Molecular and Cell Biology

Overview

The teaching and research activities of the Department of Molecular and Cell Biology (MCB) concern the molecular structures and processes of cellular life and their roles in the function, reproduction, and development of living organisms. This agenda covers a broad range of specialized disciplines such as biochemistry, microbiology, biophysics, molecular biology, genetics, genomics, bioinformatics, cell biology, developmental biology, immunology, tumor biology, and neurobiology. The types of living organisms from which the departmental faculty draws its working materials are as diverse as its disciplinary specializations, ranging from viruses and microbes to plants, roundworms, annelids, arthropods, and mollusks to fish, amphibia, and mammals. The faculty is organized into five divisions: Biochemistry, Biophysics, and Stuctural Biology; Cell and Developmental Biology; Genetics, Genomics and Development; Immunology and Pathogenesis; and Neurobiology.

Research Facilities

The Cancer Research Laboratory is a research institute on the Berkeley campus that carries on a research, teaching, and service program designed to foster interdepartmental participation in cancer research. Some of the Department of Molecular and Cell Biology faculty are also members of the Cancer Research Laboratory. The central research program represents a multidisciplinary approach to an understanding of the mechanism of neoplastic transformation using a variety of systems. Graduate student and postdoctoral research programs are supported in various areas of tumor biology, biochemistry, cell biology, endocrinology, genetics, immunology, molecular biology, and tumor virology. The Cancer Research Laboratory also operates five research facilities:

1. Flow Cytometry Facility for fluorescence activated cell sorting and analysis
2. Molecular Imaging Facility with two-photon microscopes for image analysis
3. Proteomic Mass Spectrometry Facility
4. Immunology DNA Microarray Consortium
5. Gene Targeting Facility for construction of transgenic and chimeric mice

Instrumentation in the facilities is operated by highly trained staff, and training is offered in methods and techniques associated with each facility. For more information, visit the CRL website (http://crl.berkeley.edu/?q=crl) .

The Functional Genomics Laboratory at Berkeley was established to allow Berkeley scientists to exploit profound technological advances in the field of genomics. These advances, which include the sequencing of entire genomes of selected model systems and the ability to survey genome-wide patterns of gene expression, now allow the dissection of biological processes at unprecedented levels of detail. In particular, this research facility provides the infrastructure, technologies, and computational resources for the performance of DNA microarray experiments, which allow the analysis of mRNA expression from tens of thousands of genes at a time. The Functional Genomics Laboratory currently possesses all the equipment necessary for conducting DNA microarray experiments including thermal cyclers, fluidics robots, microarray printing robots, laser scanning microscopes for microarray scanning, an Affymetrix workstation and scanner, and dedicated computers for data analysis and storage of informatics databases. For more information, visit their website (http://qb3.berkeley.edu/qb3/fgl) .

The Robert D. Ogg Electron Microscope Laboratory is an instructional and research unit of the College of Letters and Science. It houses equipment for transmission electron microscopy (TEM) and scanning electron microscopy (SEM). The staff is skilled not only in the operation and maintenance of instruments but in standard and most specialized techniques of sample preparation. Qualified undergraduates and graduate students, postdoctoral associates, faculty, and research staff in biological and physical sciences, once trained, may make arrangements for use of the instruments in research. Instruction is provided in the form of both classes and individual training. Training is provided as MCELLBI 481B and/or MCELLBI 481C. Registered students and faculty are not charged for training. Nominal charges are made for use of the laboratory for individual research work. With permission from the director, non-UC personnel can be accepted for training or laboratory use. Equipment can be used outside normal hours. The laboratory provides demonstrations of the electron microscope and preparation techniques for on-campus classes and can make special arrangements for tour groups. For more information, visit their website (http://em-lab.berkeley.edu/EML) .

Other specialized research facilities include those for x-ray crystallography, nuclear magnetic resonance studies, large-scale fermentation, tissue culture, and DNA sequencing.

The Berkeley Screening Center is a campus-wide facility enabling Berkeley researchers to perform high-throughput genetic and chemical screens. The BSC provides automation, including automated image-acquisition, microscopy, and high-throughput liquid handling technology; support for screen execution and analysis; bioinformatic tools; and siRNA libraries targeting Drosophila, mouse, and human genomes, kinomes, and ubiquitinomes.

Undergraduate Programs

Molecular and Cell Biology: Biochemistry and Molecular Biology (http://guide.berkeley.edu/archive/2014-15/undergraduate/degree-programs/molecular-cell-biology-biochemistry) : BA
Molecular and Cell Biology: Cell and Developmental Biology (http://guide.berkeley.edu/archive/2014-15/undergraduate/degree-programs/molecular-cell-biology-developmental) : BA
Molecular and Cell Biology: Genetics, Genomics, and Development (http://guide.berkeley.edu/archive/2014-15/undergraduate/degree-programs/molecular-cell-biology-genetics) : BA
Molecular and Cell Biology: Immunology and Pathogenesis (http://guide.berkeley.edu/archive/2014-15/undergraduate/degree-programs/molecular-cell-biology-immunology) : BA
Molecular and Cell Biology: Neurobiology (http://guide.berkeley.edu/archive/2014-15/undergraduate/degree-programs/molecular-cell-biology-neurobiology) : BA

Graduate Program

Molecular and Cell Biology (http://guide.berkeley.edu/archive/2014-15/graduate/degree-programs/molecular-cell-biology) : PhD

Molecular and Cell Biology

MCELLBI 15 Current Topics in the Biological Sciences 2 Units
Students in this course will critically examine modern methods of biological investigations and their social implications. Relevant literature will be used to present basic biological concepts that address the cultural, technological and health aspects of current topics in the biological sciences. Designing and evaluating scientific questions will be stressed.
Rules & Requirements

Prerequisites: Suitable for freshmen who plan to major in a biological science

Repeat rules: Course may be repeated for credit as topic varies. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam not required.

Instructor: Matsui

MCELLBI C31 Big Ideas in Cell Biology 3 Units
An introduction for students who do not intend to major in biology but who wish to satisfy their breadth requirement in Biological Sciences. Some major concepts of modern biology, ranging from the role of DNA and the way cells communicate, to interactions of cells and creatures with their environment, will be discussed without jargon and with attention to their relevance in contemporary life and culture.
Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Wilt

Also listed as: L & S C30X

MCELLBI 32 Introduction to Human Physiology 3 Units
A comprehensive introduction to human cell biology. The course will concentrate on basic mechanisms underlying human life processes, including cells and membranes; nerve and muscle function; cardiovascular, respiratory, renal, and gastrointestinal physiology; metabolism, endocrinology, and reproduction.
Rules & Requirements

Prerequisites: One year high school or college chemistry

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Summer: 8 weeks - 6 hours of lecture and 2 hours of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructors: Machen, Ball

MCELLBI 32L Introduction to Human Physiology Laboratory 2 Units
Experiments and demonstrations are designed to amplify and reinforce information presented in 32. Exercises include investigations into the structure and function of muscle, nerve, cardiovascular, renal, respiratory, endocrine, and blood systems.
Rules & Requirements

Prerequisites: 32 or may be taken concurrently

Hours & Format

Fall and/or spring: 15 weeks - 1 hour of lecture and 3 hours of laboratory per week

Summer:
6 weeks - 2 hours of lecture and 8 hours of laboratory per week
8 weeks - 2 hours of lecture and 6 hours of laboratory per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam not required.

Instructor: Ball

MCELLBI 41 Genetics and Society 3 Units
Basic communication of inheritance; gene mapping; gene expression and genetic disease in animals and humans; social inheritance of genetics.
Rules & Requirements

Prerequisites: Primarily for students not specializing in biology

Credit Restrictions: Students will receive no credit after taking Biology 1A, Biology 1B, or Letters and Science 18.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture and 1 hour of discussion per week

Summer:
6 weeks - 7.5 hours of lecture per week
8 weeks - 6 hours of lecture and 2 hours of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

MCELLBI C44 Biology for Voters 3 Units
This is a Discovery Course for non-Biology majors designed to introduce lower-division college students to biology through the lens of the contemporary problems facing people, the planet and the species of the planet. Modern genetic contributions will be presented on such issues as genetic engineering of plants and animals, the emergence of new pathogens, the role of genetic variation among individuals, and the extent to which DNA is and isn't destiny. Each week will close with the presentation and discussion of a defining biological challenge facing the world.
Objectives & Outcomes

Student Learning Outcomes: The learning objectives will be, at one end, to understand what an experiment is, how is it controlled and what does one need to know about an experiment to be able to rely upon any conclusion. That is the fundamental issue in all science, and is frequently overlooked in many media accounts of science. A second objective is to learn enough of the language of biology to be able to ask the kind of informed questions that we would want all elected representatives to pay attention to. A third objective is for students to cultivate confidence that through non-specialized information sources they can become informed consumers of contemporary scientific thought, and to develop those habits of intellect to think about evidence in a scientific manner. A fourth objective is for students to enjoy the abundance of high quality books, articles and multimedia that will enable a lifetime of discovery outside the structure of a college course.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructors: Rine, Urnov

Also listed as: L & S C30Y

MCELLBI 50 The Immune System and Disease 3 Units
Course will discuss how the immune system resolves, prevents, or causes disease. A general overview of the immune system will be covered in the first five weeks followed by five weeks discussing infectious diseases including anthrax, mad cow, herpes, malaria, tuberculosis, and HIV. In addition, other lectures will focus on current immunology topics including vaccines, autoimmunity, allergy, transplantation, and cancer.
Rules & Requirements

Prerequisites: High school chemistry or Chemistry 1A and high school biology or BIOLOGY 1A. BIOLOGY 1AL is not required

Credit Restrictions: Students will receive no credit for 50 after taking 102 or C100A/Chemistry C130.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Beatty

MCELLBI 55 Plagues and Pandemics 3 Units
Discussion of how infectious agents cause disease and impact society at large. We will examine historical and current examples of plagues and pandemics and consider the question of what we should do to ameliorate the impact of infectious disease in the future. The course is intended for non-majors and will begin by briefly providing necessary background in microbiology and immunology. The primary focus in each subsequent week, however, will be on discussing a particular infectious disease. The course will be broad in scope covering biological, historical, ethical and social implications of each disease.
Rules & Requirements

Credit Restrictions: Students will receive no credit for 55 after taking 100, C100A, 100B, 102, 103, C103, 150, Chemistry C130, Plant and Microbial Biology C103, and Public Health C102.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructors: Beatty, Vance

MCELLBI C61 Brain, Mind, and Behavior 3 Units
Introduction to human brain mechanisms of sensation, movement, perception, thinking, learning, memory, and emotion in terms of anatomy, physiology, and chemistry of the nervous system in health and disease. Intended for students in the humanities and social sciences and others not majoring in the biological sciences.
Rules & Requirements

Credit Restrictions: Students will receive no credit for Molecular and Cell Biology C61 after completing Molecular and Cell Biology 61, N61, W61, Psychology C61, Molecular and Cell Biology 104, C100A/ Chemistry C130, Molecular and Cell Biology 110, 130A, 136, 160, C160/ Neuroscience C160 or Integrative Biology 132. A deficient grade in Molecular and Cell Biology 61, N61, W61, or Psychology C61 may be removed by taking Molecular and Cell Biology C61/Psychology C61.<BR/ >

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Presti

Also listed as: PSYCH C61

MCELLBI W61 Brain, Mind, and Behavior 3 Units
This course deals with the structure and function of the human nervous system, with an emphasis on how brain physiology and chemistry are related to human behavior. This is a comprehensive introduction to the exciting field of contemporary neuroscience for students of all backgrounds and interests, including those from the humanities and social sciences, as well as physical and biological sciences. The Final Examination will be administered in a proctored setting. See Schedule of Classes for meeting information. This course is web-based.
Rules & Requirements

Credit Restrictions: Students will receive no credit for W61 after taking 61, C61, N61, or Letters and Science C30W. A deficient grade in 61, C61, N61, or Letters and Science C30W may be removed by taking W61.

