

**Descriptions—Biochemistry  
of  
Courses**

**BIOCHEMISTRY**

**BCH**

**Department of Biochemistry  
College of Human Medicine  
College of Natural Science  
College of Osteopathic Medicine**

**100. Current Issues in Biochemistry**  
Spring. 1(1-0)

R: Open only to freshmen or sophomores.  
Contemporary biochemistry: its impact on environmental, medical, and social sciences.  
QA: BCH 100

**200. Introduction to Biochemistry**  
Fall. 4(4-0)

P: CEM 143. R: Not open to students with credit in BCH 401 or BCH 461.

Basic structures of major classes of biologically important molecules and metabolic activities of major importance in living organisms.  
QP: CEM 143 QA: BCH 200

**401. Basic Biochemistry**  
Fall, Spring. 4(4-0)

P: CEM 252 or CEM 352. R: Not open to students with majors in Biochemistry. Not open to students with credit in BCH 200 or BCH 461.

Structure and function of major biomolecules, metabolism, and regulation. Examples emphasize the mammalian organism.  
QP: CEM 242, CEM 353 QA: BCH 401

**461. Biochemistry I**  
Fall. 3(4-0)

P: CEM 252 or CEM 352; MTH 120 or MTH 124 or MTH 132; BS 110, BS 111. Not open to students with credit in BCH 200 or BCH 401.  
Protein structure and function, enzymology, bioenergetics, and intermediary metabolism.  
QP: CEM 242, CEM 353 QA: BCH 452, BCH 451

**462. Biochemistry II**  
Spring. 3(4-0)

P: BCH 461.  
Continuation of BCH 461 with emphasis on metabolic regulation and nucleic acid structure, replication and protein synthesis.  
QP: BCH 451, BCH 452 QA: BCH 453, BCH 452

**471. Biochemistry Laboratory**  
Spring. 2(0-6)

P: BCH 401 or BCH 461; BS 110, BS 111; CEM 262; MTH 120 or MTH 124 or MTH 132 or LBS 118. R: Biochemistry majors or approval of department.  
Modern biochemical techniques used in the study of enzymes (proteins), lipids, and cell organelles.  
QP: BCH 451, BCH 401, MTH 113 QA: BCH 404

**472. Biochemistry Laboratory**  
Fall. 3(0-19)

P: BCH 462, CEM 262. R: Biochemistry majors or approval of department.  
Methods of molecular biology and the underlying principles on which these methods are based.  
QP: BCH 453 QA: BCH 405

**490. Research**

Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course.  
R: Approval of department.  
Participation in laboratory or library research projects.

**495. Undergraduate Seminar**  
Spring. 2(2-0)

P: BCH 462 or concurrently. R: Open only to majors in Biochemistry.  
Extension and synthesis of concepts of biochemistry. Relationships to societal issues.  
QP: BCH 453

**499. Senior Thesis**

Fall, Spring, Summer. 1 to 8 credits. A student may earn a maximum of 8 credits in all enrollments for this course.  
R: Open only to seniors. Total credits in BCH 490 and BCH 499 may not exceed 8. Approval of department.  
Laboratory research culminating in a thesis.  
QA: BCH 499

**521. Medical Biochemistry**  
Fall. 5(5-0)

R: Graduate-professional students in colleges of Human and Osteopathic Medicine.  
Basic biochemical principles and terminology: metabolism and function of biomolecules of importance in medical biology and processes pertinent to human pathophysiology.

**801. Molecular Biology and Protein Structure**  
Fall. 4(4-0)

P: BCH 462, CEM 383.  
organization of genes. Regulation of gene expression, replication, and recombination. Protein structure and relationship of function to structure.  
QP: BCH 453, CEM 353, CEM 384 QA: BCH 811, BCH 812

**802. Metabolic Regulation and Molecular Endocrinology**  
Spring. 4(4-0)

P: BCH 801.  
Molecular basis for metabolic regulation. Molecular signalling mechanisms and mechanisms for allosteric and covalent protein modifications.  
QP: BCH 812 QA: BCH 813

**821. Biochemical Mechanisms and Structure**  
Spring. 3(3-0)

P: BCH 462, CEM 383 or concurrently.  
Structures, methods of structural analysis, synthesis, and reaction mechanisms of biological substances including proteins, carbohydrates, lipids, porphyrins, phosphate esters, enzymes, and coenzymes.  
QP: CEM 353, BCH 453, CEM 384 QA: BCH 821

**825. Cell Structure and Function**

Spring. 3(3-0) Interdepartmental with Physiology and Microbiology.

