

Student ID: \_\_\_\_\_  
 Student Name: \_\_\_\_\_  
 Adviser Name: \_\_\_\_\_

Catalog: Semester Catalog 2016-2017  
 Program: Biochemistry, B.S.  
 Minimum Credits Required: \_\_\_\_\_

## Biochemistry, B.S.

The Bachelor of Science degree in Biochemistry is designed to fit the needs of those who plan to complete their formal education with the bachelor's degree and obtain positions in scientific and industrial laboratories, attend health professional schools, or do graduate study in biochemistry or molecular life sciences.

The total number of units required for the Bachelor of Science degree in Biochemistry is 120 units, of which 84 units are in the major. Consult with an advisor for the specific number of units required in all areas of the degree including GE and free electives.

### Requirements for the Major (84 units)

#### Lower Division Required Courses (46 units)

Course Name	Credits:	Term Taken	Grade	Gen Ed
CHEM 1100 - General Chemistry I	(5)			
CHEM 1110 - General Chemistry II	(5)			
CHEM 2300 - Introduction to Biomolecules	(2)			
CHEM 2200 - Organic Chemistry I	(4)			
CHEM 2201+ - Organic Chemistry Laboratory I	(1)			
CHEM 2211+ - Organic Chemistry Laboratory II	(1)			
BIOL 1100 - Principles of Biology I	(5)			
BIOL 1200 - Principles of Biology II	(5)			
MATH 2110 - Calculus I	(4)			
MATH 2120 - Calculus II	(4)			
PHYS 2100 - General Physics I: Mechanics and Thermodynamics	(5)			
PHYS 2200 - General Physics II, Electromagnetism and Optics	(5)			

#### Upper Division Required Courses (31 units)

Course Name	Credits:	Term Taken	Grade	Gen Ed
CHEM 3500+ - Quantitative Analysis	(4)			
CHEM 3200 - Organic Chemistry II	(4)			
CHEM 3600 - Inorganic Chemistry	(4)			
CHEM 3100 - Writing for Chemists	(3)			
CHEM 4420 - Physical Chemistry: Thermodynamics	(3)			
CHEM 4310 - Biochemistry I	(3)			
CHEM 4320 - Biochemistry II	(3)			
CHEM 4311+ - Biochemistry Laboratory I	(2)			
CHEM 4321+ - Biochemistry Laboratory II	(2)			
CHEM 4890 - Molecular Science Capstone	(3)			

#### Upper Division Electives (7 units)

Students must take a minimum of 2 units of coursework listed under Chemistry and a minimum of 2 units of coursework listed under Biology and Microbiology totaling 7 units to meet the major electives requirement for the Biochemistry B.S. program. Students may apply a maximum of 1 unit of CHEM 4990 to fulfill the elective requirement.

Students that seek to earn a BS Biochemistry degree that is approved by the American Chemical Society can do so by choosing as an elective an additional upper division chemistry course that includes at least one unit of laboratory, or one unit of directed laboratory research (CHEM 4990).

*Please note that some of the below electives have prerequisites. Students should consult their adviser.*

**Chemistry**

Course Name	Credits:	Term Taken	Grade	Gen Ed
CHEM 4200 - Advanced Organic Chemistry I	(3)			
CHEM 4210 - Polymer Chemistry	(3)			
CHEM 4410 - Physical Chemistry: Quantum Mechanics and Kinetics	(4)			
CHEM 4430 - Physical Chemistry: Quantum Chemical Methods	(1)			
CHEM 4431 - Physical Chemistry Laboratory	(2)			
CHEM 4460 - Drug Delivery	(3)			
CHEM 4510 - Advanced Analytical Chemistry: Optical Spectroscopy (2 units)	(1,1)			
CHEM 4520 - Advanced Analytical Chemistry: Analytical Separations and Mass Spectrometry (2 units)	(1,1)			
CHEM 4530 - Advanced Analytical Chemistry: Electrochemistry and Surface Techniques (2 units)	(1,1)			
CHEM 4800 - Special Topics in Advanced Chemistry Lecture (3 units)	(1-3)			
CHEM 4830 - History of Chemistry	(3)			
CHEM 4840 - Drug Discovery and Development	(4)			
CHEM 4860 - Bioinformatics and Computational Biology	(3)			
CHEM 4850 - Bioinorganic and Bioorganic Chemistry	(3)			
CHEM 4990 - Undergraduate Directed Study	(1-3)			
BINF 4010 - Data Mining Applications in Molecular Life Sciences	(2)			
BINF 4500 - Advanced Topics in Bioinformatics and Computational Biology	(1)			
BINF 4540 - Special Topics in Bioinformatics (2 units)	(1-3 units)			

**Biology and Microbiology**

Course Name	Credits:	Term Taken	Grade	Gen Ed
BIOL 4240 - General Embryology	(3)			
BIOL 4300 - Plant Physiology I	(4)			
BIOL 4320 - Fundamentals of Toxicology	(3)			
BIOL 4330 - Integrative Human Physiology I	(3)			
BIOL 4340 - Integrative Human Physiology II	(3)			
BIOL 4360 - Neurobiology: Cellular and Molecular Physiology of the Nervous System	(3)			
BIOL 4370 - Cell Signaling	(3)			
BIOL 4390 - Endocrinology	(3)			
MICR 3700 - Medical Microbiology	(4)			
MICR 4600 - Theoretical and Applied Immunology	(4)			
MICR 4100 - General Virology	(3)			
MICR 3500 - Bacterial Physiology	(3)			
BIOL 3000 - Biostatistics	(3)			
BIOL 3400 - Cell Biology and Genetics	(3)			
BIOL 4130 - Molecular Diagnostics	(3)			
BIOL 4150 - Population Genetics	(3)			
BIOL 4160 - Molecular Genetics	(3)			
BIOL 4170 - Gene Manipulation	(3)			
BIOL 4180 - Advanced Evolutionary Biology	(3)			
MICR 3300 - Microbial Genetics	(3)			
BINF 4020 - Phylogenomic Analysis	(2)			

BINF 4500 - Advanced Topics in Bioinformatics and Computational Biology	(1)			
BINF 4540 - Special Topics in Bioinformatics (2 units)	(1-3 units)			

**Notes:**

---