MOLECULAR BIOLOGY AND BIOTECHNOLOGY, BS

The BS degree in Molecular Biology and Biotechnology is designed to provide students an opportunity to focus their undergraduate studies in the molecular biosciences in an effort to prepare themselves for either entering the workforce directly as baccalaureate-level research scientists or for entering competitive graduate programs to further their studies. The curriculum is designed to be rich in laboratory experiences through coursework, research and an internship. In addition to over 80 credit hours of science courses, Molecular Biology and Biotechnology majors will be required to take an ethics course to appreciate the interplay between biology and society.

Student Learning Outcomes

Molecular Biology & Biotechnology majors at Washburn University, upon completion of the program will be able to:

- Acquire a comprehensive understanding of biological principles including cell biology, genetics, organismal biology, structure and function, ecology, and evolution.
- Acquire the ability to understand and utilize the scientific method.
- Master a variety of scientific techniques in the core biology disciplines of organismal biology, microbiology, genetics, molecular biology, and undergraduate research.
- Develop the ability to analyze and interpret scientific data.
- Develop the oral and written presentation skills to successfully communicate scientific information in a professional manner.

Degree Requirements

In addition to the requirements stated below, students must complete 34-35 hours of General Education (https://catalog.washburn.edu/undergraduate/programs-degrees-graduation-requirements/general-education-requirements/), all requirements for a Bachelor of Science (https://catalog.washburn.edu/undergraduate/college-arts-sciences/degrees/bachelor-science/) degree, and any additional hours needed to reach the minimum 120 credit hours required for graduation. Some of the courses below may also fulfill general education or other degree requirements. Please see your advisor for more information.

Code	Title	Hours
Required Courses Inside Department		
BI 192	General Cellular Biology	5
BI 194	General Organismal Biology	5
BI 234	Introduction to Biotechnology	3
BI 301	General Microbiology	4
BI 314	Statistics for Biologists	3
BI 333	General Genetics	4
BI 353	Molecular Genetics	3
BI 354	Molecular Biology Laboratory	3
BI 390	Biology Seminar	1
BI 395	Research in Biology	3
BI 440	Biotechnology Internship	3
Subtotal		37
Required Courses Outside Department		
CH 151 & CH 152	Fundamentals of Chemistry I and Fundamentals of Chemistry II (1 year with lab)	10
CH 340 & CH 342	Organic Chemistry I and Organic Chemistry Lab I (with lab)	5
CH 341	Organic Chemistry II	3
CH 350 & CH 351	Biochemistry I and Biochemistry Lab I (1 semester with lab)	5
MA 116	College Algebra	3
MA 117	Trigonometry	3-5
or MA 123	Pre-Calculus	
or MA 151	Calculus & Analytic Geometry I	
PH 214	Medical Ethics	3
or PH 317	Ethics of Genetic Technologies	
Select one of the following physics sequences:		10
PS 261 & PS 262	College Physics I and College Physics II (1 year with lab)	
PS 281 & PS 282	General Physics I and General Physics II (1 year with lab)	
Subtotal		42-44
Additional Required Courses		
Elective supportive courses (p. 1)		6
Subtotal		6
Total Hours		**85-87**

Elective Supportive Courses

Code	Title	Hours
BI 322	Advanced General Botany	4
BI 325	Microbiology of Human Disease	5
BI 328	Plant Physiological Ecology	3
BI 330	Advanced Physiology	4
BI 343	Human Genetics	3
BI 355	Developmental Biology	5
BI 357	Histology	4
BI 362	Immunology	3
BI 363	Immunology Laboratory	2
BI 370	Virology	3
BI 420	Forensic Molecular Biology	4
CH 343	Organic Chemistry Lab II	2
CH 352	Biochemistry II	3
CH 353	Biochemistry Lab II	2