BS in Biochemistry

Degree Program Description

Biochemists are the locksmiths of life science. They use their imagination, ingenuity and understanding of the basics of living processes to unlock life's mysteries. By unraveling the complexities of nature, they improve the quality of life. Biochemistry combines the tools of biology, chemistry and genetics to fight human disease, increase the production and quality of food, and protect the environment. The knowledge acquired through the program prepares students for careers in many areas, including Medicine, Biotechnology, Agriculture and Government.

Premedical Track Students interested in a medical career may choose from a variety of science-based majors. The most common choice of students is biochemistry because it is a collaborative program between CAFNR and the School of Medicine. The Biochemistry degree provides excellent preparation for the intellectual demands of the medical profession. This training includes, as part of the degree requirements, all of the science courses necessary for application to medical school or related professional fields. Many graduates of this program matriculate at medical, dental, veterinary, pharmacy or optometry schools.

In **Biotechnology**, some of the nation's largest and most respected private biotechnology companies, such as Bayer, Dow Chemical and Pfizer, employ biochemists in a wide range of specialties, including molecular biology, genetic engineering, pharmaceutical development and microbiology. Many graduates have chosen to pursue Masters or Doctoral degrees at major research institutions across the country. Some have been selected for internships at National Institute of Health and others have earned National Science Foundation Pre-Doctoral Awards.

In **Agriculture**, biochemists find employment with agricultural industry companies such as Cargill, Bayer, and Nestle Purina. They may work on projects to develop new varieties of crops that resist drought and insects, nutritionally correct animal feed, or herbicide resistant crops.

In **Government**, state and federal agencies such as the U.S. Food and Drug Administration, the State Public Health Lab and Epidemiology for Public Health Lab employ biochemists in many fields. They might perform genetic testing and biological sample testing, research epidemics in the region, or identify food-borne pathogens.

Major Program Requirements

Students earning a Bachelor of Science in Biochemistry are required to complete all University general education (http://catalog.missouri.edu/academicdegreerequirements/generaleducationrequirements/), University graduation (http://catalog.missouri.edu/academicdegreerequirements/universityrequirements/), and degree requirements, including selected foundational courses, which may fulfill some University general education requirements.

Foundational Courses

CHEM 1320	College Chemistry I	4
or CHEM 1320H	College Chemistry I - Honors	
BIO_SC 1500	Introduction to Biological Systems with Laboratory	5
or BIO_SC 1500H	Introduction to Biological Systems with Laboratory Honors	
MATH 1500	Analytic Geometry and Calculus I	5
or MATH 1500H	Analytic Geometry and Calculus I - Honors	
AGSC_COM 2220	Verbal Communication in Agriculture, Food and Natural Resources	3
or COMMUN 1200	Public Speaking	

Degree and Major Courses

Major core requirements		
Biochemistry		**25-26**
BIOCHM 1090	Introduction to Biochemistry	3
BIOCHM 1094	Introductory Biochemistry Laboratory	3
BIOCHM 2480	Introduction to Macromolecular Structure and Function ^	3
BIOCHM 2482	Integrative Cellular and Molecular Biochemistry ^	3
BIOCHM 4270	Biochemistry (I: First semester of two semester sequence)	3
BIOCHM 4272	Biochemistry (II: Continuation of BIOCHM 4270)	3
BIOCHM 4300	Physical Chemistry of Biological Systems ^	3
BIOCHM 4974W	Biochemistry Laboratory - Writing Intensive	5
BIOCHM 4972	Post-Normal Biochemistry	2
Biological Sciences		**3-4**
BIO_SC 2200	General Genetics	3-4
or AN_SCI 3213	Genetics of Agricultural Plants and Animals	
or PLNT_SCI 3213	Genetics of Agricultural Plants and Animals	
Chemistry		**12**
CHEM 1330	College Chemistry II	4
CHEM 2100	Organic Chemistry I	3
CHEM 2110	Organic Chemistry II	3
CHEM 2130	Organic Laboratory I (Concurrent with CHEM 2110)	2
Mathematics		**5**
STAT 1200	Introductory Statistical Reasoning	3
or ABM 2123	Quantitative Applications in Agricultural and Natural Resource Sciences	
or STAT 2500	Introduction to Probability and Statistics I	
Information Technology		
INFOTC 1040	Introduction to Problem Solving and Programming	3
Physics		**8-10**
PHYSCS 1210	College Physics I	4-5
or PHYSCS 2750	University Physics I	
PHYSCS 1220	College Physics II	4-5
or PHYSCS 2760	University Physics II	
Advanced science *		**10 or more**

5 additional BIOCHM credits; all credit hours must be 3000 level or above.

* Science courses that are not used to fulfill other major requirements. For an approved list of courses, email mubchemadvising@missouri.edu.

^ Some courses may only be offered during fall or spring semester. Please check with the department for course offerings.

Semester Plan

Below is a sample plan of study, semester by semester. A student's actual plan may vary based on course choices where options are available.

First Year			
Fall	**CR**	**Spring**	**CR**
BIOCHM 1090	3	CHEM 1330	4
CHEM 1320	4	ENGLSH 1000	3
BIO_SC 1500	5	MATH 1500	5
INFOTC 1040	3	BIOCHM 1094 or BIO_SC 2200	3-4
INTDSC 1001	1		
	16		**15-16**
Second Year			
Fall	**CR**	**Spring**	**CR**
BIOCHM 2480	3	BIOCHM 2482	3
BIO_SC 2200 or BIOCHM 1094	3-4	CHEM 2110	3
CHEM 2100	3	CHEM 2130	2
STAT 1200	3	BIO_SC 2300 (or general elective)	4
Elective (Humanities)	3	Social/Behavioral Sci Elective	3
	15-16		**15**
Third Year			
Fall	**CR**	**Spring**	**CR**
BIOCHM 4270	3	BIOCHM 4272	3
PHYSCS 1210	4	PHYSCS 1220	4
HIST 1100 or 1200	3	Advanced Science Elective (3000 level or above)	4-5
AGSC_COM 2220	3	Elective (Social/Behavioral Sci)	3
Elective (Humanities)	3		
	16		**14-15**
Fourth Year			
Fall	**CR**	**Spring**	**CR**
BIOCHM 4300	3	General Electives	6
BIOCHM 4974W (OR Writing Intensive Elective)	5	Writing Intensive Elective OR BIOCHM 4974W	3-5
BIOCHM 4972 (or other Adv Science BIOCHM)	2	Adv Sci BIOCHM OR BIOCHM 4972	2
BIOCHM 4978	3	Adv Sci BIOCHM	2
General Elective	3		
	16		**13-15**

Total Credits: 120-125