



2017 - 2018 COURSE CATALOG

NOTE: Please refer to the Course Numbering List located in this path \\bri-net\Graduate_Students\Curriculum. The core courses are numbered between BIOSCI 500 and BIOSCI 600. The elective courses are numbered between BIOSCI 601 and BIOSCI 699. Each elective course is offered about once every two years. The Course Catalog and Journal Club names are listed in the ascending alphabetical order.

COURSE NAME	COURSE #	ORGANIZER	BRIEF DESCRIPTION	DAY of the WEEK	TIME	OCCURRENCE	ROOM	START	END
Advanced Cancer Biology	BIOSCI 620	Shiuan Chen	<p>The goal of the course is to provide our graduate students with basic and critical information on cancer. We hope to stimulate interest among our graduate students to develop translational research on cancer. Lectures 1-7 will provide important key aspects of cancer biology.</p> <p>Lectures 8-10 are to teach students about basic principles of chemoprevention, radiation therapy and chemotherapy.</p> <p>Lectures 11-16 will be taught by our clinical colleagues.</p> <p>The goal of the course is to provide our graduate students with basic and critical information on cancer. We hope to stimulate interest among our graduate students to develop translational research on cancer. Lectures 1-7 will provide important key aspects of cancer biology.</p> <p>Lectures 8-10 are to teach students about basic principles of chemoprevention, radiation therapy and chemotherapy.</p> <p>Lectures 11-16 will be taught by our clinical colleagues.</p>	W	5 - 7:30 PM	Weekly	Kaplan Clinical Research Building, 2nd floor conference room #2020	1/17/2018	5/2/2018

COURSE NAME	COURSE #	ORGANIZER	BRIEF DESCRIPTION	DAY of the WEEK	TIME	OCCURRENCE	ROOM	START	END
Advanced Cancer Metabolism	BIOSCI 665	Mei Kong; Debbie Thurmond	The objective of the course is to develop fundamental concepts of the complexity of the metabolism in cells and tissues; to understand the metabolic basis of cancer; to learn cutting-edge technologies used for cancer metabolism study; to further gain fundamental concepts of targeting metabolic pathways for cancer treatment through weekly lectures, presentations, and discussion sessions.	W	8:30 - 10:30 AM	Weekly	Beckman Center 3rd Floor Conference Room # 3118	8/30/2017	11/29/2017
Advanced DNA Repair, Epigenetics, and Cancer	BIOSCI 655	Timothy O'Connor	This is a course that will use the literature and discussions, along with written evaluations to develop ideas in DNA damage, repair, mutagenesis, and cancer. Topics covered will include DNA damage and mutation, DNA replication and resolution of stalled replication forks, direct reversal of damage, DNA excision repair, DNA double-strand break repair, DNA mismatch repair, DNA methylation, histone modifications, chromatin remodeling, posttranslational modification in DNA damage responses, metabolic regulation of epigenetics.	T , TH	3:30 - 5 PM	Weekly	Classroom #1207	9/5/2017	12/7/2017

COURSE NAME	COURSE #	ORGANIZER	BRIEF DESCRIPTION	DAY of the WEEK	TIME	OCCURRENCE	ROOM	START	END		
Advanced Epigenomics	BIOSCI 660	Dustin Schones	The objectives of the course are to provide insight into problem-oriented epigenomics research at the City of Hope and explain experimental and bioinformatics tools for epigenome mapping experiments. Problem-based research lectures will focus on one biological problem and how it is approached using methods of epigenomics. Problem-based research lectures will also explain specific laboratory methods utilized for epigenomics.	This course is not offered in the 2017 - 2018 Academic Calendar.							
Advanced Immunology	BIOSCI 625	Zuoming Sun	This course provides the important principles and key concepts in immunology including the induction of the innate and adaptive immune systems, the molecular events that control immune cell activation and the function of the immune system in infection and pathophysiological events. Many lectures will have a discussion of one to two research papers published in high impact journals within one-two years. The research papers will be given to the students in the week prior to the discussion. Each student gets to choose one paper to write the critique. Other than turning in the critique, all students need to be prepared to extensively participate in the discussion of the papers rather than just the paper they chose to write the critique.	TH	1 - 3 PM	Weekly	Classroom #1207	10/5/2017	2/15/2018		

