BIOCHEMISTRY (BIOCHEM)

BIOCHEM 100 — BIOCHEMISTRY FRESHMAN SEMINAR
1 credit.

The Freshman Biochemistry Seminar will introduce freshmen to the discipline of biochemistry, to the UW Biochemistry Department, to some of the research projects the faculty are pursuing, to the University, and to the career options open to an individual with a biochemistry undergraduate degree. Enroll Info: None
Requisites: None
Repeatable for Credit: No
Last Taught: Fall 2020

BIOCHEM 104 — MOLECULES TO LIFE AND THE NATURE OF SCIENCE
3 credits.

Students in this course will be introduced to how life works at a molecular level and the evolutionary paths that led to the great diversity of life on our planet. With this foundation, we will discuss current topics in the news such as: exploring the human genome to understand our species' history and to diagnose and treat disease; genetic engineering of crops in relation to foods safety and effects on ecosystems; gene editing of insects and mammals including humans; how to determine whether herbal remedies, vaccines, etc. are effective and safe; and current trends in biotechnology and what might be on the horizon. A major goal of this course is for students to appreciate the nature of science and to become better equipped to explore and evaluate scientific topics of interest to them. Enroll Info: None
Requisites: None
Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req
Level - Elementary
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Spring 2020

BIOCHEM 289 — HONORS INDEPENDENT STUDY
1-2 credits.

Enroll Info: Enrolled in the CALS Honors Prgm So or Jr st. INTER-AG 288
Requisites: Consent of instructor
Course Designation: Level - Intermediate
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Honors - Honors Only Courses (H)
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2016

BIOCHEM 299 — INDEPENDENT STUDY
1-3 credits.

Enroll Info: Open to Fr, So or Jr st written cons inst
Requisites: Consent of instructor
Course Designation: Level - Intermediate
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Fall 2020

BIOCHEM 301 — SURVEY OF BIOCHEMISTRY
3 credits.

Explore the basic chemical properties of proteins, lipids, carbohydrates, and nucleic acids. Topics to be discussed include protein structure and function, the chemical logic of metabolism, and the mechanisms of DNA replication, DNA transcription, DNA repair, and gene expression. Understand principles and themes in biochemistry that relate to metabolic diseases, drug design, virus infection and vaccination, and gene therapy. Designed for non-biochemistry majors who intend to take a single course in biochemistry for their major - not meant to fulfill the needs of pre-med and pre-vet students. Enroll Info: None
Requisites: CHEM 104, 109, or 116. Not open to students with credit for BIOCHEM 501.
Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req
Level - Intermediate
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Fall 2020

BIOCHEM 375 — SPECIAL TOPICS
1-4 credits.

Examines various special topics in biochemistry. Topics and content will vary each semester and by section of the course. Enroll Info: Requisites will vary depending on the particular topic covered.
Requisites: None
Course Designation: Level - Intermediate
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Fall 2020

BIOCHEM 399 — COORDINATIVE INTERNSHIP/COOPERATIVE EDUCATION
1-8 credits.

Enroll Info: So, Jr or Sr st cons suprvsg inst, advisor, and intrshp prog coordinator
Requisites: Consent of instructor
Course Designation: Level - Intermediate
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Workplace - Workplace Experience Course
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2020

BIOCHEM 400 — STUDY ABROAD IN BIOCHEMISTRY
1-6 credits.

Provides an area equivalency for courses taken on Madison Study Abroad Programs that do not equate to existing UW courses. Enroll Info: Current enrollment in a UW-Madison study abroad program
Requisites: None
Repeatable for Credit: Yes, unlimited number of completions
BIOCHEM 501 — INTRODUCTION TO BIOCHEMISTRY
3 credits.

Chemistry, nutrition, and metabolism of biological systems. Enroll Info: None
Requisites: CHEM 341 or 343 or concurrent enrollment; or graduate student
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Fall 2020

BIOCHEM 507 — GENERAL BIOCHEMISTRY I
3 credits.

