

## Spring 2019 Electives/Advanced Seminars

View Course Schedules online: <https://student.apps.utah.edu/uofu/stu/ClassSchedules/main/1194/>

\*Advanced Course/Seminar, or 1-credit courses: Not available to first-year students unless otherwise noted.

Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
15304	<b>ANAT 7760</b>	3.0	Stem Cell Workshop	Alex Shcheglovitov	T, Th	2:00-3:30	HSEB 3420
Full Semester		<p>The course will begin with a lecture series on the fundamentals of stem cell biology and the use of stem cells, in particular induced-pluripotent stem cells (iPSC), as models for the study of development and disease. Following the lecture series, each student will present a journal article related to a lecture topic, and write the Specific Aims page of a hypothetical grant application based on one of the discussion papers. Lab sessions will provide students with practical hands-on techniques required for reprogramming, culturing, and cryopreserving iPSCs.</p> <p><b>Please Note: Class conflicts with MBIOL/BLCHM 6200 &amp; 6300 T, Th 3-5PM.</b></p>					
4028	<b>BIO C 6600</b>	1.5	Metabolic Regulation	Janet Lindsley	T, Th	9:30-11:00	HSEB 2908
Second Half Semester		<p><b>Frequent BC Elective (Biochemistry Research Track Course)</b>  <b>Frequent MB Elective</b>                      Prerequisite: BIOL 3520 or CHEM 3520 or equivalent.                      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> <p><b>Please Note: 9:30-11:00 AM - this class starts 10 minutes earlier than usual class times.</b></p>					
4418	<b>BIO C 7100</b>	1.0	Metabolism	Jared Rutter	TBA	TBA	TBA
Full Semester		<p><b>Advanced Seminar:</b> 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.</p>					
11670	<b>BIOL 5140</b>	3.0	Genome Biology	Richard Clark	Tu Th	9:10-10:30	LS 111
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>					
9539	<b>BIOL 5210</b>	3.0	Cell Structure Function	Ofer Rog	T, Th	10:45-12:05	JTB 130
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>					
17350	<b>BIOL 5255</b>	3.0	Prokaryotic Genetics	Parkinson	T, Th	12:25-1:45	JTB 120
Second Half 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.                      May require a lab section during registration.</p>					
12115	<b>BIOL 6530</b>	3.0	Biological Chemistry	Martin Horvath Toto Olivera	T, TH	10:45-12:05	HEB 2008
Full Semester		<p>Structure and function of biomolecules, metabolism, and regulation.</p>					

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8943	<b>BIOL 7962</b>	3.0	Seminal Papers in Biology	Kent Golic	M, W	4:00-5:30	TBA
Full Semester		<p>This course focuses on papers that have made significant and lasting contributions to biological understanding, owing to their intellectual elegance, significance of discovery, or technical advancement. Topics vary according to instructors, but may include genetics, cell biology, biochemistry, development and evolution. The course is organized around student presentations and discussion, with guidance and input from Instructors.</p> <p>The course is intended for graduate students in the biological sciences, but advanced undergraduates may also enroll with permission. The course is organized around directed readings and in-class discussion. There are no exams or writing assignments.</p>					
7458	<b>BIOL 7964</b>	1-5	Advanced Topics in Ecology and Evolution	Neil Vickers	M, W	3:30-5:30	BIOL 306
Full Semester		<p>This course covers a selected set of significant, influential and exciting topics in ecological, evolutionary, organismal and environmental biology. The course will introduce the students to the faculty, how they think and what they think is interesting and exciting. The course also will promote intellectual and social interactions among all members of the EEOB group. There will be assigned readings, but no exams or papers. Grading will be based on attendance and participation.</p> <p><b>Note: First year students need to be registered for 1.5 credits.</b></p>					
17726	<b>BLCHM 6430</b>	1.5	Structural Methods	Chris Hill	M, W, F	9:40-10:30	TBA
First Half Semester		<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>					
6701	<b>BMI 6105</b>	3.0	Statistics for Biomedical Informatics	Greg Stoddard	TBA	TBA	Online
Full Semester		<p>This course covers a range of statistical methods from classical hypothesis testing to more modern computational methods. The emphasis is on application and practice rather than extensive theoretical derivations. Simulation is used to illustrate properties of distributions, tests and methods. Students are expected to have access to a personal computer and the "R" environment for statistics and computation. (Required for all biomedical informatics students.) This course requires a permission code, please contact Bioinformatics at 801-581-4080.</p> <p>This is an online course, which does not meet in-class. For additional information, please visit <a href="http://uonline.utah.edu">http://uonline.utah.edu</a> or call 585-5959. \$60.00 fee not covered by Tuition Benefit.</p>					
6355	<b>CHEM 6810</b>	3.0	Nanoscience: Where Biology, Chemistry and Physics Intersect	Marc Porter	T, Th	9:10-10:30	LCB 219
Full Semester		<p>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.</p> <p><b>Note: This class will have an additional meeting TBA.</b></p>					

