Fall 2025 Graduate Electives

Note - This is not a full comprehensive list. Courses such as advanced journal clubs and departmental Research in Progress are not included.

Always check your department guidelines and with your department coordinator, thesis advisor, and the course instructor for permission and guidance.

Classroom assignments may change between the time you register and when classes begin. Please check your class schedule for the latest classroom location information before attending class.

**Fall 2025 Class Schedule**: https://class-schedule.app.utah.edu/main/1258/index.html

**Fall 2025 Selectives (Please see pages 6-7)**
All first year students will self-select two (2) selectives courses that match their research interest and/or explore the range of disciplines and research emphasis areas.

- All Selectives will be held during Second Half Semester
- Please note some classes overlap in days/times.
- Contact the Instructor or Department Coordinator to confirm if advanced students can enroll along with first year students and if a permission code is required
- Selectives will be 1.5-3 credits each

| Class # | Catalog # | Cr Hrs | Course Title | Lead Instructor | Day | Time | Bldg/Room |
|---|---|---|---|---|---|---|---|
| 19910 | ANAT 7750 | 1.5 | Developmental Neurobiology | Nikki Link | T, Th, F | 10:45AM-11:35AM | EHSEB 3515B |
| *Second Half Semester*<br><br>*Lecture* | | Cellular and molecular biology of nervous system development.<br><br>*Meets With NEUSC 7750 001* | | | | | |
| Class # | Catalog # | Cr Hrs | Course Title | Lead Instructor | Day | Time | Bldg/Room |
| 11937 | ANAT 7790 | 1.5 | Microscopy & Imaging | Adam Douglass, Kristen Kwan | T, Th | 9:00AM-10:00AM | EHSEB 2948 |
| *Half Semester*<br><br>*Lecture* | | Covers theory and practice of biological light microscopy, including sample preparation and staining, fluorescence and confocal microscopy, digital image analysis and quantitation, and figure preparation. A class project uses data from students' own research. | | | | | |
| Class # | Catalog # | Cr Hrs | Course Title | Lead Instructor | Day | Time | Bldg/Room |
| 19887 | BIOL 5275 | 4.0 | Microbial Diversity, Genomics and Evolution | Colin Dale | M, W | 2:00PM-2:50PM | JTB 320 |
| *Full Semester*<br><br>*Lecture* | | Microbial Diversity, Genomics and Evolution (MDGE) examines the role of microorganisms and their complex interactions with other living organisms and the environment. The lecture course provides an integrated vision of genome biology and microbial physiology, diversity and ecology and serves as a primer for all students interested in genomics. The integrated laboratory class provides students with an opportunity to collect samples from the environment and examines microbial diversity using modern molecular biological methods and bioinformatic tools.<br><br>*Differential tuition for 5000 level BIOL class that will not be covered by Tuition Benefit.* | | | | | |
| Class # | Catalog # | Cr Hrs | Course Title | Lead Instructor | Day | Time | Bldg/Room |
| 13075 | BIOL 5510 | 3.0 | Genes, Development, and Evolution | Michael D Shapiro | T, Th | 10:45AM – 12:05PM | BEH S 114 |
| *Full Semester*<br><br>*Lecture* | | Understanding the molecular basis of evolutionary change is a fundamental challenge in biology. This course focuses on recent scientific literature in genetics and developmental biology to explore the mechanisms that impact evolutionary change. Topics concentrate on animal biology and include the molecular basis of diversity in body plans, limb development and evolution, genetics of pigmentation differences, and variation in other adaptive traits. We will also address how humans have shaped animal diversity through domestication. In some cases, the genes that control normal variation among species are also involved in human disease; therefore, studying the molecular mechanisms of diversity promises a greater understanding of human health. It is recommended (but not required) that BIOL 2030 is taken concurrently or completed prior to taking this course.<br><br>*Prerequisites: 'C-' or better in BIOL 1210 OR BIOL 1610 OR AP Biology score of 4+ OR IB Biology score of 5+.*<br><br>*Differential tuition for 5000 level BIOL class that will not be covered by Tuition Benefit.* | | | | | |