Hours & Format

Summer:
6 weeks - 7 hours of web-based lecture and 2.5 hours of web-based discussion per week
8 weeks - 5.5-6 hours of web-based lecture and 1.5 hours of web-based discussion per week

Online: This is an online course.

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Presti

Formerly known as: N61

MCELLBI C62 Drugs and the Brain 3 Units
The history, chemical nature, botanical origins, and effects on the human brain and behavior of drugs such as stimulants, depressants, psychedelics, analgesics, antidepressants, antipsychotics, steroids, and other psychoactive substances of both natural and synthetic origin. The necessary biological, chemical, and psychological background material for understanding the content of this course will be contained within the course itself.
Rules & Requirements

Credit Restrictions: Students will receive no credit for C62 after taking 62, C100A/Chemistry C130, 102, 104, 110, 130A, 136, C160/ Neuroscience C160,
Integrative Biology 132, Letters and Science C30T, or Psychology C19 .

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Summer: 8 weeks - 4.5 hours of lecture per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam not required.

Instructor: Presti

Also listed as: L & S C30T/PSYCH C19

MCELLBI 63 Introduction to Functional Neuroanatomy 3 Units
This course emphasizes beginning anatomy of the brain and spinal cord to individuals interested in understanding the dynamics of motor and sensory functions in the human body. Students in the Departments of Education, Psychology, and Integrative Biology, as well as students interested in medicine and the life sciences, are especially encouraged to attend.
Hours & Format

Summer:
4 weeks - 12 hours of lecture per week
6 weeks - 7.5 hours of lecture per week
8 weeks - 6 hours of lecture per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Reyes

MCELLBI C64 Exploring the Brain: Introduction to Neuroscience 3 Units
This course will introduce lower division undergraduates to the fundamentals of neuroscience. The first part of the course covers basic membrane properties, synapses, action potentials, chemical and electrical synaptic interactions, receptor potentials, and receptor proteins. The second part of the course covers networks in invertebrates, memory and learning behavior, modulation, vertebrate brain and spinal cord, retina, visual cortex architecture, hierarchy, development, and higher cortical centers.
Rules & Requirements

Prerequisites: High school chemistry or Chemistry 1A; high school biology or BIOLOGY 1A. BIOLOGY 1AL is not required

Credit Restrictions: Students will receive no credit for Molecular and Cell Biology/Psychology C64 after taking Molecular and Cell Biology C61/Letters and Science C30W, 104, 100A/Chemistry C130, Molecular and Cell Biology 110, 130A, 136, 160, C160/Neuroscience C160, or Integrative Biology 132. Students may remove a deficient grade in Molecular and Cell Biology C64/Psychology C64 after Molecular and Cell Biology 64.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture and 1 hour of discussion per week

Summer: 8 weeks - 4 hours of lecture and 2 hours of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Caporale

Also listed as: PSYCH C64

MCELLBI 84B Sophomore Seminar 1 or 2 Units
Sophomore seminars are small interactive courses offered by faculty members in departments all across the campus. Sophomore seminars offer opportunity for close, regular intellectual contact between faculty members and students in the crucial second year. The topics vary from department to department and semester to semester. Enrollment limited to 15 sophomores.
Rules & Requirements

Prerequisites: At discretion of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 1-2 hours of seminar per week

Summer:
6 weeks - 4-6 hours of seminar per week
8 weeks - 3-4 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: The grading option will be decided by the instructor when the class is offered. Final exam required.

MCELLBI 90A Freshman Seminars: Biochemistry and Molecular Biology 1 Unit
The Berkeley Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Berkeley Seminars are offered in all campus departments, and topics vary from department to department and semester to semester.
Rules & Requirements

Prerequisites: Open to freshmen only

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 1 hour of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: The grading option will be decided by the instructor when the class is offered. Final exam required.

MCELLBI 90B Freshman Seminars: Cell and Developmental Biology 1 Unit
The Berkeley Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Berkeley Seminars are offered in all campus departments, and topics vary from department to department and semester to semester.
Rules & Requirements

Prerequisites: Open to freshmen only

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 1 hour of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: The grading option will be decided by the instructor when the class is offered. Final exam required.

MCELLBI 90C Freshman Seminars: Genetics and Development 1 Unit
The Berkeley Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Berkeley Seminars are offered in all campus departments, and topics vary from department to department and semester to semester.
Rules & Requirements

Prerequisites: Open to freshmen only

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 1 hour of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: The grading option will be decided by the instructor when the class is offered. Final exam required.

MCELLBI 90D Freshman Seminars: Immunology 1 Unit
The Berkeley Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Berkeley Seminars are offered in all campus departments, and topics vary from department to department and semester to semester.
Rules & Requirements

Prerequisites: Open to freshmen only

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 1 hour of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: The grading option will be decided by the instructor when the class is offered. Final exam required.

MCELLBI 90E Freshman Seminars: Neurobiology 1 Unit
The Berkeley Seminar Program has been designed to provide new students with the opportunity to explore an intellectual topic with a faculty member in a small-seminar setting. Berkeley Seminars are offered in all campus departments, and topics vary from department to department and semester to semester.
Rules & Requirements

Prerequisites: Open to freshmen only

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 1 hour of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: The grading option will be decided by the instructor when the class is offered. Final exam required.

MCELLBI 91D Immunology 2 - 4 Units
Freshman and sophomore seminars offer lower division students the opportunity to explore an intellectual topic with a faculty member and a group of peers in a small-seminar setting. These seminars are offered in all campus departments; topics vary from department to department and from semester to semester.
Rules & Requirements

Prerequisites: Open to freshmen and sophomores only

Hours & Format

Fall and/or spring: 15 weeks - 2-4 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: The grading option will be decided by the instructor when the class is offered. Final exam required.

MCELLBI C96 Studying the Biological Sciences 1 Unit
Freshmen will be introduced to the "culture" of the biological sciences, along with an in-depth orientation to the academic life and the culture of the university as they relate to majoring in biology. Students will learn concepts, skills, and information that they can use in their major course, and as future science professionals. Restricted to freshmen in the biology scholars program.
Rules & Requirements

Prerequisites: Consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Offered for pass/not pass grade only. Final exam required.

Instructor: Matsui

Also listed as: INTEGBI C96/PLANTBI C96

MCELLBI 98 Directed Group Study 1 - 4 Units
Lectures and small group discussions focusing on topics of interest, varying from semester to semester.
Rules & Requirements

Prerequisites: Freshmen and sophomores only

Repeat rules: Course may be repeated for credit. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 1-4 hours of directed group study per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Offered for pass/not pass grade only. Final exam not required.

MCELLBI 99 Supervised Independent Study 1 - 4 Units
Rules & Requirements

Prerequisites: 3.3 GPA and consent of instructor

Credit Restrictions: One unit of credit is given for every three hours of work in the lab per week to a maximum of 4 units.

Repeat rules: Course may be repeated for credit. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 1-4 hours of independent study per week

Summer:
8 weeks - 1.5-7.5 hours of independent study per week
10 weeks - 1.5-6 hours of independent study per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Offered for pass/not pass grade only. Final exam not required.

MCELLBI 100B Biochemistry: Pathways, Mechanisms, and Regulation 4 Units
We survey cellular metabolic pathways, with focus on the underlying chemistry, bioenergetics, and mechanisms. We discuss signaling in the context of a physical chemical understanding of diffusion, transport and molecular interactions. We will highlight the intertwining of signaling and dysregulation with metabolic disorders and cancer, and the production of renewable chemicals such as biofuels. The course is designed for majors in the biochemistry and molecular biology, genetics and development, or immunology emphases.
Rules & Requirements

Prerequisites: C100A/Chemistry C130

Credit Restrictions: Students will receive 3 units for Molecular and Cell Biology 100B after taking Molecular and Cell Biology 102 and no credit after taking Chemistry 135.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructors: Kuriyan, Savage, Alper

MCELLBI C100A Biophysical Chemistry: Physical Principles and the Molecules of Life 4 Units
Thermodynamic and kinetic concepts applied to understanding the chemistry and structure of biomolecules (proteins, DNA, and RNA). Molecular distributions, reaction kinetics, enzyme kinetics. Bioenergetics, energy transduction, and motor proteins. Electrochemical potential, membranes, and ion channels.
Rules & Requirements

Prerequisites: Chemistry 3A or 112A, Mathematics 1A, BIOLOGY 1A and 1AL; Chemistry 3B or 112B recommended

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Summer: 8 weeks - 5.5 hours of lecture and 2 hours of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Also listed as: CHEM C130

MCELLBI 102 Survey of the Principles of Biochemistry and Molecular Biology 4 Units
A comprehensive survey of the fundamentals of biological chemistry, including the properties of intermediary metabolites, the structure and function of biological macromolecules, the logic of metabolic pathways (both degradative and biosynthetic) and the molecular basis of genetics and gene expression.
Rules & Requirements

Prerequisites: BIOLOGY 1A, 1AL, and Chemistry 3B (or equivalent courses). Recommended: a course in physical chemistry

Credit Restrictions: Students will receive 2 units of credit for 102 after taking 100B or C100A/Chemistry C130. Students will receive no credit for 102 after taking 110 and any of 100B or C100A/Chemistry C130. No credit for 102 after taking Chemistry 135.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Summer:
8 weeks - 6 hours of lecture and 2 hours of discussion per week
10 weeks - 4 hours of lecture and 2 hours of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

MCELLBI C103 Bacterial Pathogenesis 3 Units
This course for upper division and graduate students will explore the molecular and cellular basis of microbial pathogenesis. The course will focus on model microbial systems which illustrate mechanisms of pathogenesis. Most of the emphasis will be on bacterial pathogens of mammals, but there will be some discussion of viral and protozoan pathogens. There will be an emphasis on experimental approaches. The course will also include some aspects of bacterial genetics and physiology, immune response to infection, and the cell biology of host-parasite interactions.
Rules & Requirements

Prerequisites: 100, 102 or consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Portnoy

Also listed as: PB HLTH C102/PLANTBI C103

MCELLBI 104 Genetics, Genomics, and Cell Biology 4 Units
This course will introduce students to key concepts in genetic analysis, eukaryotic cell biology, and state-of-the-art approaches in genomic medicine. Lectures will highlight basic knowledge of cellular processes with the basis for human diseases, particularly cancer. Prerequisite courses will have introduced students to the concepts of cells, the central dogma of molecular biology, and gene regulation. Emphasis in this course will be on eukaryotic cell processes, including cellular organization, dynamics, and signaling.
Rules & Requirements

Prerequisites: 102

Credit Restrictions: Students will receive 1 unit for Molecular and Cell Biology 104 after completing Molecular and Cell Biology 140 or C142/ Integrative Biology C163, or 3 units after completing Molecular and Cell Biology 110 or 130.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

MCELLBI 110 Molecular Biology: Macromolecular Synthesis and Cellular Function 4 Units
Molecular biology of prokaryotic and eukaryotic cells and their viruses. Mechanisms of DNA replication, transcription, translation. Structure of genes and chromosomes. Regulation of gene expression. Biochemical processes and principles in membrane structure and function, intracellular trafficking and subcellular compartmentation, cytoskeletal architecture, nucleocytoplasmic transport, signal transduction mechanisms, and cell cycle control.
Rules & Requirements

Prerequisites: C100A (may not be taken concurrently); Plan 1 Emphasis 1 (BMB) majors should take 100B prior to 110

Credit Restrictions: Students will receive 3 units of credit for 110 after taking 104.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

MCELLBI C110L General Biochemistry and Molecular Biology Laboratory 4 Units
Experimental techniques of biochemistry and molecular biology, designed to accompany the lectures in Molecular and Cell Biology 100B and 110.
Rules & Requirements

Prerequisites: 110 (may be taken concurrently)

Hours & Format

Fall and/or spring: 15 weeks - 2-2 hours of lecture and 6-8 hours of laboratory per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam not required.