Chemistry of biological materials, intermediary metabolism and protein structure. First semester of a year-long sequence in biochemistry; Biochemistry 508 is offered in the spring. This course is designed and recommended for undergraduate Biochemistry majors, but others are welcome. Enroll Info: None
Requisites: CHEM 345
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Fall 2020

BIOCHEM 508 — GENERAL BIOCHEMISTRY II
3-4 credits.

Biosynthesis of biological molecules, signal transduction mechanisms, chemistry and metabolism of nucleic acids, protein synthesis, and molecular and cellular biology. Enroll Info: A grade of BC or higher in BIOCHEM 507, or consent of instructor. Honors credits available with consent of instructor
Requisites: Must have completed BIOCHEM 507.
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Spring 2020

BIOCHEM 510 — NUTRITIONAL BIOCHEMISTRY AND METABOLISM
3 credits.

Lectures in nutrition with a substantial background in biochemistry. Emphasis on biochemical and physiological fundamentals of nutrition. Discussion of protein, fat, carbohydrate, energy, minerals and vitamins and their roles and interrelationships in nutrition and metabolism. Enroll Info: None
Requisites: BIOCHEM 301, 501, 507, BMOLCHEM 503, or graduate/professional standing
Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2020

BIOCHEM 550 — TOPICS IN MEDICAL BIOCHEMISTRY
2 credits.

Lectures. Biochemical and molecular analysis of selected human diseases. Topics will include lipid metabolism and atherosclerosis, cell cycle regulation and oncogene function in cancer, and human immunodeficiency virus (HIV) structure, life cycle, and mechanism of acquired immunodeficiency disease syndrome (AIDS). Enroll Info: None
Requisites: Must have completed BIOCHEM 501 or BIOCHEM 507.
Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Spring 2020

BIOCHEM 551 — BIOCHEMICAL METHODS
4 credits.

Lab and student seminar. Introduction to modern biochemical laboratory techniques and current biochemical literature. Students will present a seminar based upon scientific literature that parallels experiments they will perform in lab. For advanced undergraduates and non-biochemistry graduate students. Enroll Info: None
Requisites: BIOCHEM 501 or BIOCHEM 507 or concurrent enrollment
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Fall 2020
BIOCHEM 570 — COMPUTATIONAL MODELING OF BIOLOGICAL SYSTEMS
3 credits.
Introduction to the mathematical and computational tools needed to model biological systems spanning from molecules to ecosystems. Topics include protein folding and dynamics, gene regulation, biomolecular networks, and population dynamics. Teaches the fundamentals in quantitative thinking and analytical reasoning about complex biological systems. Enroll Info: None
Requisites: (MATH 217, 221, or 275) and BOTANY/BIOLOGY/ZOOLOGY 151, ZOOLOGY 153, BIOCORE 381, or (ZOOLOGY/BIOLOGY 101, 102 and BOTANY/BIOLOGY 130), or graduate/professional standing
Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2020

BIOCHEM/M M & I 575 — BIOLOGY OF VIRUSES
2 credits.
Broad coverage of animal virology taught at molecular level. Topics include virus structure, viral replication/lifecycle, aspects of pathogenesis and prevention. Enroll Info: None
Requisites: (BIOCORE 381 and 382), ZOOLOGY/BIOLOGY/BOTANY 151, M M & I 301, or graduate/professional standing
Course Designation: Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2020

BIOCHEM 601 — PROTEIN AND ENZYME STRUCTURE AND FUNCTION
2 credits.
Protein structure and dynamics. Protein folding. Physical organic chemistry of enzymatic catalysis. Analysis of enzyme kinetics and receptor-ligand interactions. Enzymatic reaction mechanisms. Enroll Info: None
Requisites: CHEM 345 and (BIOCHEM 501 or 507)
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2020

BIOCHEM/B M I/BMOLCHEM/MATH 606 — MATHEMATICAL METHODS FOR STRUCTURAL BIOLOGY
3 credits.
A rigorous foundation for mathematical modeling of biological structures. Mathematical techniques include ordinary and partial differential equations, 3D Fourier analysis and optimization. Biological applications include protein folding, molecular dynamics, implicit solvent electrostatics, and molecular interactions. Enroll Info: None
Requisites: (MATH 234, 320, 340, or 375) and (COMP SCI 200, 300, 301, 302, or 310) or graduate/professional standing or member of the Pre-Masters Mathematics (Visiting International) Program
Course Designation: Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2016

