BIOCHEMISTRY and MOLECULAR BIOLOGY

Department of Biochemistry and Molecular Biology

100 Current Issues in Biochemistry
Spring. 1(1-0) R: Open only to freshmen or sophomores. SA: BCH 100 Not open to students with credit in BMB 101.

101 Frontiers in Biochemistry
Fall. 1(1-0) SA: BCH 101 Not open to students with credit in BMB 100.

200 Introduction to Biochemistry
Fall. 4(4-0) P:M: CEM 143 SA: BCH 200

401 Basic Biochemistry
Spring. 4(4-0) P:M: CEM 252 or CEM 352 RB: BS 111 or LBS 145 or LBS 149H R: Not open to students in the Biochemistry and Molecular Biology/Biotechnology major or in the Biochemistry and Molecular Biology major. SA: BCH 401 Not open to students with credit in BMB 461.

461 Biochemistry I
Fall, Spring. 3(3-0) P:M: (CEM 251 or CEM 351) and (BS 110 or LBS 144 or BS 148H) and (MTH 124 or MTH 132 or MTH 152H or LBS 118) and (BS 111 or LBS 145 or LBS 149H) and (CEM 252 or concurrently) or (CEM 352 or concurrently) SA: BCH 461 Not open to students with credit in BMB 401.

462 Biochemistry II
Fall. 3(3-0) P:M: BMB 461 SA: BMB 462

471 Biochemistry Laboratory (W)
Spring. 3(0-9) P:M: BMB 461 and (CSE 101 or CSE 131 or CSE 231 or LBS 126) and CEM 262 and Completion of Tier I Writing Requirement R: Open only to students in the Biochemistry and Molecular Biology/Biotechnology major or in the Biochemistry and Molecular Biology major or approval of department. SA: BCH 471

472 Biochemistry Laboratory
Fall. 3(0-9) P:M: BMB 462 and CEM 262 R: Open only to students in the Biochemistry major or Biotechnology major or approval of department. SA: BCH 472

490 Biochemistry Research
Fall, Spring, Summer. 1 to 4 credits. A student may earn a maximum of 8 credits in all enrollments for this course. R: Total credits in BMB 490 and BMB 499 may not exceed 8. Approval of department. SA: BCH 490 Participation in laboratory or library research projects.

495 Undergraduate Seminar
Spring. 2(2-0) P:M: BMB 462 or concurrently R: Open only to students in the Biochemistry or the Biochemistry/Biotechnology majors. SA: BCH 495

499 Senior Thesis
Fall, Spring. 1(1-0) R: Open only to students in the Biochemistry or the Biochemistry/Biotechnology majors. Total credits in BMB 490 and BMB 499 may not exceed 8. Approval of department. SA: BCH 499

514 Medical Biochemistry
Fall. 3 credits. R: Open only to students in the College of Human Medicine and the College of Osteopathic Medicine. SA: BCH 514 Not open to students with credit in BMB 521.

523 Genetics for Medical Practice
Summer. 1(1-0) R: Open only to graduate-professional students in the colleges of Human and Osteopathic Medicine. SA: BCH 523

526 Molecular Biology and Medical Genetics
Fall. 2 credits. R: Open only to students in the College of Human Medicine or the College of Osteopathic Medicine. SA: BCH 526 Not open to students with credit in PHD 523.

528 Molecular Biology and Medical Genetics
Fall. 2 credits. R: Open only to students in the College of Human Medicine or the College of Osteopathic Medicine. SA: BCH 528 Not open to students with credit in PHD 523.

534 Cell Biology and Physiology I
Fall. 3 credits. R: Open only to graduate-professional students in the College of Human Medicine or College of Osteopathic Medicine.

535 Cell Biology and Physiology II
Spring. 4 credits. R: Open only to graduate-professional students in the College of Human Medicine or the College of Osteopathic Medicine.

801 Molecular Biology
Fall. 3(3-0) R: BMB 462, CEM 383. SA: BCH 801 Not open to students with credit in BMB 897A or BMB 897A.