Also listed as: CHEM C110L

MCELLBI C112 General Microbiology 4 Units
This course will explore the molecular bases for physiological and biochemical diversity among members of the two major domains, Bacteria and Archaea. The ecological significance and evolutionary origins of this diversity will be discussed. Molecular, genetic, and structure-function analyses of microbial cell cycles, adaptive responses, metabolic capability, and macromolecular syntheses will be emphasized.
Rules & Requirements

Prerequisites: BIOLOGY 1A and 1B

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Summer: 10 weeks - 4.5 hours of lecture and 1.5 hours of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Ryan

Also listed as: PLANTBI C112

MCELLBI C112L General Microbiology Laboratory 2 Units
Experimental techniques of microbiology designed to accompany the lecture in C112 and C148. The primary emphasis in the laboratory will be on the cultivation and physiological and genetic characterization of bacteria. Laboratory exercises will include the observation, enrichment, and isolation of bacteria from selected environments.
Rules & Requirements

Prerequisites: C112 (may be taken concurrently)

Hours & Format

Fall and/or spring: 15 weeks - 4 hours of laboratory and 1 hour of discussion per week

Summer: 10 weeks - 6 hours of laboratory and 1.5 hours of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam not required.

Instructors: Komeili, Taga

Also listed as: PLANTBI C112L

MCELLBI C114 Introduction to Comparative Virology 4 Units
This course will provide a comparative overview of virus life cycles and strategies viruses use to infect and replicate in hosts. We will discuss virus structure and classification and the molecular basis of viral reproduction, evolution, assembly, and virus-host interactions. Common features used during virus replication and host cellular responses to infection will be covered. Topics also included are common and emerging virus diseases, their control, and factors affecting their spread.
Rules & Requirements

Prerequisites: Introductory chemistry (Chemistry 1A or 3A-3B or equivalent) and introductory biology (BIOLOGY 1A, 1AL, and 1B or equivalent) and general biochemistry (Molecular and Cell Biology C100A or equivalent--preferably completed but may be taken concurrently)

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructors: Glaunsinger, Jackson

Also listed as: ESPM C138/PLANTBI C114

MCELLBI C116 Microbial Diversity 3 Units
This course for upper-division and graduate students will broadly survey myriad types of microbial organisms, both procaryote and eucaryote, using a phylogenetic framework to organize the concept of "biodiversity." Emphasis will be on the evolutionary development of the many biochemical themes, how they mold our biosphere, and the organisms that affect the global biochemistry. Molecular mechanisms that occur in different lineages will be compared and contrasted to illustrate fundamental biological strategies. Graduate students additionally should enroll in C216, Microbial Diversity Workshop.
Rules & Requirements

Prerequisites: Upper-division standing. C112 or consent of instructor and organic chemistry (may be taken concurrently)

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Coates

Formerly known as: 116

Also listed as: PLANTBI C116

MCELLBI 118 The Cancer Karyotype: What it is and What it Does 1 Unit
Mutational cancer theories do not explain why cancers: 1) have clonal individual karyotypes; 2) have polygenic transcriptomes and phenotypes; 3) have flexible karyotypes, which evolve progressive malignancy and drug resistance, but maintain autonomy and even immortality; and 4) Why carcinogens induce cancer only after conspicuously long latent periods of years to decades. To answer these questions, this course tests a new karyotypic theory, which postulates that cancers evolve much like new species.
Rules & Requirements

Prerequisites: 102. 104 recommended

Hours & Format

Fall and/or spring: 15 weeks - 1 hour of lecture per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam not required.

Instructor: Duesberg

MCELLBI 130A Cell and Systems Biology 4 Units
This course will provide a detailed discussion of a wide range of topics in cell biology emphasizing experimental approaches and key experiments that have provided important insights. The course is aimed at conveying an understanding of how cellular structure and function arise as a result of the properties of cellular macromolecules. An emphasis will be placed on the dynamic nature of cellular organization and will include a description of physical properties of cells (dimensions, concepts of free energy, diffusion, biophysical properties). Students will be introduced to quantitative aspects of cell biology and a view of cellular function that is based on integrating multiple pathways and modes of regulation (systems biology).
Rules & Requirements

Prerequisites: 102 and 104. Instructors may waive 104 prerequisite for non-Molecular and Cell Biology majors

Credit Restrictions: Students will receive no credit for 130A after taking 130.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

MCELLBI 132 Biology of Human Cancer 4 Units
The course is designed for students interested in learning about the molecular and cell biology of cancer and how this knowledge is being applied to the prevention, diagnosis and therapy of cancer. Topics covered include tumor pathology and epidemiology; tumor viruses and oncogenes; intracellular signaling; tumor suppressors; multi-step carcinogenesis and tumor progression; genetic instability in cancer; tumor-host interactions; invasion and metastasis; tumor immunology; cancer therapy.
Rules & Requirements

Prerequisites: 102 or 110 (may be taken concurrently); BIOLOGY 1A, 1AL, 1B

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Formerly known as: 135G

MCELLBI 133L Physiology and Cell Biology Laboratory 4 Units
Experimental analyses of central problems in cell biology and physiology using modern techniques, including DNA cloning and protein biochemistry, fluorescence microscopy of the cytoskeleton and organelles, DNA transfection and cell cycle analysis of cultured mammalian cells, RNA interference and drug treatments to analyze ion channel function in cell contractility and intracellular signaling, and somatosensation.
Rules & Requirements

Prerequisites: 104

Credit Restrictions: Students will receive no credit for 133L after taking 130L.

Hours & Format

Fall and/or spring: 15 weeks - 1 hour of lecture and 7 hours of laboratory per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam not required.

MCELLBI C134 Chromosome Biology/Cytogenetics 3 Units
Survey of behavior, structure, and function of chromosomes with emphasis on behavior in model organisms. Topics include mitosis, meiosis, chromosome aberrations, genome function, dosage compensation, transposons, repetitive DNA, and modern cytological imaging.
Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructors: Cande, Karpen

Also listed as: PLANTBI C134

MCELLBI 135A Topics in Cell and Developmental Biology: Molecular Endocrinology 3 Units
Molecular mechanisms by which hormones elicit specific responses and regulate gene expression; hormone-receptor interaction; synthesis, transport and targeting of hormones, growth factors and receptors.
Rules & Requirements

Prerequisites: Molecular and Cell Biology 102, BIOLOGY 1A, 1AL, 1B, Chemistry 3A-3B or equivalent, or consent of instructor

Credit Restrictions: Students will receive no credit for Molecular and Cell Biology 135A after taking Physiology 142.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Firestone

MCELLBI 136 Physiology 4 Units
Principles of mammalian (primarily human) physiology emphasizing physical, chemical, molecular and cellular bases of functional biology. The following topics will be covered: cellular and membrane ion and nonelectrolyte transport; cell and endocrine regulation; autonomic nervous system regulation; skeletal, smooth and cardiac muscle; cardiovascular physiology; respiration; renal physiology; gastrointestinal physiology. Discussion section led by Graduate Student Instructor will review material covered in lecture.
Rules & Requirements

Prerequisites: BIOLOGY 1A, 1AL, 1B, PHYSICS 8A. PHYSICS 8B recommended

Credit Restrictions: Students will receive no credit for 136 after Integrative Biology 132.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

MCELLBI 137 Computer Simulation in Biology 3 Units
Modeling and computer simulation of dynamic biological processes using special graphical interfaces requiring very little mathematical or computer experience. Models are drawn from the current literature to teach concepts and technique. The later part of the course is a workshop for student-selected individual projects. Computer work may be done at home or in the university laboratory.
Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam not required.

Instructors: Macey, Oster

Formerly known as: 136L

MCELLBI 140 General Genetics 4 Units
In-depth introduction to genetics, including mechanisms of inheritance; gene transmission and recombination; transposable DNA elements; gene structure, function, and regulation; and developmental genetics. Some exams may be given in the evening.
Rules & Requirements

Prerequisites: BIOLOGY 1A and 1AL,BIOLOGY 1A

Credit Restrictions: Students will receive 1 unit of credit for Molecular and Cell Biology 140 after completing either Molecular and Cell Biology 104, C142, or Integrative Biology C163.,Students will receive 1 unit of credit for Molecular and Cell Biology 140 after completing Molecular and Cell Biology 104, C142, or Integrative Biology C163.

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

MCELLBI 140 General Genetics 4 Units
In-depth introduction to genetics, including mechanisms of inheritance; gene transmission and recombination; transposable DNA elements; gene structure, function, and regulation; and developmental genetics. Some exams may be given in the evening.
Rules & Requirements

Prerequisites: BIOLOGY 1A and 1AL,BIOLOGY 1A

Credit Restrictions: Students will receive 1 unit of credit for Molecular and Cell Biology 140 after completing either Molecular and Cell Biology 104, C142, or Integrative Biology C163.,Students will receive 1 unit of credit for Molecular and Cell Biology 140 after completing Molecular and Cell Biology 104, C142, or Integrative Biology C163.

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

MCELLBI 140L Genetics Laboratory 4 Units
Experimental techniques in classical and molecular genetics.
Rules & Requirements

Prerequisites: Molecular and Cell Biology 104 or 140. May be taken concurrently

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture and 6 hours of laboratory per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam not required.

MCELLBI 141 Developmental Biology 4 Units
An introduction to principles and processes of embryonic and post-embryonic development, stressing mechanisms of cell and tissue interactions, morphogenesis and regulation of gene expression.
Rules & Requirements

Prerequisites: 102 or C100A; BIOLOGY 1A, 1AL, and 1B; 110 or 130 recommended

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Formerly known as: 131

MCELLBI 143 Evolution of Genomes, Cells, and Development 3 Units
This course is intended for upper-division undergraduates seeking an interactive course based on modern concepts in evolution and comparative genomics. The course will emphasize the contribution of molecular evolution to a series of seminal events in life's history: origin of life; origin of cells; origin of eukaryotes; origin of multicellularity; evolution of animal development; human origins.
Rules & Requirements

Prerequisites: BIOLOGY 1A-1B and Molecular and Cell Biology C100A or 102; 104 or 140 recommended

Credit Restrictions: Student will receive no credit for 143 after taking Integrative Biology 163.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam not required.

