

BIOLOGICAL SCIENCES (BS)

General Curriculum in Biology

General Curriculum in Biology - BS in Biological Sciences

Suggested Four-Year Flowcharts are planning guides and do not represent a required course sequence.

Courses may be completed in a different order, provided requisite requirements are satisfied.

First Year

Term 1		Units
BIO 1150	Life: History and Diversity (5B & 5C) ¹	4
CHEM 1120	Fundamentals of Chemical Structure and Properties (5A) ¹	4
STAT 1110	Applied Statistical Concepts and Methods	3
General Education Requirement (1A)		3

Units **14**

Term 2		Units
BIO 1151	Life: Molecules and Cells	4
CHEM 1122	Fundamentals of Chemical Reactivity	4
MATH 1264	Calculus for Data Science I (2) ¹	4
General Education Requirement (1B)		3

Units **15**

Second Year

Term 1		Units
BIO 2253	Principles of Ecology and Evolution	4
CHEM 2240 or CHEM 2242	Organic Chemistry: Fundamentals and Applications ³ or Organic Chemistry I	4-5
PHYS 1121 or PHYS 1141	College Physics I or General Physics I	4
General Education Requirement (1C)		3

Units **15**

Term 2		Units
BIO 3351	Principles of Genetics	3
BIO 3352	Principles of Animal Physiology	4
Technical Elective ⁴		3-4
General Education Requirement		3

Units **13**

Third Year

Term 1		Units
Bioscience Elective ^{4,6}		4
Approved Elective ^{2,4,7,8,9,10}		4
General Education Requirement		3
General Education Requirement		3
Free Elective ⁵		1-2

Units **16**

Term 2		Units
4000-level Elective ^{4,6}		3
Bioscience Elective ^{4,6}		4
Approved Elective ^{2,4,7,8,9,10}		3
General Education Requirement		3
General Education Requirement		3

Units **16**

Fourth Year

Term 1		Units
4000-level Elective ^{4,6}		4
4000-level Elective ^{4,6}		3
Approved Elective ^{2,4,7,8,9,10}		3
General Education Requirement		3
General Education Requirement		3

Units **16**

Term 2		
BIO 4461	Senior Project - Research Proposal	2
or BIO 4462	or Senior Project - Research Experience	
or BIO 4463	or Senior Project - Meta-analysis in Biology	
Approved Elective ^{2,4,7,8,9,10}		3
Approved Elective ^{2,4,7,8,9,10}		3
General Education Requirement		3
Free Elective ⁵		4
	Units	15
	Total Units	120

- ¹ Required in Major or Support; also satisfies General Education (GE) requirement.
- ² Courses taken to meet a Major or Support requirement cannot be double-counted in a concentration or the General curriculum.
- ³ Students in the Molecular and Cellular Biology concentration should take CHEM 2242 to satisfy this requirement.
- ⁴ Consultation with an advisor is recommended prior to selecting courses; the best choice for an individual will depend on area of interest, and may impact post-baccalaureate studies and career plans.
- ⁵ If a General Education (GE) course is used to satisfy a Major or Support requirement, additional units of Free Electives may be needed to complete the total units required for the degree.
- ⁶ Excess units will be applied to Bioscience Electives or Approved Electives.
- ⁷ Taking a General Education (GE) course that double-counts as an elective may cause an upper-division unit shortage. Use care to ensure that you have taken enough 3000-4000 level courses to meet the required 40 units of upper-division coursework.
- ⁸ If BIO 4461, BIO 4462, or BIO 4463 is used to meet the senior project requirement, it cannot also be counted as an elective.
- ⁹ Maximum of 6 units may be applied toward Approved Electives from the following: BIO 2200, BIO 3300, BIO 4400, BIO 4450, BIO 4466, BIO 4485, BIO 4495, or MSCI 4401.
- ¹⁰ Maximum of 2 units may be applied toward Approved Electives from ENGR/SCM 3302.

Anatomy and Physiology

Anatomy and Physiology Concentration - BS in Biological Sciences

Suggested Four-Year Flowcharts are planning guides and do not represent a required course sequence.

Courses may be completed in a different order, provided requisite requirements are satisfied.

First Year

Term 1	Units
BIO 1150	Life: History and Diversity (5B & 5C) ¹
CHEM 1120	Fundamentals of Chemical Structure and Properties (5A) ¹
STAT 1110	Applied Statistical Concepts and Methods
General Education Requirement (1A)	3
Units	
	14

Term 2	
BIO 1151	Life: Molecules and Cells
CHEM 1122	Fundamentals of Chemical Reactivity
MATH 1264	Calculus for Data Science I (2) ¹
General Education Requirement (1B)	3
Units	
	15

Second Year

Term 1	Units
BIO 2253	Principles of Ecology and Evolution
CHEM 2240 or CHEM 2242	Organic Chemistry: Fundamentals and Applications ³ or Organic Chemistry I
PHYS 1121 or PHYS 1141	College Physics I or General Physics I
General Education Requirement (1C)	3
Units	
	15

