

BS with a Major in Biological Sciences—Molecular, Cellular, and Organismal Biology Concentration

Degree Requirements

To earn a Bachelor of Science in Liberal Arts and Sciences degree from UIC, students must complete university, college, and departmental degree requirements. The Department of Biological Sciences degree requirements are outlined below. Students should consult the [College of Liberal Arts and Sciences](#) section for additional degree requirements and college academic policies.

Code	Title	Hours
Summary of Requirements		
Required Prerequisite and Collateral Courses		27-28
Major Requirements		40
General Education and Electives to reach minimum Total Hours		52-53
Total Hours		120

General Education

See General Education and Writing-in-the-Discipline in the [College of Liberal Arts and Sciences](#) section for information on meeting these requirements. Students should consult the course lists below and their advisors to determine which courses are counted toward the General Education and Writing-in-the-Discipline requirements.

Required Prerequisite and Collateral Courses

Code	Title	Hours
Required Courses		
Select one of the following math courses:		4
MATH 170	Calculus for the Life Sciences ^{a,b}	
MATH 180	Calculus I ^{a,b,c}	
STAT 130	Introduction to Statistics for the Life Sciences ^a	
Select one of the following sequences in physics:		8
PHYS 131	Introductory Physics for Life Sciences I _b	
PHYS 132	Introductory Physics for Life Sciences II _b	
OR		
PHYS 141	General Physics I (Mechanics) ^{b,c}	
PHYS 142	General Physics II (Electricity and Magnetism) ^{b,c}	
Select one of the following sequences in general chemistry:		10
CHEM 116	Honors and Majors General and Analytical Chemistry I ^b	
CHEM 118	Honors and Majors General and Analytical Chemistry II ^b	

OR

CHEM 122	Matter and Energy ^d	
CHEM 123	Foundations of Chemical Inquiry I ^{c,d}	
CHEM 124	Chemical Dynamics ^d	
CHEM 125	Foundations of Chemical Inquiry II ^{c,d}	
CHEM 230	Organic Chemistry of Biological Systems	3-4
or CHEM 232	Structure and Function	
CHEM 233	Synthesis Techniques Laboratory	2

Total Hours **27-28**

- a *MATH 170, MATH 180, and STAT 130 fulfill the LAS Quantitative Reasoning requirement.*
- b *This course is approved for the Analyzing the Natural World General Education category.*
- c *MATH 180 and MATH 181 are recommended for students planning advance work in population biology and required for enrollment in PHYS 141 and PHYS 142.*
- d *General Education credit is given for successful completion of both CHEM 122 and CHEM 123 or CHEM 124 and CHEM 125.*

Major Requirements

Of the 40 semester hours for the major, no more than 11 hours may be at the 100 level. At least 9 hours must be from courses designated as Experimental Techniques and Data Analyses. A minimum of 9 hours should be at the 300 and/or 400 level. No more than 5 hours of BIOS independent study and research may be counted toward the major.

Code	Title	Hours
Required Courses		
BIOS 110	Biology of Cells and Organisms ^a	4
BIOS 120	Biology of Populations and Communities ^a	4
BIOS 220	Genetics	3
BIOS 222	Cell Biology	3
BIOS 230	Evolution and Ecology	3

In addition to required courses, students must complete one concentration chosen from General Biology; Molecular, Cellular, and Organismal Biology; or Evolution, Ecology, and Environmental Biology.

Concentration in Molecular, Cellular, and Organismal Biology

Required core courses:

BIOS 310	Genetics Laboratory ^b	2
BIOS 312	Cell Biology Laboratory ^b	2
BIOS 343	Animal Physiological Systems ^b	3

Select at least 5 hours in Experimental Techniques and Data Analyses:

BIOS 272	Comparative Vertebrate Anatomy	
BIOS 321	Developmental Biology Laboratory ^b	
BIOS 323	Molecular Biology Laboratory ^b	
BIOS 326	Embryology Laboratory	
BIOS 351	Microbiology Laboratory ^b	
BIOS 399	Independent Research ^{b,d}	
BIOS 420	Genomics ^b	

BIOS 443	Animal Physiological Systems Laboratory ^{b,c}	
Select three courses from the following:		9-11
BIOS 320	Developmental Biology	
BIOS 325	Human Embryology	
BIOS 350	General Microbiology	
BIOS 443	Animal Physiological Systems Laboratory ^{b,c}	
BIOS 450	Advanced Microbiology	
BIOS 458	Biotechnology and Drug Discovery	
BIOS 452 & BIOS 454	Biochemistry I and Biochemistry II ^e	
or BIOS 352	Introductory Biochemistry	
BIOS 490	Topics Biological Sciences ^f	
Additional hours of BIOS elective courses to bring the total to 40 semester hours.		0-2
Total Hours		40