COURSE NAME	COURSE #	ORGANIZER	BRIEF DESCRIPTION	DAY of the WEEK	TIME	OCCURRENCE	ROOM	START	END
Advanced RNA	BIOSCI 650	Ren-Jang Lin: Mark Boldin	Topics in the following areas are to be covered: RNA Splicing and the spliceosome, RNA-binding protein and alternative splicing, Regulatory circular RNAs, Histone mRNA biogenesis, RNA engineering - Crispr RNA, RNA modification and delivery, MicroRNA, Small non-coding RNA and epigenetics, Long non-coding RNA and epigenetics, and Extracellular RNA communication.						This course is not offered in the 2017 - 2018 Academic Calendar.
Advanced Stem Cell Biology	BIOSCI 640	Michael Barish	The course examines the theories, principles, models, techniques, potentials, applications, and limitations of stem cell biology and its role in modern medicine. It is taught by instructors from basic and clinical departments spanning multiple disciplines including reproductive biology, developmental biology, and different areas of medicine, surgery, radiology, and tissue engineering. Each pair of lectures focuses on an area of stem cell and developmental biology. The first will review the background of current knowledge and technology, point out the direction of state of the art research, and discuss potential problems and controversies in the field.						This course is not offered in the 2017 - 2018 Academic Calendar.

COURSE NAME	COURSE #	ORGANIZER	BRIEF DESCRIPTION	DAY of the WEEK	TIME	OCCURRENCE	ROOM	START	END		
Advanced Stem Cell Research and Medicine	BIOSCI 645	Michael Barish	This class that explores the impact of stem cell research on our society in terms of social, legal and ethical issues. The first part of the course provides information about the fundamentals of ethics and moral philosophy and models of ethical decision. The second part addresses what exactly constitutes stem cell research, the current status of stem cell research in the scientific world, and the history of the legal and political decisions that have resulted in our current climate and controversy regarding stem cell research. The main body of the course consists of students giving presentations on specific topics that relate to ethical dilemmas that face the stem cell field.	This course is not offered in the 2017 - 2018 Academic Calendar.							

COURSE NAME	COURSE #	ORGANIZER	BRIEF DESCRIPTION	DAY of the WEEK	TIME	OCCURRENCE	ROOM	START	END		
Advanced Topics in Comparative Medicine	BIOSCI 610	Richard Ermel	This course is an introduction to the laboratory mouse, one of the most widely used animal models for biomedical research. Course topics will explore the natural history and origin of the laboratory mouse, history and uses, breeding systems, nomenclature, normative biology, specific techniques (bio methodology, gnotobiotics, imaging, surgical), infectious agents and diseases, mouse genomics, mouse pathology, and mouse models (inbred, outbred, transgenic, knock-out and knock-in, immune-deficient, humanized) and their uses in the understanding and treatment of human diseases. In addition to weekly lecture presentations, each student will read, critique, and discuss selected literature and publications. Students interested in biomedical research using mouse models, medicine, and/or veterinary medicine will benefit from this course.	This course is not offered in the 2017 - 2018 Academic Calendar.							

COURSE NAME	COURSE #	ORGANIZER	BRIEF DESCRIPTION	DAY of the WEEK	TIME	OCCURRENCE	ROOM	START	END
Advanced Topics in Medicinal Chemistry: Drug Delivery	BIOSCI 680	Jacob Berlin	<p>This course will focus on strategies for improving the delivery of therapeutics molecules including small molecule drugs, oligonucleotides and peptides. The first several weeks will cover modern methods of measuring drug distribution and activity as well as challenges to achieving efficient targeted delivery of “naked” therapeutics. The remainder of the course will discuss various systems that have been developed for improved targeting of drug delivery. These systems will include: local injection, hydrogels, liposomes, polymeric nanoparticles, and inorganic nanoparticles.</p> <p>For each topic, there will be a 2:1 ratio of discussion/presentation sections to lectures. Generally, a lecture will introduce an aspect of the topic and then a class period will be devoted to discussing a written review of the topic. Each student will also nominate, by writing a short paragraph, a recent paper on the subject for discussion at the third class period. One paper will be selected and one student will serve as the advocate for the paper and one student will serve as the “critical reviewer”. At the conclusion of the course, each student will write a specific aims page on a novel research proposal of their choosing that addresses one of the challenges discussed in the class.</p>	This course is not offered in the 2017 - 2018 Academic Calendar.					

