Biochemistry & Molecular Biology Major, B.S.

Department of Chemistry and Biochemistry

Biochemistry and molecular biology is the study of life at the molecular level. This field is both a life science and a chemical science, exploring the chemistry of living organisms and the molecular basis for the processes that occur in living cells. The Department of Chemistry and Biochemistry provides classroom and laboratory learning opportunities and research experience across the discipline to meet the needs of students in preprofessional programs as well as of students who wish to pursue careers or graduate studies in chemistry or related disciplines.

Typical Program of Study:

Fall Semester		*Spring Semester*	
First Year			
Chem 1151 General Chemistry I [a]		Chem 1152 General Chemistry II	
or Chem 1161 Honors Chemistry I [a]	5 cr	or Chem 1162 Honors Chemistry II	5 cr
Math 1296 Calculus I [b]	5 cr	Math 1297 Calculus II	5 cr
Biol 1011 General Biology I	5 cr	Biology 1012 General Biology II	5 cr
	15 cr		15 cr
Second Year			
Chem 2521 Organic Chemistry I	4 cr	Chem 2522 Organic Chemistry II	4 cr
Phys 2011 General Physics I	4 cr	Phys 2012 General Physics II	4 cr
Chem 2222 Quantitative Analysis	3 cr	Biol 2101 Cell Biology	3 cr
Chem 2223 Quantitative Analysis Lab	1 cr	Liberal education or minor field course	4 cr
Comp 1120 College Writing	3 cr		15 cr
	15 cr		
Third Year			
Chem 4351 Biochemistry I	3 cr	Chem 4352 Biochemistry II	3 cr
Chem 4363 Biochemistry Lab	2 cr	Comp 31xx Advanced Writing	3 cr
Chem 4632 Physical Chemistry	4 cr	Biol 4231 Molecular Genetics	3 cr
Chem 4633 Physical Chemistry Lab	1 cr	Biol 4232 Molecular Biology Lab	2 cr
Biol 2201 Genetics	3 cr	Liberal education or minor field courses	4 cr
Liberal education or minor field course	2 cr		15 cr
	15 cr		
Fourth Year			
Chem 4184 Undergraduate Seminar I	1 cr	Chem 4185 Undergraduate Seminar II	1 cr
Chem 4434 Inorganic Chemistry	4 cr	Chem 4242 Instrumental Analysis	3 cr
Liberal education or minor field course	10 cr	Liberal education or minor field courses	11 cr
	15 cr		15 cr

[a] High school algebra and high school chemistry are required for Chem 1151 and Chem 1161.
[b] First math course is determined by math placement exam. This schedule presupposes placement into Math 1296.

For further information:

Department of Chemistry and Biochemistry
246 Chemistry Building
1039 University Drive
Duluth, MN 55812-2496
218-726-7212
chem@d.umn.edu
http://www.d.umn.edu/chem

Biochemistry & Molecular Biology Major, B.S.

MAJOR REQUIREMENTS	CREDITS	PREREQUISITES	SEMESTER TO BE COMPLETED	GRADE
YEAR 1				
Biol 1011 General Biology I	5	1 yr. HS chemistry or 1 semester college chemistry		
Biol 1012 General Biology II	5	Biol 1012		
Chem 1151 General Chemistry I *and*	5	1 year HS chemistry; HS algebra		
Chem 1152 General Chemistry II	5	Chem 1151		
OR				
Chem 1161 Honors Chemistry I *and*	5	1 year HS chemistry; placement		
Chem 1162 Honors Chemistry II	5	Chem 1161		
Math 1296 Calculus I	5	Math placement or Math 1250 with a grade of 'C-' or better		
Math 1297 Calculus II	5	Math 1296 with a grade of 'C-'or better		
YEAR 2				
Biol 2101 Cell Biology	3	Biol 1012; 4 credits organic chemistry		
Chem 2222 Quantitative Analysis	3	Chem 1152 or 1162		
Chem 2223 Quantitative Analysis lab	1	Concurrent registration in Chem 2222		
Chem 2521 Organic Chemistry I	4	Chem 1152 or 1162		
Chem 2522 Organic Chemistry II	4	Chem 2521		
Comp 1120 College Writing	3			
Phys 2011 General Physics I	4	Math 1290 or Math 1296		
Phys 2012 General Physics II	4	Phys 2011; Math 1297		
YEAR 3				
Biol 2201 Genetics	3	Biol 1012; Math 1005 or higher		
Biol 4231 Molecular Genetics	3			
Biol 4232 Molecular Biology Lab	2			
Chem 4351 Biochemistry I	3	Chem 2222, 2522; Math 1296; concurrent registration in		
Chem 4352 Biochemistry II	3	Chem 4632 recommended		
Chem 4363 Biochemistry lab	2	Chem 2222, 2223, 2522; concurrent reg in Chem 4351		
Chem 4632 Physical Chemistry	4	2 years of chemistry; Phys 2012		
Chem 4633 Physical Chemistry lab	1	Concurrent registration in Chem 4632		
Comp 31xx Advanced Writing	3	Comp 1120; 60 credits		
YEAR 4				
Chem 4184 Undergraduate Seminar I	1	Senior standing		
Chem 4185 Undergraduate Seminar II	1	Chem 4184		
Chem 4242 Instrumental Analysis	3	Chem 2222, 4632 or 4642		
Chem 4434 Inorganic Chemistry	4	Chem 4632 or Chem 4642		

NOTE: In addition to the above requirements, students must complete a minor and the liberal education program to earn a B.S. degree.