

Descriptions — Biochemistry of Courses

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.

523. Genetics for Medical Practice
Summer. 1(1-0) Interdepartmental with Pediatrics and Human Development. Administered by Pediatrics and Human Development.
R: Graduate-professional students in colleges of Human and Osteopathic Medicine.
Basic principles of genetics for medical students.

801. Molecular Biology
Fall. 3(3-0)
P: BCH 462, CEM 383.
Organization of genes. Regulation of gene expression, replication, and recombination.

802. Metabolic Regulation and Signal Transduction
Spring. 3(3-0)
P: BCH 801.
Molecular basis for metabolic regulation. Molecular signalling mechanisms and mechanisms for allosteric and covalent protein modifications.

803. Protein Structure and Function
Fall. 2(2-0)
P: BCH 462, CEM 383.
Protein structure and relationship of function to structure. Applications of kinetic methods to elucidation of enzyme mechanisms and regulation.

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.

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.

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.

931. 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.

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

856. Plant Molecular Biology
Spring. 3(3-0) Interdepartmental with Botany and Plant Pathology. Administered by Botany and Plant Pathology.
P: ZOL 341.
Recent advances in genetics and molecular biology of higher plants.

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.

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.
Participation in research laboratories to learn experimental techniques and approaches, broaden research experience, and assess research interests prior to selecting a thesis or dissertation adviser.

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.

961. Selected Topics in Biochemistry II
Fall, Spring. 1 to 3 credits. A student may earn a maximum of 7 credits in all enrollments for this course.
R: Open only to graduate students in the Department of Biochemistry.
Contemporary biochemical research topics in such areas as bioenergetics, bioinstrumentation, complex carbohydrates, mass spectrometry, biomolecular spectroscopy or computer-based modeling and analysis of DNA and protein sequences and structures.

978. Seminar in Biochemistry
Fall, Spring. 1(1-0) A student may earn a maximum of 8 credits in all enrollments for this course.
R: Open only to graduate students in Biochemistry.
Seminars on biochemistry research mainly with visiting scientists.

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

College of Natural Science

110. Organisms and Populations
Fall, Spring. 4(3-3)
R: Not open to students with credit in LBS 144.
Biological diversity and organismal biology. Principles of evolution, population biology, and community structure.

111. Cells and Molecules
Fall, Spring, Summer. 3(3-0)
P: CEM 141 or CEM 151. R: Not open to students with credit in LBS 145.
Cell structure and function; macromolecular synthesis; energy metabolism; molecular aspects of development; principles of genetics.

111L. Cell and Molecular Biology Laboratory
Fall, Spring, Summer. 2(1-3) Interdepartmental with Microbiology, Botany and Plant Pathology, and Zoology.
P: BS 111 or concurrently
Principles and applications of common techniques used in cell and molecular biology.

148H. Honors Organismal Biology
Fall. 3 credits. Interdepartmental with Lyman Briggs School. Administered by Lyman Briggs School.
R: Honors College student or approval of department.
Not open to students with credit in BS 110 or LBS 144. Diversity and basic properties of organisms, with emphasis on genetic principles, ecological interactions, and the evolutionary process. Historical approach to knowledge discovery.

149H. Honors Cell and Molecular Biology
Spring. 3 credits. Interdepartmental with Lyman Briggs School. Administered by Lyman Briggs School.
P: CEM 141 or CEM 151 or CEM 181H or LBS 165 R: Honors College student or approval of department.
Not open to students with credit in BS 111 or LBS 145. The physicochemical and molecular organization of cells as the unifying framework for genetics, evolution, and the social relevance of biology.

158H. Honors Organismal Biology Laboratory
Fall. 2 credits. Interdepartmental with Lyman Briggs School. Administered by Lyman Briggs School.
C: LBS 148H concurrently. R: Honors College student or approval of department.
Not open to students with credit in BS 110 or LBS 144. Basic procedures used by organismal biologists, including experimental design and statistical methods. Development and implementation of research projects to test hypotheses in genetics, ecology, and evolution.

159H. Honors Cell and Molecular Biology Laboratory
Spring. 2 credits. Interdepartmental with Lyman Briggs School. Administered by Lyman Briggs School.
P: CEM 141 or CEM 151 or CEM 181H or LBS 165 C: LBS 149H concurrently. R: Honors College student or approval of department.
Not open to students with credit in BS 111 or LBS 145. Basic techniques of cellular and molecular biology, including experimental design and hypothesis formulation. Development and implementation of research projects to test hypotheses in biochemistry, molecular biology, or genetics.

BIOMEDICAL ENGINEERING

BME

College of Engineering

424. Biomaterials and Biocompatibility
Spring of even-numbered years. 3(3-0) Interdepartmental with Materials Science and Mechanics.
P: MSM 250, PSL 250.
Materials science of human implants. Design requirements imposed by the body's milieu and the need to protect the body.