B.S. and ACS Approved Degrees in Biochemistry

Requirements for the Biochemistry B.S. degree program

General Chemistry	CHM 1045 & 1045L; 1046 & 1046L **or** CHM 1050, 1050L; 1051, 1051L
Analytical Chemistry	CHM 3120 & 3120L; 4130 & 4130L
Inorganic Chemistry	CHM 4610, 4610L
Organic Chemistry	CHM 2210; 2211, 2211L
Physical Chemistry	CHM 4410, 4410L; 4411, 4411L
General Physics (calculus based)	PHY 2048C; 2049C
Calculus I, II, and III	MAC 2311; 2312; 2313

No required course with a grade below C- can be applied toward any of the degree programs in the Chemistry Department.

Minor: The required calculus courses constitute a minor in Mathematics, and no other minor is necessary.

ACS Approved Program

The above courses constitute the Chemistry core of the Biochemistry B.S. degree program. To meet theAmerican Chemical Society (ACS) approved program, two additional Chemistry courses are required from the electives listed below. Electives to satisfy the ACS approved degreeare listed below. Graduate courses may be substituted if appropriate. Courses with a C or L suffix are laboratory courses. CHM 4905 and CHM 4906 must include a final written report to be counted toward the ACS approved degree.

BCH 4053	General Biochemistry I
BCH 4053L	General Biochemistry I Laboratory
BCH 4054	General Biochemistry II
CHS 4100C	Techniques in Radiochemistry
CHM 4905	Directed Individual Study
CHM 4906	Honors Work

BCH 5xxx; CHM 5xxx	Certain graduate courses may be taken as electives in the undergraduate program; see an advisor for details.

A one-hour course in Scientific Glassblowing (CHM 4090L) is also offered; however, it will not count toward the ACS degree. Seating for this course is limited.

Approved Biological Science Electives for Biochemistry Majors

NOTE: BSC 2010/L, BSC 2011/L, CHM 1045/L and CMH 1046/L are prerequisite courses to all upper division biology courses in the major.

MCB 4403 PROKARYOTIC BIOLOGY (3 hrs)

Frequency Offered: Annually, fall and summer semesters

Prerequisites: Major prerequisite courses; CHM 2210 and PCB 3063

Typical Format: 3 hours lecture/week; 3 exams and final

Lecture Topics: History and development of microbiology as a science; prokaryotic structure and function; microbial growth and metabolism (fermentation, respiration, autotrophic metabolism); prokaryotic genetics (transformation, transduction, conjugation); methods for control of microorganisms; taxonomy and classification of microorganisms; viruses and viral replication; medical microbiology (microbial disease mechanisms, defense mechanisms of the human body, important microbial diseases, epidemiology); microbial ecology (role of microbes in the environment, use of microbes to improve the environment); food microbiology (food spoilage and preservation, use of microbes in the production of foods); industrial microbiology.
Additional Information: MCB 4403 and MCB 4403L must both be taken to fulfill an Area I (Cell and Molecular Biology) course.

PCB 3134 CELL STRUCTURE AND FUNCTION (3 hrs)

Frequency Offered: Annually, fall and spring semesters

Prerequisites: Major prerequisite courses

Typical Format: 3 hours lecture/week; 3 exams and homework problems

Lecture Topics: Cellular chemistry and physiology; morphology and function of cellular organelles; cellular motility; cell genome; cellular growth, division, communication, and regulation.
Additional Information: Designated as an Area I (Cell and Molecular Biology) course.

PCB 4701 HUMAN PHYSIOLOGY (3 hrs)

Frequency Offered: Every spring and fall, most summers

Prerequisites: PCB 3063 or PCB 3134

Typical Format: 2.5 hr lecture/week

Lecture Topics: This course covers the human nervous system, special sensory organ

systems, the central nervous system, the muscle and skeletal systems, the heart and circulatory system, the respiratory system, the urinary and digestive systems, the endocrine system, and reproduction. Cellular mechanisms underlying the homeostatic regulation of each organ system are studied in the context of clinical impacts based upon diseases. For example, Muscular Dystrophy, diabetes mellitus, cardiac arrhythmias, cardiovascular disease, renal failure, pulmonary disease, Alzheimer's, Parkinson's, metabolic disorders, or infertility.

PCB 4024 MOLECULAR BIOLOGY (3 hrs)

Frequency Offered: Annually, fall semester

Prerequisites: Major prerequisite courses; PCB 3063; PCB 3134 recommended

Typical Format: 3 lectures/week and assigned reading; 3 exams and a final

Lecture Topics: Molecular genetic control of cells; synthesis of proteins and nucleic acids; the genetic code; the controls on RNA synthesis and gene expression; chromosomes and the organization of genes; DNA replication and repair; the cell division cycle; differentiation; cancer and cell growth; the evolution of cells and molecules.

Additional Information: Designated as an Area I (Cell and Molecular Biology) course.

PCB 4233 IMMUNOLOGY (3 hrs)

Frequency Offered: Annually, spring semester

Prerequisites: Major prerequisite courses; CHM 2210, PCB 3063, PCB 3134, or instructor's permission

Typical Format: 3 hours lecture/week; 3 exams and final

Lecture Topics: Non-specific defenses and inflammation; immune response to antigens; anatomy of the immune system; immunoglobulin structure and function; cellular interactions in immunity; histocompatibility and transplantation; complement; immunopathology; AIDS.