

# BIOCHEMISTRY (BCH)

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**BCH 110 - Intro Biology for Biochemists. 3 Credits.**

Offered spring. Prereq. CHMY 141N/142N or equivalent. Prereq. or Coreq., CHMY 143N/144N. Coreq., BCH 111. An introductory course that explores biomolecules and their roles in life processes. Provides a foundation for Cellular and Molecular Biology (BIOB 260), Genetics and Evolution (BIOB 272), Introductory Biochemistry Seminar (BCH 294), and many other advanced science courses.

**BCH 111 - Intro Biol for Biochemists Lab. 1 Credit.**

Offered spring. Prereq., CHMY 141N/142N or equivalent. Prereq., or Coreq., CHMY 143N/144N. Coreq., BCH 110. Introduction to the experimental techniques used to study biomolecules and their roles in life processes. Provides a foundation for other advanced level laboratory courses in chemistry and biochemistry.

**BCH 294 - Seminar/Workshop. 1 Credit.**

Offered spring. Prereq., BCH 110/111 or equivalent. An introduction to important advances in biochemistry through readings from the primary literature and discussion of this literature. Faculty members will also make presentations on their research. Graded credit/no credit.

**BCH 380 - Biochemistry. 4.000 Credits.**

Offered autumn and spring. Prereq., CHMY 223 or BIOB 260. Fundamental biochemistry; chemistry and metabolism of biomolecules, energy relationships in metabolism; storage, transmission, and expression of genetic information. Credit not allowed for both BCH 380 and 480-482.

**BCH 480 - Advanced Biochemistry I. 3 Credits.**

Offered autumn. Prereq., CHMY 223. Primarily for science majors. The chemistry of biomolecules, with emphasis on the structure and function of proteins, carbohydrates, lipids and nucleic acids. The chemistry and regulation of the transfer and expression of genetic information, protein synthesis. Credit not allowed for both BCH 380 and 480-482.

**BCH 482 - Advanced Biochemistry II. 3 Credits.**

Offered spring. Prereq., BCH 480 or equiv. Continuation of BCH 480. Enzyme kinetics, metabolism, especially macromolecule biosyntheses and energy acquisition pathways, and the associated energetics and molecular physiology. Credit not allowed for both BCH 380 and BCH 480-482.

**BCH 486 - Biochemistry Research Lab. 3 Credits.**

Offered spring. Prereq., BCH 380 or 480. Applications of biochemical principles to modern protein biochemistry. Basic micro- and molecular biology techniques are used to produce mutant proteins; then students learn basic and advanced biophysical techniques to characterize the mutant proteins.

**BCH 490 - Undergraduate Research. 1-10 Credits.**

(R-10) Offered every term. Consent of instr. Independent research under the direction of a faculty member.

**BCH 491 - Special Topics. 1-10 Credits.**

(R-10) Offered intermittently. Experimental offerings of visiting professors, experimental offerings of new courses, or one-time offerings of current topics.

**BCH 498 - Internship/Cooperative Ed. 1-15 Credits.**

(R-15) Prereq., consent of department. Extended non-classroom experience which provides practical application of classroom learning during placements off campus. Prior approval must be obtained from the faculty supervisor and the Internship Services office. A maximum of 6 credits of Internship (198, 298, 398, 498) may count toward graduation.

**BCH 499 - Senior Thesis/Capstone. 3-6 Credits.**

(R-6) Offered every term. Prereq., senior standing and consent of instr. Preparation of a thesis or manuscript based on undergraduate research for presentation and/or publication. Student must give an oral or poster presentation at the Undergraduate Research Symposium or a scientific meeting.

**BCH 547 - Exptl Mol/Cell/Chem Biol. 1 Credit.**

(R-8) Offered every term. Prereq., graduate standing or consent of instr. Same as BIOB 547. Focus on experimental design, methods, and presentation of experimental results for graduate students in laboratories with a molecular, cellular or chemical biological focus. Level: Graduate

**BCH 561 - RNA Structure & Function. 1 Credit.**

(R-8) Offered every semester. Prereq., BCH 482, BIOB 260, and consent of instr. Exploration of current scientific literature and new data that focuses on RNA biochemistry. Emphasis on literature relevant to research on RNA viruses and ribosomes and protein synthesis. Level: Graduate

**BCH 570 - Intro to Research. 1 Credit.**

(R-2) Offered autumn and spring. Prereq., graduate standing. Required course for Biochemistry and Biophysics graduate students. Students are acquainted with faculty research projects. Instruction in basic research techniques, research equipment. Introduction to relevant scientific research literature. Level: Graduate

**BCH 581 - Physical Biochemistry. 3 Credits.**

Offered spring odd-numbered years. Prereq., CHMY 360 or CHMY 373 or CHMY 371; BCH 480. Techniques of physical chemistry used in studying biological structure and function of macromolecules. Emphasis is on spectroscopic methods, hydrodynamic methods and x-ray and other scattering and diffraction techniques. Level: Graduate

**BCH 582 - Proteins and Enzymes. 3 Credits.**

Offered autumn even-numbered years. Prereq., BCH 482 or equivalent. An investigation into the structure/function relationship in proteins and a detailed exploration of enzyme kinetics, using examples from current literature. Level: Graduate

**BCH 584 - Nucleic Acids. 3 Credits.**

Offered autumn odd-numbered years. Prereq., BCH 482 or equivalent. Emphasis on critical reading of current literature that investigates structure, chemistry, and function of nucleic acids. Level: Graduate

**BCH 595 - Special Topics. 1-6 Credits.**

(R-6) Offered intermittently. Prereq., graduate standing and consent of instr. Experimental offering of new courses by resident or visiting faculty. Level: Graduate

**BCH 597 - Research. 1-18 Credits.**

(R-18) Offered autumn and spring. Directed individual research and study appropriate to the background and objectives of the student. Level: Graduate

**BCH 599 - Thesis. 1-10 Credits.**

(R-10) Offered intermittently. Prereq., master's student in biochemistry and biophysics. Laboratory research for and preparation of a master's thesis. Level: Graduate

**BCH 600 - Cell Organization & Mechanisms. 3 Credits.**

Offered spring even-numbered years. Prereq., BCH 480 or consent of instr. Same as BMED 600. Primary literature exploration of the regulation of structure, function, and dynamics of eukaryotic cells. Topics include membranes, cytoskeleton, transcription, translation, signal transduction, cell motility, cell proliferation, and programmed cell death. Level: Graduate

**BCH 694 - Biochemistry & Biophysics Seminar. 1 Credit.**

(R-10) Credit/No credit only. Offered Autumn and Spring. Prereq., graduate standing or consent of instructor. Presentation of current research in Structural Biology, Biochemistry, Biophysics, or related fields by invited outside speakers, UM faculty, and senior graduate students. Level: Graduate

**BCH 699 - Dissertation. 1-20 Credits.**

(R-20) Offered intermittently. Prereq., doctoral student in biochemistry. Laboratory research for and preparation of a doctoral dissertation. Level: Graduate