

## Spring 2021 Electives/Advanced Seminars

View Course Schedules online:

<https://student.apps.utah.edu/uofu/stu/ClassSchedules/main/1214/>

Attention: 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.

Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
3476	<b>BIO C 6600</b>	1.5	Regulation of Metabolism	Janet Lindsley	T, TH	9:30AM – 11:00AM	TBA
Second Half		<p><b>Frequent BC Elective (Biochemistry Research Track Course)</b>  <b>Frequent MB Elective</b></p> <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>					
14898	<b>BIOL 6500</b>	3.0	Advanced Statistical Modeling for Biologist	Frederick Adler	M, W	1:25PM – 2:45PM	ASB 210
Full Semester		<p><b>Frequent MB Elective</b></p> <p>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.</p>					
16992	<b>BLCHM 6430</b>	1.5	Structural Methods	Christopher Hill	M, W, F	9:40AM – 10:30AM	Canvas
First Half		<p><b>Frequent BC Elective (Structural Biology / Biophysics Research Track)</b>  <b>Frequent MB Elective</b></p> <p>This course provides an integrated approach to the applications of NMR and X-ray crystallography in structural biology. Topics covered include: basic NMR theory, and the application of 2D and 3D NMR methods for the determining protein and RNA structures; methods of macromolecular crystallization and crystal structure determination.</p> <p><b>Please Contact Elizabeth Loertscher (elizabethl@genetics.utah.edu) for a Permission Code.</b></p>					
14926	<b>CHEM 7150</b>	2.0	Bioinorganic Chemistry	Matt Kieber-Emmons	M, W, F	9:35AM – 10:40AM	Canvas
Second Half		<p><b>Frequent BC Elective</b></p> <p>This course provides a broad overview of metal sites in biology and is intended for students at the interface of Chemistry, Biology, Biophysics, and related disciplines. It focuses on our current understanding of the role of metals in the structure and function of proteins and nucleic acids, metalloproteins as elaborated inorganic complexes, physical methods used to study metal sites with emphasis on the synergism between model complexes and biochemical studies, and applications in medicine. Three lectures, one discussion per week for 7.5 weeks.</p>					
15631	<b>CHEM 7270</b>	2.0	Organic Spectroscopy I	Bethany Buck-Koehntop	M, W, F	11:00AM – 12:05PM	Canvas
First Half		<p><b>Recommended BC Elective</b></p> <p>Students should gain an understanding of NMR theory, experimental set-up and spectral interpretation/identification of organic molecules from 1D and 2D solution NMR spectra. Specifically:</p> <ul style="list-style-type: none"> <li>• Fundamentals of organic structural determination</li> <li>• Components of the NMR spectrometer, data acquisition and sample considerations</li> <li>• Chemical shift theory and estimation of <sup>1</sup>H and <sup>13</sup>C chemical shift through empirical formulas</li> <li>• J-coupling theory, magnetic equivalence and higher order spectra, and use of spin decoupling for signal enhancement</li> <li>• NMR relaxation – theory of longitudinal (T<sub>1</sub>) and transverse (T<sub>2</sub>) relaxation, experimental measurements of T<sub>1</sub> and T<sub>2</sub> (inversion-recovery, spin-echo, CPMG), quadrupolar relaxation effects, use of relaxation properties in spectral assignment</li> <li>• Nuclear Overhauser Effect (NOE) – theory and application</li> <li>• Multinuclear NMR – spectral interpretation for direct detection of <sup>15</sup>N, <sup>19</sup>F, and <sup>31</sup>P nuclei</li> <li>• Advanced 1D NMR techniques – theory and spectral interpretation of INEPT, DEPT, TOCSY, NOESY/ROESY data</li> <li>• 2D NMR techniques – theory and spectral interpretation of homonuclear: COSY, TOCSY, NOESY/ROESY, INADEQUATE; and</li> </ul>					

# Spring 2021 Electives/Advanced Seminars

View Course Schedules online:

<https://student.apps.utah.edu/uofu/stu/ClassSchedules/main/1214/>

Attention: 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.

Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
heteronuclear: 13C/1H HMQC, HSQC, HMBC data							
15826	<b>CHEM 7470</b>	2.0	Nucleic Acid Chemistry	Ming Chen Hammond	M, W, F	8:20AM – 9:25AM	Canvas
Second Half		<p><b>Frequent BC Elective (Biochemistry Research Track)</b> <b>Frequent MB Elective</b></p> <p><b>Prerequisite: 2 semesters undergraduate organic chemistry.</b></p> <p>Three lectures, one discussion per week for 7.5 weeks. 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. Prerequisite: 2 semesters undergraduate organic chemistry.</p>					
15422	<b>H GEN 6060</b>	2.0	Applied Computational Genomics	Aaron Quinlan	T, TH	9:10AM – 10:30AM	EIHG / TBA
Full Semester		<p><b>Frequent BC Elective</b> <b>Frequent MB Elective</b></p> <p><b>Genome Science Program Core Requirement</b></p> <p>This course will provide a comprehensive introduction to fundamental concepts and experimental approaches in the analysis and interpretation of experimental genomics data. It will be structured as a series of lectures covering key concepts and analytical strategies. A diverse range of biological question enabled by modern DNA sequencing technologies will be explored including sequence alignment, the identification of genetic variation, structural variation, and ChIP-seq and RNA-seq analysis. Students will learn and apply the fundamental data formats and analysis strategies that underlie computational genomics research. The primary goal of the course is for students to be grounded in theory and have the ability to conduct independent genomic analyses.</p>					
5553	<b>H Gen 6481</b>	1.5	Cellular Signaling	Charles Murtaugh	M, W, F	10:45AM – 11:35PM	TBA
First Half		<p><b>Frequent MB Elective</b></p> <p>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.</p>					
5470	<b>MD CH 7891</b>	2.0	The Chemical Biology of Pain: Opioids and Beyond	Eric Schmidt	M, W, F	1:00PM – 2:00PM	TBA
First Half		<p><b>Frequent BC Elective (Chemical Biology / Medicinal Chemistry Track)</b></p> <p>In this half-semester course, we will introduce key concepts in Chemical Biology with an emphasis on examples from the primary literature. Topics will include chemical and biological compound library development, chemical genetics and target identification, and strategies for the development of chemical probes and therapeutic compounds. Students will leave the class with a working knowledge of the field of Chemical Biology and its relationship to medicinal chemistry and drug development, the ability to analyze the primary literature and to design experiments to test key questions at the interface between chemistry and biology.</p>					
12885	<b>MDCRC 6530</b>	2.0	Utilization of Animal Models in the Development of Clinical Research Projects	Anthea Letsou	W	1:00PM – 2:30PM	TBA
Full Semester		<p><b>Frequent MB Elective</b></p> <p><b>Med-2-Grad Core Course Requirement</b></p> <p>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</p>					

## Spring 2021 Electives/Advanced Seminars

View Course Schedules online:

<https://student.apps.utah.edu/uofu/stu/ClassSchedules/main/1214/>

Attention: 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.

			methods of gene inactivation (anti-sense constructs, inhibitory RNA, etc.). New experimental systems for modeling human disease in zebra fish and <i>C. elegans</i> will also be covered.				
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
2944	<b>ONCSC 6500</b>	1.5	Clinical and Molecular Cancer Biology - Molecular Mechanisms of Cancer	Sean Tavgigian	M, W, F	3:00PM – 4:00PM	TBA
Second Half		<p><b>Frequent BC Elective</b> <b>Frequent MB Elective</b></p> <p><b>Prerequisites: Concurrent enrollment or equivalent 1st year Cell Biology, Molecular Biology and Genetics.</b></p> <p>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.</p>					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
16804	<b>PATH 6410</b>	1.5	Molecular Virology	Vicente Planelles	M, W	1:00PM – 2:30PM	Canvas
First Half		<p><b>Frequent MB Elective</b></p> <p>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</p>					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
15459	<b>PATH 7320</b>	1.5	Topics in Immunology	Scott Hale	T, TH	1:00PM – 2:30PM	Canvas
First Half		<p><b>Frequent MB Elective</b></p> <p>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.</p>					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
16806	<b>PATH 7360</b>	1.5	Advanced Immunology	Dean Tantin	T, TH	2:00PM – 3:30PM	Canvas
First Half		<p><b>Frequent MB Elective</b></p> <p><b>Prerequisite: A survey course in Immunology (such as PATH 5030) and some exposure to Biochemistry, Cell Biology, and Genetics.</b></p> <p>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.</p>					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
11229	<b>PHCEU 7011</b>	3.0	Fundamentals of Pharmacokinetics	James Herron Shawn Owen	W, F	10:30AM – 12:00PM	Canvas
Full Semester		<p><b>Frequent BC Elective</b></p> <p><b>Prerequisite: PHCEU 7010, or Special Permission from Instructor</b></p> <p>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.</p>					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
2241	<b>ANAT 7690</b>	3.0	Scientific Lecturing and Writing	Kurt Albertine	TBA	TBA	TBA

