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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 degree and the Bachelor of Science in Biology with Integrated Science Secondary Education degree 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 SET (Secondary Education Teacher) 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.

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 five basic components:

1. Lower-division, General Education requirements, excluding Physical Science and Mathematics, which are included in degree requirements (22 credits)
2. Chemistry, physics, and math requirements (35 credits)
3. Biology major core courses (31 credits)
4. Upper-division biology elective courses (22 credits).
5. Elective credits (12 credits).

General Education

All DSC General Education requirements must be fulfilled. A previously earned degree may fulfill those requirements. However, courses must be equivalent to DSC’s minimum General Education standards in the following subjects:

- American Institutions
- English
- Mathematics

DSC General Education Requirements

Complete the following:

- ENGL 1010 Intro to Writing 3.0
- ENGL 2010 Intermediate Writing 3.0
- CIS 1200 Computer Skills 3.0
- LIB 1010 Information Literacy 1.0

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Complete the following:

- American Institutions GE approved course 3.0
- Social & Behavioral Sciences GE approved course 3.0
- Fine Arts / Communication GE approved course 3.0
- Literature / Humanities GE approved course 3.0

**Program Requirements**
Complete the following:

- CHEM 1210/1215 Principles of Chemistry I / Lab 4.0/1.0
- CHEM 1220/1225 Principles of Chemistry II / Lab 4.0/1.0
- CHEM 2310/2315 Organic Chemistry I / Lab 4.0/1.0
- CHEM 2320/2325 Organic Chemistry II / Lab 4.0/1.0
- MATH 1210 Calculus I 5.0

Complete **one of the following series of courses**: 5.0

- PHYS 2010/2015 College Physics I / Lab (4.0/1.0)
- PHYS 2020/2025 College Physics II / Lab (4.0/1.0)
  **OR**
- PHYS 2210/2215 Physics for Scientists I / Lab (4.0/1.0)
- PHYS 2220/2225 Physics for Scientists II / Lab (4.0/1.0)

**Discipline Core Requirements**
Complete the following:

- BIOL 1610/1615 Principles of Biology I / Lab 4.0/1.0
- BIOL 1620/1625 Principles of Biology II / Lab 4.0/1.0
- BIOL 2030 Principles of Genetics 4.0
- BIOL 2220/2225 General Ecology / Lab 3.0/1.0
- BIOL 3010 Biological Evolution 3.0
- BIOL 3110 Scientific Writing 2.0
- BIOL 3150/3155 Introduction to Biometry / Lab 2.0/1.0

Complete **one of the following sets of courses**: 4.0

- BIOL 3020/3025 Principles of Cell Biology / Lab (3.0 / 1.0)
- BIOL 3450/3455 General Microbiology / Lab (3.0/1.0)

Complete **one of the following courses or sets of courses**: 1.0

- BIOL 4910 Senior Seminar I (1.0)
- BIOL 4920 Senior Seminar II (1.0)

**Required Biology Electives**
Complete **one of the following sets of courses**: 4.0

- BIOL 4500/4505 Comparative Vertebrate Physiology / Lab (3.0 / 1.0)
- BIOL 4600/4605 Plant Physiology / Lab (3.0/1.0)

Complete **one of the following courses or sets of courses**: 3.0-4.0

- BIOL 3200/3205 Invertebrate Zoology / Lab (3.0/1.0)
- BIOL 4200/4205 Plant Taxonomy / Lab (3.0/1.0)
- BIOL 4230/4235 General Parasitology / Lab (3.0/1.0)
- BIOL 4260/4265 Herpetology / Lab (2.0/1.0)
- BIOL 4270/4275 Ichthyology / Lab (2.0/1.0)
- BIOL 4280 Marine Biology (3.0)
- BIOL 4380/4385 Ornithology / Lab (2.0/1.0)
- BIOL 4411/4415 Mammalogy / Lab (3.0/1.0)
BIOL 4440/4445  General Entomology / Lab (3.0/1.0)

