BS IN BIOLOGY

The Bachelor of Science degree in Biology requires a minimum of 120 hours of coursework and provides students with a strong foundation in molecular and cellular biology and develops their critical thinking skills, to prepare for careers in research, medicine, dentistry, bioinformatics, veterinary medicine, and many others. This degree is ideal for students planning on attending professional school or pursuing a master's or Ph.D. degree in the biological sciences.

Program includes:

- Biology, BS
- Biology - Cell and Molecular Biology Concentration, BS
- Biology -Bioinformatics Concentration, BS
- Biology -Neuroscience Concentration, BS

Biology, BS

Code	Title	Hours
UToledo Core Curriculum		36
UToledo Multicultural		6
College of NSM Degree Requirements		
NSM 1000	Foundations of Academic Success for Science and Math Majors	1
NSM 1500	Building a Career in Science and Math	1
One WAC course within the Program (3 cr)		
Course Requirements for the BS Biology		
Required Biology courses:		
BIOL 2170	Fundamentals of Life Science: Biomolecules, Cells, and Inheritance	4
BIOL 2180	Fundamentals of Life Science Laboratory: Biomolecules, Cells, and Inheritance	1
BIOL 2150	Fundamentals Of Life Science: Diversity Of Life, Evolution And Adaptation	4
BIOL 2160	Fundamentals Of Life Science Laboratory: Diversity Of Life, Evolution And Adaptation	1
BIOL 3010	Molecular Genetics	3
BIOL 3030	Cell Biology	3
BIOL 3070	Human Physiology	3
BIOL 3090	Developmental Biology	3
BIOL 4700	Biological Literature And Communication (WAC)	3
A minimum of nine hours of advanced elective BIOL courses (3000 - 4000 level), including two laboratory or field experiences.		9
A maximum of three credit hours of BIOL 4910 not applied to Departmental Honors may be used to fulfill the advanced elective credits.		
Required Related courses:		
MATH 2600	Introduction To Statistics	3
or MATH 2640	Statistics for Applied Science	
or PSY 2100	Statistical Methods	
MATH 1750	Calculus For The Life Sciences With Applications I	3
or MATH 1850	Single Variable Calculus I	
MATH 1760	Calculus For The Life Sciences With Applications II	3
or MATH 1860	Single Variable Calculus II	
CHEM 1230	General Chemistry I	4
CHEM 1280	General Chemistry Lab I	1
CHEM 1240	General Chemistry II	4
CHEM 1290	General Chemistry Lab II	1
CHEM 2410	Organic Chemistry I	3
CHEM 2460	Organic Chemistry Laboratory I for Non-Majors	1
CHEM 2420	Organic Chemistry II	3
CHEM 3510	Biochemistry I	3
CHEM 3520	Biochemistry II	3
Required Introductory Physics Sequence:		10
Either (PHYS 2070 General Physics I with PHYS 2075 Lab AND PHYS 2080 General Physics II with PHYS 2085 Lab)		
OR		
(PHYS 2130 Physics for Science and Engineering Majors I with PHYS 2135 Lab AND PHYS 2140 Physics for Science and Engineering Majors I with PHYS 2145 Lab)		
No classes used to satisfy the requirements of the Biology major, including related courses, may be taken P/NC with the exceptions of BIOL 4910, BIOL 4950, and BIOL 4990.		
Total Hours		**120**

Combined bachelor's to master's- MS Biology - Cell and Molecular Biology (Track C Research or Track D Non-Research)

Undergraduate students accepted to the BS in Biology/MS Biology - Cell and Molecular Biology (Track C Research or Track D Non-Research) option will be admitted to the MS Biology - Cell and Molecular Biology and allowed to complete up to three graduate level classes (nine credit hours) during their final academic year of undergraduate studies. Students admitted into the pipeline program must apply for admission to the College of Graduate Studies for the semester that they intend to matriculate. They will then continue in to the graduate program upon completion of the undergraduate degree requirements. The graduate coursework (up to nine hours) may be applied to completion of both undergraduate and graduate degree requirements. It will be the joint responsibility of the faculty and administrators in the undergraduate and graduate programs to supervise students admitted to the combined program option, to ensure that the limit of nine hours taken as an undergraduate is strictly enforced, and to request that the College of Graduate Studies change their matriculation from Undergraduate to Graduate when they meet all undergraduate degree requirements.