# Spring 2021 Electives/Advanced Seminars

View Course Schedules online:

<https://student.apps.utah.edu/uofu/stu/ClassSchedules/main/1214/>

Attention: 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.

Full Semester		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
3495	BIO C 7100	1.0 – 2.0	Metabolism	Jared Rutter	TBA	TBA	TBA
Full Semester		<u>Advanced Seminar:</u> Student and faculty discussion of advanced-level topics not covered in formal courses. Contact Jared Rutter, <a href="mailto:rutter@biochem.utah.edu">rutter@biochem.utah.edu</a> , for course info and permission to register.					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
13990	BIO C 7200	2.0	Genetic Therapies	Dana Carroll Jeffrey Botkin	M-F	9:00AM - 10:30AM 3:30PM - 5:00PM	TBA
Special Times		<u>Advanced Seminar:</u> 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.					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
10244	BIOL 6530	3.0	Biological Chemistry	Martin Horvath Baldomero Olivera	Online	Online	Online
Full Semester		The course fee covers all required textbooks and course materials at a reduced cost. Students may request to opt out here: <a href="https://portal.verba.io/utah/login">https://portal.verba.io/utah/login</a>  Structure and function of biomolecules, metabolism, and regulation.					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
6474	CHEM 6810	3.0	Nanoscience: Where Biology, Chemistry and Physics Intersect	Marc Porter	T, TH	9:10AM - 10:30AM	Canvas
Full Semester		An introduction to the emerging fields of nanoscience and nanotechnology. Concepts from biology, chemistry and physics will be used to explore the special features of phenomena at the nanometer scale, and current developments in the design and construction of nanoscale devices will be discussed.  <b>Note: This class will have an additional meeting TBA.</b>					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
18299	CHEM 7020	2.0	Introduction to Spectroscopy I	Michael Morse	M, W, F	9:35AM - 10:40AM	Canvas
First Half		This course provides an introduction into the application of time-dependent quantum mechanics and perturbation theory in modern spectroscopy. Students will learn to derive selection rules and properties of electronic, vibrational and rotational transitions in atomic and molecular systems. This course covers topics useful for chemists, physicists, and engineers with a solid background in quantum mechanics.					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
9976	CHEM 7300	2.0	Polymers: Chemistry	Ilya Zharov	T, TH	10:40AM - 12:20PM	TBA
First Half		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
13075	CHEM 7640	2.0	Materials Chemistry for Alternative Energy	Shelley Minteer	M, W, F	8:20AM -	Canvas

# Spring 2021 Electives/Advanced Seminars

View Course Schedules online:

<https://student.apps.utah.edu/uofu/stu/ClassSchedules/main/1214/>

Attention: 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.

