

BIOCHEMISTRY (BCHM)

Courses

BCHM 1020 (1) A Path to Success: Introduction to the Biochemistry Major

This course will help students navigate their first year of college and develop the skills needed for academic success as Biochemistry majors. Students will improve academic strategies (i.e. time management, problem-solving and study skills), identify available campus resources, learn how to get involved in clubs and gain research experience, and explore career opportunities as a biochemistry graduate. This is a first-year elective course specifically designed for first year and other students exploring their educational and career opportunities.

Recommended: New BCHM majors.

BCHM 1041 (3) Biotechnology and Society

Covers recent advances in biotechnology and how those impact society. Content and discussion will focus on both the science behind technological advances, their impact on society, and the ethical issues raised by new technologies. Topics change each semester but can include: GMO crops, genome editing, drug discovery and development, stem cell therapies, development and use of new cancer treatments, human genome sequencing and its impact on diagnosis and treatments, human microbiome, neurodegenerative diseases. Formerly CHEM 1041.

Requisites: Restricted to students with 0-56 credits (Freshmen or Sophomore) only.

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

BCHM 1701 (1) Biochemistry Program for Research Exploration and Planning

Biochem PREP is focused on developing first and second year student interest and engagement in undergraduate research. The program is designed to present participants with mentorship and opportunities to identify whether research is an opportunity students wish to participate in, and if so, get students connected to potential research opportunities. Participants will be provided with a cohort of their peers to explore and plan for research together through preparation workshops, research information sessions, and mentorship. The ultimate goal of the program is for participants to understand their research interests, possess the necessary skills to identify and obtain a research opportunity, and develop community with their peers and the Department of Biochemistry at large.

Requisites: Restricted to Biochemistry (BCHM) majors and minors only.

BCHM 2700 (4) Foundations of Biochemistry

Covers chemistry of aqueous solutions; energetics in biology; structure of proteins, nucleic acids, carbohydrates, and membranes; protein evolution; macromolecular interactions; enzyme kinetics, mechanism and regulation. Will be taught from a strong chemical perspective and mastery of basic concepts of general and organic chemistry will be required. Familiarity with basic concepts of molecular and cellular biology encouraged. Formerly CHEM 4700.

Requisites: Requires prerequisite course of CHEM 3311 or CHEM 3451 (minimum grade C-). Restricted to Biochemistry (BCHM) majors and minors only.

BCHM 3100 (2) Engineering RNA Aptamers

Provides laboratory experience working on an RNA sensor research project. Students will generate libraries of RNA aptamers and select and isolate aptamers that bind a novel ligand of interest. Topics covered include principles of RNA molecular recognition, polymerase chain reaction and molecular cloning, bacterial transformation, fluorescence reporter assays and high throughput screening.

Requisites: Requires prerequisite or corequisite course of BCHM 2700 or BCHM 4611 (minimum grade C-).

BCHM 3110 (1) Literature-based Co-seminar for BCHM 3100 CURE Laboratory Course

This course involves reading and discussion of primary literature. Each week students will read a scientific research article, and engage in a class discussion about the significance and impact, the scientific merits, the underlying premise of the research question and experimental plan, and whether data support conclusions of the paper. Papers will be focused on RNA structure and function, RNA molecular recognition, RNA aptamers, RNA engineering, RNA as a drug target, and fluorescent probes for RNA. Students will be responsible for reading each paper, one student will prepare a powerpoint and lead a class discussion each week, and all students are expected to participate in the discussion.

Requisites: Requires prerequisite or corequisite course of BCHM 2700 or BCHM 4611 (minimum grade C-).

BCHM 3491 (4) Organic Chemistry 2 for Biochemistry Majors

Covers amines, alkylation reactions, additions to unsaturated C-C bonds, aromaticity and aromatic reactivity, organic materials, biomolecules, nomenclature of organic compounds, reaction mechanism. Department enforced corequisite: CHEM 3341 or CHEM 3381. Formerly CHEM 3491.