Instructors: King, Levine, Patel

MCELLBI C148 Microbial Genomics and Genetics 4 Units
Course emphasizes bacterial and archaeal genetics and comparative genomics. Genetics and genomic methods used to dissect metabolic and development processes in bacteria, archaea, and selected microbial eukaryotes. Genetic mechanisms integrated with genomic information to address integration and diversity of microbial processes. Introduction to the use of computational tools for a comparative analysis of microbial genomes and determining relationships among bacteria, archaea, and microbial eukaryotes.
Rules & Requirements

Prerequisites: Molecular and Cell Biology C100A/Chemistry C130 or Molecular and Cell Biology 102

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructors: Brenner, Glass

Formerly known as: Plant and Microbial Biology 118

Also listed as: PLANTBI C148

MCELLBI 149 The Human Genome 3 Units
This is an upper division course for majors in MCB with an interest in an in-depth exploration of the forces that shape the human genome and the human population, as well as the ways that human genetic information can be used in medicine, ancestry and forensics. The course will combine lectures and discussion of research papers.
Rules & Requirements

Prerequisites: MCB 140, MCB 104 or equivalent

Credit Restrictions: Students will receive 2 units for Molecular and Cell Biology 149 after taking Integrative Biology 164.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Alternative to final exam.

Instructors: Eisen, Meyer, Rokhsar

MCELLBI 150 Molecular Immunology 4 Units
Fundamentals of immunology with emphasis on biochemical and molecular approaches to study of the immune system and its application in medicine and biotechnology. Topics covered include description of the immune system, antibody and T-cell receptor structure and function, genes of the immunoglobulin superfamily, cells and molecular mediators that regulate the immune response, allergy, autoimmunity, immunodeficiency, tissue and organ transplants, and tumor immunology.
Rules & Requirements

Prerequisites: C100A/Chemistry C130, or 102

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

MCELLBI 150L Immunology Laboratory 4 Units
Experimental techniques in mammalian molecular biology and cellular immunology. Molecular techniques covered include PCR and recombinant DNA procedures such as gene cloning, gene transfer, DNA sequencing, Southern blot, and restriction mapping. Immunological techniques covered include cell culture and monoclonal antibody production, flow cytometry, ELISA, immunoprecipitation, and western blot.
Rules & Requirements

Prerequisites: Molecular and Cell Biology 150 (may be taken concurrently); consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 8 hours of laboratory and 1 hour of lecture per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam not required.

Formerly known as: Microbiology 103L

MCELLBI 160 Cellular and Molecular Neurobiology 4 Units
Comprehensive introductory survey of cellular and molecular neuroscience, including cellular neurophysiology, ion channel function, synaptic function and plasticity, sensory transduction, and brain development. Includes introduction to molecular basis of neurological disease. Analysis from the level of molecules to cells to simple circuits.
Rules & Requirements

Prerequisites: BIOLOGY 1A and 1AL. Prerequisite or co-requisite: PHYSICS 8B

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Formerly known as: Molecular and Cell Biology C160/Neuroscience C160

MCELLBI 160L Neurobiology Laboratory 4 Units
Experimental analyses of properties and interactions of nerve cells and systems, illustrating principal features and current methods. Techniques employed include computer simulation of neuron properties, electrophysiological recording and stimulation of nerves and cells, digitally enhanced video imaging of outgrowth, fluorescence immunocytochemistry, analysis of sensory: CNS mapping, human-evoked potential recording, sensory psychophysics.
Rules & Requirements

Prerequisites: BIOLOGY 1A, 1AL; PHYSICS 8A-8B, Molecular and Cell Biology C100A/Chemistry C130 or 102; Molecular and Cell Biology 160; or equivalent

Hours & Format

Fall and/or spring: 15 weeks - 1 hour of lecture and 8 hours of laboratory per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

MCELLBI 161 Circuit, Systems and Behavioral Neuroscience 4 Units
Comprehensive survey of circuits and systems neuroscience, including sensory and motor systems, learning and memory, neuromodulatory systems and brain state and higher functions.
Biological and computational principles of neural circuit function. Analysis from the level of small circuits to behavior.
Rules & Requirements

Prerequisites: Molecular and Cell Biology 160

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

MCELLBI 163 Mammalian Neuroanatomy 4 Units
Development, structure (gross and microscopic), and functional relationships of the mammalian nervous system.
Rules & Requirements

Prerequisites: BIOLOGY 1A. BIOLOGY 1AL is not required

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 2 hours of laboratory per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

MCELLBI 165 Neurobiology of Disease 3 Units
The molecular, cellular, and neural circuit basis of neurological disease. Includes neurochemistry and reward systems, neural development and its disorders, addiction, neurodegenerative and neuropsychiatric disorders. Students will read and discuss primary papers from the research literature.
Rules & Requirements

Prerequisites: Molecular and Cell Biology 160

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructor: Caporale

MCELLBI 166 Biophysical Neurobiology 3 Units
Electrochemistry and ion transport phenomena, equivalent circuits, excitability, action potentials, voltage clamp and the Hodgkin-Huxley model. Biophysical properties of ion channels. Statistical and electrophysiological models of synaptic transmission, Quantitative models for dendritic structure and neuronal morphogenesis. Sensory transduction, cellular networks as computational devices, information processing and transfer.
Objectives & Outcomes

Course Objectives: 1) Derive equations for Nernst and GHK membrane potential from fundamental physics concepts.
2) Describe the experiments and theory underlying the Hodgkin-Huxley model.
3) Understand biophysical properties of gating particles called ion channels.
4) Apply and solve equivalent circuit models to describe resting and excitable cells, synaptic transmission and sensory transduction.
5) Use Poisson, Gaussian and binomial distributions to analyze the gating of ion channels, synaptic transmission, and absolute sensitivity of vision.
6) Model dendritic structure based on quantitative descriptors of shape and energy minimization theory.
7) Explain experiments and models of sensory transduction, neuronal integration and lateral inhibition.

Rules & Requirements

Prerequisites: BIOLOGY 1A, 1AL, PHYSICS 8A-8B, Chemistry 1A, 3A/3AL-3B, or consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam required.

Instructors: Elul, Isacoff, Miller

MCELLBI 180 Undergraduate Teaching of Biology 1A Laboratory 1 or 2 Units
Course consists of a weekly three-hour training session that focuses on laboratory techniques, instructional aids, and problem solving, plus an additional three hour weekly laboratory where the UGSI is required to assist a GSI in the instruction of laboratory (answering questions, providing demonstrations, etc.).
Rules & Requirements

Prerequisites: BIOLOGY 1A, 1AL with a minimum grade of B. Appointment as a UGSI in biology by consent of instructor. Restricted to undergraduate students

Repeat rules: Course may be repeated for a maximum of 4 units.Course may be repeated for a maximum of 4 units.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of session per week

Summer: 8 weeks - 3 hours of session per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Offered for pass/not pass grade only. Final exam not required.

MCELLBI 180C Undergraduate Teaching of Molecular and Cell Biology 32 Laboratory 1 - 2 Units
Course consists of a weekly three-hour training session that focuses on laboratory techniques, instructional aids, and problem solving, plus an additional three-hour weekly laboratory where the UGSI is required to assist a GSI in the instruction of laboratory (answering questions, providing demonstrations, etc.). Students will be graded on lecture and laboratory attendance and preparation of one quiz.
Rules & Requirements

Prerequisites: 32, 136, or Integrative Biology 132 and Molecular and Cell Biology 32L or Integrative Biology 132L laboratory courses in physiology with minimum grades of B. Appointment as a UGSI in physiology by consent of instructor

Repeat rules: Course may be repeated for a maximum of 4 units.Course may be repeated for a maximum of 4 units.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of session per week

Summer:
6 weeks - 8 hours of session per week
8 weeks - 6 hours of session per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Offered for pass/not pass grade only. Final exam required.

MCELLBI H196A Honors Research 1 - 4 Units
Individual research and thesis preparation under the supervision of a faculty member. Acceptance to the Molecular and Cell Biology Honors Program is required. Contact the MCB Undergraduate Affairs Office, 3060 Valley Life Sciences Building, for application and details. Honor students must complete at least two semesters of research, taking a minimum of 4 units and a maximum of 8 units of H196A-196B. If desired, one semester of 199 can be used to replace H196A.
Rules & Requirements

Prerequisites: Senior honors status and consent of instructor

Repeat rules: Course may be repeated for a maximum of 4 units.

Hours & Format

Fall and/or spring: 15 weeks - 1-4 hours of independent study per week

Summer: 8 weeks - 1.5-7.5 hours of independent study per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Offered for pass/not pass grade only. Final exam not required.

MCELLBI H196B Honors Research 1 - 4 Units
Individual research and completion of thesis under the supervision of a faculty member. This course satisfies the thesis requirement for the Molecular and Cell Biology Department Honors Program. Contact the MCB Undergraduate Affairs Office, 3060 Valley Life Sciences Building, for program details and an application. Honor students must complete at least two semesters of research, taking a minimum of 4 units and a maximum of 8 units of H196A-196B. One semester of H196B is required.
Rules & Requirements

Prerequisites: Senior honors status and consent of instructor

Repeat rules: Course may be repeated for a maximum of 4 units.

Hours & Format

Fall and/or spring: 15 weeks - 1-4 hours of independent study per week

Summer: 8 weeks - 1.5-7.5 hours of independent study per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Letter grade. Final exam not required.

MCELLBI 197 Supervised Internship 1 Unit
Supervised experience relevant to specific topics of biology in off-campus organizations. Written report and evaluation from internship supervisor required.
Rules & Requirements

Prerequisites: Consent of MCB Faculty, restricted to MCB majors and prospective majors only. Certification from supervisor that credit is required

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of internship per week

Summer: 8 weeks - 6 hours of internship per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Offered for pass/not pass grade only. Final exam not required.

MCELLBI 198 Directed Group Study 1 - 4 Units
Lectures and small group discussions focusing on topics of interest, varying from semester to semester.
Rules & Requirements

Prerequisites: Upper division standing

Repeat rules: Course may be repeated for credit. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 1-4 hours of directed group study per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Offered for pass/not pass grade only. Final exam not required.

MCELLBI 199 Supervised Independent Study and Research 1 - 4 Units
Enrollment restrictions apply; see the Introduction to Courses and Curricula section of this catalog.
Rules & Requirements

Prerequisites: Consent of instructor

Repeat rules: Course may be repeated for credit. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 1-4 hours of independent study per week

Summer:
6 weeks - 1-4 hours of independent study per week
8 weeks - 1-4 hours of independent study per week
10 weeks - 1-4 hours of independent study per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Undergraduate

Grading/Final exam status: Offered for pass/not pass grade only. Final exam not required.