The following provisions apply for classes taken for graduate credit: 1) graduate classes taken at The University of Toledo only after the student is accepted in the program, 2) BIOL 6030 Introduction to Graduate Studies, BIOL 6040 Introduction to Graduate Cell and Molecular Biology and Methods, BIOL 6200 Advanced Signal Transduction or BIOL 6090 Advanced Cell Biology or BIOL 6960 Graduate Research may be included in the approved nine semester hours of graduate credit taken as an undergraduate. Students interested in the combined program must

submit a graduate admission application to the College of Graduate Studies.

Biology -Bioinformatics Concentration, BS

The following biology courses must be included:

BIOL 2150 (https://catalog.utoledo.edu/search/?P=BIOL%202150) Fundamentals Of Life Science: Diversity Of Life, Evolution And Adaptation (4 credits)
BIOL 2160 (https://catalog.utoledo.edu/search/?P=BIOL%202160) Fundamentals Of Life Science Laboratory: Diversity Of Life, Evolution And Adaptation (1 credit)
BIOL 2170 (https://catalog.utoledo.edu/search/?P=BIOL%202170) Fundamentals of Life Science: Biomolecules, Cells, and Inheritance (4 credits)
BIOL 2180 (https://catalog.utoledo.edu/search/?P=BIOL%202180) Fundamentals of Life Science Laboratory: Biomolecules, Cells, and Inheritance (1 credit)
BIOL 3010 (https://catalog.utoledo.edu/search/?P=BIOL%203010) Molecular Genetics (3 credits)
BIOL 3030 (https://catalog.utoledo.edu/search/?P=BIOL%203030) Cell Biology (3 credits)
BIOL 4010 (https://catalog.utoledo.edu/search/?P=BIOL%203090) Molecular Biology (3 credits)
OR BIOL 4110 (https://catalog.utoledo.edu/search/?P=BIOL%203090) Human Genetics and Genomics (3 credits)
OR BIOL 4210 (https://catalog.utoledo.edu/search/?P=BIOL%203090) Molecular Basis of Disease (3 credits) (replaces later required graduate course)
BIOL 4700 (https://catalog.utoledo.edu/search/?P=BIOL%204700) Biological Literature and Communication (3 credits)

Required upper-division biology labs:

- BIOL 3020 (https://catalog.utoledo.edu/search/?P=BIOL%203010) Molecular Genetics Lab (2 credits)
- BIOL 4910 (https://catalog.utoledo.edu/search/?P=BIOL%204910) Undergraduate Research (1 credit)
  Honors students in the Bioinformatics Concentration may co-apply three credit hours of BIOL4910 to both the Honors and Bioinformatics Concentration requirements (provided the research was conducted in a laboratory making significant use of bioinformatic analyses). However, consistent with Honors Program policy, any BIOL4910 credit hours used to satisfy Honors requirements cannot be applied towards the two Laboratory or Field Experience requirements of the BS degree, regardless of whether they are applied within the Bioinformatics Concentration.

  No classes used to satisfy the requirements of the Biology major may be taken P/NC with the exceptions of BIOL 4910 (https://catalog.utoledo.edu/search/?P=BIOL%204910), BIOL 4950 (https://catalog.utoledo.edu/search/?P=BIOL%204950), and BIOL 4990 (https://catalog.utoledo.edu/search/?P=BIOL%204990).