Term 2	
BIO 3351	Principles of Genetics
BIO 3352	Principles of Animal Physiology
Technical Elective ⁴	3-4
General Education Requirement	3
Units	
	13

Third Year

Term 1	Units
BIO 4431	Advanced Anatomy and Physiology I
Approved Elective ^{2,7,8,9}	4
General Education Requirement	3
General Education Requirement	3
Free Elective ⁵	1-2
Units	
	16

Term 2	
BIO 4432	Advanced Anatomy and Physiology II
CHEM 3352	Biochemistry
Approved Elective ^{2,7,8,9}	3
General Education Requirement	3
Free Elective ⁵	2
Units	
	16

Fourth Year

Term 1	Units
Anatomy and Physiology Elective ⁶	4
Anatomy and Physiology Elective ⁶	4
General Education Requirement	3
General Education Requirement	3
Free Elective ⁵	0-2
Units	
	16

Term 2	
BIO 4461 or BIO 4462 or BIO 4463	Senior Project - Research Proposal or Senior Project - Research Experience or Senior Project - Meta-analysis in Biology
Anatomy and Physiology Elective ⁶	3
Approved Elective ^{2,7,8,9}	4

General Education Requirement		3
General Education Requirement		3
	Units	15
	Total Units	120

- 1 Required in Major or Support; also satisfies General Education (GE) requirement.
- 2 Courses taken to meet a Major or Support requirement cannot be double-counted in a concentration or the General curriculum.
- 3 Students in the Molecular and Cellular Biology concentration should take CHEM 2242 to satisfy this requirement.
- 4 Consultation with an advisor is recommended prior to selecting electives; the best choice for an individual will depend on area of interest and career plans.
- 5 If a General Education (GE) course is used to satisfy a Major or Support requirement, additional units of Free Electives may be needed to complete the total units required for the degree.
- 6 Excess Anatomy and Physiology Elective units will be applied to Approved Electives.
- 7 Maximum of 6 units may be applied toward Approved Electives from: BIO 3300, BIO 4400, BIO 4450, BIO 4466, BIO 4485, BIO 4495.
- 8 Maximum of 2 units may be applied toward Approved Electives from ENGR/SCM 3302 or MSCI 4401.
- 9 If BIO 4461, BIO 4462, or BIO 4463 is used to meet the senior project requirement, it cannot be double-counted as an approved elective.

Ecology, Evolution, Biodiversity, and Conservation

Ecology, Evolution, Biodiversity, and Conservation Concentration - BS in Biological Sciences
 Suggested Four-Year Flowcharts are planning guides and do not represent a required course sequence.
 Courses may be completed in a different order, provided requisite requirements are satisfied.

First Year

Term 1	Units
BIO 1150	Life: History and Diversity (5B & 5C) ¹
CHEM 1120	Fundamentals of Chemical Structure and Properties (5A) ¹
STAT 1110	Applied Statistical Concepts and Methods
General Education Requirement (1A)	3
Units	
	14

Term 2	
BIO 1151	Life: Molecules and Cells
CHEM 1122	Fundamentals of Chemical Reactivity
MATH 1264	Calculus for Data Science I (2) ¹
General Education Requirement (1B)	3
Units	
	15

Second Year

Term 1	Units
BIO 2253	Principles of Ecology and Evolution
CHEM 2240 or CHEM 2242	Organic Chemistry: Fundamentals and Applications ³ or Organic Chemistry I
PHYS 1121 or PHYS 1141	College Physics I or General Physics I
General Education Requirement (1C)	3
Units	
	15

Term 2	
BIO 3351	Principles of Genetics
Biodiversity Course ^{6,7}	4
Technical Elective ⁴	3-4
General Education Requirement	3
General Education Requirement	3
Units	
	16

Third Year

Term 1	Units
BIO 3352	Principles of Animal Physiology
Ecology Course ⁶	3
General Education Requirement	3
General Education Requirement	3
Free Elective ⁵	1-2
Units	
	15

Term 2	
BIO 4413 or BIO 4414	Evolutionary Medicine or Evolution
Ecology Course ⁶	4
Approved Elective ^{2,4,8,9,10}	4
General Education Requirement	3
Units	
	15

Fourth Year

Term 1	Units
BIO 3343 or MSCI 4439	Principles of Conservation Biology ⁶ or Marine Fisheries and Conservation
Approved Elective ^{2,4,8,9,10}	4
General Education Requirement	3
General Education Requirement	3
Free Elective ⁵	2
Units	
	15

Term 2	
BIO 4461 or BIO 4462 or BIO 4463	Senior Project - Research Proposal or Senior Project - Research Experience or Senior Project - Meta-analysis in Biology
	2

Biodiversity Course ^{6,7}	4
Approved Elective ^{2,4,8,9,10}	4
General Education Requirement	3
Free Elective ⁵	2
Units	15
Total Units	120