BIOCHEM/B M I/BMOLCHEM/MATH 609 — MATHEMATICAL METHODS FOR SYSTEMS BIOLOGY
3 credits.
Provides a rigorous foundation for mathematical modeling of biological systems. Mathematical techniques include dynamical systems and differential equations. Applications to biological pathways, including understanding of bistability within chemical reaction systems, are emphasized. Enroll Info: None
Requisites: MATH 415 and (MATH 320, 340, 341, or 375) or graduate/professional standing or member of the Pre-Masters Mathematics (Visiting International) Program
Course Designation: Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2020

BIOCHEM/GENETICS/MICROBIO 612 — PROKARYOTIC MOLECULAR BIOLOGY
3 credits.
Molecular basis of bacterial physiology and genetics with emphasis on molecular mechanisms; topics include nucleic acid-protein interactions, transcription, translation, replication, recombination, regulation of gene expression. Enroll Info: None
Requisites: None
Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2020
BIOCHEM/NUTR SCI 619 — ADVANCED NUTRITION: INTERMEDIARY METABOLISM OF MACRONUTRIENTS
3 credits.
Discuss metabolic control; gastrointestinal physiology; nutrient absorption; molecular, cellular, organismal aspects of glucose transport, metabolism, regulation; fuel sensing; molecular regulation of fatty acid, lipid metabolism; cellular, organismal aspects of protein metabolism; hormonal control of metabolism; experimental approaches for studying metabolism. Enroll Info: None
Requisites: NUTRI SCI 510, BIOCHEM 507, 508, or BMOLCHEM 503 or graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2019

BIOCHEM/GENETICS/MD GENET 620 — EUKARYOTIC MOLECULAR BIOLOGY
3 credits.
Focuses on the basic molecular mechanisms that regulate DNA, RNA, and protein metabolism in eukaryotic organisms. Enroll Info: None
Requisites: BIOCHEM 501, 508 or graduate/professional standing
Course Designation: Level - Intermediate
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2020

BIOCHEM/BOTANY 621 — PLANT BIOCHEMISTRY
3 credits.
Biochemistry of photosynthesis, respiration, cell walls, and other metabolic and biosynthetic processes in plants. Enroll Info: Biochem BIOCHEM 501 or 507
Requisites: None
Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2019

BIOCHEM 624 — MECHANISMS OF ENZYME ACTION
2 credits.
Lecture. The relation of structure and kinetics to mechanisms of enzymatic catalysis; studies of specific enzymes and enzyme systems. Enroll Info: BIOCHEM 501, or 507 508, or 601; CHEM 561 or 565; or cons inst (not open to Fr)
Requisites: None
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Fall 2012

BIOCHEM 625 — MECHANISMS OF ACTION OF VITAMINS AND MINERALS
2 credits.
Emphasizes the importance of coenzyme and cofactors of enzymes (i.e., vitamins and minerals) in biochemistry. All aspects of the biochemistry of coenzymes will be covered, including their biosynthesis as far as is known, the biochemical reactions they catalyze, their chemical and spectroscopic properties, and the mechanisms by which they facilitate biochemical reactions. Enroll Info: None
Requisites: CHEM 345 and previous or concurrent enrollment in BIOCHEM 501 or 507; or graduate standing
Course Designation: Breadth - Physical Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Spring 2020

BIOCHEM/PHMCOL-M/ZOOLOGY 630 — CELLULAR SIGNAL TRANSDUCTION MECHANISMS
3 credits.
Comprehensive coverage of human hormones, growth factors and other mediators; emphasis on hormone action and biosynthesis, cell biology of hormone-producing cells. Enroll Info: None
Requisites: (BIOCHEM 501 or 507) and (BIOCORE 383, ZOOLOGY/BIOLOGY 101, or ZOOLOGY 570) or graduate/professional standing
Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2020

