Cell Biology Major, B.S.

Department of Biology

Cell biology is one of the most rapidly growing areas of modern biology. This major prepares students for graduate school and careers in cell biology, genetics, developmental biology, physiology, immunology, and biotechnology. The major is also appropriate for students considering professional schools of medicine, dentistry, pharmacy, and veterinary medicine.

Typical Program of Study:

Fall Semester		*Spring Semester*	
First Year			
Biol 1011 General Biology I[a]	5 cr	Biol 1012 General Biology II	5 cr
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
Comp 1120 College Writing	3 cr	Math 1290 Calculus for the Natural Sciences[b]	
	13 cr	or Math 1296 Calculus I[b]	5 cr
			15 cr
Second Year			
Chem 2521 Organic Chemistry I	4 cr	Biol 2101 Cell Biology	3 cr
Math or statistics course[c]	3-5 cr	Biol 2102 Cell Biology lab	2 cr
Phys 2011 General Physics I[d]		Chem 2522 Organic Chemistry	4-5 cr
or Phys 1001 Introduction to Physics I	4-5 cr	Phys 2012 General Physics II	
Liberal education or minor field course	3 cr	or Phys 1002 Intro to Physics II	4-5 cr
	15-16 cr		13-15cr
Third Year			
Biol 2201 Genetics	3 cr	Biol 4801 Evolution	2 cr
Bio 4501 General Microbiology	4 cr	Chem 3322 Biochemistry[e]	3 cr
Chem 2222 Quantitative Analysis	3 cr	Chem 3324 Biochemistry Lab	2 cr
Chem 2223 Quantitative Analysis Lab	1 cr	Comp 3150 Advanced Writing: Science	3 cr
Liberal education or minor field course	3-4 cr	Liberal education or minor field courses	6 cr
	14-15 cr		16 cr
Fourth Year			
Biol 5601 Plant Physiology **and**	2 cr	Biol 5231 Molecular Biology	3 cr
Biol 5602 Plant Physiology Lab	2 cr	Biol 5232 Molecular Biology Lab	2 cr
OR Phsl 5601 Phys of Organ Systems I **and**	3 cr	Biol 5361 Developmental Biology	4 cr
Phsl 5602 Phys of Organ Systems II	2 cr	**OR** Biol 5331 Plant Development **and**	2 cr
Biology elective[f]	3 cr	Biol 5332 Plant Development Lab	2 cr
Liberal education or minor field courses	7-9 cr	Biology elective[f]	3 cr
	14-17 cr	Liberal education or minor field course	3 cr
			15 cr

[a]High school chemistry or Chem 1113 Intro to General Chemistry is required before Biol 1011 and Chem 1151 or Chem 1161.
[b]First math course is determined by math placement exam; this schedule presupposes placement into Math 1290/1296.
[c]Math 1297 Calculus II OR Stat 2411 Statistical Methods OR Stat 3611 Intro to Probability & Statistics.
[d]Phys 2011-2012 is a calculus-based physics series requiring completion of Math 1297 Calculus II.
[e]Or Chem 4341 Biochemistry I, offered fall semester.
[f]Majors must take an additional minimum of 6 credits, with at least one course with lab or a lab course, from the following: Biol 2801, 3990, 3994, 5121, 5133, 5199, 5331, 5332, 5361, 5511, 5513, 5601, 5602, 5765, 5801, 5802, 5990, MicB 5545, Phsl 5601, Phsl 5602.

For further information:

Department of Biology
211 Life Science Building
1110 Kirby Drive
Duluth, MN 55812-2496
218-726-6262
biol@d.umn.edu
http://www.d.umn.edu/biology

Cell Biology Major, B. S.

2003-2005 Catalog

Major Course Requirements	Credits	Prerequisites	Semester To Be Completed	Grade When Completed
Year 1				
Biol 1011 General Biology I	5	1 year hs chemistry or 1 semester college chemistry		
Biol 1012 General Biology II	5	Biol 1011		
Chem 1151 General Chemistry I **and**	5	1 year high school chemistry; high school algebra		
Chem 1152 General Chemistry II	5	Chem 1151		
OR Chem 1161 Honors General Chemistry I **and**	5	High school chemistry; placement		
Chem 1162 Honors General Chemistry II	5	Chem 1161		
Math 1290 Calculus for the Natural Sciences	5	Math placement test		
OR Math 1296 Calculus I	5	Math placement test		
Comp 1120 College Writing	3			
Year 2				
Biol 2101 Cellular Biology	3	Biol 1012; 4 credits organic chemistry		
Biol 2102 Cellular Biology lab	2			
Chem 2521 Organic Chemistry I	4	Chem 1152 or Chem 1162		
Chem 2522 Organic Chemistry II	4-5	Chem 2521		
Math 1297 Calculus II	5	Math 1290 or Math 1296		
OR Stat 2411 Statistical Methods	3	Math placement test		
OR Stat 3611 Intro To Prob & Statistics	4	Math 1290 or Math 1296		
Phys 1001 Introduction to Physics I **and**	5	Algebra, trigonometry		
Phys 1002 Introduction to Physics II	5	Phys 1001		
OR 2011 General Physics I **and**	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 1004 or higher		
Biol 4501 General Microbiology	4	Biol 2101		
Biol 4801 Evolution	2	Biol 2201		
Chem 2222 Quantitative Chemistry	3	Chem 1152 or Chem 1162		
Chem 2223 Quantitative Analysis Lab	1	Concurrent registration in Chem 2222		
Chem 3322 Biochemistry **and**	3	Chem 2522		
Chem 3324 Biochemistry Lab	1	Chem 3322 (concurrent registration ok)		
OR Chem 4341 Biochemistry I **and**	4	Chem 2522; Math 1296; physical chemistry rec		
Chem 4363 Biochemistry Lab	2	Chem 2222; Chem 3322 or 4342 (concurrent ok)		
Comp 3150 Advanced Writing: Science	3	Comp 1120; 60 credits		
Year 4				
Biol Elective*				
Biol Elective*				
Biol 5231 Molecular Biology	3	Biol 2101; Biol 2201		
Biol 5232 Molecular Biology Lab	2	Biol 5231 (concurrent registration ok)		
Biol 5361 Developmental Biology	4	Biol 2101; Biol 2201		
OR Biol 5331 Plant Development **and**	2	Biol 2101, 2201, and 3601 (or instr permission)		
Biol 5332 Plant Development Lab	2	Biol 5331 (concurrent registration ok)		
Biol 5601 Plant Physiology **and**	2	Biol 2101; Biol 2201		
Biol 5602 Plant Physiology Lab	2	Biol 5601 (concurrent registration ok)		
OR Phsl 5601 Phys of Organ Systems I **and**	3	Biol 2101 or 2201; Chem 3322 or 4341; Phsl 3011		
Phsl 5602 Physiology of Organ Systems II	2	Phsl 5601		

*A minimum of 6 credits, at least one course with a lab or a lab course (see Catalog for list).

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

The B.S. degree in Cell Biology satisfies requirements for a minor in Chemistry.