

## AUDIOLOGY AND SPEECH SCIENCES

- 999\*.** **Doctoral Dissertation Research**  
Fall, Spring, Summer. 2 to 12 credits  
in increments of 2 credits. May  
re enroll for a maximum of 98 credits.  
R: graduate level ASC  
Faculty supervised dissertation research.  
QA: ASC 999

## BIOCHEMISTRY

## BCH

- 100.** **Current Issues in Biochemistry**  
Spring. 1(1 -0)  
R: Freshmen only.  
Contemporary biochemistry: its impact on environ-  
mental, 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 impor-  
tant molecules and metabolic activities of major im-  
portance in living organisms.  
QP: CEM 143 QA: BCH 200

- 401.** **Basic Biochemistry**  
Fall, Spring. 4(4 -0)  
P: CEM 252 or concurrently. 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, metabo-  
lism, and regulation. Examples emphasize the mam-  
malian organism.  
QP: CEM 242 ORCEM 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. R: Not open  
to students with credit in BCH 200 or BCH 401.  
Protein structure and function, enzymology, bioener-  
getics, and intermediary metabolism.  
QP: CEM 242 ORCEM 353 QA: BCH 452

- 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 AND BCH 452 QA: BCH 453

- 471.** **Biochemistry Laboratory**  
Spring. 2(0 -6)  
P: CEM 262, BCH 461. R: Biochemistry  
majors or approval of department.  
Modern biochemical techniques used in the study of  
enzymes (proteins), lipids, and cell organelles.  
QP: BCH 451 OR BCH 401 MTH 113 QA: BCH  
404

- 472.** **Biochemistry Laboratory**  
Fall. 2(0 -6)  
P: CEM 262, BCH 462. 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.  
May re enroll for a maximum of 8  
credits.  
R: Approval of department.  
Participation in laboratory or library research pro-  
jects.

- 499\*.** **Senior Thesis**  
Fall, Spring, Summer. 1 to 8 credits.  
May re enroll for a maximum of 8  
credits.  
P: Approval of department R: Senior  
Cumulative total credits in BCH 490 & 499 may not  
exceed 8  
Laboratory research culminating in submission of 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: metabo-  
lism 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 352, CEM 383  
Organization of genes including recombination, regu-  
lation of gene expression, replication, and recombina-  
tion. 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 453 CEM 353 CEM 384 BCH 811 BCH 812  
QA: BCH 813

- 821\*.** **Biochemical Mechanisms and  
Structure**  
Spring. 3(3 -0)  
P: BCH 462, CEM 353, 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 the Department(s) of Physiology,  
Microbiology and Public Health.  
P: BCH 461 or BCH 401  
Molecular basis of structure and function in cells.  
Fundamental properties of cells: reproduction, dynam-  
ic organization, integration, programmed and integra-  
tive information transfer considered through original  
investigations in all five kingdoms.  
QP: BCH 451 OR 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 macro-  
molecule. Uses of the computer in structure-function  
analysis of macromolecule.  
QP: BCH 453 QA: BCH 829

- 831\*.** **Physiological Biochemistry**  
Spring. 4(4 -0)  
P: BCH 401 or BCH 462  
Mammalian physiological biochemistry; with metabo-  
lic 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.  
May re enroll for a maximum of 8  
credits.  
R: graduate level  
Laboratory or library research on special problems  
in biochemistry.

- 864\*.** **Plant Biochemistry**  
Spring. 3(3 -0) Interdepartmental  
with the Department(s) of 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 metabo-  
lism, 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.  
May re enroll for a maximum of 12  
credits.  
R: graduate biochemistry  
Participation in research laboratories to learn bio-  
chemical techniques and research approaches, broaden  
research experience, and assess research interests  
prior to selecting a thesis adviser.

- 899\*.** **Master's Thesis Research**  
Fall, Spring, Summer. 1 to 4 credits.  
May re enroll for a maximum of 60  
credits.  
R: Master's level biochemistry

- 960\*.** **Selected Topics in Biochemistry**  
Fall, Spring. 1 to 2 credits. May  
re enroll for a maximum of 7 credits.  
Topics from areas of biochemical genetics, biochemis-  
try of development, biochemical evolution, complex  
proteins, lipid metabolism, or other areas of contempo-  
rary biochemical research interest.

- 961\*.** **Selected Topics in Biochemistry**  
Fall, Spring. 1 to 2 credits. May  
re enroll for a maximum of 7 credits.

- Topics from areas of bioenergetics, bioinstrumenta-  
tion, complex carbohydrates, mass spectrometry,  
biochemistry of isoprenoid compounds, or other areas  
of contemporary biochemical research interest.

- 978\*.** **Seminar in Biochemistry**  
Fall, Spring. 1(1 -0) May re enroll for  
a maximum of 5 credits.  
R: graduate biochemistry  
Seminars on research topics in biochemistry, mainly  
by visiting scientists.

- 999\*.** **Doctoral Dissertation Research**  
Fall, Spring, Summer. 1 to 4 credits.  
May re enroll for a maximum of 99  
credits.  
R: Ph.D. level biochemistry

## BIOLOGICAL SCIENCE BS

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

Biological diversity and organismal biology. Princi-  
ples of evolution, population biology, and community  
structure.