MCELLBI 200A Fundamentals of Molecular and Cell Biology 3 Units
The goal of this course is to provide graduate-level instruction on molecular and cellular biosciences from a highly-integrated systems perspective, rather than using a more classic, techniques-oriented format. A collection of approaches, and a focus on critical thinking and problem solving, will be used to show how fundamental, highly-significant biological problems are "cracked open." Reading will be assigned from a mix of classic and current peer-reviewed papers selected by the instructors.
Rules & Requirements

Prerequisites: 200A and 200B must be taken concurrently. Combined course required and restricted to all MCB first-year graduate students

Hours & Format

Fall and/or spring: 15 weeks - 6 hours of lecture per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Letter grade.

Instructors: Marqusee, Rio, Drubin, Rine, Vance, Feller

MCELLBI 200B Fundamentals of Molecular and Cell Biology 3 Units
The goal of this course is to provide graduate-level instruction on molecular and cellular biosciences from a highly-integrated systems perspective, rather than using a more classic, techniques-oriented format. A collection of approaches, and a focus on critical thinking and problem solving, will be used to show how fundamental, highly-significant biological problems are "cracked open." Reading will be assigned from a mix of classic and current peer-reviewed papers selected by the instructors.
Rules & Requirements

Prerequisites: Must be taken concurrently. Combined course required for all MCB first-year graduate students

Hours & Format

Fall and/or spring: 15 weeks - 6 hours of lecture per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Letter grade.

Instructors: Marqusee, Rio, Drubin, Rine, Vance, Feller

MCELLBI 206 Physical Biochemistry 3 Units
Application of modern physical concepts and experimental methods to the analysis of the structure, function, and interaction of large molecules of biological interest.
Rules & Requirements

Prerequisites: Year courses in organic chemistry and physical chemistry. 100 recommended

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Letter grade.

MCELLBI 210 Macromolecular Reactions and the Cell 4 Units
General course for first-year graduate students. Covers our current understanding of, methodological approaches for analyzing, and recent advances in the function of cellular macromolecules and macromolecular complexes in DNA replication, recombination, transposition and repair, gene expression and its regulation, mRNA splicing, genome organization, noncoding RNAs, signal transduction, protein synthesis, folding and degradation, growth control, and other life processes.
Rules & Requirements

Prerequisites: 110 or equivalent. Admission to the course requires formal consent of instructors, except for MCB graduate students and graduate students in the laboratories of MCB faculty

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Letter grade.

Formerly known as: 200

MCELLBI C212A Chemical Biology I - Structure, Synthesis and Function of Biomolecules 1 Unit
This course will present the structure of proteins, nucleic acids, and oligosaccharides from the perspective of organic chemistry. Modern methods for the synthesis and purification of these molecules will also be presented.
Hours & Format

Fall and/or spring: 5 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Letter grade.

Also listed as: CHEM C271A

MCELLBI C212B Chemical Biology II - Enzyme Reaction Mechanisms 1 Unit
This course will focus on the principles of enzyme catalysis. The course will begin with an introduction of the general concepts of enzyme catalysis which will be followed by detailed examples that will examine the chemistry behind the reactions and the three-dimensional structures that carry out the transformations.
Hours & Format

Fall and/or spring: 5 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Letter grade.

Also listed as: CHEM C271B

MCELLBI C212C Chemical Biology III - Contemporary Topics in Chemical Biology 1 Unit
This course will build on the principles discussed in Chemical Biology I and II. The focus will consist of case studies where rigorous chemical approaches have been brought to bear on biological questions. Potential subject areas will include signal transduction, photosynthesis, immunology, virology, and cancer. For each topic, the appropriate bioanalytical techniques will be emphasized.
Hours & Format

Fall and/or spring: 5 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Letter grade.

Also listed as: CHEM C271C

MCELLBI C214 Protein Chemistry, Enzymology, and Bio-organic Chemistry 2 Units
The topics covered will be chosen from the following: protein structure; protein-protein interactions; enzyme kinetics and mechanism; enzyme design. Intended for graduate students in chemistry, biochemistry, and molecular and cell biology.
Rules & Requirements

Prerequisites: Graduate standing or consent of instructor

Hours & Format

Fall and/or spring:
10 weeks - 3 hours of lecture per week
15 weeks - 2 hours of lecture per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Letter grade.

Also listed as: CHEM C230

MCELLBI C216 Microbial Diversity Workshop 1 Unit
This workshop for graduate students will parallel C116, Microbial Diversity, which should be taken concurrently. Emphasis in the workshop will be on review of research literature and formulation of paper pertinent to research in microbial diversity.
Rules & Requirements

Prerequisites: Graduate standing; C112 or consent of instructor and organic chemistry (may be taken concurrently)

Hours & Format

Fall and/or spring: 15 weeks - 1 hour of workshop and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Letter grade.

Instructor: Coates

Also listed as: PLANTBI C216

MCELLBI 218C Research Review in Biochemistry and Molecular Biology: Synthetic Biology and Cellular Enzymology 2 Units
Synthetic biology, metabolic engineering, systems biology, enzyme mechanism, and gene discovery.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor or consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Chang

MCELLBI 218D Research Review in Biochemistry and Molecular Biology: Gene Regulation at the RNA Level 2 Units
RNA elements involved in alternative splicing and other co-transcriptional mechanisms of regulation. Specific areas of interest include riboswitches and other structured RNA elements involved in gene regulation.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor or consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Hammond

MCELLBI 218E Research Review in Biochemistry and Molecular Biology: Viruses as Models for Eukaryote Gene Expression and Replication 2 Units
Recent developments in eukaryote viral and cellular regulation. New concepts in transcription and RNA replication, with particular emphasis on virus-cell interactions.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor or consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Botchan

MCELLBI 218F Research Review in Biochemistry and Molecular Biology: Energy-dependent Proteases and Molecular Machines 2 Units
Our goals are to decipher the fundamental principles that govern substrate engagement, de-ubiquitylation, unfolding, and translocation by the proteasome.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor or consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Martin

MCELLBI 218G Research Review in Biochemistry and Molecular Biology: Myxobacterial Development 2 Units
Review of current literature and discussion of original research.
Rules & Requirements

Prerequisites: Consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Zusman

MCELLBI 218H Research Review in Biochemistry and Molecular Biology: Protein Synthesis in Bacteria and Mammals 2 Units
The mechanism of protein synthesis in bacteria and human cells. Specific areas of interest include the structure and function of the ribosome and the regulation of protein synthesis.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Cate

MCELLBI 218I Research Review in Biochemistry and Molecular Biology: Chemical Biology and Inorganic Chemistry 2 Units
Research and literature topics in chemical biology and inorganic chemistry relevant to human health and disease and energy science will be discussed.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Chris Chang

MCELLBI 218J Research Review in Biochemistry and Molecular Biology: Advanced 20th Century Perspectives on Cancer Cell Genetics 2 Units
Transduction of cellular sequences and genetic regulation of transformation by oncogenic retroviruses as models for natural carcinogenesis, including a critical review of the current research.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Duesberg

MCELLBI 218O Research Review in Biochemistry and Molecular Biology: Chemical Biology and Enzymology 2 Units
Topics at the interface of chemistry and biology with a particular focus on mechanisms of enzyme catalysis.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Marletta

MCELLBI 218P Research Review in Biochemistry and Molecular Biology: Chemical Biology and Neuroscience 2 Units
Molecular approaches to designing and deploying tools for voltage imaging and brain mapping.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructors: Miller, Evan

MCELLBI 218Q Research Review in Biochemistry and Molecular Biology: Single Molecular Imaging of Macromolecular Enzymes 2 Units
Yildiz laboratory combines molecular biology and single molecule biophysical techniques to understand mechanisms that underlie cellular organization and motility. Specific focuses of the lab are to dissect 1) the mechanism of cytoplasmic dynein motility, 2) the regulation of intraflagellar transport, and 3) the protection and maintenance of mammalian telomeres.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Yildiz

MCELLBI 218R Research Review in Biochemistry and Molecular Biology: The Protein Folding Problem 2 Units
Protein structure, stability, design, and the pathway of protein folding.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Marqusee

MCELLBI 218S Research Review in Biochemistry and Molecular Biology: Cryo-Electron Microscopy of Macromolecules 2 Units
Structure-function studies of the cytoskeleton and large molecular machines by cryo-electron microscopy and image reconstruction.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Nogales

MCELLBI 218V Research Review in Biochemistry and Molecular Biology: Biophysics of Macromolecule Transport Across Membranes 2 Units
Review of current literature and discussion of original research.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Krantz

MCELLBI 218W Research Review in Biochemistry and Molecular Biology: Enzyme Catalysis 2 Units
Fundamental aspects of enzyme catalysis, as probed by kinetic, spectroscopic, and molecular biological approaches.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Klinman

MCELLBI 218X Research Review in Biochemistry and Molecular Biology: Chemical Reactions of Metabolism 2 Units
Define how metabolic reactions function in the context of the cellular system in order to elucidate the so-called design principles of metabolic function.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Savage

MCELLBI 218Z Molecular and Cellular Mechanisms of Nutrient Sensing 2 Units
In our laboratory, we study the molecular mechanisms of nutrient sensing and growth control. Specific areas of interest include the mTOR pathway, energy sensing, lysosomal biology and translational control.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Zoncu

MCELLBI 219A Structural Membrane Biology 2 Units
The mechanisms by which protein complexes use their structures to bud, bend, and sever membranes will be covered in research reports and reviews of the current literature and in discussion of current experiments in the field.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Hurley

MCELLBI 219B Regulation of Translation 2 Units
Understanding the molecular basis and physiological role of translational regulation in gene expression with an emphasis on global profiling and functional genomics.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Ingolia

MCELLBI 219F Research Review in Biochemistry and Molecular Biology: Eukaryotic Gene Expression 2 Units
Protein-DNA interactions and the control of gene expression in eukaryotes.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Tjian

MCELLBI 219G Virus-Host Interactions 2 Units
Understanding the creative strategies viruses use to manipulate gene expression in host cells, with a focus on RNA-based regulation of gene expression.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Glaunsinger

MCELLBI 219H Research Review in Biochemistry and Molecular Biology: Molecular and Cell Biology of <Listeria monocytogenes> Pathogenesis 2 Units
Discussion of recent research on the genetics, cell biology, and immunology of the model facultative intracellular bacterical pathogen,
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Portnoy

MCELLBI 219J Research Review in Biochemistry and Molecular Biology: Structure and Function of RNA 2 Units
RNA structure, folding, and function. Specific topics include ribozyme mechanisms, RNA-mediated translation initiation, and protein targeting and secretion.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Doudna

MCELLBI 219Q Research Review in Biochemistry and Molecular Biology: Structural Biology of Molecular Machines 2 Units
Crystallographic and biochemical studies of protein machines, focused on protein-nucleic acid interactions; analysis of chemomechanical function within multiprotein complexes will be covered in research reports and reviews of the current literature and in discussion of current experiments in the field.
Rules & Requirements

Prerequisites: Consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Berger

MCELLBI 219S Research Review in Biochemistry and Molecular Biology: Structural Biology of Signaling and Replication 2 Units
Mechanisms and structure in DNA replication and eukaryotic cell signaling.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Kuriyan

MCELLBI 219T Research Review in Biochemistry and Molecular Biology: Signal Transduction Mechanisms 2 Units
Discussion of recent research on various aspects of signal transduction mechanisms in eukaryotic cells, including G protein-coupled receptors, protein kinase cascades, synthesis and mobilization of lipid mediators, calcium sensing and response pathways, activation and inhibition of gene expression, and the biochemical basis of signal desensitization and physiological adaptation, with strong emphasis on genetic and molecular analysis of these systems, especially in the yeast
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Thorner

MCELLBI 219U Research Review in Biochemistry and Molecular Biology: Single Molecule Biophysics 2 Units
Methods of single molecule manipulation and visualization that are used to characterize the structure and mechanochemical properties of translocating DNA binding protein such as RNA polymerase and to investigate the mechanical denaturation of single protein molecules will be covered in research reports and reviews of the current literature and in discussion of current experiments in the field.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Bustamante

MCELLBI 219X Research Review in Biochemistry and Molecular Biology: Cell Surface Glycoconjugate Interactions 2 Units
Investigations of cell surface glycoproteins as mediators of cell-cell interactions. Development of new methods for engineering cell surface structures.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Bertozzi

MCELLBI 219Y Research Review in Biochemistry and Molecular Biology: Regulation of HIV Gene Expression 2 Units
Regulation of HIV gene expression by viral proteins and cellular cofactors will be covered in research reports and reviews of the current literature and in discussion of current experiments in the field.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Zhou

MCELLBI 219Z Research Review in Biochemistry and Molecular Biology: Telomere Synthesis and Dynamics 2 Units
Emphasizes a study of the replication of eukaryotic telomeric DNA. Special focus on techniques in protein biochemistry and molecular biology.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Collins

MCELLBI 230 Advanced Cell Biology 4 Units
Advanced treatment of topics in cell biology.
Rules & Requirements

Prerequisites: 130. Formal consent of instructors required, except for MCB graduate students and graduate students in the laboratories of MCB faculty

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Letter grade.