COURSE NAME	COURSE #	ORGANIZER	BRIEF DESCRIPTION	DAY of the WEEK	TIME	OCCURRENCE	ROOM	START	END		
Advanced Virology	BIOSCI 635	Jiing-Kuan Yee	Diseases induced by virus infection are a major cause of human morbidity and mortality. Infection by human immunodeficiency virus, West Nile virus or hepatitis C virus is prevalent and creates socio-economic burden. Emerging viruses such as influenza virus or Severe Acute Respiratory Syndrome corona virus are increasing threats to become pandemic. Current Topics in Virology is designed to address key areas at the forefront of virology. Topics to be covered will include: Emerging viral infections, Viral pandemics, Host responses to control of viral infections and Harnessing the power of viruses as therapeutic tools and Virus discovery. The course will be led by Virology faculty members and will consist primarily of discussion of key papers in the context of the covered topic. Students will be expected to critically and creatively analyze assigned papers and discuss each topic. Active participation by all is required. Grades will be determined by the quality of participation in discussions throughout the course and by a written commentary of a discussed paper at the end of the course.	This course is not offered in the 2017 - 2018 Academic Calendar.							

COURSE NAME	COURSE #	ORGANIZER	BRIEF DESCRIPTION	DAY of the WEEK	TIME	OCCURRENCE	ROOM	START	END
Biochemistry and Structural Biology	BIOSCI 510	Markus Kalkum	The Biochemistry and Structural Biology course is one of the core courses of our graduate curriculum and is taught by faculty with strong background and expertise in biochemical research. The course educates the graduate students on the basic biochemistry, modern biochemical techniques, and structural biology, thus preparing them for their thesis research work. The course covers fundamental concepts and advanced topics of biochemistry and chemical and structural biology. We will focus on molecular structure function relationships of life's essential biochemical processes as well as state-of-the-art imaging and spectroscopic methods that are used to determine accurate macromolecular structures and to gain detailed insight into biochemical mechanisms. The topics to be covered in this course include nucleic acids, amino acids, carbohydrates, lipids and membranes, protein biochemistry, enzyme kinetics, protein structure analysis, separations and biophysical methods of characterizing protein complexes. The special topics in the final part of this course are designed to demonstrate contemporary applications of biochemical research strategies.	M T W F	9 -10:30 AM	Weekly	Classroom #1207	9/8/2017	12/18/2017

COURSE NAME	COURSE #	ORGANIZER	BRIEF DESCRIPTION	DAY of the WEEK	TIME	OCCURRENCE	ROOM	START	END
Cell Biology	BIOSCI 530	John Shively	<ul style="list-style-type: none"> • To understand the systemic inter-relationships from the perspective of integrative cell biology, biochemistry, developmental biology and pathophysiology. • To gain familiarity with cutting edge techniques and research problems being studied in human cell biology and its relationship to diseases. • To integrate various aspects of cell biology as applicable to your research. • To develop an analytical approach to solve problems which involve critical thinking and application of concepts learned from selected subjects in this course. • To promote your ability to understand and critically evaluate current research publications and seminars. 	MONDAY through FRIDAY	9 -10:30 AM	Daily	Classroom #1207	1/8/2018	3/30/2018
Biostatistics and Computational Molecular Biology	BIOSCI 544	Nagarajan Vaidehi	The purpose of this course is to combine Biostatistics and Computational Molecular Biology to make one integrated course that covers the statistical methods relevant to Biological data analysis and also introduce the range of computational methods and their applications from sequence based methods to atomistic to tissue level modeling. Hands-on in silico laboratory sessions are an integral part of this course and should be used as often as needed.	M W F	10:45 AM - 12:15 PM	Weekly	Graduate School Laboratory	1/8/2018	3/30/2018