  Bioinformatics Concentration: A concentration in bioinformatics is available to students pursuing a BS in Biology. This is only part of a pipeline program, for students seeking to earn both a BS in Biology and a Masters in Bioinformatics in 5-5.5 years. Students must apply the following courses towards their BS in Biology degree. Note that three of these are graduate-level courses, open only to students in the pipeline program, and those nine credits will count towards BOTH the BS in Biology AND the MS in Bioinformatics:

  BIPG 5100 (https://catalog.utoledo.edu/search/?P=BIOL%204250) Fundamentals of Bioinformatics (3 credits)
  BIPG 5200 (https://catalog.utoledo.edu/search/?P=BIOL%204700) Statistical Methods in Bioinformatics (3 credits)
  BIPG 6100 (https://catalog.utoledo.edu/search/?P=PSY%203400) Bioinformatic Computation (3 credits)

  Total Credits: 34

  The following related courses in mathematics, physics and chemistry are also required:

  MATH 2600 (https://catalog.utoledo.edu/search/?P=MATH%202600) Introduction To Statistics (or MATH 2640 (https://catalog.utoledo.edu/search/?P=MATH%202640) or PSY 2100 (https://catalog.utoledo.edu/search/?P=PSY%202100))
  MATH 1750 (https://catalog.utoledo.edu/search/?P=MATH%201750) Calculus for the Life Sciences with Applications I (or MATH 1830 (https://catalog.utoledo.edu/search/?P=MATH%201830) or MATH 1850 (https://catalog.utoledo.edu/search/?P=MATH%201850))
  MATH 1760 (https://catalog.utoledo.edu/search/?P=MATH%201760) Calculus for the Life Sciences with Applications I (or MATH 1840 (https://catalog.utoledo.edu/search/?P=MATH%201840) or MATH 1860 (https://catalog.utoledo.edu/search/?P=MATH%201860))
  CHEM 1230 (https://catalog.utoledo.edu/search/?P=CHEM%201230) General Chemistry I
  CHEM 1280 (https://catalog.utoledo.edu/search/?P=CHEM%201280) General Chemistry Lab I
  CHEM 1240 (https://catalog.utoledo.edu/search/?P=CHEM%201240) General Chemistry II
  CHEM 1290 (https://catalog.utoledo.edu/search/?P=CHEM%201290) General Chemistry Lab II
  CHEM 2410 (https://catalog.utoledo.edu/search/?P=CHEM%202410) Organic Chemistry I
  CHEM 2460 (https://catalog.utoledo.edu/search/?P=CHEM%202460) Organic Chemistry Laboratory I for Non-Majors
  CHEM 2420 (https://catalog.utoledo.edu/search/?P=CHEM%202420) Organic Chemistry II
  CHEM 3510 (https://catalog.utoledo.edu/search/?P=CHEM%203510) Biochemistry I
  CHEM 3520 (https://catalog.utoledo.edu/search/?P=CHEM%203520) Biochemistry II
  PHYS 2070 (https://catalog.utoledo.edu/search/?P=PHYS%202070) General Physics I and PHYS 2075 (or PHYS 2130 (https://catalog.utoledo.edu/search/?P=PHYS%202130) and PHYS 2135)
  PHYS 2080 (https://catalog.utoledo.edu/search/?P=PHYS%202080) General Physics II and PHYS 2085 (or PHYS 2140 (https://catalog.utoledo.edu/search/?P=PHYS%202140) and PHYS 2145)

Biology - Cell and Molecular Biology Concentration, BS

The following courses are required for the BS Biology - Cell and Molecular Concentration:

