Fall 2025 Selectives

View course schedules online: https://class-schedule.app.utah.edu/main/1258/index.html

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Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
13138	**ANAT 6400**	1.5	Fundamentals in Cellular and Molecular Neuroscience	Ismail Ahmed	M, W	9:00AM - 10:30AM	BPRB 501
		The nervous system is the most complex organ in the body; behavior requires unique cell biology and biochemistry. The goal of this course will be to introduce core cellular and molecular processes in the main brain cell types; neurons and glia. In addition, we will highlight how these processes can go awry in neurological disorders. Topics covered include: Cellular and molecular composition of the nervous system The molecular basis for synaptic transmission – the conversion of electrical activity by chemical synapses. How synapses form circuits during development and learning How synapses signal to the nucleus to regulate gene expression The role of glia (microglia and astrocytes) in brain function. Molecular basis of common neurological disorders New advanced methods to study the brain – optogenetics, human pluripotent stem cells, organoids				
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
13236	**BIO C 6420**	1.5	Biophysical Methods	Michael Kay, Owen Pornillos, & Wesley Sundquist	T, TH	2:30PM – 3:50PM	TBD
		This course will focus on biochemical and biophysical approaches to studying proteins and their functional interactions. Topics covered will include: advanced non-linear curve fitting, protein-ligand interactions, protein folding, spectroscopic techniques, analytical ultracentrifugation, calorimetry, biosensors, mass spectrometry/proteomics, and AI protein structure prediction and design.				
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
13270	**BIO C 6430**	1.5	Structural Methods	Julia Brasch, Erhu Cao, Chris Hill, & Peter Shen	M, W, F	2:00PM - 2:50PM	BPRB 501
		This course provides an integrated approach to the applications of X-ray crystallography and electron microscopy in structural biology. Topics covered include basic theory and the application of methods of structure determination.				
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
13061	**BIO C 6600**	2.0	Regulation of Metabolism	Greg Ducker & Keren Hilgendorf	T, Th	9:30AM - 11:00AM	EHSEB 2600
		This half-semester course will begin with a review of carbohydrate and lipid metabolic pathways, with an emphasis on an integrated understanding the pathways and what is known about their regulation. The course will progress to an in-depth analysis of current research in specific areas of nutritional sensing and metabolic regulation.				
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
13141	**BIOL 6140**	1.5	Advanced Genetics	Kent Golic, Kelly Hughes, & Erik Jorgensen	M, W, F	10:45AM - 11:35AM	CSC 25
		Advanced Genetics covers the fundamentals of classical genetics and genetic analysis in prokaryotes and eukaryotes. Classical genetics encompasses the mechanisms of inheritance and the behavior of genes and chromosomes in somatic cells and germ cells. Genetic analysis is a branch of biological investigation that uses mutations and mutant phenotypes to study the function and behavior of cells and groups of cells, in isolation and in a developmental context. Prokaryotes and eukaryotes have different modes of inheritance and significant differences in gene regulation and in their cellular biology. Prokaryotes provided the foundational discoveries of molecular biology and continue to be a source of new genetic tools and biological understanding with health and ecological relevance. Modern eukaryotic genetics blends the tools of molecular biology, cell biology and classical genetics to investigate gene and cell function in complex organisms.				
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
14414	**CHEM 6740**	2.0	Bioanalytical Chemistry	Jennifer Shumaker-Parry	T, Th	10:45AM-12:05PM	CSC 25
		This course is intended to provide an overview of the methods of chemical analysis used to characterize biological samples. Topics will include a discussion of separations techniques, the spectroscopy of biological molecules, immunological and enzymatic assays, and surface analytical methods.				
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
20477	**CHEM 7450**	2.0	Biophysical Chemistry	Jessica Swanson	T, TH	9:10AM – 10:30AM	HEB 2010
		This course will cover foundational principles in physical chemistry that are essential to understand biological processes from the molecular to macroscopic levels. Probability theory is a unifying framework for the statistical, dynamic, and thermodynamic descriptions of biomolecular behavior.				