MCELLBI 231 Advanced Developmental and Stem Cell Biology 4 Units
Principles of animal development will be set forth from the classical and recent experimental analysis of induction, localization, patterning mutants, axis formation, regional gene expression, and cell interactions. Early development of selected vertebrates and invertebrates will be examined, and emerging topics in microRNA and stem cell biology will be highlighted. A weekly discussion section with readings from the research literature is required.
Rules & Requirements

Prerequisites: Previous course in development (131 or equivalent) or consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1-2 hours of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Letter grade.

MCELLBI 236 Advanced Mammalian Physiology 5 Units
Principles of mammalian (primarily human) physiology emphasizing physical, chemical, molecular, and cellular bases of functional biology. The following topics will be covered: cellular and membrane ion and nonelectrolyte transport; cell and endocrine regulation; autonomic nervous system regulation; skeletal, smooth, and cardiac muscle; cardiovascular physiology; respiration; renal physiology; gastrointestinal physiology. Discussion section will study advanced physiological topics, including: presentations by the faculty; problem sets; discussion of the primary literature and of reviews; two presentations by each student on topics in current physiological research.
Rules & Requirements

Prerequisites: Consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 2 hours of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Letter grade.

MCELLBI C237 Stem Cells and Directed Organogenesis 3 Units
This course will provide an overview of basic and applied embryonic stem cell (ESC) biology. Topics will include early embryonic development, ESC laboratory methods, biomaterials for directed differentiation and other stem cell manipulations, and clinical uses of stem cells.
Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Letter grade.

Instructor: Conboy

Also listed as: BIO ENG C218

MCELLBI 239B Research Review in Cell and Developmental Biology: Regulation of the Cell Cycle 2 Units
Review of current literature and discussion of original research.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Rape

MCELLBI 239BB Research Review in Cell and Developmental Biology: Mechanics and Dynamics of Cell Movements 2 Units
Research in our laboratory is focused on the mechanics and dynamics of cell movements on the purified protein, single cell, and tissue levels. For these studies, we are developing new instruments to quantify cell and molecular mechanics bases on optical microscopy, force microscopy, and microfabrication.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Fletcher

MCELLBI 239C The Regulation of Meiotic Gene Expression and Cellular Morphogenesis 2 Units
The mechanisms that link cellular differentiation programs and dynamic gene regulation in complex eukaryotic systems remain mysterious. Such programs drive diverse and central biological processes including organismal development, immune function, disease progression, and meiosis. This course is focused on the molecular basis for the cellular remodeling accompanying meiosis, the highly conserved process by which gametes are produced.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Brar

MCELLBI 239D Research Review in Cell and Developmental Biology: Epithelial Function, Structure, and Regulations 2 Units
Review of current literature and discussion of original research.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Machen

MCELLBI 239EE Research Review in Cell and Developmental Biology: Cell Morphogenesis 2 Units
Review of current literature and discussion of original research.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Heald

MCELLBI 239F Research Review in Cell and Developmental Biology: Nucleocytoplasmic Transport 2 Units
Review of current literature and discussion of original research.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Weis

MCELLBI 239FF Research Review in Cell and Developmental Biology: Signal Transduction and Tumor Suppressor Genes 2 Units
Review of current literature and discussion of original research.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Luo

MCELLBI 239H Research Review in Cell and Developmental Biology: Cell Division 2 Units
Review of current literature and discussion of original research.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Cande

MCELLBI 239HH Research Review in Cell and Developmental Biology: Mechanisms of Control of Growth and Cell Proliferation 2 Units
Identifying pathways that restrict growth and cell proliferation in vivo.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Hariharan

MCELLBI 239I Research Review in Cell and Developmental Biology: Cytoskeleton and Cell Motility 2 Units
Review of current literature and discussion of original research.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Welch

MCELLBI 239J Research Review in Cell and Developmental Biology: Steroid Hormone and Growth Factor Action 2 Units
Review of current literature and discussion of original research.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Firestone

MCELLBI 239K Research Review in Cell and Developmental Biology: Secretion and Cell Membrane Assembly 2 Units
Cell surface growth with emphasis on the unicellular eukaryote S. cerevisiae.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Schekman

MCELLBI 239KK Research Review in Cell and Developmental Biology: Assembly and Subcellular Organization of Bacterial Organelles 2 Units
Review of current literature and discussion of original research.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Komeili

MCELLBI 239M Research Review in Cell and Developmental Biology: MicroRNA Functions in Cancer Development, Mouse Tumor Models 2 Units
Malignant transformation represents the endpoint of successive genetic lesions that confer uncontrolled proliferation and survival, unlimited replicative potential, and invasive growth.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: He

MCELLBI 239N Research Review in Cell and Developmental Biology: Biophysics of Cell Motility and Morphogenesis 2 Units
Review of current literature and discussion of original research.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Oster

MCELLBI 239O Research Review in Cell and Developmental Biology: Cancer Biology 2 Units
Inheritance, chromatin structure, gene expression, and the organization of chromosomes in the nucleus.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Karpen

MCELLBI 239Q Research Review in Cell and Developmental Biology: Regulation of Cell Polarity in Drosophila 2 Units
Mechanisms underlying the establishment and maintenance of cellular organization in epithelia and other cell types.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Bilder

MCELLBI 239R Research Review in Cell and Developmental Biology: Telomere Biology of Human Stem Cells 2 Units
The goal of our laboratory is to understand the key functions of telomeres and telomerase in tissue homeostasis, tumorigenesis, and aging. To this end, we generate genetically engineered human pluripotent and adult stem cell models to measure telomere and telomerase function during cellular differentiation and tumor formation.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Hockemeyer

MCELLBI 239T Research Review in Cell and Developmental Biology: The Cell Biology of Fertilization 2 Units
Research in our lab is focused on the cell biology of mammalian fertilization. Our lab uses biophysical, biochemical, and molecular genetics methods to study sperm ion channels and transporters that regulate sperm motility, chemotaxis, and the acrosome reaction. A better understanding of these processes will eventually lead to the development of effective tools to control and preserve male fertility, improve the reproductive health of human population worldwide, and advance family planning.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Lishko

MCELLBI 239U Research Review in Cell and Developmental Biology: The Cytoskeleton and Morphogenesis 2 Units
Review of current literature and discussion of current research.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2-0 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Drubin

MCELLBI 239V Research Review in Cell and Developmental Biology: Molecular Mechanisms of Transduction in Touch and Pain Receptors 2 Units
Review of current literature and discussion of current research. Current research focuses on elucidating the molecular mechanisms of somatosensory mechanotransduction.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Bautista

MCELLBI 239W Research Review in Cell and Developmental Biology: Leech Embryology and Development 2 Units
Review of current literature and discussion of original research.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Weisblat

MCELLBI 239X Malignant Transformation 2 Units
Malignant transformation by retroviruses and the role of protein phosphorylation in growth regulation.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Martin

MCELLBI 239Z Research Review in Cell and Developmental Biology: Chromosome Remodeling and Reorganization During Meiosis 2 Units
How chromosomes are reorganized during melosis to accomplish the pairing, recombinatin, and segregation leading up to successful gamete production.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Dernburg

MCELLBI 240 Advanced Genetic Analysis 4 Units
Principles and practice of classical and modern genetic analysis as applied to eukaryotic organisms, including yeast, nematodes, , mice and humans; isolation and analysis of mutations; gene mapping; suppressor analysis; chromosome structure; control of gene expression; and developmental genetics.
Rules & Requirements

Prerequisites: Graduate standing with 110 or 140 or consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Letter grade.

Instructors: Koshland, Meyer

MCELLBI C243 Seq: Methods and Applications 3 Units
A graduate seminar class in which a group of students will closely examine recent computational methods in high-throughput sequencing followed by directly examining interesting biological applications thereof.
Rules & Requirements

Prerequisites: Graduate standing in Math, MCB, and Computational Biology; or consent of the instructor

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Letter grade.

Instructor: Pachter

Also listed as: MATH C243

MCELLBI C244 Discrete Mathematics for the Life Sciences 4 Units
Introduction to algebraic statistics and probability, optimization, phylogenetic combinatorics, graphs and networks, polyhedral and metric geometry.
Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Letter grade.