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11540	<b>CHEM 7030</b>	2.0	Introduction to Spectroscopy II	Michael Morse	M, W, F	9:35-10:40	HEB 2002
First Half Semester	This course focuses on the symmetry and spectroscopy of polyatomic molecules, covering electronic structure and spectroscopy. The student learns how to use point group theory as a guide to understanding electronic wavefunctions, vibrational motions, and selection rules. A good background in quantum mechanics is required; CHEM 7020: Introduction to Spectroscopy I is helpful but not required.						
17182	<b>CHEM 7080</b>	2.0	Chemical Dynamics	Ryan Steele	M, W, F	8:20-9:25	HEB 2010
Second Half Semester	This course provides an introduction into the details of how chemical reactions occur. Experimental methods for studying chemical dynamics are surveyed. This course covers topics useful for chemists, physicists, and engineers.						
15118	<b>CHEM 7120</b>	2.0	Physical Inorganic Chemistry	Joel Miller	M,W,F	11:00-12:05	HEB 2010
First Half Semester	This course is intended for graduate students in Chemistry, Biology, Physics, and Material Science & Engineering with a need to understand the spectroscopic, electronic, and magnetic properties of transition metal ions. Topics covered include: vibration, electronic, Mossbauer, and photoelectron spectroscopies, and nuclear magnetic and electron paramagnetic resonances.						
15119	<b>CHEM 7210</b>	2.0	Contemporary Organic Synthesis II	Andrew Roberts	M,W,F	8:20-9:25	HEB 2002
Second Half Semester	This course is largely focused on understanding strategies and tactics used in the synthesis of complex molecules. The mechanisms of common reactions and named organic reactions will also be studied as a means to understand functional group tolerance and compatibility and how they are strategically applied. These discussions will be framed primarily in the context of the synthesis of natural products and other medicinally relevant organic compounds.						
15223	<b>CHEM 7270</b>	2.0	Organic Spectroscopy I	Andrew Roberts	M,W,F	9:35-10:40	LS 107
First Half Semester	Topics covered include: Solution NMR theory; experimental set-up and data acquisition; chemical shifts; J-coupling; NMR relaxation; NOE; advanced 1D and 2D NMR techniques; spectral interpretation/identification of organic molecules from 1D and 2D solution NMR spectra.						
11745	<b>CHEM 7300</b>	2.0	Polymers: Chemistry	Ilya Zharov	T,TH	10:40-12:20	HEB 2002
First Half Semester	Meets with CHEM 5300. 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.						