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Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
15547	**H GEN 6490**	2.0	Introduction to Omics: Applications to Research	Charlie Murtaugh & Robert Weiss	T, TH	11:10AM - 12:30PM	EHSEB 5100B
		Upon completion of this course, students will: • Understand the scope of omics research and methods in genomics, epigenomics, transcriptomics, proteomics, and metabolomics. • Understand omics in terms of investigation for biological questions. • Learn about the importance of experimental design in omics research. • Understand the challenges and limitations of big data analysis, including integration of data, batching, computational resources, and working with collaborators across all fields.					

Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
13095	**ONCSC 6500-002**	1.5	Molecular Mechanisms of Cancer	Sean Tavtigian	M, W, F	1:00PM - 1:50PM	HCI - South Auditorium
		In alternating years, this course is focused on the current understanding of the molecular and cellular biology of cancer along with how this knowledge relates to the diagnosis, treatment and prevention of cancer. The complementary sister-course is focused on clinical cancer biology. It is designed for graduate students and post-doctoral fellows in basic science departments with an interest in modern principles and practice of oncology. It will cover general principles and new developments in cancer etiology, detection, diagnosis, treatment, and prevention. The course is organized around specific diseases, using advances in each area to highlight modern principles and practice of oncology.					

Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
15206 / 15204	**ONCSC 6701/ BIO C 6701**	2.0	Cell Biology	Matthew Miller & Ben Myers	T, Th	2:30PM - 4:00PM	EHSEB 4100B
		Cell biology was redesigned in 2019 with a decreased emphasis on didactic lectures and a stronger focus on teaching students how to read and evaluate primary literature. The course consists of primary research articles within the field, and each class will discuss one paper. Students will be expected to read/watch background material posted on Canvas prior to each class. Objectives are as follows: 1. To effectively assess data in published literature. To be able to answer: a. What are the questions the authors seek to answer? b. What approaches did the authors use to answer the questions? Why did they use those approaches? c. Did the presented data answer the questions? How convinced are you? d. If you had access to unlimited resources, how would you follow up on this work? What questions would you ask, and how would you answer them? 2. To be able to articulate scientific knowledge both verbally and in written format 3. To gain a basic understanding of selected topics in cell biology					

Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
17772	**PATH 6500-002**	1.0	Immunity, Inflammation and Infectious Disease	Aaron Petrey, Melissa Reeves, & Arabella Young	M, W	2:00PM – 3:20PM	EHSEB 5100C
		The immune system is an integral part of virtually every organ system of the body including the neuronal, digestive, cardiovascular and endocrine, to name just a few. Moreover, while the immune system is fundamental to our ability to fend off infectious pathogens, it is intimately involved in a variety of diseases that plague the modern world including all cancers, behavioral diseases, and autoimmunity. Studies in immunology have led revolutionary discoveries that have fundamentally transformed human health, such as protection from deadly pathogens through vaccination and reversal of cancers through immune-based therapies. Thus, an understanding of basic immunological concepts is broadly applicable in multiple disease settings. Furthermore, the immune system provides an effective platform for understanding fundamental concepts of cellular and molecular biology, including events controlling cellular development, differentiation and function, DNA recombination and repair, and cell signaling. This course was designed to introduce basic immunology while integrating and helping to solidify cell biology, genetic and molecular biology concepts. This course will allow you to address questions such as: How does the immune system detect and respond to microbes? How does immunity elicit protection from microbes? Why doesn't the immune system react to self tissue? How do cells of the immune system differentiate and make fate decisions in response to external stimuli? What are the mechanisms used by the immune system to recognize such a diversity of microbes? How is the immune system used to fight cancer? Why don't we generally get sick twice with the same pathogen? Undergraduate exposure to basic principles of cell biology, genetics, and molecular biology will improve understanding of this course.					

Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
13298	**PHARM 6500**	2.0	Therapeutics Discovery, Development, and Evaluation	Raphael Franzini & Mei Koh	TBA	TBA	TBA
		This half-semester course, which is open to graduate students from departments in the College of Pharmacy and those participating in the Biological Chemistry/Molecular Biology PhD programs, will explore the process of developing therapeutics. Subject matters include steps spanning the entire drug development process from discovering active species, developing them into compounds that are suitable for clinical evaluation, assessing pharmacokinetics and pharmacodynamics, and determining the efficacy of candidates in clinical studies and after FDA approval.					