

BIOLOGY DEPARTMENT

101 Science Bldg.
(435) 652-7760
<http://dixie.edu/biology/>

Department Chair

David Jones
105 Science Bldg.
dwjones@dixie.edu
(435) 652-7632

Department Secretary

Kathi Steadward
101 Science Bldg.
steadward@dixie.edu
(435) 652-7760

Faculty**Professor**

Dr. Patt Allen
126 Science Bldg.
allen_p@dixie.edu
(435) 542-7776

Professor

Dr. Thomas McNeilis
123 Science Bldg.
mcneilis@dixie.edu
(435) 652-7786

Professor

Dr. Curtis Walker
124 Science Bldg.
walker@dixie.edu
(435) 652-7785

Associate Professor

Dr. Marius van der Merwe
131 Science Bldg.
marius@dixie.edu
(435) 652-7924

Assistant Professor

Dr. Jennifer Ciaccio
122 Science Bldg.
ciaccio@dixie.edu
(435) 652-7779

Lecturer/Advisor

134 Science Bldg.
(435) 879-4282

Professor

Dr. Karen Bauer
102 Science Bldg.
bauer@dixie.edu
(435) 652-7772

Professor

Dr. Del Smith
130 Science Bldg.
smithdr@dixie.edu
(435) 652-7773

Associate Professor

David Jones
105 Science Bldg.
dwjones@dixie.edu
(435) 652-7632

Associate Professor

Dr. Donald Warner
133 Science Bldg.
warner@dixie.edu
(435) 652-7631

Assistant Professor

Dr. Erin O'Brien
120 Science Bldg.
obrien@dixie.edu
(435) 652-7761

Faculty Emeritus

Dr. Andrew Barnum
207 Science Bldg.
barnum@dixie.edu
(435) 652-7772

Faculty Emeritus

Lee Bunnell
101 Science Bldg.
bunnell@dixie.edu
(435) 652-7778

Faculty Emeritus

Jack Heppler
115b Science Bldg.
heppler@dixie.edu
(435) 652-7778

School of Science & Technology**Dean**

Dr. Victor Hasfurther
116 North Instruction Bldg.
hasfurther@dixie.edu
(435) 652-7861

Administrative Assistant

Ruth Bruckert
119 North Instruction Bldg.
bruckert@dixie.edu
(435) 652-7862

Program Description

The Bachelor of Science in Biology degree at Dixie State College is designed to provide students with a firm foundation and understanding of the unifying concepts of biology, including those at the molecular, cellular, and ecosystem levels. It is also essential that biology students develop a strong background in the areas of chemistry, physics, and math because the comprehension and mastery of biological concepts is contingent upon the integration of these other sciences.

All Biology students will complete a set of core courses focusing on general biology, genetics, ecology, evolution, cellular and molecular biology, scientific writing, and data analysis. These core areas are intended to prepare an underlying support for further study in biology. Upon completion of the core, students may select other upper-division biology courses that allow them to explore and develop in one or more areas (zoology, botany, microbiology, ecological, or molecular) of their choosing.

The versatility of the Biology degree will allow successful undergraduate Biology majors to enter professional programs in medicine, dentistry, and veterinary medicine, as well as other professional or graduate schools. Graduates of the Biology degree program may also opt for governmental or private-sector careers in such fields as natural resource management, environmental research, health care, the biomedical industry, independent laboratory research, or science teaching.

The Bachelor of Science Biology, Secondary Education and the Bachelor of Science in Biology with Integrated Science, Secondary Education degrees at Dixie State College prepare students to become Biology or Biology and Integrated Science teachers at the secondary level. In addition to fulfilling the General Education requirements of Dixie State College, students will complete a set of core courses in the sciences plus 39 credits of Secondary Education Teacher (SET) courses taught through the Education Department that will satisfy the State of Utah requirements for secondary teacher licensure. Students will also be required to take the appropriate PRAXIS exam(s) for secondary licensure.

Students are strongly encouraged to meet with an advisor in the Biology Department each semester to outline their programs of study and course sequences.

Course Prefixes

- [BIOL](#)

Degrees & Certificates

- Bachelor of Science in Biology
- Bachelor of Science in Biology, Secondary Education
- Bachelor of Science in Biology with Integrated Science, Secondary Education

Bachelor of Science in Biology

122 credits

The Bachelor of Science in Biology degree has four basic components:

1. General Education and Institutional Requirements (some may also be included in program requirements)
2. Biology program requirements in Chemistry, Physics, and Mathematics
3. Biology major core courses
4. Upper-division Biology elective courses

DSC General Education & Institutional Requirements

All DSC General Education requirements must be fulfilled. A previously earned degree may fulfill those requirements, but courses must be equivalent to DSC's minimum General Education standards in American Institutions, English, and Mathematics.