BIOCHEM 636 — MACROMOLECULAR CRYSTALLOGRAPHY AND DYNAMICS
2 credits.
Provide knowledge of techniques used to obtain detailed structural and dynamic information about biological macromolecules and survey results. Techniques include x-ray diffraction, electron microscopy and molecular dynamics simulations. Designed for advanced undergraduates and beginning graduate students in the biological sciences. Enroll Info: Concurrent or prior biochem; calc, freshman physics or equiv
Requisites: None
Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Spring 2012
BIOCHEM/NUTR SCI 645 — MOLECULAR CONTROL OF METABOLISM AND METABOLIC DISEASE
3 credits.
Examination of various physiological states and how they affect metabolic pathways. Discussion of a number of special topics related to the unique roles of various tissues and to metabolic pathways in disease states, including adipocyte biology, beta-cell biology, epigenetics, inflammation, and aging related diseases. Enroll Info: None
Requisites: BIOCHEM 501, 508 or graduate/professional standing
Course Designation: Breadth - Biological Sci. Counts toward the Natural Sci req
Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: No
Last Taught: Fall 2020

BIOCHEM/CHEM 665 — BIOPHYSICAL CHEMISTRY
4 credits.
Equilibrium thermodynamics, chemical kinetics and transport properties, with emphasis on solution behavior and application to noncovalent interactions of biological macromolecules in solution. For graduate students interested in the biological applications of physical chemistry. Enroll Info: Grad st or cons inst. Stds must meet prereqs for CHEM 565 have some prev background in phys chem
Requisites: Graduate standing
Course Designation: Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2020

BIOCHEM 681 — SENIOR HONORS THESIS
2-4 credits.
Enroll Info: Sr st cons inst (for hon Biochem majors only)
Requisites: Consent of instructor
Course Designation: Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Honors - Honors Only Courses (H)
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Fall 2020

BIOCHEM 682 — SENIOR HONORS THESIS
2-4 credits.
Continuation of 681. Enroll Info: Honors program candidacy BIOCHEM 681.
Requisites: Consent of instructor
Course Designation: Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Honors - Honors Only Courses (H)
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2020

BIOCHEM 691 — SENIOR THESIS
2 credits.
Enroll Info: Sr st cons inst
Requisites: Consent of instructor
Course Designation: Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Fall 2020

BIOCHEM 692 — SENIOR THESIS
2 credits.
Enroll Info: Sr st and cons inst
Requisites: Consent of instructor
Course Designation: Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2019

BIOCHEM 699 — SPECIAL PROBLEMS
1-4 credits.
Provides academic credit for research, library, and/or laboratory work under direct guidance of a faculty member. Students are responsible for arranging the work and credits with the supervising faculty member. Enroll Info: None
Requisites: Consent of instructor
Course Designation: Level - Advanced
L&S Credit - Counts as Liberal Arts and Science credit in L&S
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Fall 2020

BIOCHEM/BMOLCHEM 701 — PROFESSIONAL RESPONSIBILITY
1 credit.
Training for the practical aspects of being a scientist. Will cover ethics, peer review, grant writing, science communication, career alternatives, paper writing, experimental design, research documentation, science funding, academic-private interface, scientific fraud, and more. Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2020

BIOCHEM/GENETICS 703 — TOPICS IN EUKARYOTIC REGULATION
2 credits.
Design and interpretation of experiments addressing molecular mechanisms of eukaryotic regulation. Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Spring 2013
BIOCHEM/CHEM 704 — CHEMICAL BIOLOGY
3 credits.

Chemistry and biology of proteins, nucleic acids and carbohydrates; application of organic chemistry to problems in cell biology, biotechnology, and biomedicine. Enroll Info: None

Requisites: Declared in Biochemistry or Chemistry graduate program

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2020

BIOCHEM 719 — FROM ATOMS TO MOLECULES
3 credits.

Topics covered include protein structure and folding, protein dynamics, biological catalysis, membrane structure and assembly, nucleic acid structure and folding, and bioenergetics. Each topic includes discussion of the primary literature, hypothesis generation, experimental design, data, analysis and interpretation underlying the facts in the textbook.