Fall 2025 Graduate Course Electives

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**Fall 2025 Class Schedule**: https://class-schedule.app.utah.edu/main/1258/index.html

| Class # | Catalog # | Cr Hrs | Course Title | Lead Instructor | Day | Time | Bldg/Room |
|---|---|---|---|---|---|---|---|
| 13139 | BIOL 6120 | 2.0 | Computing with Python | Richard M Clark | F | 2:00PM – 3:55PM | BIOL 150 |
| *Full Semester*<br><br>*Lecture* | | This course is intended to provide an introduction to computer programming, using the Python language and highlighting applications in biology. The course is intended primarily for first year graduate students in the School of Biological Sciences, but others are welcome. No prior programming experience is required. In addition to an introduction to the Python language, the course includes a bit of history, a general overview of modern computing and the use of Unix-type operating systems (including MacOS and Linux). The course structure will include lectures, in-class computing exercises, homework exercises and a project to completed during the last three weeks of the term. | | | | | |

| Class # | Catalog # | Cr Hrs | Course Title | Lead Instructor | Day | Time | Bldg/Room |
|---|---|---|---|---|---|---|---|
| 10922 | BIOL 7961 | 1.0 | Intro to MCEB Research | - | M, Th | 3:30PM-4:30PM (M)<br>9:30AM-10:30AM (TH) | CSC 13<br>AEB 320 |
| *First Half Semester*<br><br>*Special Topics* | | Topics of special interest taught when justified by student and faculty interest. Content varies from year to year.<br><br>*Contact Colin Dale (colin.dale@utah.edu) prior to adding it to schedule for content purposes.* | | | | | |

| Class # | Catalog # | Cr Hrs | Course Title | Lead Instructor | Day | Time | Bldg/Room |
|---|---|---|---|---|---|---|---|
| 15093 | BIO C 7100 | 2.0 | Advanced Methods Electron Microscopy | Peter Shen | TBA | TBA | TBA |
| *First Half Semester*<br><br>*Special Topics* | | Seminar: Student and faculty discussion of advanced-level topics not covered in formal courses. | | | | | |

| Class # | Catalog # | Cr Hrs | Course Title | Lead Instructor | Day | Time | Bldg/Room |
|---|---|---|---|---|---|---|---|
| 1634 | CHEM 7040 | 2.0 | Statistical Thermodynamics | Peter Armentrout | M, W, F | 11:00AM – 12:05PM | HEB 2010 |
| *First Half Semester*<br><br>*Lecture* | | This course introduces the statistical machinery used to connect molecular behavior with thermodynamic principles. Covered topics are useful for chemists, physicists, biologists, and engineers. | | | | | |

| Class # | Catalog # | Cr Hrs | Course Title | Lead Instructor | Day | Time | Bldg/Room |
|---|---|---|---|---|---|---|---|
| 14778 | CHEM 7050 | 2.0 | Classical Thermodynamics | Valeria Molinero | M, W, F | 8:20AM – 9:25AM | HEB 2010 |
| *Second Half Semester*<br><br>*Lecture* | | This course covers classic topics of thermodynamics, including phase and chemical equilibria, solutions, and electrochemistry. Students will learn to derive and understand fundamental thermodynamic relations, equations, and formulae and explore their importance in modern applications. The material covered in this course is useful for scientists and engineers with a thorough understanding of undergraduate thermodynamics. | | | | | |

| Class # | Catalog # | Cr Hrs | Course Title | Lead Instructor | Day | Time | Bldg/Room |
|---|---|---|---|---|---|---|---|
| 1636 | CHEM 7240 | 2.0 | Physical Organic Chemistry | Jacob Lessard | T, Th | 9:10AM - 10:30AM | HEB 2002 |
| *First Half Semester*<br><br>*Lecture* | | Physical organic chemistry studies the approaches to deciphering the mechanisms of organic reactions and the principles that govern host-guest binding. The topics include stereochemistry, conformational analysis, thermochemistry, acidity, tools to decipher reaction mechanisms, rate laws, kinetic isotope effects, linear free energy relationships.<br><br>*Meets With CHEM 5240 001* | | | | | |

| Class # | Catalog # | Cr Hrs | Course Title | Lead Instructor | Day | Time | Bldg/Room |
|---|---|---|---|---|---|---|---|
| 1639 | CHEM 7250 | 2.0 | Organic Reaction Mechanisms | Ryan Looper | M, W, F | 11:00AM – 12:05PM | HEB 2010 |
| *Second Half Semester*<br><br>*Lecture* | | Course examines organic reaction mechanisms involving all fundamental reaction types. Included will be complex mechanisms as combinations of fundamental steps, orbital symmetry controlled reactions (with Woodward-Hoffman, Fukul, and Zimmerman treatments), trajectory analysis and radical reactions.<br><br>*Meets With CHEM 5250 001* | | | | | |

