BIOCHEMISTRY (BIOC)

Courses

**BIOC 205. Biochemistry I. 3 Credits.**
Introduction to chemistry and structure of biological macromolecules; examination of mechanisms of chemical processes in biological systems including enzyme catalysis, biosynthesis, regulation, and information transfer. Prerequisite: CHEM 048 or CHEM 142 or CHEM 144. Cross-listed with: CHEM 205 and MMG 205.

**BIOC 206. Biochemistry II. 3 Credits.**
Continuation of Biochemistry I. Biochemistry of nucleic acids; nucleic acid based processes, such as replication and transcription; cellular information transfer, genomics, and proteomics. Prerequisite: BIOC 205, CHEM 205, or MMG 205. Cross-listed with: CHEM 206, MMG 206.

**BIOC 207. Biochemistry Lab. 3 Credits.**
Introduction to biochemical tools, including spectrometry, chromatography, and electrophoresis; natural and recombinant enzyme isolation; assays of DNA-modifying enzymes; computer-based structure/function exercises. Prerequisite: BIOC 205, CHEM 205, or MMG 205. Cross-listed with: CHEM 207, MMG 207.

**BIOC 212. Biochemistry of Human Disease. 3 Credits.**
Molecular approach to genetic, metabolic, and infectious diseases; recombinant DNA technology and medicine; molecular biology of cancer. Prerequisite: CHEM 042, CHEM 044, or CHEM 141.

**BIOC 240. Macromol Struct Prot&Nucl Acid. 3 Credits.**
Introduction to structural biology and macromolecular structure with an emphasis on protein-protein and protein-nucleic acids interactions. Prerequisites: BIOL 002 or BCOR 012, and CHEM 142; Junior standing. Cross-listed with: MMG 240. Alternate years.

**BIOC 301. General Biochemistry. 0 or 3 Credits.**
Survey for science majors. Chemistry, structure, metabolism, and function of proteins, carbohydrates, lipids; enzymes, bioenergetics and respiratory processes. Prerequisite: CHEM 142 or CHEM 144, or Instructor permission.

**BIOC 302. General Biochemistry. 3 Credits.**
Survey for science majors. Amino acids, nucleic acids, protein synthesis, cellular and physiological control mechanisms. Prerequisite: CHEM 142 or CHEM 144, or Instructor permission.

**BIOC 305. Medical Biochemistry. 3 Credits.**
A survey course in human biochemistry, with particular emphasis on medical applications.

**BIOC 306. Medical Biochemistry. 3 Credits.**
A survey course in human biochemistry, with particular emphasis on medical applications.

**BIOC 307. Special Topics in Biochemistry. 1-3 Credits.**
Areas of biochemistry not treated in concurrent advanced course offerings.

**BIOC 308. Special Topics in Biochemistry. 1-3 Credits.**
Areas of biochemistry not treated in current advanced course offerings.

**BIOC 309. Laboratory Research Rotations. 3 Credits.**
Two sequential research projects in Departmental faculty laboratories, composed of experimental work, an oral presentation, and a written report. First semester.

**BIOC 310. Laboratory Research Rotations. 3 Credits.**
Two sequential research projects in Departmental faculty laboratories, composed of experimental work, an oral presentation and a written report. Second semester.

**BIOC 325. Data Analysis&Presentation I. 2 Credits.**
Develop graduate level skills in data analysis, reading, writing, teaching and presenting your own work and that of others (Part 1 of 2). Prerequisites: Graduate standing; Enrollment in BIOC 301 and CLBI 301. Cross-listed with: MPBP 325.

**BIOC 326. Data Analysis&Presentation II. 2 Credits.**
Develop graduate level skills in data analysis, reading, writing, teaching and presenting your own work and that of others (Part 2 of 2). Prerequisites: BIOC 301, CLBI 301; Graduate standing. Cross-listed with MPBP 326.

**BIOC 351. Proteins I: Structure&Function. 3 Credits.**
Special Topics: Introduction to concepts in protein structure and chemistry as well as exploration of ideas in a “hands on” fashion using computational resources. Prerequisite: BIOC 301, or Department permission. Alternate years.

**BIOC 352. Protein: Nucleic Acid Interact. 3 Credits.**
Structure of DNA and RNA, and the structure and assembly of nucleoprotein complexes will be described using examples from prokaryotes, yeast, viruses, and mammalian cells in culture. Prerequisites: MMG 211 or equivalent, and BIOC 302 or equivalent. Cross-listed with: MMG 352. Alternate years.

**BIOC 353. Proteins II: Enzymology. 3 Credits.**
General consideration of enzyme nomenclature, purification, assay, kinetics, mechanisms, cofactors, active sites, subunit structure, allosteric and regulatory properties, and control of multi-enzyme systems. Prerequisite: BIOC 301, or Department permission. Alternate years.

**BIOC 354. Nucleic Acids II. 3 Credits.**
The study of structure, composition, organization, function, synthesis, and metabolism of nucleic acids and nucleoprotein particles and matrices in eukaryotic organisms. Prerequisite: BIOC 302.

**BIOC 370. Physical Biochemistry. 3 Credits.**
Protein interaction, solubility and fractionation, electrophoresis, sedimentation, phase rule study, diffusion, viscosity, spectrophotometry, and related topics. Prerequisites: BIOL 302 and CHEM 162, or Department permission.
BIOC 372. Cancer Biology. 3 Credits.
Overview of cancer biology for health science students. Foundation for cancer research. Lecture format; interdisciplinary viewpoint; outside lectures. Prerequisite: BIOC 302, or Department permission.

BIOC 381. Seminar. 1 Credit.
A review of recent developments and current literature in the various fields of biochemistry. Prerequisite: Graduate standing.

BIOC 391. Master's Thesis Research. 1-12 Credits.
Credit as arranged.

BIOC 392. Independent Literature Rsch. 1-12 Credits.
Reading and literature research culminating in a paper on a topic of current interest in biochemistry.

BIOC 393. Independent Study. 1-18 Credits.
A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

BIOC 395. Special Topics. 1-12 Credits.

BIOC 396. Advanced Special Topics. 1-12 Credits.

BIOC 491. Doctoral Dissertation Research. 1-12 Credits.
Credit as arranged.

BIOC 493. Independent Study. 1-18 Credits.
A course which is tailored to fit the interests of a specific student, which occurs outside the traditional classroom/laboratory setting under the supervision of a faculty member, for which credit is awarded. Offered at department discretion.

BIOC 496. Advanced Special Topics. 1-18 Credits.
See Schedule of Courses for specific titles.