Also listed as: MATH C239

MCELLBI 249A Research Review in Genetics and Development: Genetics of Regulatory Variation 2 Units
Work in my group will focus on transcriptional regulatory networks and their variation between members of a species.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Brem

MCELLBI 249BB Research Review in Genetics and Development: Aging and Protein Homeostasis 2 Units
Central to the aging process is the unfolding of the proteome. Specific areas under study include cellular responses to protein misfolding and coordination of these responses across an organism.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Dillin

MCELLBI 249C Research Review in Genetics and Development: Nucleic Acid-Protein Interactions and Control of Gene Expression 2 Units
Biochemical and molecular genetic aspects of eukaryotic messenger RNA splicing and transposition, with an emphasis on as an experimental system.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Rio

MCELLBI 249D Research Review in Genetics and Development: Mechanisms of Genetic Regulation in Yeast 2 Units
Genes, gene products and molecular mechanisms that control cell types in the unicellular eukaryote .
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Rine

MCELLBI 249E Research Review in Genetics and Development: Molecular Genetics of <Drosophila> 2 Units
Gene regulation and developmental neurobiology.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: G. Rubin

MCELLBI 249F Research Review in Genetics and Development: Neuronal Development 2 Units
Molecular and genetic approaches to the problem of how neurons develop, with emphasis on and .
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Garriga

MCELLBI 249G Research Review in Genetics and Development: Developmental and Evolutionary Genetics 2 Units
We study how genes control pattern formation during development and pattern modification during evolution.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Miller

MCELLBI 249H Investigating Cellular Aging and Chromosome Segregation during Gametogenesis 2 Units
This course focuses on understanding 1) how cellular aging is affected during gametogenesis, the developmental program that produces gametes for sexual reproduction and 2) how chromosome segregation is regulated during meiosis, the specialized cell division that generates gametes.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Unal

MCELLBI 249J Research Review in Genetics and Development: Developmental and Molecular Genetics of <C. elegans> 2 Units
Molecular and genetical analysis of sex determination and dosage compensation in the nematode .
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Meyer

MCELLBI 249K Research Review in Genetics and Development: Animal Origins 2 Units
Evaluation of current research on choanoflagellates, sponges, and animal origins. Intended to complement ongoing research for graduate students.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: King

MCELLBI 249L Imaging Single Molecules: Fashion or Game Changer? 2 Units
Research review in genetics, genomics and development. We will explore how the detection of single particles
(DNA, RNA, proteins) can help with understanding cellular organization and
enzymatic processes dynamics and kinetics. Most of the experiments described will be drawn from the gene expression and nuclear organization
literature.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Darzacq

MCELLBI 249M Research Review in Genetics and Development: Saccharomyces Cerevisiae Microtubule Cytoskeleton 2 Units
Review of current literature and discussion of current research.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Barnes

MCELLBI 249MM Physical Biology of Living Organisms 2 Units
Research review in genetics, genomics and development. In development a single cell goes through a series of repeated divisions and these cells read the program encoded in their DNA in order to become
familiar cell types such as those found in muscle, liver, or our brains. The goal of our lab is to uncover the rules behind these decisions with the objective of predicting and manipulating developmental programs from just
looking at DNA sequence. In order to reach this predictive understanding we
combine physics, synthetic biology, and new technologies to query and control developmental decisions in real time at the single cell level in the fruit fly embryo.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Garcia

MCELLBI 249N Research Review in Genetics and Development: Gene Regulation 2 Units
Current literature and research in gene regulation will be covered in research reports and reviews of the current literature and in discussion of current experiments in the field.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Levine

MCELLBI 249O Research Review in Genetics and Development: Genome Sequences 2 Units
Biochemistry, cancer biology and virology, cell biology, computational biology, genetics, microbiology, molecular and cell physiology.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Eisen

MCELLBI 249P Research Review in Genetics and Development: Mesodermal Patterning and Segmentation 2 Units
Genetic, molecular, and embryological aspects of mesodermal patterning and segmentation, with emphasis on the vertebrate, zebrafish.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Amacher

MCELLBI 249Q Research Review in Genetics and Development: Computational Genomics 2 Units
Recent developments in computational methods for genomics and their application for understanding the structure and function of genes encoded in completely sequenced genomes.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Brenner

MCELLBI 249S Research Review in Genetics and Development: Evolution of Development Mechanisms 2 Units
Evolution of development mechanisms with a focus on the genes that regulate segmentation and regionalization of the body plan.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Patel

MCELLBI 249T Research Review in Genetics, Genomics and Development: Evolution of Genomes 2 Units
Comparative analysis of eukaryotic genomes to inform the origins and diversification of animals and plants.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Rokhsar

MCELLBI 249U Research Review in Genetics and Development: Assembly of Eukaryotic Chromosomes 2 Units
Biochemical and genetic characterization of proteins that assemble histones onto DNA. Analysis of the relationship of chromatin assembly to DNA replication and gene expression.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Kaufman

Formerly known as: 219A

MCELLBI 249V Research Review in Genetics and Development: Induction in Vertebrate Development and ES Cell Differentiation 2 Units
The Roelink laboratory is interested in the mechanisms of embryonic induction, the phenomenon in which a group of cells changes the developmental fate of neighboring cells via the release of inducers.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Roelink

MCELLBI 249X Research Review in Genetics and Development: Comparative Genomics and Computational Biology 2 Units
The fundamental problem of comparative genomics: the determination of the origins and evolutionary history of the nucleotides in all extant genomes. My work incorporates various aspects of genomics, including the reconstruction of ancestral genomes (paleogenomics), the modeling of genome dynamics (phylogenomics and systems biology), and the assignment of function of genome elements (functional genomics and epigenomics).
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Pachter

MCELLBI 249Y Research Review in Genetics and Development: Mechanisms of Gene Control in Vertebrate Animals 2 Units
This course will focus on mechanisms of gene control in vertebrate animals, particularly in the area of vertebrate development. Amphibian egg formation, mesoderm induction, neural induction, and patterning of the nervous system at the molecular level. Control of transcription, post-transcriptional control of gene expression (including control of RNA turnover and RNA localization).
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Harland

Formerly known as: 218Y

MCELLBI 249Z Research Review in Genetics and Development: Chromosome Structure and Integrity, Genome Evolution 2 Units
Use of genetic, cell biological, and biochemical approaches in budding yeast to understand genome integrity, genome evolution, and most recently desiccation tolerance.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Koshland

MCELLBI 250 Advanced Immunology 4 Units
Molecular and cellular analysis of the immune response emphasizing concepts and methodology. Innate immunity, pathogen sensors, antibodies and T cell receptors, lymphocyte activation, tolerance and selection. Antigen processing, T cell subtypes, and T regulatory cells. NK cells, tumor surveillance, and AIDS.
Rules & Requirements

Prerequisites: 100, 110, 140, 150 or consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Letter grade.

MCELLBI 251 The Regulation of Immune System Development and Function 1 Unit
This is an advanced seminar course which will consider current research questions and experimental approaches in molecular and cellular immunology. Each registrant will present a 30-minute research talk describing the problems they are studying, the approach they are taking, their preliminary data, and technical problems. Other course participants (including basic immunology faculty) will provide criticism and suggestions.
Rules & Requirements

Prerequisites: 250 or consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 1 hour of lecture per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Winoto

MCELLBI 259B Research Review in Immunology and Pathogenesis: Specificity of T Lymphocytes 2 Units
Mechanisms of immune surveillance by T lymphocytes.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Shastri

MCELLBI 259C Research Review in Immunology and Pathogenesis: Nuclear Receptor-Mediated Regulation of Neuroinflammation 2 Units
In this course we will discuss our research as well as recent literatures focusing on understanding of 1) How is homeostasis in the CNS regulated by innate immune functions of microglia? 2) How can we intervene in dysfunction of microglia-mediated immune functions using NRs signaling and transcription?
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Saijo

MCELLBI 259D Research Review in Immunology and Pathogenesis: Mycobacterial Biology and Host-Pathogen Interactions 2 Units
We will discuss macrophage biology and innate immunity in the context of infection with *Mycobacterium tuberculosis* through
discussion of current research from the Stanley Lab and both cutting edge and classic literature in relevant fields.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Stanley

MCELLBI 259E Research Review in Immunology and Pathogenesis: Regulation of T Cell Receptor Genes Expression 2 Units
Molecular biology of T cell receptor genes and their transcription controlling proteins/genes. Programmed cell death during thymocyte differentiation.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Winoto

MCELLBI 259F Research Review in Immunology and Pathogenesis: Natural Killer (NK) Cell and T Cell Receptors 2 Units
Molecular and biological basis for recognition by natural killer cells and T cells.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Raulet

MCELLBI 259G Research Review in Immunology and Pathogenesis: T Cell Development 2 Units
Molecular and cellular aspects of thymocyte differentiation.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Robey

MCELLBI 259H Research Review in Immunology and Pathogenesis: B Cell Differentiation 2 Units
Molecular basis of terminal B cell differentiation. Role of transcription factors in B cell activation.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Sha

MCELLBI 259J Research Review in Immunology and Pathogenesis: Immune Evasion by Viruses 2 Units
The mechanisms used by viruses to counteract the pressure of the immune system.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Coscoy

MCELLBI 259M Research Review in Immunology and Pathogenesis: Innate Immunity and Innate Control of Adaptive Immunity 2 Units
Innate immunity and innate control of adaptive immunity.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Barton

MCELLBI 259N Research Review in Immunology and Pathogenesis: Immunology, Microbiology, and Genetics of Bacterial Pathogenesis 2 Units
Role of innate host responses in defense against intracellular bacterial pathogens.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Vance

MCELLBI C260 Introduction to Neurobiology 4 Units
An introductory course designed to provide a general understanding of the nervous system including how it functions, how it develops, and how it changes with learning and memory. Analysis from the level of molecules to cells to simple circuits to complex networks to higher brain functions.
Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Letter grade.

Also listed as: NEUROSC C260

MCELLBI C261 Advanced Cellular Neurobiology 3 Units
Physical-chemical basis of membrane potentials, electrotonus, action potential generation and propagation, synaptic transmission, sensory receptor function, and volume conductor potentials.
Rules & Requirements

Prerequisites: Molecular and Cell Biology 160

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Letter grade.

Also listed as: NEUROSC C261

MCELLBI C262 Advanced Topics in Systems Neuroscience 3 Units
Advanced coverage of current research problems in systems-level neuroscience, and experimental and computational techniques used for these studies.
Rules & Requirements

Prerequisites: 160 or equivalent

Repeat rules: Course may be repeated for credit. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Letter grade.

Formerly known as: IDS 200B

Also listed as: NEUROSC C262

MCELLBI C263 Advanced Developmental Neurobiology 3 Units
Advanced level coverage of current research problems in the embryonic and post-embryonic development of invertebrate and vertebrate nervous systems.
Rules & Requirements

Prerequisites: 162 or equivalent

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of lecture per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Letter grade.

Also listed as: NEUROSC C263

MCELLBI 269A Research Review in Neurobiology: Special Topics in Neuroplasticity 2 Units
Molecular and cellular studies of nerve growth, axon guidance, synaptic formation, and synaptic plasticity using electrophysiological and optical imaging techniques.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Poo

MCELLBI 269B Research Review in Neurobiology: Synaptic Transmission and Neuromodulation 2 Units
Review of current literature and discussion of original research.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Zucker

MCELLBI 269C Research Review in Neurobiology: Molecular Mechanisms of Neuronal Plasticity 2 Units
Research in our laboratory focuses on understanding how neurons use biochemical pathways to integrate diverse types of information in order to adjust synaptic strength and modulate neuronal excitability, and how these interactions go awry in disease. To investigate this we are taking a multi-disciplinary approach incorporating molecular, biochemical, imaging, and electrophysiological analyses in mouse and human cells.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Bateup

MCELLBI 269D Research Review in Neurobiology: Signaling Within and Between Neurons 2 Units
Review of recent research in molecular mechanisms involved in intracellular and extracellular signaling in the nervous system.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Kramer

MCELLBI 269F Optogenetic Dissection of Neural Circuits 2 Units
Research review in neurobiology. Review of recent optogenetic strategies for dissecting neural connectivity, function, and dysfunction in the rodent and primate brain.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Lammel

MCELLBI 269H Research Review in Neurobiology: Recent Advances in Retinal Neurobiology 2 Units
Review of current literature and discussion of original research.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Werblin

MCELLBI 269I Research Review in Neurobiology: Stem Cells and Gene Therapy in the Nervous System 2 Units
The basic investigation of neural differentiation of stem cells, as well as the
use of stem cells and gene delivery for neuroregeneration.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Schaffer