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

- BIOL 3000  Rural Health Scholars (2 cr. max.) (1.0)
- BIOL 3100  Bioethics (3.0)
- BIOL 3140/3145  Comp. Vertebrate Anatomy / Lab (3.0/1.0)
- BIOL 3230  Cadaver Practicum (2.0)
- BIOL 3250  Cancer Biology (2.0)
- BIOL 3340/3345  Plant Anatomy / Lab (2.0/1.0)
- BIOL 3360  Developmental Biology (3.0)
- BIOL 3365  Developmental Biology Lab (1.0)
- BIOL 3460  Biology of Infectious Disease (3.0)
- BIOL 3470  Introduction to Immunology (3.0)
- BIOL 4190/4195  Mammalian Histology / Lab (3.0/1.0)
- BIOL 4300  Molecular Biology (2.0)
- BIOL 4305  Molecular Biology Techniques (2.0)
- BIOL 4350/4355  Animal Behavior/Lab (3.0/1.0)
- BIOL 4440  Pathophysiology (3.0)
- BIOL 4460/4465  Plant Ecology / Lab (2.0/1.0)
- BIOL 4810*  Independent Research (1.0 - 4.0)
- BIOL 4820*  Independent Research (2.0/1.0)
- BIOL 4830*  Independent Research (2.0/1.0)
- BIOL 4930*  Senior Thesis (2.0/1.0)

*Graduation restriction: Maximum 6 total credits of BIOL, 4810, 4820, 4830, and/or 4930 may be used toward graduation requirements.

**NOTE:** No course can fulfill a requirement in more than one category.

**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.
3. Complete at least 30 upper-division credits at DSC for institutional residency.
4. Grade C or higher required (not C-) in each Program Requirement, Core Discipline Requirement, and Biology Elective Requirement course.
5. Cumulative GPA 2.0 or higher.

**Bachelor of Science in Biology Secondary Education** 125 credits

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

1. Lower-division, general education requirements, excluding Physical Science and Mathematics, which are included in degree requirements (22 credits)
2. Chemistry, physics, and math requirements (20 credits)
3. Biology major core courses (33 credits)
4. Upper-division biology elective courses (10-16 credits)
5. Lab safety certification course (1 credit)
6. Secondary Education Teaching (SET) pre-professional and professional courses (39 credits).

**General Education**

All DSC General Education requirements must be fulfilled. A previously earned degree may fulfill those requirements. However, courses must be equivalent to DSC’s minimum General Education standards in the following subjects:

- American Institutions
- English
- Mathematics
DSC General Education Requirements

Complete the following:

- ENGL 1010 Intro to Writing 3.0
- ENGL 2010 Intermediate Writing 3.0
- CIS 1200 Computer Skills 3.0
- LIB 1010 Information Literacy 1.0

Complete one of the following (SET required course): 3.0

- PSY 1010 General Psychology (3.0)
- PSY 1100 Human Development / Lifespan (3.0)
- FCS 1500 Human Development / Lifespan (3.0)

Complete the following:

- American Institutions GE approved course 3.0
- Fine Arts / Communication GE approved course 3.0
- Literature / Humanities GE approved course 3.0

Biology Program Requirements

Complete the following:

- CHEM 1210/1215 Principles of Chemistry I / Lab 4.0/1.0
- CHEM 1220/1225 Principles of Chemistry II / Lab 4.0/1.0
- MATH 1065 Pre-Calculus / Trigonometry 5.0
- PHYS 2010/2015 College Physics I / Lab 4.0/1.0

Discipline Core Requirements

Complete the following:

- BIOL 1610/1615 Principles of Biology I / Lab 4.0/1.0
- BIOL 1620/1625 Principles of Biology II / Lab 4.0/1.0
- BIOL 2030 Principles of Genetics 4.0
- BIOL 2220/2225 General Ecology / Lab 3.0/1.0
- BIOL 2460/2405 Plant Kingdom / Lab 3.0/1.0
- BIOL 2420/2425 Human Physiology / Lab 3.0/1.0
- BIOL 3010 Biological Evolution 3.0

Complete one of the following sets of courses:

- BIOL 3020/3025 Principles of Cell Biology / Lab 3.0/1.0
- BIOL 3450/3455 General Microbiology / Lab (3.0/1.0)

Biology Electives

Complete one of the following sets of courses: 3.0-4.0

- BIOL 3340/3345 Plant Anatomy / Lab (2.0/1.0)
- BIOL 4200/4205 Plant Taxonomy / Lab (3.0/1.0)
- BIOL 4460/4465 Plant Physiology / Lab (3.0/1.0)

Complete two of the following sets of courses: 3.0-4.0

- BIOL 3140/3145 Comp. Vertebrate Anatomy / Lab (3.0/1.0)
- BIOL 3200/3205 Invertebrate Zoology / Lab (3.0/1.0)
- BIOL 4230/4235 General Parasitology / Lab (3.0/1.0)
- BIOL 4260/4265 Herpetology / Lab (2.0/1.0)
- BIOL 4270/4275 Ichthyology / Lab (2.0/1.0)
- BIOL 4350/4355 Animal Behavior / Lab (3.0/1.0)
- BIOL 4380/4385 Ornithology / Lab (2.0/1.0)
BIOL 4411/4415  Mammalogy / Lab (3.0/1.0)
BIOL 4440/4445  General Entomology (3.0/1.0)