						9:25AM	
First Half		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.					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
5267	<b>CHEM 7780</b>	2.0	Surface Chemistry	Scott Anderson	T, TH	9:10AM – 10:30AM	Canvas
First Half		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
1999	<b>NEUSC 6050</b>	4.0	Systems Neuroscience: Functioning of the Nervous System	Greg Clark Alessandra Angelucci	T, TH, F	T/TH: 12:55PM – 1:45PM F: 10:45AM – 12:05PM	HSEB/TBA HSEB/TBA
Full Semester		<i>(Counts as 2 electives)</i>					
Full Semester		Understanding how the brain works is one of the deepest and most exciting challenges confronting modern science. This course will explore systems-level functioning of the nervous system, beginning with relatively concrete issues of sensory coding and motor control, and expanding into more abstract, but equally important, higher-order phenomena, such as language, cognitive and mood disorders, states of arousal, and experience-dependent modifications of neuronal operations.					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
13319	<b>PH TX 6710</b>	1.0	Developments in Biochemical Toxicology	Chris Reilly	TBA	TBA	TBA
Full Semester		This course will review current advances in the field of biochemical toxicology through weekly discussions of research articles.					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
8609	<b>PH TX 6720</b>	1.0	Developments in Neuropharmacology	Karen Wilcox	TBA	TBA	TBA
Full Semester		<u>Advanced Seminar:</u> This course will review current advances in the field of neuropharmacology through weekly discussions of research articles.					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
12912	<b>PH TX 7221</b>	1.0 – 6.0	Pharmacology II	Karen Wilcox	TBA	TBA	TBA
Full Semester		Mechanism of action and pharmacologic effects of drugs acting on the cardiovascular and renal systems; pharmacology and mechanism of action of antibiotics and other chemotherapeutic agents; drugs acting on endocrine systems.					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
16858	<b>PH TX 7280</b>	2.0	Advances in Neuropharmacology: Glial cells in health and disease	Karen Wilcox & Sarah Anderson	T	1:00PM – 3:00PM	Virtual
Full Semester		<p>The main goal of the course is to familiarize students with glial cell function by exploring, presenting, and discussing pertinent research articles.</p> <p>Objectives:</p> <ul style="list-style-type: none"> <li>• Design and deliver presentations of scientific papers</li> <li>• Describe and discuss the physiological and pathological function of glia</li> <li>• Explain state-of-the-art experimental approaches to study glia</li> <li>• Debate controversies in the field</li> <li>• Hypothesize and identify the roles for these cells in a variety of pathologies</li> <li>• Investigate the experimental limitations currently facing this field</li> <li>• Develop a 'journal club' style or mini-review manuscript for submission</li> </ul> <p>Students are expected to read primary articles prior to class and come ready to actively engage in discussion. The class will be run seminar style, with the instructor leading a student-run discussion.</p> <p>Prerequisite: Cellular and Molecular Neuroscience or related class</p>					

## Spring 2021 Electives/Advanced Seminars

View Course Schedules online:

<https://student.apps.utah.edu/uofu/stu/ClassSchedules/main/1214/>

Attention: 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.

		Limit: 15 students Contact: Karen S. Wilcox, PhD <a href="mailto:karen.wilcox@hsc.utah.edu">karen.wilcox@hsc.utah.edu</a> or Sarah Anderson, PhD <a href="mailto:sarahrose.anderson@utah.edu">sarahrose.anderson@utah.edu</a>					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
16857	<b>PH TX 7690</b>	2.0	Professional Skills Development	Kristen Keefe	F	2:00 PM – 4:00 PM	Via Zoom
Full Semester		<p>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 translational neuroscience.</p> <p>At the end of this course, students will be able to:</p> <ul style="list-style-type: none"> <li>• create and critique written scientific communications, including a manuscript or review and a technical report.</li> <li>• construct data figures for a manuscript that accurately report rigorous data collection, analysis, and interpretation.</li> <li>• evaluate the written and oral scientific communications of others and provide constructive feedback to peers.</li> <li>• apply rhetorical devices and communication knowledge to oral communications of scientific findings.</li> <li>• develop and deliver a "Ted-Talk" format oral presentation of their science.</li> <li>• relate leadership principles to their own personal and professional development</li> <li>• assemble personal PAR/STAR stories for use in cover letters and job</li> </ul>					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
9234	<b>PHCEU 6020</b>	3.0	Biomaterials	Michael Yu	T, TH	10:45AM - 12:05PM	JFB 101
Full Semester		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.					