802 Metabolic Regulation and Signal Transduction
Spring. 3(3-0) R: BMB 801. SA: BCH 802

803 Protein Structure and Function
Fall. 2(2-0) R: BMB 462, CEM 383 SA: BCH 803

816 Integrative Toxicology: Mechanisms, Pathology and Regulation
Fall of odd years. 3(3-0) Interdepartmental with Physiology. SA: BCH 816

829 Methods of Macromolecular Analysis and Synthesis
Fall. 2(2-0) R: BMB 462 or concurrently SA: BCH 829

514 Medical Biochemistry
Fall. 3(3-0) R: Open only to students in the College of Human Medicine and the College of Osteopathic Medicine. SA: BCH 514 Not open to students with credit in BMB 521.

523 Genetics for Medical Practice
Summer. 1(1-0) R: Open only to graduate-professional students in the colleges of Human and Osteopathic Medicine. SA: BCH 523

Basic biochemical principles and terminology; metabolism and function of biomolecules of importance in medical biology and human pathophysiology.

526 Molecular Biology and Medical Genetics
Fall. 2 credits. R: Open only to students in the College of Human Medicine or the College of Osteopathic Medicine. SA: BCH 526 Not open to students with credit in PHD 523.

Basic principles of human medical genetics; storage and expression of genetic information; transmission of genetic information to progeny.

534 Cell Biology and Physiology I
Fall. 3 credits. R: Open only to graduate-professional students in the College of Human Medicine or College of Osteopathic Medicine.

Modern concepts of cell biology as a basis for understanding the physiology of human tissues and organ systems in health and disease.

801 Molecular Biology
Fall. 3(3-0) R: BMB 462, CEM 383. SA: BCH 801 Not open to students with credit in BMB 897A or BMB 897A.

Organization of genes. Regulation of gene expression, replication, and recombination.

802 Metabolic Regulation and Signal Transduction
Spring. 3(3-0) R: BMB 801. SA: BCH 802

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) R: BMB 462, CEM 383 SA: BCH 803

Protein structure and relationship of function to structure. Applications of kinetic methods to elucidation of enzyme mechanisms and regulation.

804 Biochemical Mechanisms and Structure
Spring. 3(3-0) R: (BMB 462 or concurrently) and (CEM 383 or concurrently) SA: BCH 804

Structures, methods of structural analysis, synthesis, and reaction mechanisms of biological substances including proteins, carbohydrates, lipids, porphyrins, phosphate esters, enzymes, and coenzymes.

816 Integrative Toxicology: Mechanisms, Pathology and Regulation
Fall of odd years. 3(3-0) Interdepartmental with Animal Science and Pathobiology and Diagnostic Investigation and Pharmacology and Toxicology. SA: BCH 816


825 Cell Structure and Function
Spring. 3(3-0) R: Open only to students with credit in BMB 462 or concurrently.

829 Methods of Macromolecular Analysis and Synthesis
Fall. 2(2-0) R: BMB 462 or concurrently SA: BCH 829

Techniques of isolation and characterization of macromolecules. Computer use in structure-function analysis of macromolecules.
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. SA: BCH 855  
Laboratory or library research on special problems in biochemistry.

856  **Plant Molecular Biology**  
Spring. 3(3-0) Interdepartmental with Crop and Soil Sciences and Plant Biology. Administered by Plant Biology. RB: ZOL 341 SA: BOT 856  
Recent advances in genetics and molecular biology of higher plants.

864  **Plant Biochemistry**  
Spring. 3(3-0) Interdepartmental with Plant Biology. Administered by Biochemistry and Molecular Biology. RB: BMB 401 or BMB 462. SA: BCH 864  
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 the Department of Biochemistry and Molecular Biology. SA: BCH 888  
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 36 credits in all enrollments for this course. R: Open only to master's students in the Department of Biochemistry and Molecular Biology. SA: BCH 899  
Master's thesis research.

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 the Department of Biochemistry and Molecular Biology or approval of department. SA: BCH 960  
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 and Molecular Biology. SA: BCH 961  
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 the Department of Biochemistry and Molecular Biology. SA: BCH 978  
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 120 credits in all enrollments for this course. R: Open only to doctoral students in the Department of Biochemistry and Molecular Biology. SA: BCH 999  
Doctoral dissertation research.