

Biology, BS

Requirements

The Bachelor of Science with a major in biology requires a minimum of 120 s.h., including at least 69–78 s.h. of work for the major. Students must maintain a grade-point average of at least 2.00 in all courses for the major and in all UI courses for the major. Students who wish to apply transfer credit toward graduation with a major in biology should consult their biology advisor. They also must complete the College of Liberal Arts and Sciences GE CLAS Core.

Students must complete the chemistry/mathematics/physics foundation, the biology core, and one of four tracks. The four tracks emphasize dynamic and active areas in the biological sciences. Three of the tracks—cell and developmental biology, genetics and biotechnology, and neurobiology—emphasize distinct areas. The fourth track—integrative biology—provides highly diverse content.

The BS with a major in biology requires the following coursework.

Requirements	Hours
Chemistry/Mathematics/Physics Foundation	29
Biology Core Courses	15
Track Courses	25-34

Chemistry/Mathematics/Physics Foundation

Course #	Title	Hours
All of these:		
CHEM:1110 & CHEM:1120	Principles of Chemistry I-II	8
CHEM:2210	Organic Chemistry I	3
One of these:		
BMB:3110	Biochemistry	3
BMB:3120	Biochemistry and Molecular Biology I (students who take BMB:3120 also must take BMB:3130 as one of their track courses)	3
One of these sequences:		
PHYS:1511- PHYS:1512	College Physics I-II	8
PHYS:1611- PHYS:1612	Introductory Physics I-II	8
One of these:		
MATH:1460	Calculus for the Biological Sciences	4
MATH:1850	Calculus I	4
One of these:		
STAT:2010	Statistical Methods and Computing (preferred for evolution track)	3
STAT:3510	Biostatistics	3

Biology Core

Course #	Title	Hours
All of these:		
BIOL:1411- BIOL:1412	Foundations of Biology - Diversity of Form and Function	8
BIOL:2512	Fundamental Genetics	4
BIOL:2723	Cell Biology	3

Tracks

Bachelor of Science students must select a single track. Each track includes at least eight courses. The experiential elective requirement may be satisfied by taking an appropriate investigative lab for the track, or through several other options. Students who use BIOL:4999 Honors Research in Biology or BIOL:3994 Introduction to Research must complete a minimum of 6 s.h. in those courses. Students who use BIOL:4897 Teaching Internship in Biology must complete a minimum of 4 s.h. in that course.

Additionally, students may satisfy the experiential elective requirement by completing at least 4 s.h. in two different courses from a combination of these courses: BIOL:3994 Introduction to Research, BIOL:4898 Communicating Research, BIOL:4897 Teaching Internship in Biology, BIOL:4999 Honors Research in Biology, LATH:3001 Latham Fellows: Science Outreach Project, and an approved biology-related internship.

- Cell and Developmental Biology Track [p. 1]
- Genetics and Biotechnology Track [p. 2]
- Integrative Biology Track [p. 3]
- Neurobiology Track [p. 4]

Cell and Developmental Biology Track

The cell and developmental biology track provides education in the structure and function of cells and in the principles of development as they apply to animals and plants. This track is appropriate for students who wish to pursue graduate study in cellular and developmental biology, to prepare for professional study in medicine and other health-related fields, or to take positions in laboratories and companies engaged in cancer research and related fields.

Cell and Developmental Biology Track Courses

Course #	Title	Hours
Two of these:		
BIOL:3172	Evolution	4
BIOL:3233	Introduction to Developmental Biology	3
BIOL:3363	Plant Developmental Biology	3
One of these:		
BIOL:3626	Cell Biology Laboratory	4
BIOL:3736	Developmental Biology Lab	4
One of these:		
BIOL:3212	Bioinformatics for Beginners	3
BMB:3130	Biochemistry and Molecular Biology II (students who take BMB:3120 as a chemistry/mathematics/physics foundation course must take this course)	3

CHEM:2220	Organic Chemistry II	3
MICR:2157-	General Microbiology	5
MICR:2158	- General Microbiology Laboratory	