Equivalent - Duplicate Degree Credit Not Granted: CHEM 3471 and CHEM 3331

Requisites: Requires prerequisite courses of CHEM 3451 and CHEM 3321 or CHEM 3361 (all minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

BCHM 4312 (3) Quantitative Optical Imaging

Explores the fundamentals of optical imaging in biology, especially molecular and cellular biology. Covered topics include an introduction to optics and microscopes, fluorescence microscopy and image analysis, and biological applications. MATLAB will be taught at the beginning of the course and used throughout for image processing. Prior experience with MATLAB (or Python) is highly recommended but not required.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4312, MCDB 5312 and BCHM 5312

Grading Basis: Letter Grade

BCHM 4400 (4) Core Concepts in Physical Chemistry for Biochemists

Introduces thermodynamics, kinetics and spectroscopy, emphasizing macromolecule and biochemical applications. Includes thermodynamics, chemical and physical equilibria, solution chemistry, rates of chemical and biochemical reactions, chemical bonds and principles and selected examples of spectroscopies applied to biological systems. Department enforced prerequisite or corequisite: PHYS 1120 or PHYS 2020. Formerly CHEM 4411.

Equivalent - Duplicate Degree Credit Not Granted: BCHM 5400 CHEM 4511

Requisites: Requires prerequisite courses BCHM 2700 or BCHM 4611 or BCHM 4700 or and PHYS 1110 or PHYS 2010 and MATH 2300 or APPM 1360 (all minimum grade C-).

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

BCHM 4491 (3) Modern Biophysical Methods

Covers the basic theory of biophysical methods widely employed in biochemistry and biology, including: electrophoresis, mass spec, calorimetry, evanescent waves, plasmon resonance, Xray diffraction, absorbance and fluorescence spectroscopy, magnetic resonance, electron and optical microscopy and single molecule methods. Discusses ways to maximize rigor and reproducibility in biophysical studies.

Department enforced prerequisites: undergraduate chemistry (general, organic physical); physics; calculus.

Equivalent - Duplicate Degree Credit Not Granted: BCHM 5491

Requisites: Requires prerequisite courses of PHYS 1110 or PHYS 2010 and MATH 2300 or APPM 1360 and BCHM 2700 or BCHM 4700 or BCHM 4611 (all minimum grade C).

Recommended: Prerequisite or corequisite BCHM 4400 or CHEM 4531.

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

BCHM 4611 (3) Principles of Biochemistry

One-semester overview of the main themes of modern biochemistry: biomolecular structure/function, metabolism, biosynthesis, DNA from genome to proteome and cellular signaling. For biology and engineering majors and others wanting an overview of biochemistry. Formerly CHEM 4611.

Equivalent - Duplicate Degree Credit Not Granted: BCHM 5611

Requisites: Requires prerequisite course of CHEM 3311 or CHEM 3451 (minimum grade C-).

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

BCHM 4621 (3) Genome Databases: Mining and Management

Develops essential skills for performing genomic analyses, with focus on developing practical research tools. Introduces human genome and microbiome projects, Python/Sql scripting, accessing and understanding genomic data, sequence alignment and search, evolutionary models, expression data, biological networks, and macromolecular structure.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 4621, MCDB 5621 and BCHM 5621

Requisites: Requires prerequisite course of BCHM 2700 or BCHM 4700 or CSCI 3104 or MCDB 3500 (minimum grade C-).

Recommended: Prerequisite MCDB 3135 or CSCI 3104 or BCHM 2700 and recommended corequisite of CSCI 2270.

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

BCHM 4631 (3) Statistical and Computational Analysis of the Human Genome

This lab course covers fundamental statistical and computational approaches to large scale data. Students will learn the unix command line to: access public human genome data, learn what statistics apply to which types of data and apply them to study specific regions of the human genome involved in development and disease. This lab course will cover fundamental aspects of Virtual computing, Container analysis pipelines (e.g. NextFlow, GitHub) in an intuitive and practical learning framework.

Equivalent - Duplicate Degree Credit Not Granted: BCHM 5631

Requisites: Requires prerequisite course of BCHM 4740 or MCDB 3135 (minimum grade C-).

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

BCHM 4720 (4) Metabolic Pathways and Human Disease

Covers energy metabolism and anabolic/catabolic pathways; metabolism of carbohydrates, lipids, amino acids, and nucleic acids; photosynthesis; special topics on human diseases with pathologies and metabolic pathways. Formerly CHEM 4720.

Equivalent - Duplicate Degree Credit Not Granted: BCHM 5720

Requisites: Requires prerequisite courses of BCHM 2700 and CHEM 3331 or CHEM 3471 or BCHM 3491 (all minimum grade C-).

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

BCHM 4740 (4) Biochemistry of Gene Transmission, Expression and Regulation

Covers biosynthesis and function of macromolecules including DNA, RNA and proteins; molecular basis of replication, transcription and translation; biochemistry of subcellular systems; signaling and regulation of gene expression in eukaryotes; and special topics. Formerly CHEM 4740.

