

Bachelor of Science in Biology-Chemistry

Program Overview

The biology-chemistry major is a joint major involving the Biology and Chemistry and Physics Departments at Manchester University. It provides a strong, broad-based, interdisciplinary background in science that prepares students for a variety of career paths, including the professional areas of medicine, dentistry, optometry, pharmacy, and veterinary medicine, as well as graduate programs leading to master's or doctorate degrees in chemistry, biochemistry, molecular and cell biology, organismic biology and pharmacogenomics. Additional options include entry-level employment in the fields of biology, chemistry or biochemistry.

Degree Requirements

To earn this degree, students must have a GPA of 2.0 or higher in the Major as well as an overall GPA of 2.0, complete a minimum of 120 credit hours, and fulfill the course requirements of the program listed below.

*This is a sample plan; specific courses may vary from year to year. Academic advisors will work with each student to develop their individual schedule.

MAJOR	*Options
CORE	^CORE equivalent
ELECTIVE/MINOR	
EXPERIENTIAL	

CORE		CREDITS
✓	Foundation	
	LA-FWS First-Year Writing Seminar	3
	LA-FCS First-Year Communication Seminar	3
	LA-FQR Quantitative Reasoning	3-4
	LA-FSS First Year Success Seminar	1
	LA-FCG Cultural and Global Understanding	3-5
	Exploration	
	LA-EAH Arts and Humanities	3
	LA-ENS Natural Sciences	3-6
	LA-ESS Social Sciences	3-4
	Transformation	
	LA-TFR Faith, Reason, and Ethics	3
	LA-TBI Big Issues - 2 courses	6-7
	LA-TCE Creative Expression	1-3
Additional credits to bring total to 120+ credits		CREDITS
✓	Electives	
	Experiential Learning	

Total Program Credits: 120+

Major-Specific Required Courses		CREDITS
✓		
	BIOL 106/L Principles of Biology I/Lab	4
	BIOL 108/L Principles of Biology II/Lab	4
	BIOL 229/L Introduction to Molecular Biology/Lab	4
	BIOL 422/L Advanced Human Physiology/Lab	4
	CHEM 111/L General Chemistry I/Lab	4
	CHEM 113/L General Chemistry II/Lab	4
	CHEM 235/L Analytical Chemistry/Lab	4
	CHEM 311/L Organic Chemistry I/Lab	4
	CHEM 312/L Organic Chemistry II/Lab	4
	CHEM 405 Biochemistry I	3
	NASC 202 STEM Careers	1
	NASC 450 Senior Seminar	1
Choose 1 of the following:		CREDITS
	BIOL 202/L Fundamentals of Human Anatomy/Lab	4
	BIOL 364/L Comparative Vertebrate Anatomy/Lab	4
Choose 1 of the following:		CREDITS
	BIOL 313/L Microbiology/Lab	4
	BIOL 365/L Cell Biology	3
Choose 1 of the following:		CREDITS
	CHEM 405L Biochemistry I Lab	1
	CHEM 406 Biochemistry II	3
Two hours of experiential learning selected from:		CREDITS
	BIOL 475 Internship in Biology	3
	BIOL 496 Research in Biology	1-2
	CHEM 475 Internship	1-2
	CHEM 496 Research	1-2
	NASC 310 Medical Practicum	3
	NASC 375 Health Science Practicum	1-2
	PHYS 499 Research	1-2
1 year of Physics selected from:		CREDITS
	PHYS 111 College Physics I	4
	PHYS 112 College Physics II	4
	OR	
	PHYS 210 General Physics I	4
	PHYS 220 General Physics II	4

Example Course Sequence:

The following is a sample of a semester-by-semester approach to completing this program in 4 years.

YEAR 1			
FIRST SEMESTER			
COURSE		CREDITS	PREREQUISITES
BIOL 106/L^	Principles of Biology I/Lab	4	Fall
CHEM 111/L^	General Chemistry I/Lab	4	Fall
LA-FQR	Quantitative Reasoning	3	
LA-FWS	First-Year Writing Seminar	3	
LA-FSS	First Year Success Seminar	1	
JAN TERM			
COURSE		CREDITS	
SECOND SEMESTER			
COURSE		CREDITS	
BIOL 108/L	Principles of Biology II/Lab	4	Spring
CHEM 113/L	General Chemistry II/Lab	4	CHEM 111
LA-FCS	First-Year Communication Seminar	3	
LA-ESS	Social Sciences	3	
		29	

YEAR 2			
THIRD SEMESTER			
COURSE		CREDITS	PREREQUISITES
BIOL 229/L	Introduction to Molecular Biology/Lab	4	One year of biology & one year of chemistry
CHEM 311/L	Organic Chemistry I/Lab	4	Grade of C- or higher in CHEM 113, Fall
PHYS 111	College Physics I	4	MATH 105 or higher, Fall
LA-TCE	Creative Expression	3	
JAN TERM			
COURSE		CREDITS	
ELECTIVE/MINOR		3	
FOURTH SEMESTER			
COURSE		CREDITS	
BIOL 313/L*	Microbiology/Lab	4	BIOL 229 or BIOL 260
CHEM 312/L	Organic Chemistry II/Lab	4	Grade of C- or higher in CHEM 311, Spring
PHYS 112	College Physics II	4	PHYS 111, Spring
LA-EAH	Arts and Humanities	3	
		33	

4-Year Sample Schedule Cont.

YEAR 3			
FIFTH SEMESTER			
COURSE		CREDITS	PREREQUISITES
BIOL 364/L	Comparative Vertebrate Anatomy/Lab	4	
ELECTIVE/MINOR		3	
LA-TBI	Big Issues	3	
LA-FCG	Cultural and Global Understanding	3	
JAN TERM			
COURSE		CREDITS	
EXPERIENTIAL		3	
SIXTH SEMESTER			
COURSE		CREDITS	
BIOL 422/L	Advanced Human Physiology/Lab	4	BIOL 106/L, BIOL 108/L, and 1 year chemistry
NASC 202	Exploring STEM Careers	1	Spring
CHEM 235/L	Analytical Chemistry/Lab	4	CHEM 113, Spring
ELECTIVE/MINOR		3	
ELECTIVE/MINOR		3	
		31	

YEAR 4			
SEVENTH SEMESTER			
COURSE		CREDITS	PREREQUISITES
CHEM 405	Biochemistry I	3	CHEM 312, FWS or ENG 111, Fall
CHEM 405L*	Biochemistry I Lab	1	
LA-TFR	Faith, Reason, and Ethics	3	
EXPERIENTIAL		4	
JAN TERM			
COURSE		CREDITS	
EXPERIENTIAL		3	
EIGHTH SEMESTER			
COURSE		CREDITS	
NASC 450	Senior Seminar	1	Junior standing
BIOL 475*	Internship in Biology	3	Junior or senior standing
LA-TBI	Big Issues	3	
EXPERIENTIAL		3	
ELECTIVE/MINOR		3	
		27	
	TOTAL CREDITS	120	