Major in Biological Science, Biological Science Concentration

The curriculum includes a two-semester introductory biology sequence, cell biology, developmental biology, ecology, evolution, and genetics. Required courses in the physical sciences include a minimum of one year in introductory chemistry and in physics (with labs), and at least one course in organic chemistry (with lab), and one in biochemistry. A calculus course and a statistics course are also required. In addition, students choose a selected field of 12 credits in one of the following: anatomy/physiology, aquatic biology, behavioral biology, cellular/molecular and genetic biology, ecology, evolution/genetics, and systematics, microbiology, or integrative organismal biology. There is an additional requirement of one course in two other fields, which assures a broad base of study.

Requirements
Effective Fall 2015

View Major Completion Map (http://wsnet.colostate.edu/CWIS608/Home/MajorCompletionMap)

To be qualified for graduation, students in the Biological Science major must have a minimum grade of C- in each of their biological, physical science, and mathematical courses used to meet requirements for the major. This applies to courses taken as substitutions for meeting these requirements. The minimum scholastic average acceptable for graduation is 2.000 computed only for courses attempted at CSU.

**Freshman**

Select one group from the following:

**Group A:**
- BZ 110 Principles of Animal Biology (GT-SC2) 3A
- BZ 111 Animal Biology Laboratory (GT-SC1) 3A
- BZ 120 Principles of Plant Biology (GT-SC2) 3A

**Group B:**
- LIFE 102 Attributes of Living Systems (GT-SC1) 3A
- LIFE 103 Biology of Organisms-Animals and Plants 3A
- CHEM 111 General Chemistry I (GT-SC2) 3A
- CHEM 112 General Chemistry Lab I (GT-SC1) 3A
- CO 150 College Composition (GT-CO2) 1A

Select one from the following:
- MATH 155 Calculus for Biological Scientists I (GT-MA1) 1B
- MATH 160 Calculus for Physical Scientists I (GT-MA1) 1B
- Arts and Humanities 3B
- Elective

**Sophomore**

- BZ 220 Introduction to Evolution 3
- CHEM 113 General Chemistry II 3
- CHEM 114 General Chemistry Lab II 1
- Select one group from the following:
  **Group A:**
  - CHEM 245 Fundamentals of Organic Chemistry
  - CHEM 246 Fundamentals of Organic Chemistry Laboratory
  **Group B:**
  - CHEM 341 Modern Organic Chemistry I
  - STAT 301 or STAT 307 Introduction to Statistical Methods or Introduction to Biostatistics
- Selected Field (see Selected Field lists below) 6
- Arts and Humanities 3B 3
- Global and Cultural Awareness 3E 3
- Historical Perspectives 3D 3
- Social and Behavioral Sciences 3C 3

**Total Credits** 31-33

**Junior**

Select one group from the following:

**Group A:**
- BC 351 Principles of Biochemistry
**Group B:**
- BC 401 Comprehensive Biochemistry I
- BC 403 Comprehensive Biochemistry II
- BZ 350 Molecular and General Genetics 4
- Students should take the following two courses only if CHEM 341 was selected in the sophomore year:
  - CHEM 343 Modern Organic Chemistry II
  - CHEM 344 Modern Organic Chemistry Laboratory
- Selected Field (see Selected Field lists below) 5
- Advanced Writing 2 3
- Elective 0-4

**Total Credits** 28-31
Major in Biological Science, Biological Science Concentration

Freshman

<table>
<thead>
<tr>
<th>Course</th>
<th>AUCC</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BZ 310</td>
<td></td>
<td>Cell Biology 4</td>
</tr>
<tr>
<td>BZ 311</td>
<td></td>
<td>Developmental Biology 4</td>
</tr>
<tr>
<td>LIFE 320</td>
<td></td>
<td>Ecology 4C 3</td>
</tr>
</tbody>
</table>

Selected Field (see Selected Field lists below) 3

Additional fields 6

Electives 2-17

Total Credits 22-37

Program Total Credits: 120-126

The Biology Department maintains a list of current selected fields. Twelve credits must be taken from one field.