Cell and Developmental Biology Track Experiential Elective

Course #	Title	Hours
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One of these 11 options:

BIOL:3245	Animal Behavior Laboratory	4
BIOL:3626	Cell Biology Laboratory (if not taken as a track course)	4
BIOL:3655	Neurogenetics Laboratory	4
BIOL:3656	Neurobiology Laboratory	4
BIOL:3676	Evolution Lab	4
BIOL:3716	Genetics and Biotechnology Lab	4
BIOL:3736	Developmental Biology Lab (if not taken as a track course)	4
BIOL:3994	Introduction to Research (taken twice for 3 s.h. each or three times for 2 s.h. each)	6
BIOL:4314	Introduction to Synthetic Biology in the Lab	4
BIOL:4897	Teaching Internship in Biology (taken twice for 2 s.h. each)	4
BIOL:4999	Honors Research in Biology	6

or

A combination of at least two different courses
for a total of 4 s.h. from these:

BIOL:3994	Introduction to Research	1-3
BIOL:4897	Teaching Internship in Biology	1-3
BIOL:4898	Communicating Research	2
BIOL:4999	Honors Research in Biology	arr.
LATH:3001	Latham Fellows: Science Outreach Project	2

An approved biology-related internship

Cell and Developmental Biology Track Electives

Course #	Title	Hours
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At least three of these, with a minimum of one
course numbered 3000 or above:

BIOL:2254	Endocrinology	3
BIOL:3172	Evolution (if not taken as a track course)	4
BIOL:3233	Introduction to Developmental Biology (if not taken as a track course)	3
BIOL:3244	Animal Behavior	3
BIOL:3253	Neurobiology I	4
BIOL:3254	Neurobiology II	4
BIOL:3314	Genomics	3
BIOL:3343	Animal Physiology	3
BIOL:3363	Plant Developmental Biology (if not taken as a track course)	3

BIOL:3713	Molecular Genetics	4
BIOL:4333	Genes and Development	3
May include one of these:		
BIOL:2663	Plant Response to the Environment	3
BIOL:3663	Plant Response to the Environment	3

Genetics and Biotechnology Track

The genetics and biotechnology track provides education in the key principles of transmission, maintenance, regulation, and manipulation of genes. This track is appropriate for students who wish to pursue graduate study in fields related to genetics or to enter the modern biotechnology industry. It also provides excellent preparation for professional study in medicine and other health-related fields.

Genetics and Biotechnology Track Courses

Course #	Title	Hours
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All of these:

BIOL:3172	Evolution	4
BIOL:3314	Genomics	3
BIOL:3713	Molecular Genetics	4
BIOL:3716	Genetics and Biotechnology Lab	4

One of these:

BIOL:3212	Bioinformatics for Beginners	3
BMB:3130	Biochemistry and Molecular Biology II (students who take BMB:3120 as a chemistry/ mathematics/physics foundation course must take this course)	3

CHEM:2220	Organic Chemistry II	3
MICR:2157-	General Microbiology	5
MICR:2158	- General Microbiology Laboratory	

Genetics and Biotechnology Track Experiential Elective

Course #	Title	Hours
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One of these 9 options:

BIOL:3245	Animal Behavior Laboratory	4
BIOL:3626	Cell Biology Laboratory	4
BIOL:3655	Neurogenetics Laboratory	4
BIOL:3676	Evolution Lab	4
BIOL:3736	Developmental Biology Lab	4
BIOL:3994	Introduction to Research (taken twice for 3 s.h. each or three times for 2 s.h. each)	6
BIOL:4314	Introduction to Synthetic Biology in the Lab	4
BIOL:4897	Teaching Internship in Biology (taken twice for 2 s.h. each)	4
BIOL:4999	Honors Research in Biology	6

or

A combination of at least two different courses
for a total of 4 s.h. from these:

BIOL:3994	Introduction to Research	1-3
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BIOL:4897	Teaching Internship in Biology	1-3
BIOL:4898	Communicating Research	2
BIOL:4999	Honors Research in Biology	arr.
LATH:3001	Latham Fellows: Science Outreach Project	2