COURSE NAME	COURSE #	ORGANIZER	BRIEF DESCRIPTION	DAY of the WEEK	TIME	OCCURRENCE	ROOM	START	END
Concepts In Molecular Biology & Genetics Laboratory	BIOSCI 505	Glenn Manthey	This course will introduce basic genetic and molecular concepts including; genotype and phenotype, dominance and recessiveness, pleiotropism, complementation, epistasis and plasmid structure and manipulation. These core concepts will be presented in the context of investigating the genetic control of genome stability in the yeast model system, <i>Saccharomyces cerevisiae</i> . The benefit of utilizing a laboratory platform for instruction is it presents a tangible demonstration of the concepts that will be concurrently discussed in the Principles of Gene Expression (PoGE) lecture course.	M W F (1st and 2nd week) T TH (3rd week)		Weekly	Graduate School Lab	8/21/2017	9/7/2017

COURSE NAME	COURSE #	ORGANIZER	BRIEF DESCRIPTION	DAY of the WEEK	TIME	OCCURRENCE	ROOM	START	END
Fundamentals of Scientific Research (FSR)	BIOSCI 550	Timothy O'Connor; Jeremy Stark	<p>Teaching assistants are available on Thursdays between 4 and 5 pm.</p> <p>The capstone course for the core curriculum of a Ph.D. program in Molecular Biology should foster the further development of skills that contribute to the essential skill set for the professional scientist. The skills that beginners require the most opportunity to develop are: reading the scientific literature, writing, discussion, critique, and debate. Such a course should also permit students to leverage their prior training toward deepening their fund of scientific knowledge, and developing greater independence in evaluating the merits of different experimental approaches and bodies of work. This explicit transition from passive to active learning is an essential step in becoming an independent scientist. It is also required for the acquisition of the experimental design skills that are the foundation of a career in science.</p>	M TH	9 AM - 12:30 PM	Weekly	Classroom #1207	4/5/2018	6/14/2018

COURSE NAME	COURSE #	ORGANIZER	BRIEF DESCRIPTION	DAY of the WEEK	TIME	OCCURRENCE	ROOM	START	END
Principles of Gene Expression	BIOSCI 520	Ren-Jang Lin; Jeremy Stark	The purpose of the course is to prepare our students in several key areas that we believe a graduate level introductory course in molecular biology must accomplish. First, it must stimulate the acquisition and utilization of essential concepts and terms. Second, it must encourage the transition from passive learning from textbooks to active learning from the primary literature. Third, it should provide the students the opportunity to begin interpreting experimental results within the context of a body of work. Fourth, it must acquaint the students with the seminal experiments that form the foundation of molecular biology so they can observe the clearest possible application of the fundamental concepts that will be guiding their own experiments.	M W F	10:45AM - 1PM	Weekly	Classroom #1207	9/8/2017	12/19/2017

COURSE NAME	COURSE #	ORGANIZER	BRIEF DESCRIPTION	DAY of the WEEK	TIME	OCCURRENCE	ROOM	START	END
Responsible Conduct in Research	BIOSCI 500	Kate Sleeth	<p>To help students navigate the ethical decision making. Lectures, discussions and writing assignments are covered these key areas:</p> <ol style="list-style-type: none"> 1. Ethics and the Scientist presented by the research compliance officer (this covers collaborative research, research misconduct and the scientist as a responsible member of society) 2. Ethical use of animals in research provided by the director of the animal resources center 3. Ethical use of Humans in research given by the chairperson of the Institutional Review Board (IRB) and the IRB operations manager 4. Conflict of Interest (COI) presented by the campus COI manager 5. Mentoring given by one of the professors on campus (this includes mentor/mentee responsibilities) 6. Authorship and peer review provided by the scientific writing-editing manager and the director of the light microscopy core (this covers responsible authorship and publication as well as peer review) 7. Record keeping, ownership of data, and intellectual property presented by the manager of the campus Office of Technology Licensing (OTL) 8. Ethical Issues Surrounding Cloning, Transgenics, and Stem Cell Research provided by the Associate Dean of Administration and Student Development 	MON. through THURS.	<p>1st week: 3:30pm - 5pm</p> <p>2nd week: 9am - 10:30am</p>	Daily	Classroom #1207	8/14/2017	8/24/2017