Anatomy/Physiology Field Department List

Required Courses: 3-4
- BMS 300 Principles of Human Physiology
- BMS 360 Fundamentals of Physiology
- BZ 440 Plant Physiology

Selected Courses: 8-9
- Select enough credits from the following courses to complete the 12-credit field requirement:
  - ANEO 310 Animal Reproduction
  - BMS 310, BMS 384, and BMS 495
  - BSPM 525 Insect Physiology
  - BZ 331 Developmental Plant Anatomy
  - BZ 401 Comparative Animal Physiology
  - BZ 403 Comparative Endocrinology
  - BZ 440 Plant Physiology
  - BZ 441 Plant Physiology Laboratory
  - ERHS 450 Introduction to Radiation Biology
  - F 510 Ecophysiology of Trees
  - FW 405 Fish Physiology
  - HES 403 Physiology of Exercise
  - MIP 315 Human and Animal Disease
  - MIP 342 Immunology
  - MIP 343 Immunology Laboratory
  - PSY 454 Biological Psychology
  - PSY 455 Biological Psychology Laboratory
  - VS 331 Histology
  - VS 333 Domestic Animal Anatomy

Behavioral Biology Field Department List

Required Courses:
- BMS 325 Cellular Neurobiology 3
- BZ 300 Animal Behavior 3

Selected Courses:
- Select a minimum of 6 credits from the following: 6
  - BSPM 507 Insect Behavior
  - BSPM 570 Chemical Ecology
  - BZ 301 Animal Behavior Laboratory
  - BZ 430 Animal Behavior and Conservation
  - BZ 433 Behavioral Genetics
  - BZ 466 Biological Basis of Animal Behavior
  - BZ 479/VS 479 Biology and Behavior of Dogs
  - BZ 535 Behavioral Ecology
  - NB 501 Cellular and Molecular Neurophysiology
  - NB 502/CM 502 Techniques in Molecular & Cellular Biology
  - PSY 352 Learning and Memory
  - PSY 454 Biological Psychology
  - PSY 455 Biological Psychology Laboratory

Cellular, Molecular and Genetic Biology Field Department List

Select a minimum of 12 credits from the following: 12
- ANEQ 330 Principles of Animal Breeding
- BC 401 Comprehensive Biochemistry I
- BC 403 Comprehensive Biochemistry II
- BC 463 Molecular Genetics
- BC 511 Structural Biology I
- BC 513 Enzymology
- BC 517 Metabolism
- BMS 325 Cellular Neurobiology
- BMS 330 Microscopic Anatomy
- BMS 405 Nerve and Muscle-Toxins, Trauma and Disease
- BZ 346 Population and Evolutionary Genetics
- BZ 402 Molecular Cytogenetics
- BZ 403 Comparative Endocrinology
- BZ 425 Molecular Ecology
- BZ 433 Behavioral Genetics
- BZ 455 Human Heredity and Birth Defects
- BZ 460 Genome Evolution
- BZ 476 Genetics of Model Organisms
- BZ 570 Molecular Aspects of Plant Development
- BZ 577/ MIP 577 Computer Analysis in Population Genetics

Aquatic Biology Field Department List

Select a minimum of 12 credits from the following: 12
- BSPM 445 Aquatic Insects
- BZ 321 Aquatic Vascular Plants
- BZ 332 Introductory Phycology
- BZ 415 Marine Biology
- BZ 471 Stream Biology and Ecology
- BZ 472 Stream Biology and Ecology Laboratory
- BZ 474 Limnology
- FW 300 Ichthyology
- FW 301 Ichthyology Laboratory
- FW 400 Conservation of Fish in Aquatic Ecosystems
- FW 540 Fisheries Ecology
- FW 544 Ecotoxicology
Ecology Field Department List

Group A: 2-4
Select one course from the following:

- BZ 325 Plant Systematics
- BZ 330 Mammalogy
- BZ 332 Introductory Phycology
- BZ 333 Introductory Mycology
- BZ 335 Ornithology
- BZ 338 Comparative Morphology of Vascular Plants
- FW 300 Ichthyology
- FW 301 Ichthyology Laboratory
- MIP 300 General Microbiology
- MIP 302 General Microbiology Laboratory

Group B: 8-10
Select enough credits from the following to fulfill the 12-credit field requirement:

- ANTH 370 Primate Behavior and Ecology
- BZ 329 Herpetology
- BZ 330 Mammalogy
- BZ 332 Introductory Phycology
- BZ 333 Introductory Mycology
- BZ 335 Orinnithology
- BZ 338 Comparative Morphology of Vascular Plants
- FW 300 Ichthyology
- FW 301 Ichthyology Laboratory
- MIP 300 General Microbiology
- MIP 302 General Microbiology Laboratory