Institutional Requirement

Complete **one** of the following:

CIS 1200	Computer Literacy	3
CIS 1201	Computer Literacy Exam	0

General Education Requirements

Complete the following:

ENGL 1010	Intro to Writing	3
ENGL 2010	Intermediate Writing	3
LIB 1010	Information Literacy	1
Mathematics GE course		3-5
American Institutions GE course		3
Life Sciences GE course		3-5
Physical Sciences GE course		3-5
Laboratory Science GE course		0-1
Fine Arts GE course		3
Literature/Humanities GE course		3
Social & Behavioral Sciences GE course		3
Exploration GE course		3-5
Two (2) Global & Cultural Perspectives GE courses		0-6

Complete **one** of the following sets of courses:

PHYS 2010/2015	College Physics I / Lab	4/1
----------------	-------------------------	-----

PHYS 2210/2215	Physics for Scientists I / Lab	4/1
----------------	--------------------------------	-----

Biology Program Requirements

Complete the following:

CHEM 1210/1215	Principles of Chemistry I / Lab	4/1
CHEM 1220/1225	Principles of Chemistry II / Lab	4/1
CHEM 2310/2315	Organic Chemistry I / Lab	4/1
CHEM 2320/2325	Organic Chemistry II / Lab	4/1
MATH 1210	Calculus I	5

Complete **one** of the following series of courses:

PHYS 2010/2015	College Physics I / Lab	4/1
PHYS 2020/2025	College Physics II / Lab	4/1

OR

PHYS 2210/2215	Physics for Scientists I / Lab	4/1
PHYS 2220/2225	Physics for Scientists II / Lab	4/1

Biology Core Requirements

Complete the following:

BIOL 1610/1615	Principles of Biology I / Lab	4/1
BIOL 1620/1625	Principles of Biology II / Lab	4/1
BIOL 2030	Principles of Genetics	4
BIOL 2220/2225	General Ecology / Lab	3/1
BIOL 3010	Biological Evolution	3
BIOL 3110	Scientific Writing	2
BIOL 3150/3155	Introduction to Biometry / Lab	2/1

Complete **one** of the following sets of courses:

BIOL 3020/3025	Principles of Cell Biology / Lab	3/1
BIOL 3450/3455	General Microbiology / Lab	3/1

Complete **one** of the following:

BIOL 4910	Senior Seminar I	1
BIOL 4920	Senior Seminar II	1

Required Biology Electives

Complete **one** of the following sets of courses:

BIOL 4500/4505	Comparative Vertebrate Phys/Lab	3/1
BIOL 4600/4605	Plant Physiology / Lab	3/1

Complete **one** of the following courses or sets of courses:

BIOL 3200/3205	Invertebrate Zoology / Lab	3/1
BIOL 4200/4205	Plant Taxonomy / Lab	2/2
BIOL 4230/4235	General Parasitology / Lab	3/1
BIOL 4260/4265	Herpetology / Lab	2/1
BIOL 4270/4275	Ichthyology / Lab	2/1
BIOL 4280	Marine Biology	3
BIOL 4380/4385	Ornithology / Lab	2/1
BIOL 4411/4415	Mammalogy / Lab	3/1
BIOL 4440/4445	General Entomology / Lab	3/1

Complete **14 credits** from the following or from the following or from any upper-division BIOL course listed above not already used to fulfill a requirement:

BIOL 3000	Rural Health Scholars (2 cr. max.)	1
BIOL 3100	Bioethics	3
BIOL 3140/3145	Comp. Vertebrate Anatomy / Lab	3/1
BIOL 3230	Cadaver Practicum	2
BIOL 3250	Cancer Biology	2
BIOL 3340/3345	Plant Anatomy / Lab	3/1
BIOL 3360	Developmental Biology	3
BIOL 3365	Developmental Biology Lab	1
BIOL 3460	Biology of Infectious Disease	3
BIOL 3470	Introduction to Immunology	3
BIOL 4190/4195	Mammalian Histology / Lab	3/1
BIOL 4300	Molecular Biology	2
BIOL 4305	Molecular Biology Techniques	2
BIOL 4350/4355	Animal Behavior/Lab	3/1
BIOL 4400	Pathophysiology	3
BIOL 4460/4465	Plant Ecology / Lab	2/1
BIOL 4810	Independent Research	1-4
BIOL 4820	Independent Research	1-4
BIOL 4830	Independent Research	1-4
BIOL 4930	Senior Thesis	1-4

NOTE: A course may only be used to fulfill one program requirement.