An approved biology-related internship

Genetics and Biotechnology Track Electives

Course #	Title	Hours
At least two of these, with a minimum of one course numbered 3000 or above:		
BIOL:2254	Endocrinology	3
BIOL:2673	Ecology	3
BIOL:3233	Introduction to Developmental Biology	3
BIOL:3244	Animal Behavior	3
BIOL:3253	Neurobiology I	4
BIOL:3254	Neurobiology II	4
BIOL:3343	Animal Physiology	3
BIOL:3363	Plant Developmental Biology	3
BIOL:3373	Human Population Genetics and Variation	3
BIOL:4333	Genes and Development	3
BIOL:4373	Molecular Evolution: Genes, Genomes, and Organisms	3
BIOL:4386	Introduction to Scientific Computing for Biologists	3
May include one of these:		
BIOL:2663	Plant Response to the Environment	3
BIOL:3663	Plant Response to the Environment	3

Integrative Biology Track

The integrative biology track offers a diverse, well-balanced introduction to the major fields of biology. This track prepares students for graduate study in the biological sciences, in science education, and for work in laboratories that engage in research and applications in many fields of biology. It also provides broadly based preparation for professional study in medicine and other health-related fields.

Integrative Biology Track Courses

Course #	Title	Hours
Both of these:		
BIOL:2673	Ecology	3
BIOL:3172	Evolution	4
One of these:		
BIOL:3212	Bioinformatics for Beginners	3
BMB:3130	Biochemistry and Molecular Biology II (students who take BMB:3120 as a chemistry/mathematics/physics foundation course must take this course)	3
CHEM:2220	Organic Chemistry II	3
MICR:2157- MICR:2158	General Microbiology - General Microbiology Laboratory	5

Integrative Biology Track Breadth Menus

Genes and Genomes

Course #	Title	Hours
One of these:		
BIOL:3314	Genomics	3
BIOL:3373	Human Population Genetics and Variation	3
BIOL:3713	Molecular Genetics	4
BIOL:4333	Genes and Development	3
BIOL:4373	Molecular Evolution: Genes, Genomes, and Organisms	3
BIOL:4386	Introduction to Scientific Computing for Biologists	3

Biological Systems

Course #	Title	Hours
Two of these:		
BIOL:2254	Endocrinology	3
BIOL:3233	Introduction to Developmental Biology	3
BIOL:3244	Animal Behavior	3
BIOL:3253	Neurobiology I	4
BIOL:3254	Neurobiology II	4
BIOL:3343	Animal Physiology	3
BIOL:3363	Plant Developmental Biology	3
May include one of these:		
BIOL:2663	Plant Response to the Environment	3
BIOL:3663	Plant Response to the Environment	3

Investigative Lab

Course #	Title	Hours
One of these:		
BIOL:2246	Entomology Lab	4
BIOL:3245	Animal Behavior Laboratory	4
BIOL:3626	Cell Biology Laboratory	4
BIOL:3655	Neurogenetics Laboratory	4
BIOL:3656	Neurobiology Laboratory	4
BIOL:3676	Evolution Lab	4
BIOL:3716	Genetics and Biotechnology Lab	4
BIOL:3736	Developmental Biology Lab	4

Integrative Biology Track Experiential Elective

Course #	Title	Hours
One of these 12 options:		
BIOL:2246	Entomology Lab (if not used for investigative lab course)	4
BIOL:3245	Animal Behavior Laboratory (if not used for investigative lab course)	4
BIOL:3626	Cell Biology Laboratory (if not used for investigative lab course)	4
BIOL:3655	Neurogenetics Laboratory (if not used for investigative lab course)	4