Code	Title	Hours
UToledo Core Curriculum		36
UToledo Multicultural		6
College of NSM Degree Requirements		
NSM 1000	Foundations of Academic Success for Science and Math Majors	1
NSM 1500	Building a Career in Science and Math	1
One WAC course within the Program (3 cr)		
Required Biology courses:		
BIOL 2150	Fundamentals Of Life Science: Diversity Of Life, Evolution And Adaptation	4
BIOL 2160	Fundamentals Of Life Science Laboratory: Diversity Of Life, Evolution And Adaptation	1
BIOL 2170	Fundamentals of Life Science: Biomolecules, Cells, and Inheritance	4
BIOL 2180	Fundamentals of Life Science Laboratory: Biomolecules, Cells, and Inheritance	1
BIOL 3010	Molecular Genetics	3
BIOL 3030	Cell Biology	3
BIOL 3070	Human Physiology	3
or BIOL 3090	Developmental Biology	
BIOL 4010	Molecular Biology	3
BIOL 4700	Biological Literature And Communication (WAC)	3
A minimum of nine hours of advanced elective BIOL courses (3000 - 4000 level), including two laboratory or field experiences. A maximum of three credit hours of BIOL 4910 not applied to Departmental Honors may be used to fulfill the advanced elective credits.		9
Required related courses in mathematics, physics and chemistry:		
MATH 2600	Introduction To Statistics	3
or MATH 2640	Statistics for Applied Science	
or PSY 2100	Statistical Methods	
MATH 1750	Calculus For The Life Sciences With Applications I	4
or MATH 1850	Single Variable Calculus I	
or MATH 1860	Single Variable Calculus II	
CHEM 1230	General Chemistry I	4
CHEM 1280	General Chemistry Lab I	1
CHEM 1240	General Chemistry II	4
CHEM 1290	General Chemistry Lab II	1
CHEM 2410	Organic Chemistry I	3
CHEM 2420	Organic Chemistry II	3
CHEM 2460	Organic Chemistry Laboratory I for Non-Majors	1
CHEM 3510	Biochemistry I	3
CHEM 3520	Biochemistry II	3
Take one of these combinations:		5
PHYS 2070 & PHYS 2075	General Physics I and General Physics I - Lab	
PHYS 2130 & PHYS 2135	Physics For Science And Engineering Majors I and Physics for Science and Engineering Majors I - Lab	
Take one of these combinations:		5
PHYS 2080 & PHYS 2085	General Physics II and General Physics II - Lab	
PHYS 2140 & PHYS 2145	Physics For Science And Engineering Majors II and Physics for Science and Engineering Majors II - Lab	
Elective to complete 120 credit hours		2
Total Hours		**120**

No classes used to satisfy the requirements of the Biology major, including related courses, may be taken P/NC with the exceptions of BIOL 4910, BIOL 4950, and BIOL 4990.

Combined bachelor's to master's - SM-BIOL-BS-CMOL : BS in Cell/ Molecular Biology Concentration

Undergraduate students accepted to the SM-BIOL-BS-CMOL : BS in Cell/ Molecular Biology Concentration option may be admitted to the SM-BIOL-MS-CMOL : MS in Cell/Molecular Biology Concentration and allowed to complete graduate level classes (nine credit hours) during their final academic year of undergraduate studies. Applicants need to be accepted to BA or BS program in biology. To enter the combined program, an undergraduate student needs to have an overall ~~BS or BA with a~~ GPA of 3.00 or an overall GPA of 2.75 with a GPA of at least 3.00 in the last 30 credit hours.

Students admitted into the pipeline program must apply for admission to the College of Graduate Studies for the semester that they intend to matriculate. They will then continue in to the graduate program upon completion of the undergraduate degree requirements. The graduate coursework (up to nine hours) may be applied to completion of both undergraduate and graduate degree requirements. It will be the joint responsibility of the faculty and administrators in the undergraduate and graduate programs to supervise students admitted to the combined program option, to ensure that the limit of nine hours taken as an undergraduate is strictly enforced, and to request that the College of Graduate Studies change their matriculation from Undergraduate to Graduate when they meet all undergraduate degree requirements.

The following provisions apply for classes taken for graduate credit:

```
1) Graduate classes taken at The University of Toledo only after
 the student is accepted in the program. 2)
```

```
BIOL 6030 Introduction to Graduate Studies BIOL 6040 Introduction
 to Graduate Cell and Molecular Biology and Methods BIOL 6200
 Advanced Signal Transduction or BIOL 6090 Advanced Cell
 Biology BIOL 6960 Graduate Research
```

are included in the approved nine semester hours of graduate credit taken as an undergraduate. Students interested in the combined program must submit a graduate admission application to the College of Graduate Studies.