- a *This course is approved for the Analyzing the Natural World General Education category.*
- b *BIOS 310, BIOS 312, BIOS 321, BIOS 323, BIOS 336, BIOS 351, BIOS 399, BIOS 420, BIOS 443, and BIOS 480 fulfill the Writing-in-the-Discipline requirement.*
- c *BIOS 443 can be used as a selective to either meet the Experimental Techniques and Data Analyses requirement OR the MCOB requirement for this concentration but not both.*
- d *BIOS 399 can only be counted once to fulfill Experimental Techniques and Data Analyses credit requirements.*
- e *BIOS 452 and BIOS 454 will count as two courses toward the three course requirement. However, if only BIOS 452 is taken, it will not count as an MCOB selective course.*
- f *BIOS 490 can only be used once with the consent of the advisor.*

Recommended Plan of Study

Course	Title	Hours
First Year		
Fall Semester		
ENGL 160	Academic Writing I: Writing in Academic and Public Contexts	3
MATH 180 or MATH 170 or STAT 130	Calculus I ^a or Calculus for the Life Sciences or Introduction to Statistics for the Life Sciences	4
Select one of the following:		5
CHEM 116	Honors and Majors General and Analytical Chemistry I	
CHEM 122 & CHEM 123	Matter and Energy and Foundations of Chemical Inquiry I ^b	
General Education Requirement course		3
Hours		15
Spring Semester		
ENGL 161	Academic Writing II: Writing for Inquiry and Research	3
Select one of the following:		5
CHEM 118	Honors and Majors General and Analytical Chemistry II	
CHEM 124 & CHEM 125	Chemical Dynamics and Foundations of Chemical Inquiry II ^b	
General Education Requirement course		3
BIOS 110 or BIOS 120	Biology of Cells and Organisms ^b or Biology of Populations and Communities	4
Hours		15

Second Year		
Fall Semester		
CHEM 230 or CHEM 232	Organic Chemistry of Biological Systems or Structure and Function	3-4
BIOS 110 or BIOS 120	Biology of Cells and Organisms ^b or Biology of Populations and Communities	4
Foreign Language		4
General Education Requirement course or Elective		3-4
Hours		15

Spring Semester		
BIOS 222	Cell Biology	3
BIOS 230	Evolution and Ecology	3
CHEM 233	Synthesis Techniques Laboratory	2
Foreign Language		4
General Education Requirement course		3
Hours		15

Third Year		
Fall Semester		
BIOS 220	Genetics	3
PHYS 131 or PHYS 141	Introductory Physics for Life Sciences I ^b or General Physics I (Mechanics)	4
BIOS 310 or BIOS 312	Genetics Laboratory or Cell Biology Laboratory	2
Foreign Language		4
General Education Requirement course		3
Hours		16

Spring Semester		
BIOS 310 or BIOS 312	Genetics Laboratory or Cell Biology Laboratory	2
BIOS 343	Animal Physiological Systems	3
PHYS 132 or PHYS 142	Introductory Physics for Life Sciences II or General Physics II (Electricity and Magnetism)	4
General Education Requirement course		3
Foreign Language		4
Hours		16

Fourth Year		
Fall Semester		
Select 5-9 hours from the following: ^c		5-9
BIOS experimental techniques and data analyses selectives ^c		
BIOS Selectives ^c		
BIOS Electives ^c		
General Education Requirement course		3
Electives		7
Hours		15-19

Spring Semester		
Select 5-9 hours from the following: ^c		5-9
BIOS experimental techniques and data analyses selectives ^c		
BIOS Selectives ^c		
BIOS Electives ^c		
Electives		8-9
Hours		13-18
Total Hours		120

- a *MATH 170, MATH 180, or STAT 130, individually, will satisfy the Quantitative Reasoning requirement with a grade of C or better.*
- b *The Analyzing the Natural World and the two additional General Education course requirements can be satisfied with four courses chosen from PHYS 131, PHYS 132, PHYS 141, PHYS 142, BIOS 110, BIOS 120 and/or CHEM 122/CHEM 123 and CHEM 124/CHEM 125.*
- c *To complete the degree, students must take 23 additional hours, including 9 hours in experimental techniques and data analyses and the biological sciences selectives/electives to meet concentration*

requirements (21-25 hours for MCOB). At least 9 of these 23 hours must be taken at the 300 to 400 level (excluding BIOS 391).