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11535	<b>CHEM 7470</b>	2.0	Nucleic Acid Chemistry	Cynthia Burrows	M, W, F	8:20-9:25	HEB 2006
First Half Semester	<p><b><i>Frequent BC Elective (Biochemistry Research Track Course)</i></b>  <b><i>Frequent MB Elective</i></b>                      Prerequisite: 2 semesters undergraduate organic chemistry.                      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.</p>						
17161	<b>CHEM 7530</b>	2.0	Molecular Simulations	Valeria Molinero	M,W,F	11:00-12:05	HEB 2010
Second Half Semester	<p>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.</p>						
17168	<b>CHEM 7640</b>	2.0	Materials Chemistry for Alternative Energy	Shelley Minteer	M,W,F	8:20-9:25	WEB L122
First Half Semester	<p>Meets with CHEM 5640. 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.</p>						
11536	<b>CHEM 7750</b>	2.0	Information Processing	Joel Harris	M,W,F	9:35-10:40	HEB 2002
Second Half Semester	<p>Three lectures, one discussion per week for 7.5 weeks. This course provides an overview of analytical chemistry from the perspective of the information content of chemical signals and data. The course is organized around principles of statistics, information theory, and signal processing as they relate to chemical analysis and measurements. The material is useful for chemists who wish to optimize and interpret quantitative results in their research.</p>						
5957	<b>CHEM 7780</b>	2.0	Surface Chemistry	Scott Anderson	M,W,F	8:20-9:25	HEB 2002
First Half Semester	<p>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.</p>						
1691	<b>CHEM 7800</b>	2.0	Physical Seminar	Joel Harris Valeria Molinero	M,TH	4:10-5:00	TBBC 4630
Full Semester	TBA						
10648	<b>CHEM 7810</b>	1.0- 2.0	Inorganic Seminar	Caroline Saouma	Tu	10:45-12:05	TBBC 4630
Full Semester	TBA						

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1692	<b>CHEM 7820</b>	1.0- 2.0	Organic Seminar	Matthew Kieber- Emmons Andrew Roberts	Th	10:45-12:05	TBBC 4630
Full Semester		TBA					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
1693	<b>CHEM 7840</b>	1.0- 2.0	Biological Seminar	Matthew Kieber- Emmons	Th	10:45-12:05	TBBC 4630
Full Semester		TBA					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
1694	<b>CHEM 7870</b>	1.0- 2.0	Analytical Seminar	Joel Harris Valeria Molinero	M,Th	4:10-5:00	TBBC 4630
Full Semester		TBA					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
16004	<b>H GEN 6020</b>	1.0	New Tools of Genetic Analysis: Genetics meets Genomics	Mark Metzstein David Grunwald	W	2:00-4:00	HSEB 3515A
Second Half Semester		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
8759	<b>H GEN 6030</b>	2.0	Special Topics in Genetics	Carl Thummel	TBD	TBD	TBD
Full Semester		Seminar for Human Genetics graduate students covering current topics in the scientific literature.					
Class #	Catalog #	Cr Hrs	Course Title	Lead Instructor	Day	Time	Bldg/Room
18521	<b>HGEN 6091</b>	1.5	Evolution and Development	Gabrielle Kardon Nels Elde Mike Shapiro Nitin Phadnis	T, Th	1:15-2:45	HSEB 2949
Second Half Semester		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
10231	<b>H GEN 6410</b>	2.0	Adult Genetics	Amanda Gammon	T	1:00-3:00	HSEB 4100D
Full Semester		This hybrid course covers topics related to genetic conditions seen in adults. Mendelian, as well as multifactorial, conditions will be discussed. Given the hybrid nature of the course students will be expected to review online lectures and participate in online discussions, in addition to in-class discussions and assignments. Lectures will be given by a variety of content experts from across the nation. Genetic counseling skills for clinical practice will be emphasized throughout the course as well.					

