same. The comparison of the bioavailabilities is examined by conducting a bioequivalence study. The course will train the students in the design and data analysis of bioequivalence studies.

140762	**Basic Skills for Scientists I**
Subject:	Catalog Nbr:
SK	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.

140763	**Basic Skills for Scientists II**
Subject:	Catalog Nbr:
SK	0102

This three module course is designed to give trainees basic skills in in presenting data and in writing grant applications.

141543	**Translational Medicine - Drug Discovery to Clinical Development**			
Subject:	Catalog Nbr:			
PPET	0205			
2017 FALL		Primary	Emmanuel Pothos	emmanuel.pothos@tufts.edu
2017 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.

141547	**Mouse Transgenic Model**			
Subject:	Catalog Nbr:			
CMDB	0350			
2018 SPRG		Primary	Lucy Liaw	No Email on file.

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.

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141552	Introduction to Infectious and Inflammatory Diseases			
Subject:	Catalog Nbr:			
IMM	0223			
2017 SUMR	Primary	Miguel Stadecker	miguel.stadecker@tufts.edu	
2017 SUMR	Primary	Ralph Isberg	ralph.isberg@tufts.edu	
2017 SUMR	Primary	Andrew Plaut	andrew.plaut@tufts.edu	
2017 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.

141613	Survey of Clinical Care Research
Subject:	Catalog Nbr:
CTS	0125

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.

141614	Principles of Biostatistics for Clinical Research			
Subject:	Catalog Nbr:			
CTS	0127			
2017 FALL	Primary	Angie Rodday	Angie.Rodday@tufts.edu	

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.

141615	Elements of Epidemiology for Clinical Research
Subject:	Catalog Nbr:
CTS	0123

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2017 SUMR	Primary	David Kent	No Email on file.
2018 SPRG	Primary	Jessica Paulus	Jessica.Paulus@tufts.edu

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.

141715 **Health Economics**

Subject: CTS Catalog Nbr: 0557

2018 SPRG	Primary	James Chambers	James.Chambers@tufts.edu
2018 SPRG	Secondary	Tara Lavelle	No Email on file.
2018 SPRG	Secondary	Pei-Jung Lin	No Email on file.

This course aims to introduce health care professionals and clinical researchers to key economic concepts and their relation to health care. The course is designed for students with no or rudimentary understanding of economics. In addition to providing students with a foundation in economics, the course will provide students with an understanding of the structure and performance of the US health care system, and an introduction to methods for the economic evaluation of medical technology. The course will also include lectures on the regulation of medical technology, health care innovation, and emerging health policy trends. Coursework will include a workshop in which students will gain hands-on experience manipulating economic evaluations for medical technology.

142318 **Inflammation and Chronic Inflammatory Diseases**

Subject: IMM Catalog Nbr: 0230

2017 FALL	Primary	Maria Alcaide Alonso	Pilar.Alcaide@tufts.edu
2017 FALL	Secondary	Miguel Stadecker	miguel.stadecker@tufts.edu
2017 FALL	Secondary	Li Zeng	Li.Zeng@tufts.edu
2017 FALL	Secondary	Giuseppina Tesco	Giuseppina.Tesco@tufts.edu
2017 FALL	Secondary	Athan Kuliopulos	athan.kuliopulos@tufts.edu
2017 FALL	Secondary	Robert Blanton	Robert.Blanton@tufts.edu
2017 FALL	Secondary	Caroline Genco	Caroline.Genco@tufts.edu
2017 FALL	Secondary	Pedram Hamrah	No Email on file.
2017 FALL	Secondary	Xudong Li	Xudong.Li@tufts.edu
2017 FALL	Secondary	Shruti Sharma	Shruti.Sharma@tufts.edu

The course focuses on reading primary literature about the role of inflammation in several chronic diseases. The emphasis is on understanding the role of the immune response during the initiation and progression of chronic inflammatory diseases. The course will explore human diseases and delve into available animal models for such conditions, discuss the beneficial vs pathological aspects of inflammation in various diseases, and ongoing therapies and clinical trials for such conditions.

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142319	Clinical Trial Practicum
Subject:	Catalog Nbr:
CTS	0520

This course is designed to explore how to design and run real-world clinical trials. Course activities will include hands-on activities in the CTRC with clinical trial principal investigators and staff, invitations to attend IRB and Scientific Review Committees, and meetings with the CTRC Scientific Director and administrative leadership. Through these activities, students will be exposed to some of the cornerstones of launching and implementing a clinical trial. Topics to be covered include cohort identification, patient recruitment, protection of human subjects, disease registries (especially for rare diseases), data collection (biological samples and patient questionnaires) and organizing and managing patient visits at the Clinical and Translational Research Center at Tufts Medical Center.

142383	Foundations in Biostatistics and Computational Biology
Subject:	Catalog Nbr:
CMDB	0320

2017 FALL	Primary	Gregory Carter	Gregory.Carter@tufts.edu
2017 FALL	Primary	Christine Duarte	Chrsitine.Duate@tufts.edu

Introduction to biostatistics with application to the biomedical sciences and genetics, and introduction to computational biology.

142483	Building Diversity in Biomedical Sciences Summer Research Experience
Subject:	Catalog Nbr:
SK	0099

Summer residential research program designed to develop interest and talent in underrepresented minority students in STEM.

142496	CNS Drug Discovery
Subject:	Catalog Nbr:
NRSC	0277

2017 FALL	Primary	Thomas Biederer	Thomas.Biederer@tufts.edu
2017 FALL	Secondary	Philip Haydon	Philip.Haydon@tufts.edu

This course covers the process of bringing a new pharmaceutical treatment against disorders of the central nervous system (CNS) to the market, starting at the conception of a novel idea. Compared to other disease areas, CNS drug discovery faces – literally – several additional barriers. Most importantly, therapeutics need to cross the blood-brain-barrier in order to reach their site of action. This provides unique challenges throughout the discovery and development stages, especially for large molecules like antibodies. Moreover, CNS drug discovery has a high need for innovation in areas such as biomarker development and drug delivery. Students will gain an understanding of pre-clinical research, including molecular, biological, neuroanatomical, electrophysiological, and behavioral techniques; biomarker development and strategy, as well as proof of

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mechanism and concept testing in volunteers and patients.

142692	**Advanced Topics in Microbiology O**
Subject: MMB	Catalog Nbr: 026O
This collection of lectures of four trending topics in Microbiology is offered in odd years.	

142693	**Advanced Topics in Microbiology E**
Subject: MMB	Catalog Nbr: 026E
This collection of lectures of four trending topics in Microbiology is offered in odd years.	

143029	**Special Topics in Genetics A**			
Subject: GENE	Catalog Nbr: 293A			
	2017 FALL	Primary	Brent Cochran	brent.cochran@tufts.edu
	2017 FALL	Primary	Alexander Poltorak	Alexander.Poltorak@tufts.edu
In-depth information is provided on selected topics. Students may also pursue guided individual study of an approved topic.				