Zoology (700-170)

The zoology emphasis is designed to prepare students for career opportunities and graduate work in zoology and related areas. This emphasis will provide students with opportunities to study the structure, function, diversity, ecology, and evolution with an appropriate minor or clusters. This emphasis can qualify students for entry-level positions in industry or government agencies, as well as for further study at the graduate level.

Neuroscience (700-62)

Neuroscience is a multi-disciplinary program that focuses on the development, structure and function of the nervous system and its regulation of body systems and behavior. The neuroscience emphasis examines topics such as molecular and cellular neurobiology, neuroanatomy, the neural basis of behavior, learning, memory, cognition and perception, neuroendocrinology, neurophysiology, neuropharmacology, and neurological disorders. Students will be prepared to pursue advanced degrees in biology, psychology, and neuroscience or to enter into the pharmaceutical and biotechnology workforce. Neuroscience is an excellent pre-professional field of study for those interested in health professions, law, or business.

Environmental Biology (700-68)

The Environmental Biology emphasis is designed to prepare students for careers and graduate studies in the biology-related fields of environmental science. Students selecting this emphasis complete all core courses for the Biology Major, as well as specified coursework designed to prepare them for work as environmental biologists. This sector of environmental science is expected to undergo significant increases in employment opportunities for the foreseeable future, and career paths for people trained in this field are found in education, government, industry, and non-governmental organizations.

Human Biology (700-69)

The Human Biology emphasis is designed for students planning on careers centered on human health and well-being, such as medicine, dentistry, optometry, podiatry, physical/occupational therapy, etc., and for students desiring to pursue graduate degrees in anatomy and physiology. The courses were chosen to prepare students for further study in these professional schools as well as for students interested in continuing their education in graduate school.

Biotechnology (700-70)

Biotechnology is the application of biological information and techniques to meet medical, agricultural, and environmental needs. Students selecting this emphasis will be well prepared to pursue graduate studies in genetics, molecular biology, cellular biology, biochemistry and physiology. The emphasis will also prepare students for immediate employment as entry level technicians in one of hundreds of different biotechnology companies and university research labs. The emphasis will also serve pre-professional students interested in one of the medical professions.

B.S. in Plant and Wildlife Ecology (488)

This degree provides a powerful foundation for most ecological and natural resource related fields. It offers five separate areas of specialization, with course work requirements designed to meet State and Federal hiring prerequisites, and to prepare students for graduate studies.

Human Biology (700-69)

The Human Biology emphasis is designed for students planning on careers centered on human health and well-being, such as medicine, dentistry, optometry, podiatry, physical/occupational therapy, etc., and for students desiring to pursue graduate degrees in anatomy and physiology. The courses were chosen to prepare students for further study in these professional schools as well as for students interested in continuing their education in graduate school.

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Human Biology (700-69)

The Human Biology emphasis is designed for students planning on careers centered on human health and well-being, such as medicine, dentistry, optometry, podiatry, physical/occupational therapy, etc., and for students desiring to pursue graduate degrees in anatomy and physiology. The courses were chosen to prepare students for further study in these professional schools as well as for students interested in continuing their education in graduate school.

Biotechnology (700-70)

Biotechnology is the application of biological information and techniques to meet medical, agricultural, and environmental needs. Students selecting this emphasis will be well prepared to pursue graduate studies in genetics, molecular biology, cellular biology, biochemistry and physiology. The emphasis will also prepare students for immediate employment as entry level technicians in one of hundreds of different biotechnology companies and university research labs. The emphasis will also serve pre-professional students interested in one of the medical professions.

B.S. in Plant and Wildlife Ecology (488)

This degree provides a powerful foundation for most ecological and natural resource related fields. It offers five separate areas of specialization, with course work requirements designed to meet State and Federal hiring prerequisites, and to prepare students for graduate studies.
Range Emphasis (488-179)
The Range emphasis prepares students for careers in rangeland conservation, rangeland ecology, rangeland/livestock production consulting, wildlife and livestock production in a rangeland setting, or for post-baccalaureate studies in rangeland ecology related fields.

Ecology Emphasis (488-180)
The Ecology emphasis is designed to be somewhat broader than the other emphasis in the 488 series and should be taken by students interested in careers in conservation biology, natural history education/interpretation, natural resource policy/law, as park rangers, or as a foundation for post baccalaureate studies in ecology related fields.

Wildlife Emphasis (488-176)
The Wildlife emphasis prepares students for careers as wildlife biologists, conservation officers, natural resource managers, park rangers, natural resource policy/administration officers, and for legal careers and post-baccalaureate studies in wildlife related fields.

Fisheries Emphasis (488-177)
The Fisheries emphasis prepares students for careers as fisheries biologists, conservation officers, natural resource managers, park rangers, natural resource policy/administration officers and for legal careers and post-baccalaureate studies in fisheries related fields.