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9130	<b>H GEN 6421</b>	1.5	Genetics of Complex Diseases	Lynn Jorde	W	1:30-3:30	HSEB 2969
First Half Semester	<p><b><i>Frequent MB Elective</i></b>                      Course work addresses issues relevant to the identification of genes underlying susceptibility to complex disorders. Subjects covered include advantages and disadvantages of isolates versus large population, utilization of affected sibling pairs, discordant sibling pairs and extended families. Methods taught include traditional case-control association methods and family based methods. Other subjects include locus and allelic heterogeneity, phenotypic heterogeneity, gene-gene and gene-environment interactions and density of polymorphic markers. Cross-listed with MDCRC 6420.</p>						
6297	<b>H GEN 6481</b>	1.5	Cellular Signaling	Charles Murtaugh	M, W, F	10:45-11:35	HSEB 3515B
First Half Semester	<p><b><i>Frequent MB Elective</i></b>                      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>						
2496	<b>MD CH 7890</b>	1.0	Research Seminar in Medicinal Chemistry	Jaclyn Winter	Th	3:00-6:00	HSEB 2600
Full Semester	<p>Formal seminar on personal research or selected literature surveys. Informal presentation of current research results. Includes a tutorial in presentation methods. Required for graduate study.  <b><i>Please Note: Class conflicts with MBIOL/BLCHM 6200 &amp; 6300 T, Th 3-5PM.</i></b></p>						
6194	<b>MD CH 7891</b>	2.0	Medicinal and Biological Chemistry	Eric Schmidt	M, W, F	1:00-2:00	HSEB 4100C
First Half Semester	<p><b><i>Frequent BC Elective (Chemical Biology / Medicinal Chemistry Research Track Course)</i></b>                      Biological chemistry in the context of modern drug discovery and development. This course is intended for graduate students interested in a chemical approach to biological problems.</p>						
7895	<b>MD CH 7895</b>	2.0	Medicinal and Biological Chemistry	Amy Barrios	M, W, F	1:00-2:00	HSEB 4100C
Second Half Semester	TBA						
10415	<b>MDCRC 6420</b>	1.5	Genes & Complex Disease	Lynn Jorde	W	1:30-3:30	HSEB 2969
First Half Semester	<p><b><i>Frequent MB Elective</i></b>                      Course work addresses issues relevant to the identification of genes underlying susceptibility to complex disorders. Subjects covered include advantages and disadvantages of isolates versus large population, utilization of affected sibling pairs, discordant sibling pairs and extended families. Methods taught include traditional case-control association methods and family based methods. Other subjects include locus and allelic heterogeneity, phenotypic heterogeneity, gene-gene and gene-environment interactions and density of polymorphic markers. This course is cross listed with HGEN 6421.</p>						

