

Molecular Biology (MOL)

MOL 380 Advanced Readings in Molecular Biology 3 Hours
Individual instruction in the literature of molecular biology.

MOL 080M Dual MD/PhD Program with UT Medical Branch 0 Hours
Preclinical medical study at the University of Texas Medical Branch at Galveston.

MOL 381K Cellular and Molecular Bases of Neural Development 3 Hours
Introduction to the principles by which the neural tube (brain and spinal cord) forms during embryonic development. Discuss the cellular and molecular mechanisms underlying the formation of a three-dimensional neural tube and its division into forebrain, midbrain, hindbrain, and spinal cord.

MOL 382E Epigenetics 3 Hours
Examine how epigenetic modifications are covalent modifications of DNA or histones that cause changes in gene expression and how epigenetic modifications appear to be a method through which nurture or the environment can influence nature. Focus on how experience or environmental factors epigenetically modify health or behavior of animals.

MOL 383K Developmental, Stem Cell, and Regenerative Biology 3 Hours
Explore the principles and mechanisms of embryonic development and the processes guiding stem cell differentiation and tissue repair.

MOL 384K Topics in Advanced Molecular Biology 3 Hours
Examine molecular biology topics in-depth.

MOL 384K.1 Integrative Omics in the Evolution of Development and Behavior 3 Hours
Discuss the conceptual foundations and historical roots of research programs in evo-devo and evolutionary neuroscience including recent discoveries and limitations in these fields. Explore how -omics approaches and comparative methods enable novel insights into the diversification, convergence, and constraint of complex traits.

MOL 386 Topics in Problems and Methods in the Life Sciences 3 Hours
Examine the questions addressed in modern life sciences research and the experimental methods used. Focus on experimental reasoning and on the application of different techniques to solve problems.

MOL 388M Plant Molecular Biology 3 Hours
Examine the fundamentals of plant molecular biology, including structure and expression of the chloroplast and mitochondrial genomes.

MOL 190C, 290C, 390C Topics in Molecular Biology: Seminar 1-3 Hours
Lectures and discussions on current topics in molecular biology.

MOL 190C.1, 290C.1, 390C.1 Seminar in Molecular Biology I 1-3 Hours
Students read, present, and discuss current research papers based on speakers for the Institute for Cellular and Molecular Biology weekly seminar series. Students also will present short talks on their the research from one of their laboratory rotations.

MOL 190C.2, 290C.2, 390C.2 Seminar in Molecular Biology II 1-3 Hours
Students write a mock grant proposal with their principle investigator and present a practice part one preliminary exam talk based on the proposal.

MOL 190C.3, 290C.3, 390C.3 Seminar in Molecular Biology III 1-3 Hours
Students present a detailed seminar on their thesis research.

MOL 391 Grant Writing and Presentation Skills 3 Hours
Designed for second-year doctoral students. Prepare a detailed proposal of the dissertation research goals of each student with a presentation in the form of a short talk. Focus on critical evaluation of research aims, methodology, and communication skills.

MOL 391P Advanced Virology 3 Hours
Explore the replication of and transformation by DNA and RNA animal viruses.

MOL 192, 292, 392, 492, 592, 692, 792, 892, 992 Research Problems 1-9 Hours

MOL 394L Immunology 3 Hours
Introduction to the immune system for graduate students without prior coursework in immunology. Discuss innate immunity, the molecular basis of T cell and B cell antigen recognition, hematopoiesis and the development of lymphocytes, and cellular and humoral immune responses. Touch on immunodeficiency, autoimmunity, immunotherapy and vaccination. Explore current primary literature on select immunological topics in greater depth.

MOL 394M Genomics 3 Hours
Examine genome structure, organization, and function of model organisms; theory and methodology of genetic and physical mapping; sequencing analysis and annotation; genome duplication and evolution; and ethics for biotechnology and cloning.

MOL 195 Molecular Biology Conference Course 1 Hour

MOL 395F Genetics 3 Hours
Basic principles of Mendelian and molecular genetics, and an exploration of the genetic toolbox using examples of analytic methods and modern manipulations. Focus on the genetic analysis of model organisms. Use of genetic tools in dissecting complex biological pathways, developmental processes, and regulatory systems.

MOL 395G Structure and Function of Proteins and Membranes 3 Hours
Explore advanced biochemistry concepts and the scientific process. Examine a detailed consideration of the structure and function of proteins, carbohydrates, lipids and nucleic acids, as well as discussion of enzyme mechanisms and kinetics.

MOL 395H Cell Biology 3 Hours
Detailed consideration of mechanisms of growth control, cell cycle regulation, mitosis, cell signaling, protein targeting, and the integration of these processes.

MOL 395I Advanced Biochemistry 3 Hours
Explore advanced biochemistry concepts and the scientific process. Consider the structure and function of proteins, carbohydrates, lipids and nucleic acids, and discuss enzyme mechanisms and kinetics.

MOL 395J Genes, Genomes, and Gene Expression 3 Hours
Detailed consideration of prokaryotic and eukaryotic mechanisms of DNA replication and transcription; posttranscriptional processing of transcription products; and mechanism and regulation of the translation of messenger RNAs.

MOL 395L Laboratory Studies in Molecular Biology 3 Hours
Explore modern molecular biology with a research project focus in a laboratory setting. Use methods such as eukaryotic RNA purification, quantitative PCR, CRISPR or site-directed mutagenesis cloning, cell fractionation, protein purification and Western blotting detection toward experimental goals.

MOL 698 Thesis 6 Hours

MOL 398T Supervised Teaching in Molecular Biology 3 Hours
Teaching under close supervision of the instructor; weekly laboratory instruction of undergraduates, group meetings with the instructor, individual consultations, and reports throughout the teaching period.

MOL 399W, 699W, 999W Dissertation 3,6,9 Hours