MCELLBI 269J Research Review in Neurobiology: Taste Recognition in Drosophila 2 Units
The molecular and cellular basis of taste perception in the model organism .
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Scott

MCELLBI 269M Research Review in Neurobiology: Insect Neurophysiology 2 Units
Drosophila mutants that have behavioral abnormalities to unravel new and basic features of nervous system structure and function.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Tanouye

MCELLBI 269O Research Review in Neurobiology: Neural Circuits for Sensory Processing and Behavior 2 Units
Microcircuitry of the cerebral cortex that underlies sensory processing and adaptive behavior.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Adesnik

MCELLBI 269Q Research Review in Neurobiology: Sensory Processing and Plasticity in Cerebral Cortex 2 Units
How the cerebral cortex processes sensory input and stores information about the sensory world. We focus on the rat's primary somatosensory (S1) cortex.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Feldman

MCELLBI 269R Research Review in Neurobiology: Potassium Channels and Synaptic Plasticity 2 Units
Review of current literature and discussion of original research.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 1 hour of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Isacoff

MCELLBI 269S Research Review in Neurobiology: Molecular Mechanisms of Olfaction 2 Units
Review of current literature and discussion of original research.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Ngai

MCELLBI 269T Research Review in Neurobiology: Processing of Visual Information in the Mammalian Brain 2 Units
Review of current literature and discussion of original research.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Dan

MCELLBI 269U Research Review in Neurobiology: Diseases/Retina 2 Units
Evaluation of current research in molecular mechanisms underlying diseases of the retina.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Flannery

MCELLBI 269W Research Review in Neurobiology: Neural Activity Affecting the Assembly of Neural Circuits 2 Units
How neural activity affects the assembly of neural circuits.
Rules & Requirements

Prerequisites: Enrollment is restricted to students conducting research in the laboratory of the instructor, or requires consent of instructor

Repeat rules: Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Feller

MCELLBI 280A Selected Topics in Molecular and Cell Biology 1 Unit
The course will focus on fundamental principles, essential concepts, and recent advances in select topics in molecular and cell biology. Topics include genomics and computational biology, molecular evolution, neurons and synapses, microbi ology and immunology, macromolecular structure and function, and scientific writing. Courses are taught in tandem and maybe taken individually.
Rules & Requirements

Prerequisites: Graduate standing or consent of instructor

Repeat rules: Course may be repeated for credit as topic varies. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 5 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Letter grade.

MCELLBI 280B Selected Topics in Molecular and Cell Biology 1 Unit
The course will focus on fundamental principles, essential concepts, and recent advances in select topics in molecular and cell biology. Topics include genomics and computational biology, molecular evolution, neurons and synapses, microbi ology and immunology, macromolecular structure and function, and scientific writing. Courses are taught in tandem and maybe taken individually.
Rules & Requirements

Prerequisites: Graduate standing and consent of instructor

Repeat rules: Course may be repeated for credit as topic varies. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 5 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Letter grade.

MCELLBI 280C Selected Topics in Molecular and Cell Biology 1 Unit
The course will focus on fundamental principles, essential concepts, and recent advances in select topics in molecular and cell biology. Topics include genomics and computational biology, molecular evolution, neurons and synapses, microbi ology and immunology, macromolecular structure and function, and scientific writing. Courses are taught in tandem and maybe taken individually.
Rules & Requirements

Prerequisites: Graduate standing and consent of instructor

Repeat rules: Course may be repeated for credit as topic varies. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 5 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Letter grade.

MCELLBI 280D Selected Topics in Molecular and Cell Biology 1 Unit
The course will focus on fundamental principles, essential concepts, and recent advances in select topics in molecular and cell biology. Topics include genomics and computational biology, molecular evolution, neurons and synapses, microbi ology and immunology, macromolecular structure and function, and scientific writing. Courses are taught in tandem and maybe taken individually.
Rules & Requirements

Prerequisites: Graduate standing or consent of instructor

Repeat rules: Course may be repeated for credit as topic varies. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 5 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Letter grade.

MCELLBI 280E Selected Topics in Molecular and Cell Biology 1 Unit
The course will focus on fundamental principles, essential concepts, and recent advances in select topics in molecular and cell biology. Topics include genomics and computational biology, molecular evolution, neurons and synapses, microbi ology and immunology, macromolecular structure and function, and scientific writing. Courses are taught in tandem and maybe taken individually.
Rules & Requirements

Prerequisites: Graduate standing and consent of instructor

Repeat rules: Course may be repeated for credit as topic varies. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 5 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Letter grade.

MCELLBI 280F Selected Topics in Molecular and Cell Biology 1 Unit
The course will focus on fundamental principles, essential concepts, and recent advances in select topics in molecular and cell biology. Topics include genomics and computational biology, molecular evolution, neurons and synapses, microbi ology and immunology, macromolecular structure and function, and scientific writing. Courses are taught in tandem and maybe taken individually.
Rules & Requirements

Prerequisites: Graduate standing and consent of instructor

Repeat rules: Course may be repeated for credit as topic varies. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 5 weeks - 3 hours of lecture and 1 hour of discussion per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Letter grade.

MCELLBI 290 Graduate Seminar 1 Unit
Graduate student presentations on selected research topics in molecular and cell biology. Several sections covering different topics offered each semester. Concurrent enrollment in more than one section is permitted. List of topics to be announced before each semester.
Rules & Requirements

Prerequisites: Graduate standing in the department or consent of instructor

Repeat rules: Course may be repeated for credit. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 1-2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Letter grade.

MCELLBI 291A Introduction to Research 2 - 12 Units
Closely supervised experimental work under the direction of an individual faculty member; an introduction to experimental methods and research approaches in particular areas of molecular and cell biology.
Rules & Requirements

Prerequisites: Consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 2-12 hours of independent study per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Letter grade. This is part one of a year long series course. A provisional grade of IP (in progress) will be applied and later replaced with the final grade after completing part two of the series.

MCELLBI 291B Introduction to Research 2 - 12 Units
Closely supervised experimental work under the direction of an individual faculty member; an introduction to experimental methods and research approaches in particular areas of molecular and cell biology.
Rules & Requirements

Prerequisites: Consent of instructor

Hours & Format

Fall and/or spring: 15 weeks - 2-12 hours of independent study per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Letter grade. This is part two of a year long series course. Upon completion, the final grade will be applied to both parts of the series.

MCELLBI 292 Research 3 - 12 Units
Individual research under the supervision of a faculty member.
Rules & Requirements

Repeat rules: Course may be repeated for credit. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 0 hours of independent study per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Letter grade.

MCELLBI N292 Research 3 - 6 Units
Individual research under the supervision of a staff member.
Rules & Requirements

Prerequisites: Consent of instructor

Repeat rules: Course may be repeated for credit. Course may be repeated for credit when topic changes.

Hours & Format

Summer: 8 weeks - 3-6 hours of independent study per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Letter grade.

MCELLBI 293A Research Seminar 2 Units
Seminar on presentation and evaluation of results in area of student's individual research interests.
Rules & Requirements

Prerequisites: Concurrent enrollment in 291A or 292

Hours & Format

Fall and/or spring: 15 weeks - 3 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

MCELLBI 293C Responsible Conduct of Research 1 Unit
This course will cover topics in responsible conduct in research drawing from case studies of the Association of American Medical Colleges and the NIH. Students will review case studies in preparation for class discussion. Required of all MCB graduate and post doctoral students funded on NIH training grants. One session will probably feature a guest lecturer on a topic relevant to the course.
Rules & Requirements

Prerequisites: Consent of instructor

Repeat rules: Course may be repeated for credit. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 1.5-1.5 hours of discussion and 1.5-1.5 hours of lecture per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

MCELLBI 295 Careers for Life Sciences Ph.D's 1 Unit
This course is designed to assist graduate students in the biological sciences with planning their postgraduate careers. Weekly guest speakers will present their experiences on a variety of topics. Postdoctoral students are invited. Topics may include academia; job searches; setting up a laboratory; patent law/technology transfer; public policy/regulatory affairs; bioinformatics; science writing/technical support; forensic science; postdoctoral positions in industry; teaching, and other topics of interest.
Rules & Requirements

Prerequisites: Open to graduate and postdoctoral students

Hours & Format

Fall and/or spring: 15 weeks - 2 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate

Grading: Offered for satisfactory/unsatisfactory grade only.

MCELLBI 380 Teaching of Molecular and Cell Biology 1 - 2 Units
Teaching laboratories and/or discussions for Molecular and Cell Biology courses: analysis of specific format and problems. Two units of credit for those with 50% teaching appointment; one unit of credit for those with 25% teaching appointment.
Rules & Requirements

Prerequisites: Appointment as graduate student instructor or consent of instructor

Repeat rules: Course may be repeated for a maximum of 4 units.Course may be repeated for a maximum of 4 units.

Hours & Format

Fall and/or spring: 15 weeks - 0 hours of seminar per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Professional course for teachers or prospective teachers

Grading: Offered for satisfactory/unsatisfactory grade only.

MCELLBI 481B Instrumentation in Molecular and Cell Biology: Transmission Electron Microscopy 1 - 4 Units
Individualized laboratory instruction.
Rules & Requirements

Prerequisites: Graduate standing; consent of instructor and sponsorship of a faculty member

Hours & Format

Fall and/or spring: 15 weeks - 0 hours of independent study per week

Summer:
6 weeks - 1-5 hours of independent study per week
8 weeks - 1-4 hours of independent study per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Other professional

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Cande

MCELLBI 481C Instrumentation in Molecular and Cell Biology: Scanning Electron Microscopy 1 - 4 Units
Individualized laboratory instruction.
Rules & Requirements

Prerequisites: Graduate standing; consent of instructor and sponsorship of a faculty member

Hours & Format

Fall and/or spring: 15 weeks - 0 hours of independent study per week

Summer:
6 weeks - 1-5 hours of independent study per week
8 weeks - 1-4 hours of independent study per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Other professional

Grading: Offered for satisfactory/unsatisfactory grade only.

Instructor: Cande

MCELLBI 601 Individual Study for Master's Students 1 - 8 Units
Individual study for the comprehensive or language examinations in consultation with the field adviser.
Rules & Requirements

Credit Restrictions: Course does not satisfy unit or residence requirements for master's degree.

Repeat rules: Course may be repeated for credit. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 1-8 hours of independent study per week

Summer: 8 weeks - 1.5-15 hours of independent study per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate examination preparation

Grading: Offered for satisfactory/unsatisfactory grade only.

MCELLBI 602 Individual Study for Doctoral Students 1 - 8 Units
Individual study in consultation with the major field adviser. Intended to provide an opportunity for qualified students to prepare themselves for the various examinations required of candidates for the Ph.D.
Rules & Requirements

Prerequisites: Restricted to Ph.D. candidates

Credit Restrictions: Course does not satisfy unit or residence requirements for doctoral degree.

Repeat rules: Course may be repeated for credit. Course may be repeated for credit when topic changes.

Hours & Format

Fall and/or spring: 15 weeks - 0 hours of independent study per week

Summer:
6 weeks - 1-8 hours of independent study per week
8 weeks - 1-8 hours of independent study per week

Additional Details

Subject/Course Level: Molecular and Cell Biology/Graduate examination preparation

Grading: Offered for satisfactory/unsatisfactory grade only.