BIOCHEMISTRY & MOLECULAR BIOLOGY (SECOND MAJOR ONLY)

The biochemistry & molecular biology program exists to give students an opportunity to augment their education in this technologically-important field. To support this effort, Rose-Hulman provides students with access to a modern and well-equipped biochemistry lab, along with an excellent biological sciences facility.

Biochemistry & molecular biology is available to Rose-Hulman students as a second major. This means that the student will receive a first degree in some other discipline and then can augment their education with this program. Students whose first degree programs are in chemistry or chemical engineering will find the program easiest since there is considerable overlap between those programs and the biochemistry & molecular biology requirements. Students from other disciplines are also encouraged to participate, but will have to take more courses. All students are encouraged to take individual courses in the program, regardless of whether or not they wish to fulfill the second major requirements, or to participate in related research projects under faculty supervision.

Two degree or double major programs in Biochemistry & Molecular Biology and Biochemistry are not allowed.

Requirements

Below is a sample plan of study that illustrates one way to achieve the program requirements. Any given student's plan of study may differ based on a variety of factors (e.g., advanced credit, placement exams, adding a minor). Enrolled students will work with their academic advisor; utilize the degree audit/planner to create a specific plan of study.

Required Courses

Code	Title	Hours
Required Courses		
CHEM 111	General Chemistry I	3
CHEM 111L	General Chemistry I Lab	1
CHEM 113	General Chemistry II	3
CHEM 113L	General Chemistry II Laboratory	1
CHEM 115	General Chemistry III	3
CHEM 115L	General Chemistry III Laboratory	1
CHEM 251	Organic Chemistry I	3
CHEM 251L	Organic Chemistry I Laboratory	1
CHEM 252	Organic Chemistry II	3
CHEM 252L	Organic Chemistry II Laboratory	1
CHEM 253	Organic Chemistry III	3
CHEM 253L	Organic Chemistry III Laboratory	1
CHEM 330	Biochemistry I	4
CHEM 430	Advanced Biochemistry	4
CHEM 433	Biochemistry Laboratory	1
Select one of the following:		8-12
CHEM 361 & CHEM 362	Physical Chemistry I and Physical Chemistry II	
Or		
CHEM 360 & CHE 303 & CHE 304	Introduction to Physical Chemistry for Engineers and Chemical Engineering Thermodynamics and Multi-Component Thermodynamics	
BIO 110	Cell Structure and Function	4
BIO 120	Comparative Anatomy & Physiology	4
BIO 130	Evolution & Diversity	4
BIO 210	Mendelian & Molecular Genetics	4
BIO 220	Microbiology	4
BIO 230	Cell Biology	4
Genetics Elective [1]		4
Advanced Electives (most majors) [2]		12
Advanced Electives (CHEM majors) [3]		8

1. Genetics Elective must be a course that has BIO210 as a prerequisite or any course approved by the major advisor. Examples include BIO411, BIO431, and CHEM331.
2. Advanced Electives include CHEM225, PH302, or any 300 level or greater CHEM, BIO, or BMTH course. For Biology majors, 8 of the Advanced Elective credits must not be BIO courses. Electives may not be named, required courses in a student's other majors or minors but may count as electives for other majors or minors.
3. Chemistry majors are required to only take 8 credits of advanced electives, but they must not be CHEM courses.

Students with a major in Biology must take 8 credits from the elective courses listed above with a CHEM prefix, and 4 credits from any 300 level or above BIO course (total: 29 hours required beyond Biology major).

Learning Outcomes

Student Learning Outcomes

Upon graduation, Rose-Hulman Biochemistry and Molecular Biology students will be able to

1. Solve problems by applying core concepts of biochemistry and molecular biology.
2. Explain and and apply techniques related to the manipulation and analysis of cells and biomolecules.
3. Communicate complex scientific findings and ideas from the discipline of biochemistry and molecular biology through a variety of media.