

B.S. in Chemistry, Biochemistry Option

Program Learning Outcomes

- Program Learning Outcomes: Biochemistry Option: Our graduates in the Professional, Biochemistry and Teaching options will be able to communicate effectively.
- These graduates will be able to analyze problems in their field and develop solutions or strategies to solve those problems.
- Our graduates in the Biochemistry Option will demonstrate a solid foundation in all aspects of biochemistry.
- Biochemistry Option graduates will be able to apply mathematical tools and computational methods to biochemical problems.
- Biochemistry Option graduates will be able to explain the problems in another biological science that biochemical techniques help solve.

Freshman Year	Credits	
	Fall	Spring
BCH 194 - Seminar/Workshop	1	
Please take one of the following:	4	
CHMY 141 - College Chemistry I & CHMY 142 - College Chemistry I Lab		
CHMY 151 - Honors College Chemistry I & CHMY 152 - Honors College Chemistry I Lab		
STAT 216Q - Introduction to Statistics	3	
University Core and Electives	7	
Please take one of the following:		4
CHMY 143 - College Chemistry II & CHMY 144 - College Chemistry II Lab		
CHMY 153 - Honors College Chemistry II & CHMY 154 - Honors College Chemistry II Lab		
M 161Q - Survey of Calculus ¹ or M 171Q - Calculus I		4
BIOB 160 - Principles of Living Systems		4
University Core and Electives		3
Year Total:	15	15
Sophomore Year	Credits	
	Fall	Spring
Please take one of the following:	4	
CHMY 321 - Organic Chemistry I & CHMY 322 - Organic Chemistry I Lab		
CHMY 331 - Honors Organic Chemistry I & CHMY 332 - Honors Organic Chemistry I Lab		
PHSX 205 - College Physics I or PHSX 220 - Physics I with Calculus	4	
BIOB 260 - Cellular and Molecular Biology or CHMY 311 - Fundamental Analytical Chem	4	
University Core and Electives	3	
BCH 294 - Seminar/Workshop		1
CHMY 311 - Fundamental Analytical Chem ⁶ or BIOB 260 - Cellular and Molecular Biology		4
Please take one of the following:		4
CHMY 323 - Organic Chemistry II & CHMY 324 - Organic Chemistry II Lab		

CHMY 333 - Honors Organic Chemistry II & CHMY 334 - Honors Organic Chemistry II Lab			4
PHSX 207 - College Physics II or PHSX 222 - Physics II with Calculus			4
University Core and Electives			3
Year Total:	15		16
Junior Year	Credits		
	Fall	Spring	
Please take one of the following sequences: ²	5-7		
CHMY 361 - Elements of Physical Chemistry & CHMY 362 - Elements of Physical Chemistry Lab			
OR			
CHMY 371 - Physical Chemistry-Quantum Chemistry and Spectroscopy I & CHMY 372 - Physical Chemistry Laboratory I & CHMY 373 - Physical Chemistry - Kinetics and Thermodynamics			
BCH 394 - Seminar/Workshop		1	
BCH 441 - Biochemistry of Macromolecules or BCH 442 - Metabolic Regulation		3	
BCH 490R - Undergraduate Research ³		3	
BIOB 320 - Biomedical Genetics		3	
CHMY 490R - Undergraduate Research ³			3
BCH 442 - Metabolic Regulation or BCH 441 - Biochemistry of Macromolecules			3
BCH 444R - Biochemistry & Molecular Biology Methods			3
Physical and Biological Science Electives ⁴			3
University Core and Electives			3
Year Total:		17	15
Senior Year	Credits		
	Fall	Spring	
Physical and Biological Science Electives ⁴	3		
University Core and Electives	9		
BCH 494 - Seminar/Workshop		1	
BCH 499 - Senior Thesis/Capstone ⁵		1	
BIOB 425 - Adv Cell & Molecular Biology		3	
Physical and Biological Science Electives ⁴		3	
University Core and Electives		7	
Year Total:	12	15	
Total Program Credits:			120

¹ If you want to take a full year of Physical Chemistry (CHMY 371, CHMY 372 and CHMY 373) then you will need to take M 171Q, M 172, and M 273 (see footnote 2).