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
13875	<b>BMI 6016</b>	2.0	Biomedical Data Wrangling & Quality	Ramkiran Gouripeddi	TBA	TBA	TBA
Full Semester		<p>This course will provide an introduction to understanding general concepts of data quality that can be applied to data sources from multiple domains and practical application of these concepts with a variety of biomedical data sources. Students will learn the universal principles of data quality common measures of data quality and the role data quality has in understanding biomedical data.</p> <p><b><i>Note – Tuition Benefit does NOT pay for differential tuition charges. Please be sure to check tuition bills and coverage.</i></b></p> <p><b><i>Differential Tuition is \$176 per credit hour</i></b></p>					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
13876	<b>BMI 6019</b>	1.0	Bioinformatics in Practice: RNA-Seq Data Analysis	Younghee Lee	T	5:30PM - 6:30PM	Canvas
First Half		<p>Description of the course: The course provides an overview of various RNA-Seq data analysis tools and practices using Linux command line and shell script in CHPC. The overall goals of the course are to prepare the student in the methods of quality control (QC) of raw fastq files, to acquire basic shell script skills, and to conduct a research project using RNA-Seq data from scratch. This course will address the following key skills: Linux: This course fundamentally provides a lecture for how to execute the RNA-Seq analysis tools in Linux environment, Programming skills: Every topic in this course includes examples and practices using command line in Linux, Research design and writing: Students will conduct a group project from identifying a RNA-Seq dataset from SRA, conducting QC, applying appropriate alignment/assembly tools, and interpreting results. Final report will be a format of an abstract.</p>					

# Spring 2021 Electives/Advanced Seminars

View Course Schedules online:

<https://student.apps.utah.edu/uofu/stu/ClassSchedules/main/1214/>

Attention: 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.

<p><b><u>Note – Tuition Benefit does NOT pay for differential tuition charges. Please be sure to check tuition bills and coverage.</u></b></p> <p><b><u>Differential Tuition is \$176 per credit hour</u></b></p>							
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
16087	<b>BMI 6103</b>	2.0	Systems Modeling and Process Improvement	Iona Thraen	Online	Online	Online
Full Semester		<p>This course provides the students with an evidence-based overview of the current status of the U.S. healthcare system including both problems and opportunities; introduces the student to process improvement tools and techniques; provides hands on experiences in system modeling tools and processes; and concludes with student group presentations.</p> <p><b><u>Note – Tuition Benefit does NOT pay for differential tuition charges. Please be sure to check tuition bills and coverage.</u></b></p> <p><b><u>Differential Tuition is \$176 per credit hour</u></b></p>					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
5870	<b>BMI 6105</b>	3.0	Statistics for Biomedical Informatics	Gregory Stoddard	Online	Online	Online
Full Semester		<p>This class covers a wide range of statistical methods, from basic statistics to advanced regression methods for repeated measurements and developing and validating prognostic and diagnostic tests.</p> <p><b><u>Note – Tuition Benefit does NOT pay for differential tuition charges. Please be sure to check tuition bills and coverage.</u></b></p> <p><b><u>Differential Tuition is \$176 per credit hour</u></b></p>					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
12446	<b>BMI 6106</b>	3.0	Introduction to Probability and Statistics for Biomedical Data Science	Edgar Hernandez	M & W	6:00PM – 8:00PM (M) & 5:00PM – 6:00PM (W)	421 WA 1016
Full Semester		<p>This course offers an introduction to an extensive array of methods for mathematical biomedical data analysis with emphasis on three major topics (probability analysis, statistical inference, and the basic concepts of statistical pattern recognition through machine learning), with a clear emphasis on the biomedical field. As an additional component of this class will be the extensive use of the statistical software R, which is one of the most used statistical packages in many disciplines.</p> <p><b><u>Note – Tuition Benefit does NOT pay for differential tuition charges. Please be sure to check tuition bills and coverage.</u></b></p> <p><b><u>Differential Tuition is \$176 per credit hour</u></b></p>					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
12382	<b>BMI 6115</b>	2.5	Biomedical Text Processing	John Hurdle	M	5:00PM – 6:00PM	Canvas
Full Semester		<p>This course provides an introduction to the automatic extraction of information from clinical and biomedical (e.g., the literature, textbooks, etc) texts. This introductory course lays the foundation for the Department’s Biomedical Natural Language Processing NLP Track.</p> <p><b><u>Note – Tuition Benefit does NOT pay for differential tuition charges. Please be sure to check tuition bills and coverage.</u></b></p> <p><b><u>Differential Tuition is \$176 per credit hour</u></b></p>					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
7982	<b>BMI 6120</b>	2.0	Standards in Biomedical Informatics	Damian Borbolla, Stanley Huff, Carolyn Scheese, and Catherine Staes	T	5:00PM – 6:30PM	Online
Full Semester		<p>This online introductory course will focus on vocabularies and standards commonly used in clinical and public health systems, particularly those required for information exchange and meaningful use of data. Students will be directed to the current literature and resources to gain knowledge about clinical information models and standard terminologies.</p> <p>This class is online with six synchronous (Zoom) sessions scheduled on Thursday from 5:00 to 6:30pm. Exact days will be confirmed during the course</p>					