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2239	<b>NEUSC 6050</b>	4.0	Systems Neuroscience: Functioning of the Nervous System	Greg Clark Alessandra Angelucci	T, Th F	10:45-12.05 12:55-1:45	HSEB 2948
Full Semester		<p><i>(Counts as 2 electives)</i></p> <p>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.</p> <p>This course is cross listed with BIOEN 6430.</p>					
3382	<b>ONCSC 6500</b>	1.5	Molecular Mechanisms of Cancer	Sean Tavtigian	M, W, F	3:00-4:00	HCI North 4 <sup>th</sup> Floor Conference Room
Second Half Semester		<p><b>Frequent MB and BC Elective</b></p> <p>Prerequisites: Concurrent enrollment or equivalent 1st year Cell Biology, Molecular Biology and Genetics. Review current understanding of the genetic, molecular, and cellular biology of cancer and how this knowledge relates to the prevention, diagnosis, and treatment of cancer.</p>					
16767	<b>PATH 6410</b>	1.5	Molecular Virology	Vicente Planelles	M,W	1:00-2:30	EEJMRB 1200
First Half Session		<p><b>Frequent MB and BC Elective</b></p> <p>This course is offered during the Spring semester, first half, every other year and it includes basic, fundamental mechanisms of viral replication as well as contemporaneous aspects of viral biology. Topics include virus evolution, immune escape, transposable elements, and many others. Available to upper level undergraduate and graduate students that have some background in immunology, microbiology, and cell biology.</p>					
11534	<b>PATH 6910</b>	1.5	Noncoding RNAs and Immune Responses	Ryan O'Connell	T, Th	2:00-4:30	TBD
Full Semester		<p><b>Advanced Seminar:</b> This course is a mix of faculty lectures and student discussions of primary research papers. Topics are selected from current primary literature sources on subjects relevant to the focus of the class, and these will include different types of long and short noncoding RNAs (e.g. miRNAs and lincRNAs) and how they contribute to inflammatory responses. Classes will be lead by a small team of faculty. Basic knowledge of noncoding RNAs and mammalian immunity will be assumed.</p> <p><b>Please Note: Class conflicts with MBIOL/BLCHM 6200 &amp; 6300 T, Th 3-5PM.</b></p>					
16769	<b>PATH 7360</b>	1.5	Advanced Immunology	Dean Tantin	T, Th	2:00-3:30	TBD
First Half Session		<p><b>Frequent MB Elective</b></p> <p>Offered during the first half of Spring Semester every other year, the course consists partly of faculty lectures and partly of discussion with students of contemporary topics in the scientific literature. Topics are selected from primary literature sources on a select number of representative areas of research (e.g., immune development, dendritic cells, functions of specific lymphoid and myeloid cell types, immune activation, memory, tumor immunity and autoimmunity). Classes will be lead by a team of faculty. Knowledge of cellular macromolecular processes (e.g., signal transduction, transcription, microRNAs) and a basic working understanding of immunology will be assumed.</p> <p>The course will meet for 1.5 hr Tuesdays/Thursdays. Grades will be determined by class participation. Graduate students and upper level undergraduates with prior experience with immunology are welcome.</p> <p><b>Please Note: Class conflicts with MBIOL/BLCHM 6200 &amp; 6300 T, Th 3-5PM.</b></p>					

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16768	<b>PATH 7907</b>	1.5	Immunity to Infectious Diseases	Tracey Lamb Scott Hale Keke Fairfax	T, TH	2-3:30	EEJMRB 5 <sup>th</sup> Floor Conference Room
Second Half Session		Offered in the second half of the Spring semester this course consists of lectures and presentation sessions where we will discuss how the immune system fights all types of infections from parasites and fungi to bacteria and viruses. Knowledge of cellular processes will be assumed. Graduate students and advanced undergraduate students with prior experience of immunology are welcome. If you wish to take this course and have not completed PATH 5030-001 please contact the course director Dr Tracey Lamb to discuss whether you have sufficient baseline knowledge and understanding of immunology to understand the material. Grades will be determined by class participation. <i>Please Note: Class conflicts with MBIOL/BLCHM 6200 &amp; 6300 T, Th 3-5PM.</i>					
12112	<b>PED 5750</b>	1.5	Genomic Analysis I	Clinton Mason	Th	10:30-11:45	HSEB 1750
Full Semester		Provides comprehensive instruction on the analysis of genomic data. An overview of basic statistics, study design, genomic technologies, and computational software will be provided in addition to current best practices in the analysis of genomic data. Genomic Analysis I will focus on analysis and detection of variants and mutations from next generation sequencing data (whole genome sequencing, whole exome sequencing, and targeted panel sequencing) as well as the analysis of genomic copy number data.					
17687	<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.					
9964	<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.					
16814	<b>PH TX 7114</b>	2.0	Principles of Toxicology	Karen Wilcox	TBA	TBA	TBA
Full Semester		General principles, testing procedures, toxic responses, and target organ toxicities.					
16815	<b>PH TX 7221</b>	2.0	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.					
10767	<b>PHCEU 6020</b>	3.0	Biomaterials	Michael Yu	T, Th	10:45-12:05	WEB 1248
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.					

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13653	<b>PHCEU 7011</b>	3.0	Fundamentals of Pharmacokinetics	Shawn Owen James Herron	M, W, Th	11:00-11:50	HSEB 2680
Full Semester		<p><b><i>Frequent BC Elective</i></b>                      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. This course is cross listed with PHARM 5121.</p>					