Advising Note: Pre-health professionals should complete CHEM 3510 and a diversity course.

Graduation Requirements

1. Complete a minimum of 122 college-level credits (1000 and above).
2. Complete at least 40 upper-division credits (3000 and above).
3. Complete at least 30 upper-division credits at DSC for institutional residency.
4. Cumulative GPA 2.0 or higher.
5. Grade C or higher required (not C-) in each Program Requirement, Core Discipline Requirement, and Biology Elective Requirement course.
6. Maximum 6 total credits of BIOL, 4810, 4820, 4830, and/or 4930 may be used toward graduation requirements.

Bachelor of Science in Biology, Secondary Education

125 credits

The Bachelor of Science in Biology Secondary Education degree has six basic curricular components:

1. General Education and Institutional Requirements (some may also be included in program requirements)
2. Biology program requirements in Chemistry, Physics, and Mathematics
3. Biology major core courses
4. Upper-division Biology elective courses
5. Lab safety certification course
6. Secondary Education Teaching (SET) pre-professional and professional courses

DSC General Education & Institutional Requirements

All DSC General Education requirements must be fulfilled. A previously earned degree may fulfill those requirements, but courses must be equivalent to DSC's minimum General Education standards in American Institutions, English, and Mathematics.

Institutional Requirement

Complete **one** of the following:

CIS 1200	Computer Literacy	3
CIS 1201	Computer Literacy Exam	0

General Education Requirements

Complete the following:

ENGL 1010	Intro to Writing	3
ENGL 2010	Intermediate Writing	3
LIB 1010	Information Literacy	1
Mathematics GE course		3-5
Life Sciences GE course		3-5
Physical Sciences GE course		3-5
Laboratory Science GE course		0-1
Fine Arts GE course		3
Literature/Humanities GE course		3
Exploration GE course		3-5
Two (2) Global & Cultural Perspectives GE courses		0-6

Complete **one** of the following American Institutions GE courses (SET requirement):

HIST 1700	American Civilization	3
POLS 1100	American Government	3

Complete **one** of the following Social & Behavioral Sciences GE courses (SET requirement):

FCS 1500	Human Development / Lifespan	3
PSY 1010	General Psychology	3
PSY 1100	Human Development / Lifespan	3

Biology Program Requirements

Complete the following:

CHEM 1210/15	Principles of Chemistry I / Lab	4/1
CHEM 1220/25	Principles of Chemistry II / Lab	4/1
MATH 1065	Pre-Calculus / Trigonometry	5
PHYS 2010/2015	College Physics I / Lab	4/1

Discipline Core Requirements

Complete the following:

BIOL 1610/1615	Principles of Biology I / Lab	4/1
BIOL 1620/1625	Principles of Biology II / Lab	4/1
BIOL 2030	Principles of Genetics	4
BIOL 2220/2225	General Ecology / Lab	3/1
BIOL 2400/2405	Plant Kingdom / Lab	3/1
BIOL 2420/2425	Human Physiology / Lab	3/1
BIOL 3010	Biological Evolution	3

Complete **one** of the following sets of courses:

BIOL 3020/3025	Principles of Cell Biology / Lab	3/1
BIOL 3450/3455	General Microbiology / Lab	3/1

Required Biology Electives

Complete **one** of the following sets of courses:

BIOL 3340/3345	Plant Anatomy / Lab	3/1
BIOL 4200/4205	Plant Taxonomy / Lab	2/2
BIOL 4600/4605	Plant Physiology / Lab	3/1

Complete **two** of the following sets of courses:

BIOL 3140/3145	Comp. Vertebrate Anatomy / Lab	3/1
BIOL 3200/3205	Invertebrate Zoology / Lab	3/1
BIOL 4230/4235	General Parasitology / Lab	3/1
BIOL 4260/4265	Herpetology / Lab	2/1
BIOL 4270/4275	Ichthyology / Lab	2/1
BIOL 4350/4355	Animal Behavior / Lab	3/1
BIOL 4380/4385	Ornithology / Lab	2/1
BIOL 4411/4415	Mammalogy / Lab	3/1
BIOL 4440/4445	General Entomology / Lab	3/1

Complete **1 – 4 credits** from the following or from the following or from any upper-division BIOL course listed above that was not already used to fulfill a requirement:

BIOL 3100	Bioethics	3
BIOL 3110	Scientific Writing	2
BIOL 3360	Developmental Biology	3
BIOL 3365	Developmental Biology Lab	1
BIOL 3460	Biology of Infectious Disease	3
BIOL 3470	Introduction to Immunology	3
BIOL 4190/4195	Mammalian Histology / Lab	3/1
BIOL 4280	Marine Biology	3
BIOL 4300	Molecular Biology	2

BIOL 4305	Molecular Biology Techniques	2
BIOL 4400	Pathophysiology	3
BIOL 4810*	Independent Research I	1-4
BIOL 4820*	Independent Research II	1-4
BIOL 4830*	Independent Research III	1-4
BIOL 4910	Senior Seminar I	1
BIOL 4920	Senior Seminar II	1
BIOL 4930*	Senior Thesis	1-4

* Graduation restriction: Maximum 4 total credits of BIOL, 4810, 4820, 4830, and/or 4930 may be used toward graduation requirements.

NOTE: A course may only be used to fulfill one program requirement.

Lab Safety Certification Requirement

Complete the following:

SCI 2600	Lab Safety for Teachers	1
----------	-------------------------	---

Secondary Education Pre-Professional Courses

Complete the following pre-professional courses:

EDUC 1010	Foundations/Intro to Education	3
EDUC 2010	Intro to Exceptional Learners	3
EDUC 2400	Foundations of Multicultural & ESL	3
EDUC 2500	Tech / Educ. / Electronic Portfolio	3
EDUC 3110	Educational Psychology	3

Secondary Education Teaching (SET) Program Admission

To be admitted to the SET program and enroll in Professional courses, students must have completed all pre-professional Education classes with 3.0 or higher GPA with no D credit and students must pass the appropriate PRAXIS II content area subject test(s). In addition, **one** of the following must be completed:

- Students with BA/BS degrees in progress must have completed at least 95% of major coursework and have approval of major academic content area department advisor
- Students with completed BA/BS or higher degrees must have their transcripts reviewed by content area department advisor

Secondary Education Professional Requirements

Semester I

Complete the following:

SCED 3720	Reading / Writing in Content Areas	3
SCED 4100	Curriculum, Instruction, Assessment	3
SCED 4600	Classroom Management	3

Complete **one** of the following:

BIOL 4130	Biology Teaching Methods	3
SCED 4700	Content Methods Course	3

Semester II

Complete the following:

SCED 4900	Secondary Student Teaching	10
SCED 4989	Student Teacher Seminar	2

NOTE: Grade C- or higher in each class and 3.0 GPA or higher in professional courses required.

Graduation Requirements

1. Complete a minimum of 125 college-level credits (1000 and above).
2. Complete at least 40 upper-division credits (3000 and above).
3. Complete at least 30 upper-division credits at DSC for institutional residency.
4. Cumulative GPA 2.75 or higher.
5. Grade C or higher required (not C-) in each Biology Program Requirement, Core Discipline Requirement, and Biology Elective Requirement course.
6. Grade C- or higher in each pre-professional and professional Education and Secondary Education courses and
7. 3.0 GPA in pre-professional and professional courses required.

Bachelor of Science in Biology with Integrated Science, Secondary Education

127 credits

The Bachelor of Science in Biology with Integrated Science, Secondary Education degree has seven basic curricular components:

1. General Education and Institutional Requirements (some may also be included in program requirements)
2. Biology program requirements
3. Biology major core courses
4. Additional Integrated Science requirements
5. Upper-division Biology elective requirements
6. Lab safety certification course
7. Secondary Education Teaching (SET) Pre-Professional and Professional courses

DSC General Education & Institutional Requirements

All DSC General Education requirements must be fulfilled. A previously earned degree may fulfill those requirements, but courses must be equivalent to DSC's minimum General Education standards in American Institutions, English, and Mathematics.