Biology -Neuroscience Concentration, BS

The following courses must be included:

BIOL 2170 Fundamentals of Life Science: Biomolecules, Cells, and Inheritance
BIOL 2180 Fundamentals of Life Science Laboratory: Biomolecules, Cells, and Inheritance
BIOL 2150 Fundamentals Of Life Science: Diversity Of Life, Evolution And Adaptation
BIOL 2160 Fundamentals Of Life Science Laboratory: Diversity Of Life, Evolution And Adaptation
BIOL 3010 Molecular Genetics
BIOL 3030 Cell Biology
BIOL 3070 Human Physiology
BIOL 3090 Developmental Biology
BIOL 4700 Biological Literature and Communication

A minimum of nine hours of advanced elective BIOL courses (3000 - 4000 level), including two laboratory or field experiences. A maximum of three credit hours of BIOL 4910 not applied to Departmental Honors may be used to fulfill the advanced elective credits.

The following related courses in mathematics, physics and chemistry are also required:

MATH 2600Introduction To Statistics (or MATH 2640 or PSY 2100)
MATH 1750Calculus for the Life Sciences with Applications I (or MATH 1830or MATH 1850)
MATH 1760Calculus for the Life Sciences with Applications I (or MATH 1840or MATH 1860)

CHEM 1230General Chemistry I
CHEM 1280General Chemistry Lab I
CHEM 1240General Chemistry II
CHEM 1290General Chemistry Lab II
CHEM 2410Organic Chemistry I
CHEM 2460Organic Chemistry Laboratory I for Non-Majors
CHEM 2420Organic Chemistry II
CHEM 3510Biochemistry I
CHEM 3520Biochemistry II

PHYS 2070General Physics I and PHYS 2075 (*or* PHYS 2130 and PHYS 2135)
PHYS 2080General Physics II and PHYS 2085 (*or* PHYS 2140 and PHYS 2145)

No classes used to satisfy the requirements of the Biology major or minor may be taken P/NC with the exceptions ofBIOL 4910,BIOL 4950, and BIOL 4990.

Neuroscience Concentration: A concentration in neuroscience is available to students pursuing a BS in Biology. Students must apply the following courses towards their BS in Biology degree:

BIOL 2050 Fundamentals of Neuroscience I
BIOL 3050 Fundamentals of Neuroscience II
BIOL 4910 Undergraduate Research (in a section with a neuroscience focus)
BIOL 4700 Biological Literature And Communication (in a section with a neuroscience focus)
PSY 3400 Cognitive Neuropsychology *or* PSY 3610 Behavioral Neuroscience *or* any NSCI 4000 level course

Biology, BS
Biology - Bioinformatics Concentration, BS (p. 5)
Biology - Cell and Molecular Biology Concentration, BS (p. 3)
Biology - Neuroscience Concentration, BS (p. 7)

Biology, BS

First Term		Hours
NSM 1000	Foundations of Academic Success for Science and Math Majors	1
BIOL 2170	Fundamentals of Life Science: Biomolecules, Cells, and Inheritance	4
BIOL 2180	Fundamentals of Life Science Laboratory: Biomolecules, Cells, and Inheritance	1
CHEM 1230	General Chemistry I	4
CHEM 1280	General Chemistry Lab I	1
ENGL 1110	College Composition I	3
	Hours	**14**
Second Term		
NSM 1500	Building a Career in Science and Math	1
BIOL 2150	Fundamentals Of Life Science: Diversity Of Life, Evolution And Adaptation	4
BIOL 2160	Fundamentals Of Life Science Laboratory: Diversity Of Life, Evolution And Adaptation	1
CHEM 1240	General Chemistry II	4
CHEM 1290	General Chemistry Lab II	1
ENGL 1130	College Composition II: Academic Disciplines And Discourse	3
Arts/Humanities Core		3
	Hours	**17**
Third Term		
BIOL 3010	Molecular Genetics	3
BIOL 3020	Molecular Genetics Laboratory [1]	2
CHEM 2410	Organic Chemistry I	3
CHEM 2460	Organic Chemistry Laboratory I for Non-Majors	1
Select one of the following:		4
MATH 1750	Calculus For The Life Sciences With Applications I	
MATH 1850	Single Variable Calculus I	
Social Sciences Core		3
	Hours	**16**
Fourth Term		
BIOL 3030	Cell Biology	3
CHEM 2420	Organic Chemistry II	3
Select one of the following:		3-4
MATH 1760	Calculus For The Life Sciences With Applications II	
MATH 1860	Single Variable Calculus II	
Social Sciences Core		3