BIOL:3656	Neurobiology Laboratory (if not used for investigative lab course)	4
BIOL:3676	Evolution Lab (if not used for investigative lab course)	4
BIOL:3716	Genetics and Biotechnology Lab (if not used for investigative lab course)	4
BIOL:3736	Developmental Biology Lab (if not used for investigative lab course)	4
BIOL:3994	Introduction to Research (taken twice for 3 s.h. each or three times for 2 s.h. each)	6
BIOL:4897	Teaching Internship in Biology (taken twice for 2 s.h. each)	4
BIOL:4999	Honors Research in Biology	6
An approved Iowa Lakeside Laboratory course		4
or		
A combination of at least two different courses for a total of 4 s.h. from these:		
BIOL:3994	Introduction to Research	1-3
BIOL:4897	Teaching Internship in Biology	1-3
BIOL:4898	Communicating Research	2
BIOL:4999	Honors Research in Biology	arr.
LATH:3001	Latham Fellows: Science Outreach Project	2
An approved biology-related internship		

Neurobiology Track

The neurobiology track provides education in nervous system function at all levels, from molecular to systems biology. This track is appropriate for students who wish to pursue graduate study in neurobiology and related areas, including psychology and the social sciences; to enter laboratories that study the therapeutic basis of neurological disorders; or to work in pharmaceutical companies. It also provides good preparation for professional study in medicine and other health-related fields.

Neurobiology Track Courses

Course #	Title	Hours
One of these:		
BIOL:2753	Introduction to Neurobiology	3
PSY:2701	Introduction to Behavioral Neuroscience	4
Both of these:		
BIOL:3253	Neurobiology I	4
BIOL:3254	Neurobiology II	4
One of these:		
BIOL:3245	Animal Behavior Laboratory	4
BIOL:3655	Neurogenetics Laboratory	4
BIOL:3656	Neurobiology Laboratory	4
One of these:		
BIOL:3212	Bioinformatics for Beginners	3

BMB:3130	Biochemistry and Molecular Biology II (students who take BMB:3120 as a chemistry/mathematics/physics foundation course must take this course)	3
CHEM:2220	Organic Chemistry II	3
MICR:2157- MICR:2158	General Microbiology - General Microbiology Laboratory	5
PSY:3040	Psychology of Learning	3
PSY:3230	Psychopharmacology	3
PSY:3250	Neuroscience of Learning and Memory	3

Neurobiology Experiential Elective

Course #	Title	Hours
One of these 9 options:		
BIOL:3245	Animal Behavior Laboratory (if not used as a track course)	4
BIOL:3626	Cell Biology Laboratory	4
BIOL:3676	Evolution Lab	4
BIOL:3716	Genetics and Biotechnology Lab	4
BIOL:3736	Developmental Biology Lab	4
BIOL:3994	Introduction to Research (taken twice for 3 s.h. each or three times for 2 s.h. each)	6
BIOL:4314	Introduction to Synthetic Biology in the Lab	4
BIOL:4897	Teaching Internship in Biology (taken twice for 2 s.h. each)	4
BIOL:4999	Honors Research in Biology	6
or		
A combination of at least two different courses for a total of 4 s.h. from these:		
BIOL:3994	Introduction to Research	1-3
BIOL:4897	Teaching Internship in Biology	1-3
BIOL:4898	Communicating Research	2
BIOL:4999	Honors Research in Biology	arr.
LATH:3001	Latham Fellows: Science Outreach Project	2
An approved biology-related internship		

Neurobiology Electives

Course #	Title	Hours
At least two of these, with a minimum of one course numbered 3000 or above:		
BIOL:2254	Endocrinology	3
BIOL:3172	Evolution	4
BIOL:3233	Introduction to Developmental Biology	3
BIOL:3244	Animal Behavior	3
BIOL:3343	Animal Physiology	3
BIOL:4333	Genes and Development	3

BIOL:4386 Introduction to Scientific 3
 Computing for Biologists

Teacher Licensure

Students interested in teaching in elementary and/or secondary schools should seek admission to the Teacher Education Program (TEP) in the College of Education.

To qualify for licensure in secondary teaching, students in the TEP complete a degree in education as well as a related College of Liberal Arts and Sciences degree. See Apply on the College of Education website for details on requirements and deadlines for applying to the College of Education and about TEP choices of majors leading to licensure.