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| Class # | Catalog # | Cr Hrs | Course Title | Lead Instructor | Day | Time | Bldg/Room |
|---|---|---|---|---|---|---|---|
| 6062 | CHEM 7460 | 2.0 | Protein Chemistry | Aaron Puri | M, W, F | 8:20AM-09:25AM | JTB 120 |
| *First Half Semester*<br><br>*Lecture* | This is a one half semester course which focuses on the mechanisms of chemical reactions involving peptides and proteins and methods for their study. Subject matter includes enzyme mechanisms, chemical modification of proteins and cofactor chemistry. Prerequisite: organic chemistry.<br><br>*Meets With CHEM 5460 001* | | | | | | |
| Class # | Catalog # | Cr Hrs | Course Title | Lead Instructor | Day | Time | Bldg/Room |
| 13646 | CHEM 7640 | 2.0 | Materials Chemistry for Alternative Energy | Ming Lee Tang | M, W, F | 11:00AM – 12:05PM | HEB 2002 |
| *Second Half Semester*<br><br>*Lecture* | This course is designed to introduce you to the fundamentals of materials approaches to alternative energy. Topic to be covered include materials for: electrofuels, solar, fuel cells, batteries chemistry and engineering of electrodes used for each type of energy production, conversion, or storage, as well as fundamental understanding of energy sources, including their advantages and limitations.<br><br>*Meets With CHEM 5640 001* | | | | | | |
| Class # | Catalog # | Cr Hrs | Course Title | Lead Instructor | Day | Time | Bldg/Room |
| 12268 | CHEM 7725 | 2.0 | Mass Spectrometry | Gabe Nagy | M, W, F | 8:20AM-9:25AM | CSC 10-12 |
| *Second Half Semester*<br><br>*Lecture* | This one-half semester course will cover material related to the instrumentation, fundamentals, and applications of mass spectrometry. Topics will include a discussion of mass spectrometry nomenclature, ionization sources, mass analyzers, and detectors. Prerequisite: quantitative analysis. | | | | | | |
| Class # | Catalog # | Cr Hrs | Course Title | Lead Instructor | Day | Time | Bldg/Room |
| 10344 | CHEM 7730 | 2.0 | Electrochemistry I | Henry White | M, W, F | 9:35AM – 10:40AM | PAB 103 |
| *First Half Semester*<br><br>*Lecture* | This course will provide an overview of the fundamental concepts of electrochemical science. The course is devoted to the basic principles underlying chemical reactions at the electrode/electrolyte interface. | | | | | | |
| Class # | Catalog # | Cr Hrs | Course Title | Lead Instructor | Day | Time | Bldg/Room |
| 18009 | CHEM 7740 | 2.0 | Electrochemistry II | Long Luo | M, W, F | 9:35AM – 10:40AM | TBBC 2429 |
| *Second Half Semester*<br><br>*Lecture* | This course is designed to introduce you to electrochemical reaction mechanisms, electroanalytical techniques, and electrochemical technologies. Topics to be covered include: a variety of voltammetric and amperometric techniques, electrochemical reaction mechanisms and modified electrodes, and modern electrochemical technologies. | | | | | | |
| Class # | Catalog # | Cr Hrs | Course Title | Lead Instructor | Day | Time | Bldg/Room |
| 20215 | COMP 6960-009 | 3.0 | Programming for BioMedical Data Science | Rebecca Barter | Online | Online | Online |
| *Online*<br><br>*Special Topics* | This course will provide an introduction to programming, in R and/or python, with topics and pace designed for biomedical students interested in data science. Prior programming experience is not required. Students will learn how to write code for handling data, focusing on dataframe representations. Using these common representations, students will learn to prepare data for analysis starting from various formats, visualize its contents, and perform basic analysis to evaluate the data veracity. This course is structured as a series of stackable short-courses, where students need to select and complete 4 short courses in the semester to fulfill requirements for this credit-earning course<br><br>*Meets With*:<br>• *COMP 5960 090* | | | | | | |
| Class # | Catalog # | Cr Hrs | Course Title | Lead Instructor | Day | Time | Bldg/Room |
| 5195 | MBIOL 7570 | 1.0 | Research Ethics | Vasiliki Karahalios | W | 4:00PM - 5:20PM | EHSEB 1750 |
| *First Half Semester*<br><br>*Lecture* | An examination of research integrity and other ethical issues involved in scientific research. Topics may include scientific fraud, conflicts of interest, plagiarism and authorship designation, and the role of science in formulating social policy. This course is designed for graduate students, post-docs and regular faculty in the sciences. | | | | | | |