Plant Biology Emphasis (488-178)
The Plant Biology emphasis prepares students for careers as botanists. The degree also provides a strong foundation for post-baccalaureate studies in plant ecology, physiology, systematic, pathology, or other related fields.

B.S. in Biology Education (800)
The Biology Education Major at BYU–Idaho requires completion of specific coursework in Biology, BYU–Idaho Foundations classes, and Education classes needed for certification as a secondary education teacher in the state of Idaho (Idaho certification qualifies graduates to teach in 44 states). The Biology Education major at BYU–Idaho also requires the completion of a Science Education Minor. Students who graduate from this program are eligible for teacher certification in biology and in their chosen Science education minor.

For a listing of approved Secondary Science Education majors and minors, see the Teacher Education section of this catalog or the program notes for BS in Biology Education.

B.S. in Biology Education Composite (805)
A second pathway to the Biology Education Major at BYU–Idaho requires completion of specific coursework in Biology, BYU–Idaho Foundation classes, and Secondary Education classes needed for certification as a teacher in the State of Idaho. The Composite Biology Education major at BYU–Idaho does not require a minor, but gives more emphasis to preparation in the various biological sciences. Students who graduate from this program are eligible for teacher certification in biology but do not receive any other teaching endorsements.
BS in Plant and Wildlife Ecology
Wildlife Emphasis (488-176)

**Core Courses**
- Take these courses during your first 2 semesters:
  - BIO 199 1
  - BIO 208 4
  - CHEM 105 4
  - CHEM 106 13
- Take 1 course:
  - BIO 398 1-4
  - BIO 498R 1-4

**Emphasis Courses**
- Take these courses:
  - BIO 208 4
  - BIO 203 2
  - BIO 311 1
  - BIO 352 3
  - BIO 362 3
  - BIO 375 3
  - BIO 379 3
  - BIO 423 3
  - BIO 475 3
  - GEOG 230 3
  - GEOG 340 3
  - MATH 221B 3

**Program Notes:**
- No Double Counting of Major Courses
- No Grade Less Than C- in Major Courses

**Credit Requirements:**
- Foundations: 40
- Major: 79
- Elective: 1
- Total: 120

**Tracks Available:**
- Fall-Winter: Yes
- Winter-Spring: Yes
- Spring-Fall: Yes

BS in Plant and Wildlife Ecology
Fisheries Emphasis (488-177)

**Core Courses**
- Take these courses during your first 2 semesters:
  - BIO 199 1
  - BIO 208 4
  - CHEM 105 4
  - CHEM 106 13
- Take 1 course:
  - BIO 398 1-4
  - BIO 498R 1-4

**Emphasis Courses**
- Take these courses:
  - BIO 307 3
  - BIO 312 4
  - BIO 314 3
  - BIO 331 3
  - BIO 351 3
  - BIO 360 3
  - BIO 420 3
  - BIO 445 3
  - BIO 446 3
  - BIO 447 3
  - BIO 448 3
  - GEOG 230 3
  - GEOG 340 3
  - MATH 221B 3

**Program Notes:**
- No Double Counting of Major Courses
- No Grade Less Than C- in Major Courses

**Credit Requirements:**
- Foundations: 40
- Major: 80
- Total: 120

**Tracks Available:**
- Fall-Winter: Yes
- Winter-Spring: Yes
- Spring-Fall: Yes

BS in Plant and Wildlife Ecology
Plant Biology Emphasis (488-178)

**Core Courses**
- Take these courses during your first 2 semesters:
  - BIO 199 1
  - BIO 208 4
  - CHEM 105 4
  - CHEM 106 13
- Take 1 course:
  - BIO 398 1-4
  - BIO 498R 1-4

**Emphasis Courses**
- Take these courses:
  - APS 220 3
  - APS 230L 1
  - APS 413 1
  - BIO 209 4
  - BIO 210 3
  - BIO 225 3
  - BIO 391 2
  - BIO 392 2
  - BIO 393 4
  - BIO 401R 1
  - BIO 408 4
  - CHEM 351 4

**Program Notes:**
- No Double Counting of Major Courses
- No Grade Less Than C- in Major Courses

**Credit Requirements:**
- Foundations: 40
- Major: 80
- Total: 120

**Tracks Available:**
- Fall-Winter: Yes
- Winter-Spring: Yes
- Spring-Fall: Yes
BS in Plant and Wildlife Ecology
Range Emphasis (488-179)

Core Courses
Take these courses during your first 2 semesters:
BIO 199 1
BIO 208 4
CHEM 105 4
CHEM 106 4

Take 1 course:
BIO 398 1-4
BIO 498R 1-4

Take these courses:
BIO 302 4
BIO 303 2
BIO 311 1
BIO 352 3
BIO 362 3
BIO 375 3
BIO 379 3
BIO 423 3
BIO 475 3
GEOG 230 3
MATH 221B 3

Emphasis Courses
Take these courses:
APS 220 3
AGRON 425 3
AS 220 3
BIO 210 3
BIO 225 3
BIO 351 3
BIO 466 3