Equivalent - Duplicate Degree Credit Not Granted: BCHM 5740

Requisites: Requires a prerequisite course of BCHM 2700 or CHEM 4700 (minimum grade C-).

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

BCHM 4751 (3) Current Topics in Biochemical Research

Lec. Covers current topics in modern biochemical research through lectures, reading recent research articles, critical thinking and class discussion. Topics include protein and nucleic acid structure and function, biomolecular interactions, enzyme function and cellular signaling and regulation. Formerly CHEM 4751.

Equivalent - Duplicate Degree Credit Not Granted: BCHM 5751

Requisites: Requires prerequisite courses of MCDB 3135 or BCHM 4700 or BCHM 2700 and BCHM 4740 (all minimum grade C-).

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sciences

BCHM 4761 (3) Biochemistry Laboratory

Two 4-hour periods per week. Introduction to modern biochemical techniques. Topics include enzymology, spectrophotometry, electrophoresis, multi-step protein purification, recombinant DNA techniques and molecular cloning. Formerly CHEM 4761.

Requisites: Requires prerequisite courses of BCHM 2700 or CHEM 4700 and CHEM 3341 or 3381 (all minimum grade C-). Restricted to Chemistry (CHEM) or Biochemistry (BCHM) majors only.

Additional Information: Arts Sci Gen Ed: Distribution-Natural Sci Lab
Arts Sci Gen Ed: Distribution-Natural Sciences

BCHM 4850 (3) Chemistry and Biology of Nucleic Acids

A comprehensive course in advanced topics in nucleic acid chemistry and biology. Topics will include the chemical properties of nucleic acids, chemical and biological synthesis, structure, biology of ribozymes and ribonuclear complexes, protein recognition, nucleic acids as targets and therapeutics and diagnostic and other applications of nucleic acids.

Equivalent - Duplicate Degree Credit Not Granted: BCHM 5850

Requisites: Requires prerequisite courses of BCHM 2700, BCHM 4720 and BCHM 4740 (all minimum grade C-).

Grading Basis: Letter Grade

BCHM 4901 (1-6) Independent Study in Biochemistry

For undergraduate study. Department consent required.

Repeatable: Repeatable for up to 8.00 total credit hours.

BCHM 5312 (3-4) Quantitative Optical Imaging

Explores the fundamentals of optical imaging in biology, especially molecular and cellular biology. Covered topics include an introduction to optics and microscopes, fluorescence microscopy and image analysis, and biological applications. MATLAB will be taught at the beginning of the course and used throughout for image processing. Prior experience with MATLAB (or Python) is highly recommended but not required.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5312, MCDB 4312 and BCHM 4312

Grading Basis: Letter Grade

BCHM 5341 (3) Chemical Biology and Drug Design

Develop knowledge base and skills in the interdisciplinary field of chemical biology, including aspects of chemistry and biology, and integrating both with respect to hierarchical levels of structure (atomic, molecular, cellular). Students will receive training that helps to develop their careers in biotech, pharmaceutical and other research-oriented industries as well as in academia. Department enforced prerequisites: introductory organic chemistry and general biochemistry. Formerly CHEM 5341.

Requisites: Restricted to graduate students only.

BCHM 5400 (4) Core Concepts in Physical Chemistry for Biochemists

Introduces thermodynamics, kinetics and spectroscopy, emphasizing macromolecule and biochemical applications. Includes thermodynamics, chemical and physical equilibria, solution chemistry, rates of chemical and biochemical reactions, chemical bonds and principles and selected examples of spectroscopies applied to biological systems. Formerly CHEM 5400.

Equivalent - Duplicate Degree Credit Not Granted: BCHM 4400 CHEM 4511

Requisites: Restricted to graduate students only.

BCHM 5491 (3) Modern Biophysical Methods

Covers the basic theory of biophysical methods widely employed in biochemistry and biology, including: electrophoresis, mass spec, calorimetry, evanescent waves, plasmon resonance, X-ray diffraction, absorbance and fluorescence spectroscopy, magnetic resonance, electron and optical microscopy and single molecule methods. Discusses ways to maximize rigor and reproducibility in biophysical studies. Department enforced prerequisites: undergraduate chemistry (general, organic, physical), biochemistry, physics, calculus.

Equivalent - Duplicate Degree Credit Not Granted: BCHM 4491

Requisites: Restricted to graduate students only.