The goal is to help students transition from undergraduate consumers of knowledge to graduate students and future independent scientists who will discover and add new knowledge. Enroll Info: None

Requisites: Declared in Biochemistry PhD program

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2020

BIOCHEM 721 — BIOCHEMICAL COMMUNICATION
2 credits.

Designed to introduce students to written and visual communication of biochemical research, both to other scientists and to general audiences, including: how to recognize and adapt work to different audiences; how to construct a scientific argument and the different strategies used for research reports, reviews, and proposals; and how to create figures and posters that clearly convey scientific data and concepts. Also an introduction to the peer review process and revision of scientific writing. An intensive writing component requires students to produce multiple written and visual documents on the topic of their thesis research. Enroll Info: None

Requisites: Declared in Biochemistry PhD program

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2020

BIOCHEM 729 — ADVANCED TOPICS
1-3 credits.

Specialized subjects of current interest. Enroll Info: None

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Fall 2020

BIOCHEM 799 — PRACTICUM IN BIOCHEMISTRY TEACHING
1-3 credits.

Enroll Info: None

Requisites: Consent of instructor

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Fall 2014

BIOCHEM 800 — PRACTICAL NUCLEAR MAGNETIC RESONANCE THEORY
2 credits.

Multiple pulse NMR, off-resonance effects, composite and shaped pulses, product operators, coherence transfer, one- and two-dimensional NMR, phase cycling, multiple quantum coherence, and cross relaxation. Enroll Info: None

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2020

BIOCHEM 801 — BIOCHEMICAL APPLICATIONS OF NUCLEAR MAGNETIC RESONANCE
2 credits.

Survey of current solution-state nuclear magnetic resonance techniques used in biochemical research; the emphasis will be on how data are acquired and on practical applications. Enroll Info: None

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Spring 2020

BIOCHEM/BOTANY/GENETICS 840 — REGULATORY MECHANISMS IN PLANT DEVELOPMENT
3 credits.

Molecular mechanisms whereby endogenous and environmental regulatory factors control development; emphasis on stimulus perception and primary events in the signal chain leading to modulated gene expression and cellular development. Enroll Info: None

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: No

Last Taught: Fall 2020

BIOCHEM/CHEM 872 — SELECTED TOPICS IN MACROMOLECULAR AND BIOPHYSICAL CHEMISTRY
1-3 credits.

Enroll Info: None

Requisites: Graduate/professional standing

Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement

Repeatable for Credit: Yes, unlimited number of completions

Last Taught: Fall 2020
BIOCHEM/NUTR SCI 901 — SEMINAR-NUTRITION AND METABOLISM (ADVANCED)
1 credit.

Presentation of original research results; discussion of recent articles in animal metabolism and nutrition. Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Fall 2020

BIOCHEM 906 — TOPICS IN MODELING FOR BIOCHEMICAL SYSTEMS
1 credit.

Participants discuss topics relevant to predictive modeling of bioenergy systems. Students present talks and lead brainstorming sessions intended to sharpen their skills at cross-disciplinary communication. Modeling microbes and plants at the genetic, molecular and systems level is emphasized. Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Fall 2016

BIOCHEM 909 — SEMINAR-ENZYMOLGY (ADVANCED)
1 credit.

Research reports, special topics, and reports from recent literature in enzymology and enzyme mechanisms. Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2016

BIOCHEM 910 — SEMINAR-MOLECULAR VIROLOGY (ADVANCED)
1 credit.

Research reports, special topics, and reports from recent literature in molecular virology. Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2016

BIOCHEM 912 — SEMINAR-MOLECULAR MECHANISMS OF DEVELOPMENT
1 credit.

Classical and current papers concerning molecular and genetic mechanisms of eukaryotic development will be presented and discussed. Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Fall 2018

BIOCHEM/BMOLCHEM 913 — SEMINAR-RIBOGROUP (ADVANCED)
1 credit.

Student-led discussions of RNA-related problems. Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2020

BIOCHEM/BMOLCHEM/M M & I 914 — SEMINAR-MOLECULAR BIOSCIENCES (ADVANCED)
1 credit.