² Students should consider taking the full year of Physical Chemistry sequence (CHMY 371 and CHMY 372 in the fall and CHMY 373 in the spring) instead of the one-semester overview, particularly if planning to go to graduate school. As noted in footnote 1, this sequence requires more calculus as prerequisite coursework.

³ Six (6) credits of Undergraduate Research BCH 490R are tabulated. Students are encouraged to fulfill additional credits of research up to a maximum of 12 credits of 490R research whether it be in CHMY, BCH, or another department.

⁴ A minimum of 9 credits of physical and biological science electives are required.

⁵ BCH 499 (Senior Year) is required for majors who are writing a thesis for Departmental Honors consideration.

⁶ CHMY 311 should be taken before CHMY 361 or CHMY 371

All students are encouraged to take a 200 level English writing course. Please note that this course would be in addition to the core requirement.

A minimum of 120 credits is required for graduation; 42 of these credits must be in courses numbered 300 and above.

Acceptable Physical and Biological Sciences Electives Include

BIOB 375	General Genetics	3
BIOB 410	Immunology	3
BIOB 420	Evolution	3
BIOB 424	Ethical Practice of Science	3
BIOB 430	Plant Biotechnology	3
BIOB 438	Developmental Mechanisms	3
BIOB 476R	Gene Construction	4
BIOB 480	Conservation Genetics	3
BIOH 365	Human Anatomy and Physiology I for Health Professions	3
BIOH 366	Human Anatomy and Physiology I for Health Professions Lab	1
BIOH 370	Human Anatomy and Physiology II for Health Professions	3
BIOH 371	Human Anatomy and Physiology II for Health Professions Lab	1
BIOH 405	Hematology	3
BIOH 406	Hematology Laboratory	1
BIOH 411	Advanced Human Appendicular Anatomy	4
BIOH 422	Genes and Cancer	3
BIOH 423	Human Developmental Biology	4
BIOH 445	Introduction to Pharmacology	3
BIOH 458	Human Pathophysiology	3
BIOM 360	General Microbiology	5
BIOM 400	Medical Microbiology	3
BIOM 405	Host-Associated Microbiomes	3
BIOM 410	Microbial Genetics	3
BIOM 415	Microbial Diversity, Ecology, and Evolution	3
BIOM 419	Programming for Biologists	3
BIOM 421	Concepts of Plant Pathology	3
BIOM 425	Toxicology: Science of Poisons	3
BIOM 430	Applied and Environmental Microbiology	4
BIOM 431	Medical Bacteriology	3
BIOM 432	Med Bacteriology Lab	2
BIOM 435	Virology	3
BIOM 441	Eukaryotic Pathogens	4
BIOM 450	Microbial Physiology	3
BIOM 452	Soil & Environmental Microbiology	3
BIOM 455R	Research Mthds in Microbiology	4
BIOM 465	Plant-Pathogen Interactions	3
BIOO 310	Comparative Vertebrate Anatomy	4
BIOO 412	Animal Physiology	3
BIOO 433	Plant Physiology	3

BIOO 437	Plant Development	3
BIOO 460	Plant Metabolism	3
CHMY 340	Environmental Chemistry	3
CHMY 401	Advanced Inorganic Chemistry	3
CHMY 404	Advanced Inorganic Techniques	3
CHMY 415	Structure and Bonding in Inorganic Chemistry	3
CHMY 417	Synthetic Chemistry	3
CHMY 421	Advanced Instrument Analysis	3
EBIO 438	Bioprocess Engineering	3
ENSC 466	Chemical Ecology	3
M 430	Mathematical Biology	3
NEUR 313	Neurophysiology	3
NEUR 425	Sensory Neurophysiology	3
NEUR 428R	Molecular Basis of Neurological Diseases	3
NUTR 421	Macronutrient Metabolism	3
NUTR 422	Micronutrient Metabolism	3