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| Class # | Catalog # | Cr Hrs | Course Title | Lead Instructor | Day | Time | Bldg/Room |
|---|---|---|---|---|---|---|---|
| 7723 | MDCRC 6000 | 2.0 | Introduction to Biostatistics | Greg Stoddard | Online | Online | Online |
| *Online*<br><br>*Lecture* | | Basic statistics with emphasis on medical and epidemiologic research problems, including description of data, theoretical distributions, hypothesis testing, multiple comparisons, correlation, confidence intervals, basic regression models, and sample size estimation. | | | | | |
| Class # | Catalog # | Cr Hrs | Course Title | Lead Instructor | Day | Time | Bldg/Room |
| 13417 | MDCRC 6050 | 2.0 | Biostatistics for Basic Science | Greg Stoddard | Online | Online | Online |
| *Online*<br><br>*Lecture* | | Applied statistical methods in basic science. Problems will be solved using the Stata statistical software. Topics include: descriptive statistics, significance testing, multiple comparison adjustment, data management using Stata, computer graphics, sample size determination, and analysis of clustered data (multiple observations in same animal). Animal and bench experiment datasets will be used in lectures and homework. | | | | | |
| Class # | Catalog # | Cr Hrs | Course Title | Lead Instructor | Day | Time | Bldg/Room |
| 14808 | MDCRC 6450 | 3.0 | Grant Writing | Julie Shakib | T | 5:00PM – 7:00PM | EHSEB 2948 |
| *Full Semester*<br><br>*Lecture* | | This course covers the preparation of a research grant application including Abstract, Aims, Significance, Innovation, Research Plan, and Biosketch, as well as supporting appendices. Over the course of the semester, students will complete a grant application (usually in the NIH format). The course concludes with a mock study section. Enrolled students should be in the process of writing a research grant with a planned submission in the next 12 months. | | | | | |
| Class # | Catalog # | Cr Hrs | Course Title | Lead Instructor | Day | Time | Bldg/Room |
| 15070 | MDCRC 6521 | 1.0-5.0 | Medicine & Physiology for Molecular Biologists | Kevin J Whitehead | T, Th | 9:10AM-10:30AM | EHSEB 2908 |
| *Full Semester*<br><br>*Special Topics* | | This course explores and provides a richer understanding of human physiology and pathophysiology. This information is critical for understanding the importance of any molecular mechanism at the level of cells, organ and whole animals, and applying this information to humans.<br><br>*This course has a DIFFERENTIAL TUITION attached to it that is NOT covered by the Tuition Benefit Program.* | | | | | |
| Class # | Catalog # | Cr Hrs | Course Title | Lead Instructor | Day | Time | Bldg/Room |
| 21378 | ONCSC 6500-003 | 1.5 | Clinical Biology of Cance | Rob Judson-Torres & Allie Grossmann | M, W, F | 3:00PM-4:00PM | HCI Research South 6th floor conference room |
| *First Half Semester*<br><br>*Lecture* | | 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 |
| 21248 | ONCSC 6700-003 | 2 | Oncogene Addiction in Cancer | Martin McMahon | T | 2:00-4:00PM | HCI Research South-2C |
| *First Half Semester*<br><br>*Advanced Seminar* | | Mutationally-activated proto-oncogenes are key drivers of many common malignancies including melanoma, lung, pancreatic, breast and colorectal cancers. Moreover, oncoprotein-targeted therapeutics continue to have a dramatic impact on the treatment of these otherwise lethal diseases. Through review of the primary literature, this discussion course will examine the: 1. Origins of our knowledge of the genetic and biochemical basis of "Oncogene Addiction"; 2.Subsequent development of oncoprotein-targeted cancer therapeutics; 3. Critical importance of drug resistance in understanding the mechanism(s) of cancer drug activity and; 4. Importance of combination therapy to deepen and extend the durability of patient's clinical response. By the end of the course, students will have a thorough grounding on the history of oncogenes and the prospect(s) for future cancer cures based on oncoprotein pathway-targeted therapies.<br><br>*Please reach out to Martin McMahon (Martin.McMahon@hci.utah.edu) to sign up.* | | | | | |
| Class # | Catalog # | Cr Hrs | Course Title | Lead Instructor | Day | Time | Bldg/Room |
| 4410 | PATH 7330 | 3.0 | Basic Immunology | Maria Bettini | T, Th | 2:00PM - 3:30PM | EHSEB 3515B |
| *Full Semester*<br><br>*Lecture* | | This is a survey course covering the basic principles in Immunology with lectures provided by faculty directly involved in particular areas. The final third of the course will feature clinical and experimental topics in Immunology. The course is primarily slated for graduate and master students. It is also open for particularly interested undergrad students, but is not specifically intended as preparation for Med School due to its programmatic depth. Students should have some exposure to biochemistry, modern genetics, and cell biology. Undergrad students are encouraged to complete BIOL 2020, 2030 and 3510 prior to taking this course. | | | | | |