# Spring 2021 Electives/Advanced Seminars

View Course Schedules online:

<https://student.apps.utah.edu/uofu/stu/ClassSchedules/main/1214/>

Attention: 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.

<p><b><i>Note – Tuition Benefit does NOT pay for differential tuition charges. Please be sure to check tuition bills and coverage.</i></b></p> <p><b><i>Differential Tuition is \$176 per credit hour</i></b></p>							
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
13754	<b>BMI 6810</b>	.5	Essentials of the Business of Biomedical Informatics Seminar	Damian Borbolla	W	4:00PM – 5:00PM	Canvas
Full Semester		<p>This course introduces informatics students to fundamental principles about the business of our field. The seminar also explores vital areas in Biomedical Informatics and Health IT including Leadership, Management, and Innovation.</p> <p><b><i>Note – Tuition Benefit does NOT pay for differential tuition charges. Please be sure to check tuition bills and coverage.</i></b></p> <p><b><i>Differential Tuition is \$176 per credit hour</i></b></p>					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
14897	<b>BIOL 5120</b>	3.0	Gene Expression	Rebecca Kurzahls	M, W, F	10:45AM - 11:35AM	Canvas
Full Semester		<p>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.</p> <p><b><i>Note – Tuition Benefit does NOT pay for differential tuition charges. Please be sure to check tuition bills and coverage</i></b></p>					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
9912	<b>BIOL 5140</b>	3.0	Genome Biology	Richard Clark	T, TH	9:10AM - 10:30AM	Canvas
Full Semester		<p>The sequence of the human genome, and that of other animals and plants, highlights the rapid progress in genomics, the study of the DNA sequence and genes of an organism. This course will examine recent findings in the field, with an emphasis on how advances in genomics are revolutionizing the ways by which we assign functions to sequence and genes. While human genomics will feature prominently, examples will be selected from diverse organisms to illustrate basic principle.</p> <p><b><i>Note – Tuition Benefit does NOT pay for differential tuition charges. Please be sure to check tuition bills and coverage</i></b></p>					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
8293	<b>BIOL 5210</b>	3.0	Cell Structure Function	Ofer Rog	T, TH	10:45AM - 12:05PM	Canvas
Full Semester		<p>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.</p> <p><b><i>Note – Tuition Benefit does NOT pay for differential tuition charges. Please be sure to check tuition bills and coverage</i></b></p>					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
-	<b>BIOL 5255</b>	3.0	Prokaryotic Genetics	Kelly Hughes	M, W, F	12:55PM – 1:45PM	Canvas
Full Semester		<p>A project-oriented lecture/laboratory on use of experimental and analytical tools of modern genetics using bacteria and their viruses. It is recommended that BIOL 2020 and BIOL 2030 be completed prior to taking this course. Section 001 lecture meets weeks 1-5 of the semester. Sections 2 belongs to this lecture. This course requires registration for the lab section. Students will be automatically registered for this lecture section when registering for the pertinent lab section.</p> <p>Section 002, the lab portion of this course will be held weeks 6 - through the end of the semester on Mon/Wed/Fri from 12:55pm-3:55pm in JTB 340 and 345. Class Number: 17314</p> <p><b><i>Note – Tuition Benefit does NOT pay for differential tuition charges. Please be sure to check tuition bills and coverage</i></b></p>					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
14900	<b>BIOL 5270</b>	3.0	Microbial Ecosystems	William Brazelton	T, TH	12:25PM- 1:45PM	BIOL 150
Full Semester		<p>Microorganisms run the world. They are the foundation of every habitat on earth, from our bodies to the deep sea. The aim of this course is to train students to appreciate the fundamental microbial processes that are at the heart of many pressing medical and environmental</p>					



## Spring 2021 Electives/Advanced Seminars

View Course Schedules online:

<https://student.apps.utah.edu/uofu/stu/ClassSchedules/main/1214/>

Attention: 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.