Institutional Requirement

Complete **one** of the following:

CIS 1200	Computer Literacy	3
CIS 1201	Computer Literacy Exam	0

General Education Requirements

Complete the following:

ENGL 1010	Intro to Writing	3
ENGL 2010	Intermediate Writing	3
LIB 1010	Information Literacy	1
Mathematics GE course		3-5
Life Sciences GE course		3-5
Physical Sciences GE course		3-5
Laboratory Science GE course		0-1
Fine Arts GE course		3
Literature/Humanities GE course		3
Exploration GE course		3-5
Two (2) Global & Cultural Perspectives GE courses		0-6

Complete **one** of the following American Institutions GE courses (SET requirement):

HIST 1700	American Civilization	3
POLS 1100	American Government	3

Complete **one** of the following Social & Behavioral Sciences GE courses (SET requirement):

FCS 1500	Human Development / Lifespan	3
PSY 1010	General Psychology	3
PSY 1100	Human Development / Lifespan	3

Biology Program Requirements

Complete the following:

CHEM 1210/15	Principles of Chemistry I / Lab	4/1
CHEM 1220/25	Principles of Chemistry II / Lab	4/1
MATH 1065	Pre-Calculus / Trigonometry	5
PHYS 2010/2015	College Physics I / Lab	4/1

Discipline Core Requirements

Complete the following:

BIOL 1610/1615	Principles of Biology I / Lab	4/1
BIOL 1620/1625	Principles of Biology II / Lab	4/1
BIOL 2030	Principles of Genetics	4
BIOL 2220/2225	General Ecology / Lab	3/1
BIOL 2400/2405	Plant Kingdom / Lab	3/1
BIOL 2420/2425	Human Physiology / Lab	3/1
BIOL 3010	Biological Evolution	3

Complete **one** of the following sets of courses:

BIOL 3020/3025	Principles of Cell Biology / Lab	3/1
BIOL 3450/3455	General Microbiology / Lab	3/1

Required Biology Electives

Complete **one** of the following sets of Botany courses:

BIOL 3340/3345	Plant Anatomy / Lab	3/1
BIOL 4200/4205	Plant Taxonomy / Lab	2/2
BIOL 4600/4605	Plant Physiology / Lab	3/1

Complete **one** of the following sets of Zoology courses:

BIOL 3140/3145	Comp. Vertebrate Anatomy / Lab	3/1
BIOL 3200/3205	Invertebrate Zoology / Lab	3/1
BIOL 4230/4235	General Parasitology / Lab	3/1
BIOL 4260/4265	Herpetology / Lab	2/1
BIOL 4270/4275	Ichthyology / Lab	2/1
BIOL 4350/4355	Animal Behavior/Lab	3/1
BIOL 4380/4385	Ornithology / Lab	2/1
BIOL 4411/4415	Mammalogy / Lab	3/1
BIOL 4440/4445	General Entomology / Lab	3/1

Additional Integrated Science Requirements

Complete the following:

GEO 1080	Introduction to Oceanography	3
GEO 1110/1115	Physical Geology / Lab	3/1
PHYS 1040/1045	Elementary Astronomy / Lab	3/1

Lab Safety Requirement

Complete the following:

SCI 2600	Lab Safety for Teachers	1
----------	-------------------------	---

Secondary Education Pre-Professional Courses

Complete the following pre-professional courses:

EDUC 1010	Foundations/Intro to Education	3
EDUC 2010	Intro to Exceptional Learners	3
EDUC 2400	Foundations of Multicultural & ESL	3
EDUC 2500	Tech / Educ. / Electronic Portfolio	3
EDUC 3110	Educational Psychology	3

Secondary Education Teaching (SET) Program Admission

To be admitted to the SET program and enroll in Professional courses, students must have completed all pre-professional Education classes with 3.0 or higher GPA with no D credit and students must pass the appropriate PRAXIS II content area subject test(s). In addition, **one** of the following must be completed:

- Students with BA/BS degrees in progress must have completed at least 95% of major coursework and have approval of major academic content area department advisor

- Students with completed BA/BS or higher degrees must have their transcripts reviewed by content area department advisor

Secondary Education Professional Requirements

Semester I

Complete the following:

SCED 3720	Reading / Writing in Content Areas	3
SCED 4100	Curriculum, Instruction, Assessment	3
SCED 4600	Classroom Management	3

Complete **one** of the following:

BIOL 4130	Biology Teaching Methods	3
SCED 4700	Content Methods Course	3

Semester II

Complete the following:

SCED 4900	Secondary Student Teaching	10
SCED 4989	Student Teacher Seminar	2

Graduation Requirements

1. Complete a minimum of 127 college-level credits (1000 and above).
2. Complete at least 40 upper-division credits (3000 and above).
3. Complete at least 30 upper-division credits at DSC for institutional residency.
4. Cumulative GPA 2.75 or higher.
5. Grade C or higher required (not C-) in each Biology Program Requirement, Core Discipline Requirement, and Biology Elective Requirement courses.
6. Grade C- or higher in each pre-professional and professional Education and Secondary Education course and 3.0 GPA in pre-professional and professional courses required.