During the fall semester, molecular biosciences trainees who have not achieved dissertator status will present seminars based primarily on literature related to their projects. During the spring semester, molecular biosciences trainees with dissertator status will present seminars based upon their own research. Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Fall 2020

BIOCHEM/B M E/B M I/CBE/COMP SCI/GENETICS 915 — COMPUTATION AND INFORMATICS IN BIOLOGY AND MEDICINE
1 credit.

Participants and outside speakers will discuss current research in computation and informatics in biology and medicine. This seminar is required of all CIBM program trainees. Enroll Info: None
Requisites: Consent of instructor
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Fall 2020

BIOCHEM 916 — CELLULAR MECHANISMS OF PROTEIN BIOGENESIS AND TRAFFICKING
1 credit.

Recent literature relating to cellular aspects of the regulation of protein biogenesis including protein synthesis, folding, modification, degradation and trafficking, as well as function of molecular chaperones, will be presented and discussed. Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2019
Biochemistry (BIOCHEM)

Biochemistry/Microbio 917 — Regulation of Gene Expression (Advanced Seminar) 1 credit.

Analysis of recent literature in topics related to prokaryotic and eukaryotic gene regulation, including regulation of transcription, translation, and genome organization. Enroll Info: None
Requisites: Consent of instructor
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: No
Last Taught: Fall 2020

Biochemistry/Chem 918 — Single Molecule Approaches to Biology 1 credit.

A combination of recent literature and original research presentations relating to the use of single molecule techniques in biochemistry including fluorescence microscopy, tethered particle motion, patch-clamping, cryo-electron microscopy, optical trapping, magnetic tweezers, and super resolution microscopy. Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Fall 2018

Biochemistry 919 — Synthetic Biology Seminar 1 credit.

Synthetic biology is a burgeoning field encompassing understanding and designing biological systems spanning from biomolecules to ecosystems. It builds on advances in molecular and cellular technologies to revolutionize biological engineering in the same way that organic synthesis transformed chemistry and integrated circuit design transformed computing. Synthetic biology has the potential to address many of society's grand challenges including: understanding human disease, sustainable biomanufacturing, medical diagnostics and therapeutics, programming mammalian cell behaviors, engineering living materials, information storage, carbon sequestration, and energy generation. Latest advances in the field will be reviewed by covering literature including but not limited to biomolecular design, sequence-structure-function relationship, regulatory and signaling networks, metabolic engineering, interactions in microbial communities, cell-based therapeutics and genome design. Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Fall 2020

Biochemistry 924 — Membrane Protein Structure and Function 1 credit.

Membrane proteins comprise over a fourth of proteins encoded in any given genome, providing many vital functions to all cells. For example, ion channels and pumps modulate the membrane potential and help conduct information via nerves and other long distance conducting tissue. Transporters mediate the uptake and secretion of molecules. Receptors, such as G protein coupled receptors and receptor protein kinases, transfer information about the environment to the inside of the cell. Membrane proteins also contribute to the shape of the cell, the structure of the membrane and a myriad of other functions. Structure/function relationships for this critical class of proteins are discussed, addressing questions such as "how do membrane proteins fold?", "how do certain important classes of membrane proteins work?", "what are the challenges in studying membrane proteins" and "what methods are available for studying their biophysical properties?" Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions

Biochemistry/Cbe 932 — Biotechnology Training Program Seminar 1 credit.

Biotechnology Training Program trainees will present their research for critical review by audience. Enroll Info: Grad st. Required of Biotechnology Training Program trainees
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Fall 2020

Biochemistry/Chem 945 — Seminar-Chemical Biology (Advanced) 1 credit.

Recent published research in chemical biology and related areas. Intended for advanced graduate students, and required of all NIH Chemistry-Biology Interface trainees. Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Spring 2020

Biochemistry 990 — Research 1-12 credits.

Enroll Info: None
Requisites: Graduate/professional standing
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Fall 2020
BIOCHEM 999 — SPECIAL PROBLEMS
1-3 credits.

Enroll Info: None
Requisites: Consent of instructor
Course Designation: Grad 50% - Counts toward 50% graduate coursework requirement
Repeatable for Credit: Yes, unlimited number of completions
Last Taught: Fall 2005