

## Fall 2023 Selectives

View course schedules online: <https://student.apps.utah.edu/uofu/stu/ClassSchedules/main/1238/index.html>

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Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
15574	<b>ANAT 6400</b>	1.5	Fundamentals in Cellular and Molecular Neuroscience	Jason Shepherd	M, W	9:00AM - 10:30AM	BPRB 501
<p>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</p>							
15798	<b>BIO C 6430</b>	1.5	Structural Methods	Julia Brasch, Erhu Cao, Chris Hill, & Peter Shen	M, W, F	2:00PM - 2:50PM	BPRB 501
<p>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.</p>							
15421	<b>BIO C 6600</b>	1.5	Regulation of Metabolism	Keren Hilgendorf & Janet Lindsley	T, Th	9:30AM - 11:00AM	EHSEB 2600
<p>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.</p>							
15583	<b>BIOL 6140</b>	1.5	Advanced Genetics	Kent Golic, Kelly Hughes, & Erik Jorgensen	M, W, F	10:45AM - 11:35AM	CSC 25
<p>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.</p>							
18677	<b>CHEM 6740</b>	2.0	Bioanalytical Chemistry	Jennifer Shumaker-Parry	T, Th	10:45AM- 12:05PM	CSC 25
<p>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.</p>							
11731	<b>CHEM 7430</b>	2.0	Chemical Biology of Proteins	Ming Hammond	T, Th	9:10AM - 10:30AM	HEB 2002
<p>This is a one half semester course that focuses on the application of organic chemistry to the study and manipulation of proteins. Topics include chemical synthesis of peptides, proteins, and peptide mimics and chemical biology methods to study the role of proteins in cell biology and signaling. Prerequisite: 2 semesters undergraduate organic chemistry.</p>							
20788	<b>H GEN 6490</b>	2.0	An Introduction to Techniques and Applications	Robert Weiss	T, TH	11:15AM - 12:30PM	EHSEB 5100B
<p>This half-semester course explores the development and application of DNA/RNA sequencing technology, with a specific focus on genomics and transcriptomics. The main goal of this course is to introduce students to the technical aspects and underlying principles used in high-throughput 'omic' approaches. In addition to gaining know-how about these methods, including single-molecule and single-cell techniques, students will learn how omics data can be generated and analyzed to comprehend functional elements of genomes.</p>							
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15486	<b>ONCSC 6500-002</b>	1.5	Clinical and Molecular Cancer Biology	Sean Tavtigian	M, W, F	3:00PM - 3:50PM	HCI - South Auditorium
Offered as a Fall Selective, this course is focused on the current understanding of the genetics, molecular, and cellular biology of cancer along with how this knowledge relates to cancer diagnosis, treatment, and prevention. The course alternates didactic lectures with student-driven presentations on notable publications that were important to a topic covered in a prior lecture. 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.							
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20109 / 20107	<b>ONCSC 6701/ BIO C 6701</b>	2.0	Cell Biology	Matthew Miller & Ben Myers	T, Th	2:30PM - 4:00PM	EHSEB 4100B
This course covers basic and advanced topics related to cell structure and function including cytoskeleton, membrane trafficking, protein targeting/modification and degradation, cell cycle regulation, and signal transduction.							
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15716	<b>PATH 6500</b>	1.0 - 2.0	Immunity, Inflammation and Infectious Disease	June Round	M, W	1:30PM - 2:50PM	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.							
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15847	<b>PHARM 6500</b>	2.0	Therapeutics Discovery, Development, and Evaluation	Raphael Franzini & Mei Koh	M, W, F	11:10AM - 12:00PM	EHSEB 4100C
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.							