P: BCH 401 or BCH 461.  
Molecular basis of structure and function. Cell properties: reproduction, dynamic organization, integration, programmed and integrative information transfer. original investigations in all five kingdoms.  
QP: BCH 451, BCH 401 QA: BCH 825

**829. Methods of Macromolecular Analysis and Synthesis**  
Fall. 2(2-0)

P: BCH 462.  
Techniques of isolation and characterization of macromolecules. Computer use in structure-function analysis of macromolecules.  
QP: BCH 453 QA: BCH 829

**831. Physiological Biochemistry**  
Spring. 4(4-0)

P: BCH 401 or BCH 462.  
Mammalian physiological biochemistry. Metabolic interpretation of normal and altered physiological states of humans and other mammals.  
QP: BCH 401 QA: BCH 831, BCH 832

**855. Special Problems**

Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course.  
R: Approval of department.  
Laboratory or library research on special problems in biochemistry.

**864. Plant Biochemistry**

Spring. 3(3-0) Interdepartmental with Botany and Plant Pathology.

P: BCH 401 or BCH 462.  
Biochemistry unique to photosynthetic organisms. Photosynthetic and respiratory electron transport, nitrogen fixation, carbon dioxide fixation, lipid metabolism, carbon partitioning, cell walls, biosynthesis of plant hormones.  
QP: BCH 401, BOT 301 QA: BCH 864

**888. Laboratory Rotation**

Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 12 credits in all enrollments for this course.  
R: Open only to graduate students in Biochemistry.  
Research laboratory in biochemical techniques and research approaches.  
QA: BCH 888

**899. Master's Thesis Research**

Fall, Spring, Summer. 1 to 12 credits. A student may earn a maximum of 24 credits in all enrollments for this course.  
R: Open only to master's students in Biochemistry.

**960. Selected Topics in Biochemistry I**

Fall, Spring. 1 to 2 credits. A student may earn a maximum of 7 credits in all enrollments for this course.  
R: Open only to graduate students in Biochemistry or approval of department.  
Contemporary biochemical research topics in such areas as biochemical genetics, biochemistry of development, biochemical evolution, complex proteins, or lipid metabolism.  
QA: BCH 960

**961. Selected Topics in Biochemistry II**

Fall, Spring. 1 to 2 credits. A student may earn a maximum of 7 credits in all enrollments for this course.  
R: Open only to graduate students in Biochemistry or approval of department.  
Contemporary biochemical research topics in such areas as bioenergetics, bioinstrumentation, complex carbohydrates, mass spectrometry, or biochemistry of isoprenoid compounds.  
QA: BCH 961

**978. Seminar in Biochemistry**

Fall, Spring. 1(1-0) A student may earn a maximum of 5 credits in all enrollments for this course.  
R: Open only to graduate students in Biochemistry.  
Seminars on biochemistry research mainly with visiting scientists.  
QA: BCH 978

**999. Doctoral Dissertation Research**

Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 99 credits in all enrollments for this course.  
R: Open only to doctoral students in Biochemistry.

**BIOLOGICAL SCIENCE**

**BS**

**College of Natural Science**

**110. Organisms and Populations**  
Fall, Spring. 4(3-3)

Biological diversity and organismal biology. Principles of evolution, population biology, and community structure.  
QA: BS 211, BS 212

**111. Cells and Molecules**  
Fall, Spring. 4(3-3)

P: CEM 141 or CEM 151.  
Cell structure and function; macromolecular synthesis; energy metabolism; molecular aspects of development; principles of genetics.  
QP: CEM 141 QA: BS 210, BS 211

**BIOMECHANICS**

**BIM**

**Department of Biomechanics  
College of Osteopathic Medicine**

**590. Special Problems in Biomechanics**

Fall, Spring, Summer. 1 to 24 credits. A student may earn a maximum of 48 credits in all enrollments for this course.  
R: Approval of department.  
Each student works under faculty direction on an experimental, theoretical, or applied problem.  
QA: BIM 590