Spring 2023 Electives/Advanced Seminars

View Course Schedules online:

https://student.apps.utah.edu/uofu/stu/ClassSchedules/main/1234/index.html

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

Please note you may need Permission Codes to register. Please contact the Department Coordinator or Instructor.

Frequent MB & BC Electives

Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
12883	**BIOL 6500**	3.0	**Advanced Statistical Modeling for Biologist**	Jody Reimer	M, W	2:00-3:30PM	JTB 320
Full Semester Lecture		***Frequent MB Elective;*** *Counts as 2 electives* This course is designed for life science graduate students with a perhaps rusty background in mathematics and statistics who wish to become real practitioners of the art of modern statistics. The course is based on the R programming language. To obtain a registration code, please contact the instructor and Shannon Nielsen shannon.nielsen@bioscience.utah.edu					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
13478	**CHEM 7470**	2.0	**Nucleic Acid Chemistry**	Ming Hammond	T, Th	9:10AM - 10:30AM	BEH S 105
Second Half Semester Lecture		***Frequent BC & MB Elective;*** **Prerequisite: 2 semesters undergraduate organic chemistry.** This is a one half semester course that focuses on the application of organic chemistry to the study and manipulation of nucleic acids. Topics include chemical synthesis of DNA and RNA, nucleoside and oligomer analogs, chemistry of DNA damage and repair, nucleic acid-targeted drugs and binding agents.					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
18020	**CHEM 7530**	2.0	**Molecular Simulations**	Valeria Molinero	M, W, F	11:00AM - 12:05PM	HEB 2010
Second Half Semester Lecture		Molecular simulations and modeling are playing an increasingly important role in chemistry, for their power to bridge the way from the microscopic structure and interactions to macroscopic properties that are key for the modeling and design of new materials and processes. The purpose of this course is to educate students in the foundation and practice of classical Molecular Dynamics and Monte Carlo simulations. Through lectures, laboratory practice, review of recent literature and a final laboratory project, the students learn how to plan, execute and interpret molecular simulation experiments and to read critically the literature involving molecular simulations applied to chemistry, molecular physics and molecular biology.					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
12064	**H GEN 6091**	1.5	**Evolution & Development**	Gabrielle Kardon Michael Shapiro	T, TH	1:15-2:45PM	EHSEB 2962
Second Half Semester Lecture		***Frequent MB Elective*** This course will explore the molecular, developmental, and genetic mechanisms underlying evolutionary change, with an emphasis on current research in animal biology. Topics include regulatory networks and signaling pathways, modularity, developmental constraints, origin of animals, molecular/developmental origin of diverse body plans and appendages, and genetics of speciation. The class will consist of both lectures and discussions of current literature. Suitable for graduate students at all levels.					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
14578	**H GEN 6092**	2.0	**Evolutionary Genetics and Genomics**	Nathan Clark Ellen Leffler	M, W, F	9:30AM - 10:20AM	EHSEB 2958
First Half Semester Lecture		***Recommended MB Elective*** This course will cover the fundamentals of population and evolutionary genetics with an emphasis on molecular and sequence-level approaches, including practical exercises in computational analysis aimed at students at all levels of experience. Lectures will cover both theory and experimental studies of the forces that shape genetic variation within and between species.					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
7355	**H GEN 6421**	1.5	**Genetics of Complex Diseases**	Lynn Jorde	W	1:30-3:30PM	EHSEB 2969
First Half Semester Lecture		***Frequent MB Elective*** This course addresses issues relevant to the identification of genes that underlie susceptibility to complex diseases. Topics include: design of genome-wide association and DNA sequencing studies; utilization of extended families; gene-gene and gene-environment interaction; use of the Utah Population Database. Methods and principles will be illustrated with discussions of ongoing studies of complex diseases such as inflammatory bowel disease, common cancers, and psychiatric diseases.					

Updated 1/6/2023

Spring 2023 Electives/Advanced Seminars

View Course Schedules online:

https://student.apps.utah.edu/uofu/stu/ClassSchedules/main/1234/index.html

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

Please note you may need Permission Codes to register. Please contact the Department Coordinator or Instructor.

Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
5179	**H GEN 6481**	1.5	**Cellular Signaling**	Charles Murtaugh	M, W, F	10:45AM - 11:35AM	EHSEB 3515B
First Half Semester Lecture		***Frequent BC & MB Elective*** This course will examine the mechanisms of a variety of eukaryotic signal transduction pathways, and explore how these pathways affect the behavior of cells within developing and adult tissues. The material will include readings and discussion of the primary literature, and emphasize experimental techniques and analyses.					

Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
11513	**MDCRC 6530**	2.0	**Utilization of Animal Models in the Development of Clinical Research Projects**	Anthea Letsou	W	1:00-2:30PM	EHSEB 4100A
Full Semester Lecture		***Frequent MB Elective;*** *Counts as 2 electives* ***Med-2-Grad Core Course Requirement*** It is now possible to precisely modify any DNA sequence within the genome of the mouse. This course emphasizes using mouse models to dissect the genetic basis of human disease. Deletion of genes using homologous recombination will be covered extensively as will other methods of gene inactivation (anti-sense constructs, inhibitory RNA, etc.). New experimental systems for modeling human disease in zebra fish and C. elegans will also be covered.					

Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
17566	**PATH 6410**	1.5	**Molecular Virology**	Vicente Planelles	M, W	1:00-2:30PM	EEJMRB 1200
First Half Semester Lecture		***Frequent MB Elective*** Basic knowledge of molecular biology is required. The molecular biology of virus lifestyle strategies, including cell entry, nucleic acid replication, gene expression, assembly of progeny virions, interaction with the host cell, and molecular epidemiology. The course will provide both a general introduction to the diversity of virus lifestyles and a detailed analysis of several of these strategies.					

Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
13285	**PATH 7320**	1.5	**Topics in Immunology**	Matthew Bettini	T, TH	1:00-2:30PM	EEJMRB Conference RM 5420
First Half Semester Lecture		***Frequent MB Elective*** **This class is specifically geared toward 1st year MB students. Other students should contact Dr. Bettini prior to registering.** This course will address core topics in immunology including cellular and molecular mechanisms of innate and adaptive immune responses to infection, vaccines, autoimmunity and cancer immunology and immunotherapies. The course will provide a general introduction to each topic by a faculty, followed by a student led discussion of a manuscript on the specific topic.					

Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
10214	**PHCEU 7011**	3.0	**Fundamentals of Pharmacokinetics**	James Herron Shawn Owen	W, F	10:30AM - 12:00PM	EHSEB 4100B
Full Semester Lecture		***Frequent BC Elective;*** *Counts as 2 electives;* ***Prerequisite: PHCEU 7010, or Special Permission from Instructor*** This course will review fundamental aspects of pharmacokinetics with an emphasis on understanding concepts for compartmental and non-compartmental modeling, physiologic modeling, and modeling of targeted drug delivery systems. The goal of the course is to understand how these techniques can be used to optimize drug delivery.					

Updated 1/6/2023

Spring 2023 Electives/Advanced Seminars

View Course Schedules online:

https://student.apps.utah.edu/uofu/stu/ClassSchedules/main/1234/index.html

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

Please note you may need Permission Codes to register. Please contact the Department Coordinator or Instructor.

Additional Electives

Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
2083	**ANAT 7690**	3.0	**Scientific Lecturing and Writing**	Kurt Albertine	TBA	TBA	TBA
Full Semester Seminar		*Counts as 2 electives* To provide guidelines for writing clear scientific papers and delivering good lectures. Lectures, discussion, homework assignments and submission of a new original scientific paper in an area chosen by each student.					

Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
14056	**BIO C 7100 - 002**	1.0 – 2.0	**CryoEM Image Processing**	Peter Shen	TBA	TBA	TBA
Second Half Semester Special Topics		Advanced 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
12295	**BIO C 7200**	2.0	**Genetic Therapies**	Dana Carroll Amy Hawkins	March 20-31, M -F	10:00 AM - 11:30AM & 1:30PM - 3:00PM	TBA
March 20-31 Seminar		Advanced Seminar: This intensive, 2-week, 2-credit elective course is designed to introduce advanced medical and graduate students to issues that will be relevant to research and practice in an era of molecular medicine. Emerging therapies based on genetic abnormalities are promising, but also frequently controversial. The course will begin with early efforts at gene therapy and attendant ethical considerations. It will cover contemporary methods for gene manipulation and recent clinical experience with genetic therapies. Human germline modification will be covered, as will current efforts at regulation and societal issues, including justice and access. Because of its relevance to human health, uses of genetic manipulation in food organisms will also be discussed. Relevant readings, largely from the primary literature, will be assigned for each session. In the first week, class time will consist of presentations by the faculty, discussions of the lecture material and the assigned readings, and broader discussion of issues raised by these exposures. In the second week, student presentations will replace a portion of the lecture time, the extent depending on the number of students enrolled. The student presentations will be on literature-based topics chosen by the students themselves in consultation with the faculty. The written assignments can take a number of forms, from thoughtful reviews of specific technical and/or ethical topics, to drafting of an opinion piece for submission to a newspaper, to a creative writing project for submission to Rubor. This is an intensive 2-week course with twice daily meetings. It is particularly appropriate for advanced students working in areas of biomedical research but is open to anyone with a background in molecular biology. Most sessions will feature a presentation by one of the faculty or a guest speaker, with plenty of time for discussion. Each student will make a short presentation during the final week on a topic of their choosing. The focus will be on engagement with the science and ramifications of the powerful technologies we now possess to address genetic diseases. The course should satisfy departmental requirements for an advanced course but check with your department to make sure. You are welcome to contact me if you have questions. To obtain a registration code, please contact Amity Mower in the Biochemistry Office, amity.mower@biochem.utah.edu.				

Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
9321	**BIOL 6530**	3.0	**Foundations in Biological Chemistry**	David Blair Martin Horvath	T, TH	10:45AM - 12:05PM	HEB 2008
Full Semester Lecture		*Counts as 2 electives* The course fee covers all required textbooks and course materials at a reduced cost. Students may request to opt out here: https://portal.verba.io/utah/login Structure and function of biomolecules, metabolism, and regulation. To obtain a registration code, please contact the instructor and Shannon Nielsen shannon.nielsen@bioscience.utah.edu					

Updated 1/6/2023

Spring 2023 Electives/Advanced Seminars

View Course Schedules online:

https://student.apps.utah.edu/uofu/stu/ClassSchedules/main/1234/index.html

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

Please note you may need Permission Codes to register. Please contact the Department Coordinator or Instructor.

Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
15910	**BIOL 7961**	1.0 – 5.0	Advanced Topics in Biochemistry and Molecular Biology	Toto Olivera	M, W	3:30-5:30PM	BIOL 306
Second Half Semester Special Topics		Topics of special interest taught when justified by student and faculty interest. Content varies from year to year. To obtain a registration code, please contact the instructor and Shannon Nielsen shannon.nielsen@bioscience.utah.edu					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
12895	**BIOL 7962**	1.0 – 5.0	**Advanced Topics in Cell and Developmental Biology**	Markus Babst & Julie Hollein	M, W	3:30-5:30PM	BIOL 306
First Half Semester Special Topics		Topics of special interest taught when justified by student and faculty interest. Content varies from year to year. To obtain a registration code, please contact the instructor and Shannon Nielsen shannon.nielsen@bioscience.utah.edu					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
13393	**CHEM 7160**	2.0	**Organometallic Chemistry I**	Caroline Saouma	T, TH	9:10-10:30AM	HEB 2010
First Half Semester Lecture		This course is intended for graduate students in Chemistry with interests in the intersection of organic and inorganic chemistry. Organometallic chemistry is defined by metal complexes performing chemical reactions might involve intermediates containing transition metal-carbon bonds. The course will introduce fundamental concepts of both inorganic and organic chemistry and the application of these concepts to designing and applying catalytic chemical reactions to target directed organic synthesis, chemical biology, and material science.					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
9088	**CHEM 7300**	2.0	**Polymers: Chemistry**	Ilya Zharov	T, TH	10:40-12:20PM	WBB 207
First Half Semester Lecture		This course will cover the fundamentals of polymer chemistry and polymer structure. The topics will include basic types of polymers, their characterization, mechanisms of polymer formation, specific examples of polymer structures, applications of polymeric materials, advances in polymer chemistry. Three lectures, one discussion per week for 7.5 weeks. Students will be required to pass a midterm and a final exam and prepare a presentation on a topic of current interest in the area of polymer chemistry.					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
4920	**CHEM 7780**	2.0	**Surface Chemistry**	Scott Anderson	M, W, F	8:20AM - 9:25AM	HEB 2010
First Half Semester Lecture		This course is a half semester introduction to the physics and chemistry of solid surfaces, with about equal emphasis on scientific questions and on the spectroscopic and other methods used to probe surfaces. The focus is decidedly practical, and the course is intended for graduate students needing to understand surface properties in their future research, or for those interested in learning how to analyze surfaces.					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
13421	**H GEN 6020**	1.0	**Advances in Genetics**	David Grunwald Mark Metzstein	W	2:00-4:00PM	EHSEB 4100D
Full Semester Seminar		***Frequent MB Elective*** Seminar for graduate students. Faculty and topics will change yearly. Consult instructor before registration.					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
18228	**NEUSC 6050**	4.0	**Principles of Systems Neuroscience**	Adam Douglass Jim Heys	T, TH, F	10:45-12:05PM	TBA
Full Semester Lecture		*Counts as 2 electives* Perhaps the most essential function of the brain is to generate behaviors that maximize an animal's well-being in a dynamically changing environment. Doing so requires often-enormous numbers of neurons to work together in a highly coordinated way. In this course, we will learn about the principles that govern such activity within neural circuits and how they shape an animal's ability to sense, learn, plan and ultimately adapt to its environment. Our approach will use a combination of didactic lectures and group discussion that emphasizes the primary systems neuroscience literature, and the myriad quantitative and experimental techniques that are used to understand the brain.					