COURSE NAME	COURSE #	ORGANIZER	BRIEF DESCRIPTION	DAY of the WEEK	TIME	OCCURRENCE	ROOM	START	END
Rigor and Reproducibility	BIOSCI 501	Kate Sleeth	<p>Rigor and reproducibility are critical for the advancement of science as researchers repeat and build upon others work. Over the past few years issues have arisen showing that pre-clinical studies cannot be replicated. While there are certainly variables which may affect researcher's abilities to reproduce work, all scientists are obligated to provide transparent information to allow others to verify the data. There are four areas which scientists should consider throughout their experimental design and reporting:</p> <ol style="list-style-type: none"> 1. The scientific premise of the proposed research. 2. Rigorous experimental design for robust and unbiased results 3. Consideration of relevant biological variables 4. Authentication of key biological and/or chemical resource 	TH	1 - 5 PM	A one-day course	Classroom #1207	4/5/2018	4/5/2018
Scientific Writing Course	BIOSCI 600A	Chris Gandhi	<p>The ability to write high-quality, professional manuscripts and grant proposals is a necessary skill for biomedical researchers. This course addresses advanced topics in scientific writing, with a focus on developing, organizing, and writing larger documents for logical consistency and readability. The course incorporates lectures, discussions, and "hands-on" writing assignments to help students understand:</p> <ul style="list-style-type: none"> • The importance of developing strong writing skills • How to improve word choice and syntax • How to construct logical paragraphs <p>The course provides students with the experience of writing and revising a short scientific document and having their work critiqued. The class format includes lectures together with in class assignments and discussions.</p>	T	10:45 AM - 12:15 PM	Weekly	Classroom #1207	2/6/2018	3/19/2018

COURSE NAME	COURSE #	ORGANIZER	BRIEF DESCRIPTION	DAY of the WEEK	TIME	OCCURRENCE	ROOM	START	END
Scientific Writing Course	BIOSCI 600B	Chris Gandhi	<p>The ability to write high-quality, professional manuscripts and grant proposals is a necessary skill for biomedical researchers. This course addresses advanced topics in scientific writing, with a focus on developing, organizing, and writing larger documents for logical consistency and readability. The course incorporates lectures, discussions, and “hands-on” writing assignments to help students understand:</p> <ul style="list-style-type: none"> • The importance of developing strong writing skills • The importance of preparation and organization in scientific writing • How to develop major sections of common scientific documents (e.g., manuscripts, grant proposals, and fellowships). <p>The course provides students with the experience of writing longer scientific documents and having their work critiqued. The class format includes lectures together with in-class assignments and discussions.</p>	T	3 - 4:30 PM	Weekly	Classroom #1207	8/1/2018	9/19/2018



2017 - 2018 JOURNAL CLUBS

JOURNAL CLUB	ORGANIZER	DAY of the WEEK	TIME	OCCURRENCE	ROOM	START	END
Comparative Medicine	Richard Ermel	Thurs.	1 pm - 3 pm	Once a month	Huntington Laboratory Room #1087	On going	On going
Current Science	Michael Barish	Tues.	11:30 am -12:30 pm	Every other week	Beckman Center Conference Room #4118	On going	On going
DNA Repair and Recombination	Jeremy Stark	Wed.	1:30 pm - 3 pm	Every other week	Fox North Building 1st floor Conference Room	On going	On going
Epigenetics and Chromatin Structure	Zhen Chen Dustin Schones	Tues.	11 am - noon	Every other week	Gonda Building 1st floor Confernce Room #1000	On going	On going
Immunology	Zuoming Sun	Tues.	2 pm - 3 pm	Every other week	Graduate School Classroom #1207	On going	On going
Protein Post-Translation Modification	Yuan Chen	Thurs.	noon - 1 pm	Every 3rd Thurs	Shapiro Conference Room	On going	On going
RNA	Mark Boldin	Fri.	1 pm - 2 pm	Every other week	Library Conference Room	On going	On going
Signaling and Regulation with Translational Focus	David Ann Mei Kong	Tues.	12:30 pm - 1:30 pm	Every other week	Beckman Center Conference Room #4118	On going	On going
Stem Cell	Theresa Ku	Mon.	noon - 1 pm	Every other week	Conference Room C	On going	On going
Structural and Chemical Biology	John Williams	Wed.	10 am - 11 am	Every 3rd Wed.	Flower Building Conference Room	On going	On going