Evolution, Genetics and Systematics Field Department List

Required Courses 6-7

- BSPM 424/ BZ 424 Principles of Systematic Zoology
- BSPM 302 Applied and General Entomology
- BSPM 303A Entomology Laboratory: General
- BSPM 423 Evolution and Classification of Insects
- BSPM 462/ BZ 462/ MIP 462 Parasitology and Vector Biology
- BSPM 507 Insect Behavior
- BSPM 520 Advanced Systematics
- BZ 300 Animal Behavior
- BZ 329 Herpetology
- BZ 330 Mammalogy
- BZ 332 Introductory Phycology
- BZ 333 Introductory Mycology
- BZ 335 Ornithology
- BZ 338 Comparative Morphology of Vascular Plants
- BZ 348 Theory of Population and Evolutionary Ecology
- BZ 349 Tropical Ecology and Evolution
- BZ 402 Molecular Cytogenics
- BZ 425 Molecular Ecology
- BZ 433 Behavioral Genetics
- BZ 455 Human Heredity and Birth Defects
- BZ 460 Genome Evolution
- BZ 530 Ecological Plant Morphology
- BZ 535 Behavioral Ecology
- BZ 577/ MIP 577 Computer Analysis in Population Genetics
- BZ 578/ MIP 578 Genetics of Natural Populations

Selected Courses: 5-6

- ANTH 373 Human Evolution
- ANTH 374 Human Biological Variation
- BC 463 Molecular Genetics
- BZ 330 Mammalogy
- BZ 332 Introductory Phycology
- BZ 333 Introductory Mycology
- BZ 335 Ornithology
- BZ 338 Comparative Morphology of Vascular Plants
- BZ 348 Theory of Population and Evolutionary Ecology
- BZ 349 Tropical Ecology and Evolution
- BZ 402 Molecular Cytogenics
- BZ 425 Molecular Ecology
- BZ 433 Behavioral Genetics
- BZ 455 Human Heredity and Birth Defects
- BZ 460 Genome Evolution
- BZ 530 Ecological Plant Morphology
- BZ 535 Behavioral Ecology
- BZ 577/ MIP 577 Computer Analysis in Population Genetics
- BZ 578/ MIP 578 Genetics of Natural Populations
**Integrative Organismal Biology Field Department List**

Select a minimum of 12 credits total, to include at least one course from each of the following lists:

<table>
<thead>
<tr>
<th>List A: Botany</th>
<th>List B: Zoology</th>
</tr>
</thead>
<tbody>
<tr>
<td>BZ 223 Plant Identification</td>
<td>BSPM 302 Applied and General Entomology</td>
</tr>
<tr>
<td>BZ 302 Poisonous Plants</td>
<td>BSPM 303A Entomology Laboratory: General</td>
</tr>
<tr>
<td>BZ 321 Aquatic Vascular Plants</td>
<td>BSPM 424/ BZ 424 Principles of Systematic Zoology</td>
</tr>
<tr>
<td>BZ 325 Plant Systematics</td>
<td>BSPM 462/ BZ 462/ MIP 462 Parasitology and Vector Biology</td>
</tr>
<tr>
<td>BZ 332 Introductory Physiology</td>
<td>BZ 212 Animal Biology-Invertebrates</td>
</tr>
<tr>
<td>BZ 333 Introductory Mycology</td>
<td>BZ 214 Animal Biology-Vertebrates</td>
</tr>
<tr>
<td>BZ 338 Comparative Morphology of Vascular Plants</td>
<td>BZ 300 Animal Behavior</td>
</tr>
<tr>
<td>BZ 450 Plant Ecology</td>
<td>BZ 329 Herpetology</td>
</tr>
<tr>
<td>BZ 572 Phytoremediation</td>
<td>BZ 330 Mammalogy</td>
</tr>
</tbody>
</table>

**Microbiology Field Department List**

Select a minimum of 12 credits from the following:

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSPM 361</td>
<td>Elements of Plant Pathology</td>
</tr>
</tbody>
</table>

1. A minimum of one course must be selected from two additional fields (cannot use courses that were used to fulfill selected field). Courses in additional fields must be at least three credits.
2. Select enough elective credits to bring the program total to a minimum of 120-126 credits, of which at least 42 must be upper-division (300- to 400-level).
3. Only one of BMS 300 and BMS 360 may be used to fulfill the 12-credit Anatomy/Physiology Field requirement.