Updated 1/6/2023

Spring 2023 Electives/Advanced Seminars

View Course Schedules online:

https://student.apps.utah.edu/uofu/stu/ClassSchedules/main/1234/index.html

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

Please note you may need Permission Codes to register. Please contact the Department Coordinator or Instructor.

Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
17571	**PATH 7360**	1.5	**Advanced Immunology**	Dean Tantin	T, Th	2:00-3:30PM	EEJMRB 2420
First Half Semester Lecture		Prerequisite: A survey course in Immunology (such as PATH 5030) and some exposure to Biochemistry, Cell Biology, and Genetics. This is an advanced lecture and seminar course addressing topics of immunological research and interest. The course will focus upon original research articles, not a textbook. Students will be expected to participate in discussions. Class grade will be determined based upon classroom participation and a research proposal based upon some aspect of immunology covered in this course. ***(Conflicts with BLCHM/MBIOL 6200 Critical Thinking in Research)***					

Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
17567	**PATH 7907**	1.0	**Immunity to Infectious Disease**	Tracey Lamb	T, TH	2:00-3:30PM	EEJMRB 2420
Second Half Semester Special Topics		Prerequisite: PATH 7330 Basic Immunology Email Tracey Lamb before registering					

Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
8464	**PHCEU 6020**	3.0	**Biomaterials**	Michael Yu	T, TH	10:45AM - 12:05PM	GC 2760
Full Semester Lecture		*Counts as 2 electives* Chemical, physical, and biological properties of synthetic polymer, metal, and ceramic biomaterials. Relationship between the structure of biomaterials and their interaction with blood, soft, and hard tissue. Mechanical properties, fabrication, and degradation mechanisms, and performance testing of materials in biomedical use.					

Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
12151	**PHCEU 7020**	4.0	**Physical Chemistry of Biomedical and Drug Delivery Systems**	David Grainger	T, TH	2:00-4:00PM	TBA
Full Semester Lecture		*Counts as 2 electives* Physicochemical fundamentals of dosage form design. Molecular thermodynamics approach to establishing principles of solutions, structures of liquids and solids, complexation, ion-solvent interactions, and multiple equilibria of organic solutes. Physicochemical examination of peptides and proteins, and protein structures. Thermodynamics of nucleic acids: temperature effects, cooperativity, and hybridization equilibria. Principles of colloid and interfacial sciences applied to pharmaceutical dosage formulations.					

Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
11532	**PH TX 7114**	2.0	**Principles of Toxicology**	Alessandro Venosa Cameron Metcalf	TBA	TBA	TBA
Full Semester Lecture		Prerequisite: Instructor's Consent; *Counts as 2 electives* General principles, testing procedures, toxic responses, and target organ toxicities. This course is designed to familiarize students with adverse effects that chemicals may produce based on the dose, exposure and hazard of those chemicals. There will be a focus on mechanisms of toxicity in different organ systems (Neurotoxicology, cardiovascular, lungs, skin and kidney toxicology) that are relevant based on common exposure. The course will also cover environmental toxicology, toxic effects of pesticides, and natural products.					

Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
19410	**PH TX 7280**	2.0	**Advances in Neuropharmacology: Glial cells in heath and disease**	Karen S. Wilcox	T	1:00-3:00PM	TBA
Full Semester Lecture		*Counts as 2 electives* The main goal of the course is to familiarize students with glial cell function by exploring, presenting, and discussing pertinent research articles. Objectives: • Design and deliver presentations of scientific papers • Describe and discuss the physiological and pathological function of glia • Explain state-of-the-art experimental approaches to study glia • Debate controversies in the field • Hypothesize and identify the roles for these cells in a variety of pathologies					

Updated 1/6/2023

Spring 2023 Electives/Advanced Seminars

View Course Schedules online:

https://student.apps.utah.edu/uofu/stu/ClassSchedules/main/1234/index.html

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

Please note you may need Permission Codes to register. Please contact the Department Coordinator or Instructor.

		• Investigate the experimental limitations currently facing this field • Develop a 'journal club' style or mini-review manuscript for submission					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
16174	**PH TX 7690**	2.0	**Professional Skills Development**	Kristen A. Keefe	W	3:00-5:00PM	EHSEB 4100C
Full Semester Special Projects		*Counts as 2 electives* In this course, trainees will focus on developing four professional skill areas to promote their leadership and communication skills. First, the course will address technical writing, with a focus on manuscript/review and technical report communications. These sections will emphasize rigor and transparency in scientific writing, including figure preparation, data analysis and reporting of results. Exercises will focus on preparation of a manuscript or review based on the trainee's research to date or research area. Second, students will learn about communication styles and rhetorical devices to apply to communicating their science to different stakeholders, including training in the preparation and delivery of a "Ted-talk" format presentation. Third, the class will address leadership development, including assessment of leadership strengths and capabilities, and approaches to and practice in mindful leadership and effective team performance, collaboration and communication. Finally, career development issues including cover letters, resumes, and interviewing will be addressed. Students will prepare resumes and cover letters, as well as develop PAR/STAR-format descriptions of their knowledge and skills related to their career aspirations.					

The classes below, Tuition Benefits will ***NOT*** cover the differential tuition. Please be sure to check tuition bills and coverage

Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
7644	**BIOL 5210**	3.0	**Cell Structure and Function**	Ofer Rog	T, TH	10:45-12:05PM	ASB 210
Full Semester Lecture		*Counts as 2 electives* Relations between structure and function in animal cells. Membranes and permeability, structural components and motility, cell division, and hormone receptors and functions. Reading from current research literature. ***Note – Tuition Benefit does NOT pay for differential tuition charges. Please be sure to check tuition bills and coverage***					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
12882	**BIOL 5120**	3.0	**Gene Expression**	Michael Werner	M, W, F	10:45-11:35AM	ASB 210
Full Semester Lecture		*Counts as 2 electives* How cells decode the information in their genomes and regulate the processing, localization, and degradation of RNA and proteins. Exploration of the role of gene expression in cell differentiation and disease. Reading from the current research literature. It is recommended that BIOL 2030 is completed prior to taking this course. ***Note – Tuition Benefit does NOT pay for differential tuition charges. Please be sure to check tuition bills and coverage***					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
12206	**BMI 6016**	2.0	**Biomedical Data Wrangling and Quality**	Ram Gouripeddi	TBA	TBA	TBA
Full Semester Lecture		*Counts as 2 electives* This course will provide an introduction to understanding general concepts of data wrangling and quality and practical application of these concepts in a variety of biomedical domains and data sources. Critical initial steps in biomedical data science and informatics include data engineering to support operations and research. These steps need to be performed with continuous efforts to assess and communicate quality of these data through their life-cycle of extraction, transformation, integration assimilation and consumption. Fees: $386.92 ***Note – Tuition Benefit does NOT pay for differential tuition charges. Please be sure to check tuition bills and coverage.***					

Updated 1/6/2023