

BACHELOR OF SCIENCE IN MOLECULAR BIOCHEMISTRY AND BIOPHYSICS

Why should a biologist know about physics and chemistry? Why should physicists and chemists know about biology? Just ask some of Illinois Institute of Technology's faculty who are using x-ray synchrotron radiation science to study proteins and their molecular structures. This research may lead to the important advances in understanding the causes of a number of diseases.

Molecular biochemistry and biophysics (MBB) is an interdisciplinary major, combining studies in biology, chemistry, and physics. Its objectives are to give students solid training in the areas of modern cell biology, genetics, and biochemistry while also providing a strong background in mathematics and the physical sciences. In this way the MBB degree will provide each student with the skills needed to succeed as a professional in biology as the field becomes increasingly dependent on new technologies.

Through this curriculum, students will discover the essential building blocks of life, how they fit together, how they work, and the physical methods for exploring them. With its quantitative emphasis encompassing all the sciences, this program is a great way to prepare for careers in medicine or medical research. It is also one of the majors that is part of the honors medical programs with Rush University.

Required Courses

Code	Title	Credit Hours
Biology Requirements (34-35)		
BIOL 100	Introduction to the Profession	2
BIOL 107	General Biology Lectures	3
BIOL 109	General Biology Laboratory	1
BIOL 115	Human Biology	3
BIOL 117	Human Biology Laboratory	1
BIOL 210	Microbiology	3
BIOL 214	Genetics	3
BIOL 401	Introductory Biochemistry	3
BIOL 402	Metabolic Biochemistry	3
BIOL 445	Cell Biology	3
BIOL 455	Macromolecular Techniques	3
BIOL 451	Biological Literature	2-3
or CHEM 451	Undergraduate Seminar	
BIOL 495	Biology Colloquium	1
Select three credit hours from the following courses:		3
BIOL 404	Biochemistry Laboratory	3
BIOL 431	Animal Physiology Laboratory	3
BIOL 446	Cell Biology Laboratory	3
Chemistry Requirements (22)		
CHEM 124	Principles of Chemistry I with Laboratory	4
CHEM 125	Principles of Chemistry II with Laboratory	4
CHEM 237	Organic Chemistry I	4
CHEM 239	Organic Chemistry II	3
CHEM 247	Analytical Chemistry	3
CHEM 343	Physical Chemistry I	3
CHEM 485	Chemistry Colloquium	1
Physics Requirements (11-12)		
PHYS 123	General Physics I: Mechanics	4
PHYS 221	General Physics II: Electricity and Magnetism	4
PHYS 223	General Physics III	3-4
or PHYS 224	General Physics III for Engineers	
Molecular Biochemistry and Biophysics Electives (6)		
Select two courses from the following:		6
BIOL 555	Macromolecular Structure	3

CHEM 538	Physical Biochemistry	3
CHEM 553	Chemical Statistical Thermodynamics and Molecular Simulation	3
PHYS 304 or PHYS 410	Thermodynamics and Statistical Physics Molecular Biophysics	3
PHYS 420	Bio-Nanotechnology	3
Technical Electives		(6)
Select a minimum of six credit hours from any 300-level or above Biology, Chemistry, or Physics class, or other approved class.		6
Mathematics Requirements		(21)
MATH 151	Calculus I	5
MATH 152	Calculus II	5
MATH 251	Multivariate and Vector Calculus	4
MATH 252	Introduction to Differential Equations	4
MATH 425	Statistical Methods	3
Computer Science Requirement		(2)
CS 104	Introduction to Computer Programming for Engineers	2
Humanities and Social Science Requirements		(21)
See Illinois Tech Core Curriculum, sections B and C		21
Interprofessional Projects		(6)
See Illinois Tech Core Curriculum, section E		6
Total Credit Hours		129-131

Bachelor of Science in Molecular Biochemistry and Biophysics Curriculum

		Year 1	
Semester 1	Credit Hours	Semester 2	Credit Hours
BIOL 100	2	BIOL 115	3
BIOL 107	3	BIOL 117	1
BIOL 109	1	CHEM 125	4
CHEM 124	4	MATH 152	5
MATH 151	5	Humanities 200-level Course	3
15		16	
		Year 2	
Semester 1	Credit Hours	Semester 2	Credit Hours
BIOL 214	3	BIOL 210	3
CHEM 237	4	CHEM 239	3
CS 104	2	MATH 251	4
PHYS 123	4	PHYS 221	4
Humanities or Social Sciences Elective	3	Social Sciences Elective	3
16		17	
		Year 3	
Semester 1	Credit Hours	Semester 2	Credit Hours
BIOL 401	3	BIOL 402	3
CHEM 247	3	BIOL 495	1
MATH 252	4	CHEM 343	3
PHYS 223 or 224	3-4	Technical Elective ¹	3
I PRO Elective I	3	I PRO Elective II	3
		Humanities Elective (300+)	3
16-17		16	
		Year 4	
Semester 1	Credit Hours	Semester 2	Credit Hours
BIOL 445	3	BIOL 451 or CHEM 451	2-3
BIOL 455	3	Biology Laboratory Elective ³	3
CHEM 485	1	MATH 425	3
MBB Elective ²	3	MBB Elective ²	3
Technical Elective ¹	3	Social Sciences Elective (300+)	3
Humanities Elective (300+)	3	Social Sciences Elective (300+)	3
16		17-18	

Total Credit Hours: 129-131

¹ Choose from any BIOL, CHEM, or PHYS 300-level or above approved course.

² Students may select from the following courses: BIOL 555; CHEM 538; CHEM 553; PHYS 410 or PHYS 304; or PHYS 420.

³ Students may select from the following courses: BIOL 404, BIOL 431, or BIOL 446.