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 (3.0)
- BIOL 3110  Scientific Writing (2.0)
- BIOL 3360  Developmental Biology (3.0)
- BIOL 3365  Developmental Biology Lab (1.0)
- BIOL 3460  Biology of Infectious Disease (3.0)
- BIOL 3470  Introduction to Immunology (3.0)
- BIOL 3490/4195  Mammalian Histology / Lab (3.0/1.0)
- BIOL 4280  Marine Biology (3.0)
- BIOL 4290  Molecular Biology (2.0)
- BIOL 4305  Molecular Biology Techniques (2.0)
- BIOL 4400  Pathophysiology (3.0)
- BIOL 4810*  Independent Research I (1.0 – 4.0)
- BIOL 4820*  Independent Research II (1.0 – 4.0)
- BIOL 4830*  Independent Research III (1.0 – 4.0)
- BIOL 4910  Senior Seminar I (1.0)
- BIOL 4920  Senior Seminar II (1.0)
- BIOL 4930*  Senior Thesis (1.0 – 4.0)

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

NOTE: No course can fulfill a requirement in more than one category. Grade C or higher (not C-) required in each Biology Program Requirement, Core Discipline Requirement, and Biology Elective Requirement course.

Lab Safety Certification Requirement

Complete the following:

- Approved online lab safety course 1.0

Secondary Education Pre-professional Courses

Complete the following pre-professional courses:

- EDUC 1010  Intro to Education 3.0
- EDUC 2010  Intro to Teaching Exceptional Learners 3.0
- EDUC 2400  Foundations of Multicultural & ESL Educ. 3.0
- EDUC 2500  Technology / Educ. / Electronic Portfolio 3.0
- EDUC 3110  Educational Psychology 3.0

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

To take any professional classes listed below, students must be admitted to the Secondary Education Teaching Program (SET) along with these additional requirements:

1. All Pre-Professional Education classes have been completed.
2. Students with BS/BA degrees in progress need to have at least 90% of major coursework completed and approved by the major academic content department advisor.
3. Students with completed BS/BA or higher degrees need to have their transcripts reviewed by degree content areas.

Secondary Education Professional Requirements

Complete the following:

Semester I

- SCED 3720  Reading and Writing in the Content Areas 3.0
- SCED 4100  Curriculum, Instruction, and Assessment 3.0

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• SCED 4600 Classroom Management 3.0

Complete one of the following: 3.0

• BIOL 4130 Biology Teaching Methods (3.0)
• SCED 4700 Content Methods Course (3.0)

Semester II

• SCED 4900 Secondary Student Teaching 10.0
• SCED 4989 Student Teaching Seminar 2.0

**Licensure Requirement**

- Students are required to pass the PRAXIS II Biology Content Knowledge Test prior to student teaching.

**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.
3. Complete at least 30 upper-division credits at DSC for institutional residency.
4. Grade C or higher required (not C-) in each Biology Program Requirement, Core Discipline Requirement, and Biology Elective Requirement course.
5. 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.
6. Cumulative GPA 2.0 or higher.

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**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 components:

1. Lower-division, general education requirements, excluding Physical Science and Mathematics, which are included in degree requirements (22 credits)
2. Chemistry, physics, and math requirements (20 credits)
3. Biology major core courses (28 credits)
4. Upper-division biology elective courses (6-8 credits)
5. Lab safety certification course (1 credit)
6. Additional courses to meet the requirements for the integrated science endorsement (11 credits)
7. Secondary Education Teaching (SET) pre-professional and professional courses (39 credits).

**General Education**

All DSC General Education requirements must be fulfilled. A previously earned degree may fulfill those requirements. However, courses must be equivalent to DSC’s minimum General Education standards in the following subjects:

- American Institutions
- English
- Mathematics

**DSC General Education Requirements**

Complete the following:

- ENGL 1010 Intro to Writing 3.0
- ENGL 2010 Intermediate Writing 3.0
- CIS 1200 Computer Skills 3.0
- LIB 1010 Information Literacy 1.0

Complete one of the following (SET required course): 3.0
• PSY 1010 General Psychology (3.0)
  PSY 1100 Human Development / Lifespan (3.0)
  FCS 1500 Human Development / Lifespan (3.0)

Complete the following:

• American Institutions GE approved course 3.0
• Fine Arts / Communication GE approved course 3.0
• Literature / Humanities GE approved course 3.0