- ¹ Required in Major or Support; also satisfies General Education (GE) requirement.
- ² Courses taken to meet a Major or Support requirement cannot be double-counted in a concentration or the General curriculum.
- ³ Students in the Molecular and Cellular Biology concentration should take CHEM 2242 to satisfy this requirement.
- ⁴ Consultation with an advisor is recommended prior to selecting courses; the best choice for an individual will depend on area of interest, and may impact post-baccalaureate studies and career plans.
- ⁵ If a General Education (GE) course is used to satisfy a Major or Support requirement, additional units of Free Electives may be needed to complete the total units required for the degree.
- ⁶ Excess units will be applied to Approved Electives.
- ⁷ Students seeking certification (e.g., as an Associate Wildlife Biologist from the Wildlife Society) should see their faculty advisor for guidance.
- ⁸ Maximum of 6 units may be applied toward Approved Electives from the following: BIO 3300, BIO 4400, BIO 4450, BIO 4466, BIO 4485, BIO 4495.
- ⁹ If BIO 4461, BIO 4462, or BIO 4463 is used to meet the senior project requirement, it cannot be double-counted as an approved elective.
- ¹⁰ Maximum of 2 units may be applied toward the Approved Electives from ENGR/SCM 3302 or MSCI 4401.

Molecular and Cellular Biology

Molecular and Cellular Biology Concentration - BS in Biological Sciences

Suggested Four-Year Flowcharts are planning guides and do not represent a required course sequence.

Courses may be completed in a different order, provided requisite requirements are satisfied.

First Year

Term 1	Units
BIO 1150	Life: History and Diversity (5B & 5C) ¹
CHEM 1120	Fundamentals of Chemical Structure and Properties (5A) ¹
STAT 1110	Applied Statistical Concepts and Methods
General Education Requirement (1A)	3

Units **14**

Term 2	Units
BIO 1151	Life: Molecules and Cells
CHEM 1122	Fundamentals of Chemical Reactivity
MATH 1264	Calculus for Data Science I (2) ¹
General Education Requirement (1B)	3

Units **15**

Second Year

Term 1	Units
BIO 2255	Molecular and Cellular Biology Lab Skills
BIO 3351	Principles of Genetics
CHEM 2240 or CHEM 2242	Organic Chemistry: Fundamentals and Applications ³ or Organic Chemistry I
General Education Requirement (1C)	3
General Education Requirement	3

Units **14**

Term 2	Units
BIO 2253	Principles of Ecology and Evolution
BIO 3352	Principles of Animal Physiology
PHYS 1121 or PHYS 1141	College Physics I or General Physics I
General Education Requirement	3

Units **15**

Third Year

Term 1	Units
BIO 4457	Molecular Biology Laboratory
Approved Elective ^{2,7,8,9}	4
Technical Elective ⁴	3-4
General Education Requirement	3
General Education Requirement	3

Units **16**

Term 2	Units
BIO 4452	Cell Biology
Advanced Elective ^{2,4,6}	3
Approved Elective ^{2,7,8,9}	4
General Education Requirement	3
General Education Requirement	3

Units **16**

Fourth Year

Term 1	Units
Advanced Elective ^{2,4,6}	4
Approved Elective ^{2,7,8,9}	4
Approved Elective ^{2,7,8,9}	2
General Education Requirement	3
Free Elective ⁵	3

Units **16**

Term 2	Units
BIO 4461 or BIO 4462 or BIO 4463	Senior Project - Research Proposal or Senior Project - Research Experience or Senior Project - Meta-analysis in Biology
Advanced Elective ^{2,4,6}	3

Approved Elective ^{2,7,8,9}	3
General Education Requirement	3
Free Elective ⁵	2-3
Units	14
Total Units	120

- ¹ Required in Major or Support; also satisfies General Education (GE) requirement.
- ² Courses taken to meet a Major or Support requirement cannot be double-counted in a concentration or the General curriculum.
- ³ Students in the Molecular and Cellular Biology concentration should take CHEM 2242 to satisfy this requirement.
- ⁴ Consultation with an advisor is recommended prior to selecting courses; the best choice for an individual will depend on area of interest, and may impact post-baccalaureate studies and career plans.
- ⁵ If a General Education (GE) course is used to satisfy a Major or Support requirement, additional units of Free Electives may be needed to complete the total units required for the degree.
- ⁶ Excess units from Advanced Electives applied to Approved Electives.
- ⁷ Consult with your faculty advisor for approval to use other relevant upper-division coursework from other departments.
- ⁸ Maximum of 6 units may be applied toward Approved Electives from the following: BIO 3300, BIO 4400, BIO 4450, BIO 4466, BIO 4485, BIO 4495.
- ⁹ Maximum of 2 units may be applied toward Approved Electives from ENGR/SCM 3302 or MSCI 4401.