

B.S. in Cell Biology & Neuroscience, Biomedical Sciences Option

The curriculum of the biomedical sciences option provides a strong background for students who plan on a career in medicine or other health profession. This option is also for students that are interested in a biomedical sciences career in research or teaching in cell biology, molecular biology, developmental biology, or neuroscience. The curriculum provides the opportunity to take the courses necessary to make a competitive application to health profession school, graduate school or to obtain a technical position. The curriculum has sufficient breadth to introduce the student to a wide range of disciplines, but is flexible enough so that students can focus, in their last two years, on areas of specific interest. Students interested in a career in a health science profession should consult the Health Professions Advising Office for information regarding admission to professional schools.

Employment opportunities, especially at the technical level, are available with a B.S. in Cell Biology and Neuroscience. However, this curriculum is designed to better prepare students for professional or graduate training. The biomedical sciences curriculum is designed to allow the students to take basic courses in physical sciences while tailoring the courses in life sciences to meet their personal objectives and interests. This is done by allowing 24 of the required credits in Biology to be elective credits in life sciences; biology, biochemistry, microbiology, or other appropriate fields. Advanced students are strongly encouraged to enroll in undergraduate research. This provides an opportunity to gain valuable experience in biomedical research which is extremely useful for both an appreciation of the research effort required in graduate school and for gaining experience in technical methods for a technical position.

Program Learning Outcomes

- Be able to describe intra and inter-cellular signaling pathways at the molecular level.
- Be able to describe the functional organization of sensory and motor systems of the human nervous system both in terms of structure and function.
- Be able to describe the function and physiology of major organ systems such as the heart and kidney.
- Be able to describe some of the signaling mechanisms that mediate embryonic development.
- Be able to describe the relationship of genetics to inherited diseases, the development of new therapies, and the molecular basis for these diseases.
- Be able to read modern cell biology or neuroscience paper published in a top journal, appreciate the strengths and weaknesses of the paper's approach and develop a coherent, synthetic review of this paper's place in our knowledge.
- Be able to design and carry out experiments that address fundamental questions about cell biology or neuroscience.
- Effectively communicate complex biological concepts in presentations and in writing.

Freshman Year	Credits	
	Fall	Spring
CHMY 141 - College Chemistry I & CHMY 142 - College Chemistry I Lab	4	
WRIT 101W - College Writing I	3	
University Core and Electives	8	

BIOB 260 - Cellular and Molecular Biology or BIOB 160 - Principles of Living Systems	4	
CHMY 143 - College Chemistry II & CHMY 144 - College Chemistry II Lab	4	
M 161Q - Survey of Calculus	4	
US CORE		3
Year Total:	15	15

Sophomore Year	Credits	
	Fall	Spring
CHMY 321 - Organic Chemistry I & CHMY 322 - Organic Chemistry I Lab	4	
PHSX 205 - College Physics I	4	
STAT 216Q - Introduction to Statistics	3	
University Core and Electives	4	
CHMY 323 - Organic Chemistry II & CHMY 324 - Organic Chemistry II Lab	4	
NEUR 313 - Neurophysiology	3	
PHSX 207 - College Physics II	4	
University Core and Electives	4	
Year Total:	15	15

Junior Year	Credits	
	Fall	Spring
BCH 380 - Biochemistry & BCH 381 - Biochemistry Lab or BCH 441 and BCH 442	5	
BIOH 320 - Biomedical Genetics	3	
University Core and Electives	7	
WRIT 201 - College Writing II		3
University Core and Electives		12
Year Total:	15	15

Senior Year	Credits	
	Fall	Spring
BIOB 499 - Senior Thesis/Capstone	2	
University Core and Elective	13	
BIOB 420 - Evolution		3
BIOB 425 - Adv Cell & Molecular Biology		3
University Core and Elective		9
Year Total:	15	15
Total Program Credits:		120

Additional Requirements

A minimum of 24 additional elective credits in the life sciences must be completed, most typically from courses in Cell Biology & Neuroscience, Microbiology and Immunology, and Biochemistry. Of these 24 credits, at least 18 must be upper division. See the department office for a full list of approved electives.

Examples of elective courses include, but are not limited to:

BIOB 410	Immunology	3
BIOB 476R	Gene Construction	4
BIOH 201	Human Anatomy and Physiology I	4
BIOH 211	Human Anatomy and Physiology II	4
BIOH 303	Global Diseases and Health Disparities	3
BIOH 305	Human Skeletal Biology	3
BIOH 409	Advanced Human Torso Anatomy	4
BIOH 411	Advanced Human Appendicular Anatomy	4

BIOH 420	Molecular Genetics	3
BIOH 422	Genes and Cancer	3
BIOH 423	Human Developmental Biology	4
BIOH 445	Introduction to Pharmacology	3
BIOH 458	Human Pathophysiology	3
BIOH 454	Microanatomy (Histology)	3
BIOM 435	Virology	3
NEUR 409	Human Neuroanatomy	4
NEUR 425	Sensory Neurophysiology	3