

# BCHM - BIOCHEMISTRY

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## **BCHM399 Undergraduate Research in Biochemistry (1-3 Credits)**

Basic biochemical research conducted under the supervision of a faculty member.

**Restriction:** Requires permission of the Department of Chemistry and Biochemistry.

**Repeatable to:** 6 credits if content differs.

## **BCHM461 Biochemistry I (3 Credits)**

First semester of a comprehensive introduction to modern biochemistry. Structure, chemical properties, and function of proteins and enzymes, carbohydrates, lipids, and nucleic acids. Basic enzyme kinetics and catalytic mechanisms.

**Prerequisite:** Minimum grade of C- in CHEM271 and CHEM272; or minimum grade of C- in CHEM276 and CHEM277; and minimum grade of C- in (CHEM241 and CHEM242) or CHEM247.

**Credit Only Granted for:** BCHM461 or BCHM463.

## **BCHM462 Biochemistry II (3 Credits)**

A continuation of BCHM 461. Metabolic pathways and metabolic regulation, energy transduction in biological systems, enzyme catalytic mechanisms.

**Prerequisite:** Minimum grade of C- in BCHM461.

**Credit Only Granted for:** BCHM462 or BCHM463.

## **BCHM463 Biochemistry of Physiology (3 Credits)**

A one-semester introduction to general biochemistry. A study of protein structure, enzyme catalysis, metabolism, and metabolic regulation with respect to their relationship to physiology.

**Prerequisite:** Minimum grade of C- in CHEM271 and CHEM272; or minimum grade of C- in CHEM276 and CHEM277; and minimum grade of C- in (CHEM241 and CHEM242) or CHEM247.

**Credit Only Granted for:** BCHM461, BCHM462 or BCHM463.

## **BCHM464 Biochemistry Laboratory (3 Credits)**

Biochemical and genetic methods for studying protein function. Site-directed mutagenesis and molecular cloning, protein purification, enzyme activity assays, computer modeling of protein structure.

**Prerequisite:** BCHM461 or BCHM463; and a grade of C- or better in the prerequisite is required for all College of Computer, Mathematical, and Natural Sciences majors and recommended for all students.

**Corequisite:** BCHM465.

**Restriction:** BCHM, CHEM, and Nutritional Sciences majors have first priority, followed by other life science majors.

## **BCHM465 Biochemistry III (3 Credits)**

CORE Capstone (CS) Course. An advanced course in biochemistry. Biochemical approach to cellular information processing. DNA and RNA structure. DNA replication, transcription, and repair. Translation of mRNA to make proteins.

**Prerequisite:** BCHM461 or BCHM463; and a grade of C- or better in the prerequisite is required for College of Computer, Mathematical, and Natural Sciences majors and recommended for all students.

**Recommended:** BCHM462.

## **BCHM477 Biomolecular Measurement and Data Analysis (3 Credits)**

Covers a range of classic and modern biochemical assays and techniques as well as introducing data science approaches to "omics" data. Upon successful completion of this course, students should have the necessary preparation and experience to collaborate productively with research scientists in industrial, clinical or academic contexts.

**Prerequisite:** CHEM271 or CHEM276; and (CHEM277 or CHEM272).

**Restriction:** Must be in the Chemistry or Biochemistry major.

## **BCHM485 Physical Biochemistry (3 Credits)**

Physical Chemistry with applications to biological systems. Principal topics: quantum chemistry, spectroscopy, structural methods for biological macromolecules, statistical thermodynamics, transport processes in liquid phase, chemical and biochemical kinetics, modeling and simulation, polymer dynamics.

**Prerequisite:** Minimum grade of C- in CHEM135; or minimum grade of C- in (CHEM271 or CHEM276) and in (CHEM272 or CHEM277); and minimum grade of C- in MATH141; and minimum grade of C- in (PHYS260 and PHYS261) or C- in PHYS142.

**Recommended:** MATH241.

**Restriction:** Must be in Biochemistry program; or permission of instructor.

**Credit Only Granted for:** CHEM482 or BCHM485.