Grading Basis: Letter Grade

BCHM 5611 (3) Principles of Biochemistry

One-semester overview of the main themes of modern biochemistry: biomolecular structure/function, metabolism, biosynthesis, DNA from genome to proteome and cellular signaling. For biology and engineering majors and others wanting an overview of biochemistry.

Equivalent - Duplicate Degree Credit Not Granted: BCHM 4611

BCHM 5621 (3) Genome Databases: Mining and Management

Lec. Develops essential skills for performing genomic analyses, with focus on developing practical research tools. Introduces human genome and microbiome projects, Python/SQL scripting, accessing and understanding genomic data, sequence alignment and search, evolutionary models, expression data, biological networks, and macromolecular structure.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5621, MCDB 4621 and BCHM 5621

Requisites: Restricted to graduate students only.

BCHM 5631 (3) Statistical and Computational Analysis of the Human Genome

This lab course covers fundamental statistical and computational approaches to large scale data. Students will learn the unix command line to: access public human genome data, learn what statistics apply to which types of data and apply them to study specific regions of the human genome involved in development and disease. This lab course will cover fundamental aspects of Virtual computing, Container analysis pipelines (e.g. NextFlow, GitHub) in an intuitive and practical learning framework.

Equivalent - Duplicate Degree Credit Not Granted: BCHM 4631

BCHM 5661 (3) Advances in Molecular Biophysics

Discuss recent literature concerning biophysical studies of macromolecular structure and mechanism, including DNA, RNA, proteins, and their interactions.

Recommended: Prerequisites one year of physical chemistry or quantum mechanics, one year of biology, graduate standing, or instructor consent.

BCHM 5720 (4) Metabolic Pathways and Human Disease

Covers energy metabolism and anabolic/catabolic pathways; metabolism of carbohydrates, lipids, amino acids, and nucleic acids; photosynthesis; special topics on human diseases with pathologies and metabolic pathways. Formerly CHEM 5720.

Equivalent - Duplicate Degree Credit Not Granted: BCHM 4720

Requisites: Restricted to graduate students only.

BCHM 5740 (4) Biochemistry of Gene Transmission, Expression and Regulation

Covers biosynthesis and function of macromolecules including DNA, RNA and proteins; molecular basis of replication, transcription and translation; biochemistry of subcellular systems; signaling and regulation of gene expression in eukaryotes; and special topics. Formerly CHEM 5740.

Equivalent - Duplicate Degree Credit Not Granted: BCHM 4740

Requisites: Restricted to graduate students only.

BCHM 5751 (3) Current Topics in Biochemical Research

Lec. Covers current topics in modern biochemical research through lectures, reading recent research articles, critical thinking and class discussion. Topics include protein and nucleic acid structure and function, biomolecular interactions, enzyme function and cellular signaling and regulation. Department consent required. Formerly CHEM 5751.

Equivalent - Duplicate Degree Credit Not Granted: BCHM 4751

Requisites: Restricted to graduate students only.

BCHM 5770 (3) Fundamentals of Biochemistry I

Analysis of topics in biochemistry including DNA structure and replication, RNA synthesis and processing, protein synthesis, enzyme function and mechanism, and protein structure and dynamics. Intended as a comprehensive treatment of areas central to modern biochemistry for entering graduate students. Lectures concurrent with BCHM 5771 covering the same topics except for the requirement of a written research proposal. Formerly CHEM 5770.

BCHM 5771 (5) Advanced General Biochemistry I

Lect. In-depth analysis of DNA structure and replication, RNA synthesis and processing, protein synthesis, enzyme function and mechanism, protein structure, protein dynamics, and physical chemistry of macromolecules. Intended as a comprehensive treatment of areas central to modern biochemistry for entering graduate students. Formerly CHEM 5771.

BCHM 5776 (1) Scientific Ethics and Responsible Conduct in Research

Lect. Advanced discussion of topics in scientific ethics, including requirements for responsible conduct of research, case histories of fraud, research misconduct, ethical misconduct and development of professional values and ethical standards.

Equivalent - Duplicate Degree Credit Not Granted: MCDB 5776

Requisites: Requires prerequisite course of BCHM 5771 or CHEM 5271 (minimum grade B-). Restricted to graduate students only.

BCHM 5780 (3) Fundamentals of Biochemistry II

Analysis of topics in biochemistry including protein structure, methods of structure determination and prediction, protein folding, and protein dynamics. Intended as a comprehensive treatment of areas central to modern biochemistry for entering graduate students. Lectures concurrent with CHEM 5781, covering the same topics except for the requirement of a written research proposal. Formerly CHEM 5780.