Arts/Humanities Core		3
	Hours	**15-16**
Fifth Term		
BIOL 3090	Developmental Biology	3
BIOL 3100	Developmental Biology Laboratory [1]	1
PHYS 2070	General Physics I	4
PHYS 2075	General Physics I - Lab	1
CHEM 3510	Biochemistry I	3
Diversity of US		3
	Hours	**15**
Sixth Term		
BIOL 3070	Human Physiology	3
PHYS 2080	General Physics II	4
PHYS 2085	General Physics II - Lab	1
CHEM 3520	Biochemistry II	3
Writing Across the Curriculum Elective (WAC)		3
	Hours	**14**
Seventh Term		
BIOL 3XXX/4XXX Major Requirement [2]		3
Arts/Humanities Core		3
Electives to get to 120 hours		9
	Hours	**15**
Eighth Term		
BIOL 4700	Biological Literature And Communication	3
BIOL 3XXX/4XXX Major Requirement [2]		3
MATH 2600 or MATH 2640	Introduction To Statistics or Statistics for Applied Science	3
Electives to get to 120 hours		2
Non-US Diversity		3
	Hours	**14**
	Total Hours	**120-121**

[1] May take different 3000-4000 level lab in different semester, 2 lab experiences are required.

[2] 9 hours of 3000-4000 level BIOL electives are required. Hours from the 3000-4000 level BIOL lab requirement count toward elective requirements.

Biology -Bioinformatics Concentration, BS

First Term		**Hours**
BIOL 2150	Fundamentals Of Life Science: Diversity Of Life, Evolution And Adaptation	4
BIOL 2160	Fundamentals Of Life Science Laboratory: Diversity Of Life, Evolution And Adaptation	1
CHEM 1230	General Chemistry I	4
CHEM 1280	General Chemistry Lab I	1
ENGL 1110	College Composition I	3
NSM 1000	Foundations of Academic Success for Science and Math Majors	2
	Hours	**15**
Second Term		
BIOL 2170	Fundamentals of Life Science: Biomolecules, Cells, and Inheritance	4
BIOL 2180	Fundamentals of Life Science Laboratory: Biomolecules, Cells, and Inheritance	1
CHEM 1240	General Chemistry II	4
CHEM 1290	General Chemistry Lab II	1
ENGL 1130	College Composition II: Academic Disciplines And Discourse	3
Elective		3
	Hours	**16**
Third Term		
BIOL 3010	Molecular Genetics	3
BIOL 3020	Molecular Genetics Laboratory	2
CHEM 2410	Organic Chemistry I	3
CHEM 2460	Organic Chemistry Laboratory I for Non-Majors	1
MATH 1750 or MATH 1850	Calculus For The Life Sciences With Applications I or Single Variable Calculus I	4
Elective		3
	Hours	**16**
Fourth Term		
BIOL 3030	Cell Biology	3
CHEM 2420	Organic Chemistry II (NOTE that adding CHEM 2470 (1 cr. Organic II Lab) would give you a minor in chemistry.])	3
MATH 1760 or MATH 1860	Calculus For The Life Sciences With Applications II or Single Variable Calculus II	3
Electives		6
	Hours	**15**
Fifth Term		
BIOL 4910	Undergraduate Research	1
PHYS 2070 or PHYS 2130	General Physics I or Physics For Science And Engineering Majors I	4
PHYS 2075 or PHYS 2135	General Physics I - Lab or Physics for Science and Engineering Majors I - Lab	1
CHEM 3510	Biochemistry I	3
MATH 2600	Introduction To Statistics	3
Elective		3
	Hours	**15**
Sixth Term		
PHYS 2080	General Physics II	4
PHYS 2085	General Physics II - Lab	1
CHEM 3520	Biochemistry II	3
BIOL 4010	Molecular Biology	3
Elective		3
	Hours	**14**