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|---|---|---|---|---|---|---|---|
| 20263 | PH TX 7211 | 4.0 | Principles of Toxicology | Farzana Alam | T, Th | 1:30PM - 3:30PM | EHSEB 2948 |
| *Full Semester*<br><br>*Lecture* | This course aims to provide an overall understanding of current pharmacotherapeutic approaches and the basic science underpinnings of those approaches for managing important disease conditions. Topics in Pharmacology and Toxicology will consist of the major drug categories applied in the different systems of the body, including Central nervous systems, Autonomic Nervous Systems, Cardiac drugs, Respiratory drugs, Gastrointestinal drugs, Renal drugs, Bone and Endocrine systems, Antibiotics, Cancer therapeutics, and Immunotherapies. The relevant pathophysiology, pharmacology, and toxicology will be presented in each module, and therapeutic advances will be presented or discussed by the students during each session. | | | | | | |
| Class # | Catalog # | Cr Hrs | Course Title | Lead Instructor | Day | Time | Bldg/Room |
| 8669 | PHCEU 7010 | 1.5 | Molecular Biology for Pharmaceutical Scientists | Carol Lim | M, W | 11:00AM - 12:30PM | EHSEB 5100B |
| *Second Half Semester*<br><br>*Lecture* | This course will review fundamental aspects of genetic engineering and molecular biology, with application to health sciences. | | | | | | |
| Class # | Catalog # | Cr Hrs | Course Title | Lead Instructor | Day | Time | Bldg/Room |
| 6946 | PHCEU 7030 | 2.0 | Drug Delivery | Shreya Goel | T, Th | 8:50AM-10:50AM | EHSEB 5100C |
| *First Half Semester*<br><br>*Lecture* | Introduction to polymer in Pharmaceutics and drug delivery. Transport phenomena in drug delivery systems. Macromolecular and vesicular carriers. Biorecognition and drug targeting. Protein, oligonucleotide, and gene delivery systems.<br><br>*Prerequisite: Graduate student status or instructor consent and CHEM 7050.* | | | | | | |
| Class # | Catalog # | Cr Hrs | Course Title | Lead Instructor | Day | Time | Bldg/Room |
| 11523 | PHCEU 7040 | 3.0 | Biotechnology | James Herron, Yue Lu & Shawn Owen | M, W, F | 10:00AM-12:00PM | EHSEB 5100B |
| *First Half Semester*<br><br>*Lecture* | Principles of kinetics and mechanisms of organic reactions and structure-reactivity relationships applied to pharmaceutical systems. Mechanisms of the degradation and stabilization of drugs, proteins, and DNA. | | | | | | |

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|---|---|---|---|---|---|---|---|
| 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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|---|---|---|---|---|---|---|---|
| 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<br><br>***Reach out to Matt Miller ( matt.miller@biochem.utah.edu) & Ben Myers (benjamin.myers@hci.utah.edu) for a permission code*** | | | | | |
| 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. | | | | | |
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| 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. | | | | | |