Requisites: Requires prerequisite course of BCHM 5770 (minimum grade B-). Restricted to graduate students only.

BCHM 5781 (5) Advanced General Biochemistry 2

Lect. Detailed consideration of contemporary topics in biochemistry, including protein structure (primary, secondary, tertiary, and quaternary), methods of structure determination and prediction, protein folding (kinetics, thermodynamics, denaturation, and renaturation), and protein dynamics (internal motions and methods of analysis). Formerly CHEM 5781.

Requisites: Requires prerequisite course of BCHM 5771 (minimum grade B-). Restricted to graduate students only.

BCHM 5801 (3) Advanced Signal Transduction and Cell Cycle Regulation

Lect. Advanced discussion of current research and literature in signal transduction, including ligands, receptors, and intracellular signaling pathways, as well as control on transcription, chromatin structure, DNA replication, mitosis, and cell cycle progression. Formerly CHEM 5801.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites CHEM 5771 and CHEM 5781 and MCDB 5210 or MCDB 5220.

BCHM 5811 (3) Advanced Methods in Protein Sequencing and Analysis

Lect. Advanced discussion of current methods in protein sequencing, sequence analysis, and posttranslational modifications, emphasizing techniques of mass spectrometry, use of protein databases, sequence alignment and motifs, structure prediction, and modeling of signaling pathways. Department consent required. Formerly CHEM 5811.

Requisites: Restricted to graduate students only.

Recommended: Prerequisites CHEM 5771 and CHEM 5781 and MCDB 5210.

BCHM 5821 (1) Special Topics in Signaling and Cell Regulation

Lect. Reviews and evaluates literature on subjects of current interest in signal transduction transcription, cell cycle progression, and cell regulation. Primarily for graduate level presentation of special topics by students, faculty, and research staff. Department consent required. Formerly CHEM 5821.

Repeatable: Repeatable for up to 5.00 total credit hours.

Requisites: Restricted to graduate students only.

BCHM 5850 (3) Chemistry and Biology of Nucleic Acids

A comprehensive course in advanced topics in nucleic acid chemistry and biology. Topics will include the chemical properties of nucleic acids, chemical and biological synthesis, structure, biology of ribozymes and ribonuclear complexes, protein recognition, nucleic acids as targets and therapeutics and diagnostic and other applications of nucleic acids.

Equivalent - Duplicate Degree Credit Not Granted: BCHM 4850

Requisites: Requires prerequisite courses of BCHM 2700, BCHM 4720 and BCHM 4740 (all minimum grade C-).

Grading Basis: Letter Grade

BCHM 6601 (1) Biochemistry Seminar

Restricted to and required for all currently funded NIH/CU Biophysics trainees and current NIH/CU Biophysics affiliates. Credit is deferred until presentation of satisfactory seminar. Formerly CHEM 6601.

Requisites: Restricted to graduate students only.

BCHM 6711 (3-6) Advanced Topics in Biochemistry

Detailed study of current literature relative to one main topic is undertaken each semester. Topics covered on a rotating basis include enzyme kinetics and mechanisms; lipids and lipoproteins; chemistry and enzymology of nucleic acids; biochemistry of nucleic acids in eukaryotic cells; protein chemistry. Presentations include faculty lectures and student reports. Department enforced prerequisite: one year of biochemistry courses. Department consent required. Formerly CHEM 6711.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

BCHM 6731 (3-6) Advanced Topics in Biochemistry

Detailed study of current literature relative to one main topic is undertaken each semester. Topics covered on a rotating basis include enzyme kinetics and mechanisms; lipids and lipoproteins; chemistry and enzymology of nucleic acids; biochemistry of nucleic acids in eukaryotic cells; protein chemistry. Presentations include faculty lectures and student reports. Department enforced prerequisite: one year of biochemistry courses. Department consent required. Formerly CHEM 6731.

Repeatable: Repeatable for up to 12.00 total credit hours.

Requisites: Restricted to graduate students only.

BCHM 6901 (1-6) Research in Biochemistry

Repeatable: Repeatable for up to 15.00 total credit hours.

Requisites: Restricted to graduate students only.

BCHM 6941 (1) Master's Candidate for Degree

Students are not admitted for the master's degree but may be transferred to the MS plan if they are unable to meet the demands of the PhD program.

Requisites: Restricted to graduate students only.

BCHM 6951 (1-6) Master's Thesis

Students are not admitted for the master's degree but may be transferred to the MS plan if they are unable to meet the demands of the PhD program.