<p>issues today. The course is inherently interdisciplinary and will involve concepts in microbiology, genomics, ecology, evolution, and biogeochemistry. Students with any interest in medical, molecular, environmental, or evolutionary aspects of microbiology are welcome.</p> <p>This is a split attendance class, where students will be assigned to attend one or more of the times listed on the schedule. Students will receive additional content through technology.</p> <p><b><i>Note – Tuition Benefit does NOT pay for differential tuition charges. Please be sure to check tuition bills and coverage</i></b></p>							
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
2247	<b>BIOL 5315</b>	3.0	Advanced Human Anatomy	Mark Nielsen	M, W, TH	2:00PM - 3:30PM	Canvas
<p>Full Semester</p> <p>Design and organization of the human peripheral nervous system and its connections to the central nervous system. Establishes strong foundation for clinical neuroanatomy, incorporating solid biological principles of anatomy.</p> <p><b><i>Note – Tuition Benefit does NOT pay for differential tuition charges. Please be sure to check tuition bills and coverage</i></b></p>							
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
13451	<b>BIOL 5350</b>	3.0	Ornithology	Dale Clayton	T, TH	12:25PM – 1:45PM	Canvas
<p>Full Semester</p> <p>Birds (Aves) constitute the best known class of organisms on earth. This course presents an overview of the enormous body of information on birds, including topics such as the evolutionary origin and early radiation of birds, molecular systematics, form and function, reproduction and development, population and community ecology, behavior and communication and conservation biology.</p> <p><b><i>Note – Tuition Benefit does NOT pay for differential tuition charges. Please be sure to check tuition bills and coverage</i></b></p>							
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
12102	<b>BIOL 5370</b>	3.0	Mammalogy	Lucas Moyer-Horner	M, W	11:50AM - 1:10PM	Canvas
<p>Full Semester</p> <p>Biology of wild animals with emphasis on local forms. It is recommended that BIOL 3310 and 3320 be completed prior to taking this course. It is recommended that BIOL 3410 is completed prior to or concurrently with this course.</p> <p><b><i>Note – Tuition Benefit does NOT pay for differential tuition charges. Please be sure to check tuition bills and coverage</i></b></p>							
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
17310	<b>BIOL 5471</b>	3.0	Quantitative Models in Evolutionary Ecology	Adrian Bell	T, TH	12:25PM – 1:45PM	GC 1855
<p>Full Semester</p> <p>An introduction to the quantitative models of evolutionary ecology, with computer exercises in Maple. Topics to be covered included natural selection, migrations, genetic drift, optimization models, population growth, competition, predation, and age structure.</p> <p><b><i>Note – Tuition Benefit does NOT pay for differential tuition charges. Please be sure to check tuition bills and coverage</i></b></p>							
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
17307	<b>BIOL 5570</b>	3.0	Ecology and Evolution of Parasites and Pathogens	Sarah Bush	T, Th	10:45AM-12:05PM	Canvas
<p>Full Semester</p> <p>Parasitism is arguably the most common lifestyle on earth. Most organisms are host to an entire community of parasites and pathogens. For example, humans host hundreds of parasite species and pathogens. The lectures will address key concepts in the ecology and evolution of parasites and pathogens, such as: origins of parasitism, evolution of virulence, disease ecology, host-parasite co-evolution and co-extinction, the role of parasites and pathogens in human history and the new field of Darwinian Medicine.</p> <p><b>BIOL 5575 - Ecology and Evolution of Parasites and Pathogens Lab - Class Number: 17308</b></p> <p><b><i>Note – Tuition Benefit does NOT pay for differential tuition charges. Please be sure to check tuition bills and coverage</i></b></p>							