Seventh Term		
Electives		6
	Hours	**6**
Eighth Term		
BIOL 4700	Biological Literature And Communication	3
BIPG 5200	Statistical Methods in Bioinformatics	3
BIPG 5100	Fund Bioinformatics Proteomics	3
Electives		6
	Hours	**15**
Ninth Term		
BIPG 6100	Bioinformatic Computation	3
BMSP 6390	Mentored Research	1
BIPG 6400 or BRIM 6200	Applications of Bioinformatics or Biomarker Disc,Valid & Impleme	3
BMSP 6360	Current Problems and Research Approaches in Cell Membranes	2
Undergraduate Elective		3
	Hours	**12**
	Total Hours	**124**

Biology - Cell and Molecular Biology Concentration, BS

First Term		**Hours**
NSM 1000	Foundations of Academic Success for Science and Math Majors	1
BIOL 2170	Fundamentals of Life Science: Biomolecules, Cells, and Inheritance	4
BIOL 2180	Fundamentals of Life Science Laboratory: Biomolecules, Cells, and Inheritance	1
CHEM 1230	General Chemistry I	4
CHEM 1280	General Chemistry Lab I	1
ENGL 1110	College Composition I	3
	Hours	**14**
Second Term		
NSM 1500	Building a Career in Science and Math	1
BIOL 2150	Fundamentals Of Life Science: Diversity Of Life, Evolution And Adaptation	4
BIOL 2160	Fundamentals Of Life Science Laboratory: Diversity Of Life, Evolution And Adaptation	1
CHEM 1240	General Chemistry II	4
CHEM 1290	General Chemistry Lab II	1
ENGL 1130	College Composition II: Academic Disciplines And Discourse	3
Arts/Humanities Core		3
	Hours	**17**
Third Term		
BIOL 3010	Molecular Genetics	3
BIOL 3020	Molecular Genetics Laboratory [1]	2
CHEM 2410	Organic Chemistry I	3
CHEM 2460	Organic Chemistry Laboratory I for Non-Majors	1
Select one of the following:		4
MATH 1750	Calculus For The Life Sciences With Applications I	
MATH 1850	Single Variable Calculus I	
Social Sciences Core		3
	Hours	**16**
Fourth Term		
BIOL 3030	Cell Biology	3
BIOL 3070 or BIOL 3090	Human Physiology or Developmental Biology	3
CHEM 2420	Organic Chemistry II	3
Social Sciences Core		3
Arts/Humanities Core		3
	Hours	**15**
Fifth Term		
BIOL 4010	Molecular Biology	3
PHYS 2070	General Physics I	4
PHYS 2075	General Physics I - Lab	1
CHEM 3510	Biochemistry I	3
Diversity of US		3
	Hours	**14**
Sixth Term		
PHYS 2080	General Physics II	4
PHYS 2085	General Physics II - Lab	1
CHEM 3520	Biochemistry II	3
Writing Across the Curriculum Elective (WAC)		3
BIOL 3XXX/4XXX Major/Concentration Requirement [2]		3
	Hours	**14**
Seventh Term		
BIOL 3XXX/4XXX Major/Concentration Requirement [2]		3
Elective BIOL Lab [1]		3
BIOL 4090	Cancer Biology	3
BIOL 4910	Undergraduate Research in a section with a focus in cellular or molecular biology	3
Arts/Humanities Core		3
	Hours	**15**
Eighth Term		
BIOL 4700	Biological Literature And Communication	3
BIOL 3XXX/4XXX Major/Concentration Requirement [2]		3
MATH 2600 or MATH 2640	Introduction To Statistics or Statistics for Applied Science	3
Non-US Diversity		3
Electives to get to 120 credit hours [3]		3
	Hours	**15**
	Total Hours	**120**

1 May take different 3000-4000 level lab in different semester, 2 lab experiences are required.

2 9 hours of 3000-4000 level BIOL electives are required. Hours from the 3000-4000 level BIOL lab requirement count toward elective requirements.

[3] 3 credits are available in the proposed plan of study for students to freely elect from across the University curriculum.