**Biology Program Requirements**

Complete the following:

• CHEM 1210/1215 Principles of Chemistry I / Lab 4.0/1.0
• CHEM 1220/1225 Principles of Chemistry II / Lab 4.0/1.0
• MATH 1065 Pre-calculus/Trigonometry 5.0
• PHYS 2010/2015 College Physics I / Lab 4.0/1.0

**Discipline Core Requirements**

Complete the following:

• BIOL 1610/1615 Principles of Biology I / Lab 4.0/1.0
• BIOL 1620/1625 Principles of Biology II / Lab 4.0/1.0
• BIOL 2030 Principles of Genetics 4.0
• BIOL 2220/2225 General Ecology / Lab 3.0/1.0
• BIOL 2400/2405 Plant Kingdom / Lab 3.0/1.0
• BIOL 2420/2425 Human Physiology / Lab 3.0/1.0
• BIOL 3010 Biological Evolution 3.0

Complete one of the following sets of courses: 4.0

• BIOL 3020/3025 Principles of Cell Biology / Lab (3.0/1.0)
• BIOL 3450/3455 General Microbiology / Lab (3.0/1.0)

**Biology Electives**

Complete one of the following sets of courses: 3.0-4.0

• BIOL 3140/3145 Plant Anatomy / Lab (2.0/1.0)
• BIOL 3200/3205 Invertebrate Zoology / Lab (3.0/1.0)
• BIOL 4230/4235 General Parasitology / Lab (3.0/1.0)
• BIOL 4260/4265 Herpetology / Lab (2.0/1.0)
• BIOL 4270/4275 Ichthyology / Lab (2.0/1.0)
• BIOL 4350/4355 Animal Behavior / Lab (3.0/1.0)
• BIOL 4380/4385 Ornithology / Lab (2.0/1.0)
• BIOL 4411/4415 Mammalogy / Lab (3.0/1.0)
• BIOL 4440/4445 General Entomology (3.0/1.0)

Complete two of the following sets of courses: 3.0-4.0

• BIOL 3140/3145 Comp. Vertebrate Anatomy / Lab (3.0/1.0)
• BIOL 3200/3205 Invertebrate Zoology / Lab (3.0/1.0)
• BIOL 4230/4235 General Parasitology / Lab (3.0/1.0)
• BIOL 4260/4265 Herpetology / Lab (2.0/1.0)
• BIOL 4270/4275 Ichthyology / Lab (2.0/1.0)
• BIOL 4350/4355 Animal Behavior / Lab (3.0/1.0)
• BIOL 4380/4385 Ornithology / Lab (2.0/1.0)
• BIOL 4411/4415 Mammalogy / Lab (3.0/1.0)
• BIOL 4440/4445 General Entomology (3.0/1.0)

**Integrated Science Endorsement Requirements**

Complete the following:

• GEO 1080 Introduction to Oceanography 3.0
• GEO 1110/1115 Physical Geology / Lab 3.0/1.0
• PHYS 1040/1045 Elementary Astronomy / Lab 3.0/1.0

**Lab Safety Certification Requirement**
Complete the following:

- Approved online lab safety course

Secondary Education Pre-Professional Requirements

Complete the following:

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

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

To take any professional classes listed below, students must be admitted to the Secondary Education Teaching Program (SET) along with these additional requirements:

1. All Pre-Professional Education classes have been completed.
2. Students with BS/BA degrees in progress need to have at least 90% of major coursework completed and approved by the major academic content department advisor.
3. Students with completed BS/BA or higher degrees need to have their transcripts reviewed by degree content areas.

Secondary Education Professional Requirements

Complete the following:

Semester I

- SCED 3720 Reading and Writing in the Content Areas
- SCED 4100 Curriculum, Instruction, and Assessment
- SCED 4600 Classroom Management

Complete one of the following:

- BIOL 4130 Biology Teaching Methods (3.0)
- SCED 4700 Content Methods Course (3.0)

Semester II

- SCED 4900 Secondary Student Teaching
- SCED 4989 Student Teaching Seminar

Licensure Requirement

- Students are required to pass the PRAXIS II Content Knowledge Test prior to student teaching.

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 127 college-level credits (1000 and above).
2. Complete at least 40 upper-division credits.
3. Complete at least 30 upper-division credits at DSC for institutional residency.
4. Grade C or higher required (not C-) in each Biology Program Requirement, Core Discipline Requirement, Biology Elective Requirement, and Integrated Science Endorsement Requirement course.
5. 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.
6. Cumulative GPA 2.0 or higher.