Requisites: Restricted to graduate students only.

BCHM 7601 (2) Seminar: Nucleic Acid Chemistry

Topics in various aspects of current research; emphasizes student readings and presentations. Department consent required.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

BCHM 7611 (1) Seminar: Structures and Dynamics of Biopolymers in Solution

Discussion of experimental and theoretical approaches for probing structures and dynamics of proteins, peptides, and nucleic acids; and computations in molecular dynamics simulation, modeling, and geometry. Department consent required. Formerly CHEM 7611.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

BCHM 7621 (1) Seminar: Biochemistry and Molecular Biology of Signal Transduction

Discusses and reviews the current literature and experimental results in signal transduction, cell cycle and tumor suppressor gene regulation. Emphasizes the understandings of molecular and biochemical mechanisms of the origin of human tumor cells. Formerly CHEM 7621.

Requisites: Restricted to graduate students only.

BCHM 7651 (2) Seminar: Environmental Biochemistry

Topics in various aspects of current biochemical and environmental research. Department consent required. Formerly CHEM 7651.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

BCHM 7661 (1) Structure/Function of Human Mediator Transcription Complexes

Study of the mechanisms of eukaryotic gene expression with an emphasis on the structure and function of human mediator transcription complexes. Formerly CHEM 7661.

Requisites: Restricted to graduate students only.

BCHM 7671 (1) Seminar: Topics in Designing Probes for Signaling Reactions

Discussion of advances and developments in biomolecular dynamics, with emphasis on experimental studies via ultrafast laser spectroscopy. The connection of protein dynamics with function will also be considered. Formerly CHEM 7671.

Requisites: Restricted to graduate students only.

BCHM 7691 (1) Seminar: Protein Dynamics and the Mechanism of Sensory Proteins

Discusses recent results and current literature in the areas of the mechanism of sensory proteins, internal motions of proteins, and protein folding. Department consent required. Formerly CHEM 7691.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

BCHM 7701 (1) Seminar: Enzyme Mechanisms and Kinetics

Studies experimental approaches to understand the mechanisms of enzymic catalysis. Techniques include steady-state and pre-steady-state kinetics, isotope trapping and partitioning, inhibition by substrate analogues, and covalent modification of proteins. Department consent required. Formerly CHEM 7701.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

BCHM 7711 (1) RNA Mediated Inorganic and Organic Reactions

Discussion of advances and developments in biomolecular dynamics, with emphasis on experimental studies via ultrafast laser spectroscopy. The connection of protein dynamics with function will also be considered. Formerly CHEM 7711.

Requisites: Restricted to graduate students only.

BCHM 7741 (1) Seminar: Signal Transduction and Protein Phosphorylation

Devoted to experimental methods for understanding mechanisms of signal transduction in mammalian cells through pathways involving regulation of protein phosphorylation. Department consent required. Formerly CHEM 7741.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

BCHM 7751 (1) Seminar: Protein Structure and Folding

Studies structure and folding of proteins and protein complexes using biophysical methods, including nuclear magnetic resonance (NMR), circular dichroism, and fluorescence spectroscopies. Department consent required. Formerly CHEM 7751.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

BCHM 7761 (1) Seminar: Eukaryotic Transcriptional Regulation

Studies the regulation of transcription by RNA Polymerase II from human promoters. Department consent required. Formerly CHEM 7761.

Repeatable: Repeatable for up to 6.00 total credit hours.

Requisites: Restricted to graduate students only.

BCHM 7781 (1) Seminar: Topics in Structural Biology

Discussion of advances and developments in structural biology with emphasis on new methods for protein expression, purification and crystallization; and structure solution implementation. Formerly CHEM 7781.

Requisites: Restricted to graduate students only.

BCHM 7791 (1) Seminar: Topics in Ribonucleoprotein Assemblies

Studies aspects of the biochemical and structural analysis of ribonucleic acid (RNA) and its interactions with proteins and assemblies into functional ribonucleoprotein (RNP) enzymes. Techniques focus on x-ray crystallography, spectroscopic methods, and biochemical probing. Formerly CHEM 7791.

Requisites: Restricted to graduate students only.

BCHM 8991 (1-10) Doctoral Dissertation

All doctoral students must register for 30 hours of dissertation credit as part of the requirements for the degree. For a detailed discussion of doctoral dissertation credit, refer to the Graduate School section.

Repeatable: Repeatable for up to 30.00 total credit hours.

Requisites: Restricted to graduate students only.