Biology -Neuroscience Concentration, BS

First Term		Hours
NSM 1000	Foundations of Academic Success for Science and Math Majors	2
BIOL 2170	Fundamentals of Life Science: Biomolecules, Cells, and Inheritance	4
BIOL 2180	Fundamentals of Life Science Laboratory: Biomolecules, Cells, and Inheritance	1
CHEM 1230	General Chemistry I	4
CHEM 1280	General Chemistry Lab I	1
ENGL 1110	College Composition I	3
	Hours	**15**
Second Term		
BIOL 2150	Fundamentals Of Life Science: Diversity Of Life, Evolution And Adaptation	4
BIOL 2160	Fundamentals Of Life Science Laboratory: Diversity Of Life, Evolution And Adaptation	1
CHEM 1240	General Chemistry II	4
CHEM 1290	General Chemistry Lab II	1
Humanities Core		3
ENGL 1130	College Composition II: Academic Disciplines And Discourse	3
	Hours	**16**
Third Term		
BIOL 3010	Molecular Genetics	3
BIOL 3020	Molecular Genetics Laboratory [1]	2
CHEM 2410	Organic Chemistry I	3
CHEM 2460	Organic Chemistry Laboratory I for Non-Majors	1
Select one of the following:		4
MATH 1750	Calculus For The Life Sciences With Applications I	
MATH 1830	Calculus I For Mathematicians, Scientists And Educators	
MATH 1850	Single Variable Calculus I	
Social Sciences Core		3
	Hours	**16**
Fourth Term		
BIOL 3030	Cell Biology	3
CHEM 2420	Organic Chemistry II	3
Select one of the following:		3-4
MATH 1760	Calculus For The Life Sciences With Applications II	
MATH 1840	Calculus II For Mathematicians, Scientists And Educators	
MATH 1860	Single Variable Calculus II	
Arts/Humanities Core		3
Social Sciences Core		3
	Hours	**15-16**
Fifth Term		
BIOL 3090	Developmental Biology	3
PSY 2400	Cognitive Psychology	3
PHYS 2070	General Physics I	4
PHYS 2075	General Physics I - Lab	1
CHEM 3510	Biochemistry I	3
	Hours	**14**
Sixth Term		
BIOL 3070	Human Physiology	3
PHYS 2080	General Physics II	4
PHYS 2085	General Physics II - Lab	1
CHEM 3520	Biochemistry II	3
BIOL 2050	Fundamentals of Neuroscience I	3
	Hours	**14**
Seventh Term		
PSY 3400	Cognitive Neuropsychology	3
BIOL 3050	Fundamentals of Neuroscience II [2]	3
MATH 2600 or MATH 2640	Introduction To Statistics or Statistics for Applied Science	3
BIOL 3XXX/4XXX	Biology Elective	3
Non US Diversity		3
	Hours	**15**
Eighth Term		
BIOL 4910	Undergraduate Research (Neuro) [2]	3
BIOL 4700	Biological Literature And Communication ((Neuro))	3
Electives to get to 120 hours		3
Elective (WAC)		3
Diversity of US		3
	Hours	**15**
	Total Hours	**120-121**

[1] May take different 3000-4000 level lab in different semester, 2 are required.

[2] 9 hours of 3000-4000 level BIOL electives are required. Hours from the 3000-4000 level BIOL lab requirement count toward requirement.

- PLO 1. Students will demonstrate a thorough understanding of fundamental concepts of cell and molecular biology, chemistry, biochemistry, evolutionary biology, and physiology.
- PLO 2. Students will demonstrate the ability to use fundamental concepts of biological science to analyze and evaluate biological observations in written and mathematical terms.
- PLO 3. Students will act effectively as a member of a team.
- PLO 4. Students will understand and comply with ethical behavior in coursework, research, and the use of scientific information.
- PLO 5. Students will be able to perform effective primary literature searches and identify relevant primary literature.

- PLO 6. Students will be able to read primary biological literature and apply critical thinking to the analysis and interpretation of biological experiments.
- PLO 7. Students will demonstrate appropriate oral and written skills to communicate concepts in biology to the public, peers, and specialists.
- PLO 8. Students will demonstrate the ability to incorporate diverse views and perspectives.