Program Notes:
• No Double Counting of Major Courses
• No Grade Less Than C- in Major Courses

Credit Requirements:
Foundations 40
Major 71
Elective 9
Total 120

Tracks Available:
Fall-Winter Yes
Winter-Spring Yes
Spring-Fall Yes

BS in Plant and Wildlife Ecology
Ecology Emphasis (488-180)

Core Courses
Take these courses during your first 2 semesters:
BIO 199 1
BIO 208 4
CHEM 105 4
CHEM 106 4

Take 1 course:
BIO 398 1-4
BIO 498R 1-4

Take these courses:
BIO 302 4
BIO 303 2
BIO 311 1
BIO 352 3
BIO 362 3
BIO 375 3
BIO 379 3
BIO 423 3
BIO 475 3
GEOG 230 3
MATH 221B 3

Emphasis Courses
Take 1 course:
BIO 445 3
BIO 446 3
BIO 447 3
BIO 448 3

Take these courses:
APS 220 3
BIO 210 3
BIO 225 3
BIO 351 3
BIO 392 3
BIO 393 4
BIO 408 4
BIO 420 3
CHEM 351 4

Program Notes:
• No Double Counting of Major Courses
• No Grade Less Than C- in Major Courses

Credit Requirements:
Foundations 40
Major 80
Total 120

Tracks Available:
Fall-Winter Yes
Winter-Spring Yes
Spring-Fall Yes

BS in Biology
Microbiology Emphasis (700-55)

Core Courses
Take these courses during your first 2 semesters:
BIO 180 4
BIO 199 1
CHEM 105 4
CHEM 106 4

Take 1 course:
BIO 398 1-4
BIO 499R 3

Take these courses:
BIO 398 1-4
BIO 498R 1-4

Take these courses:
BIO 375 3
BIO 475 3
MATH 221B 3

Take 6 credits:
BIO 376 3
CHEM 481 3
CHEM 482 3
HS 370 3

Emphasis Courses
Take these courses:
BIO 321 4
BIO 410 3
BIO 411 3
BIO 412 3
BIO 413 3

Program Notes:
• No Double Counting of Major Courses
• No Grade Less Than C- in Major Courses

Credit Requirements:
Foundations 40
Major 51
Elective 29
Total 120

Tracks Available:
Fall-Winter Yes
Winter-Spring Yes
Spring-Fall Yes
### BS in Biology

#### Neuroscience Emphasis (700-62)

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#### Tracks Available:
Fall-Winter: Yes
Winter-Spring: Yes
Spring-Fall: Yes

### BS in Biology

#### Environmental Biology Emphasis (700-68)

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#### Tracks Available:
Fall-Winter: Yes
Winter-Spring: Yes
Spring-Fall: Yes

### BS in Biology

#### Human Biology Emphasis (700-69)

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#### Tracks Available:
Fall-Winter: Yes
Winter-Spring: Yes
Spring-Fall: Yes

*Course has prerequisites not in the Core Courses. Refer to Catalog for description.*
BS in Biology
Biotechnology Emphasis (700-70)

**Core Courses**
- Take these courses during your first 2 semesters:
  - BIO 180 4
  - BIO 199 1
  - CHEM 105 4
  - CHEM 106 4
- Take these courses:
  - BIO 375 3
  - BIO 181 4
  - MATH 221B 3
- Take 1 course:
  - BIO 298 1-4
  - BIO 497 3
  - BIO 498R 1-4

**Emphasis Courses**
- Take these courses:
  - BIO 321 4
  - BIO 376 3
  - CHEM 351 4
  - CHEM 481 3
- Take 8 credits:
  - BIO 410 3
  - BIO 411 3
  - BIO 412 3
  - BIO 413 2
  - CHEM 482 3

**Credit Requirements:**
- Foundations: 40
- Major: 52
- Elective: 28
- Total: 120

**Tracks Available:**
- Fall-Winter: Yes
- Winter-Spring: Yes
- Spring-Fall: Yes

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BS in Biology
Zoology Emphasis (700-170)

**Introduction to Biology Module**
- Take these courses during your first 2 semesters:
  - BIO 180 4
  - BIO 181 4
  - BIO 199 1
  - MATH 221B 3
- Take these courses:
  - BIO 204 4
  - BIO 312 4
  - BIO 445 3
  - BIO 446 3
  - BIO 447 3
  - BIO 448 3
- Take 9 credits:
  - BIO 208 4
  - BIO 209 4
  - BIO 314 3
  - BIO 331 3
  - BIO 380 4
  - BIO 381 3
  - BIO 383 3
  - BIO 401R 1

**Animal Diversity Module**
- Take this course:
  - BIO 204 4
- Take 9 credits:
  - BIO 312 4
  - BIO 331 3
  - BIO 445 3
  - BIO 446 3
  - BIO 447 3
  - BIO 448 3
- Take 9 credits:
  - BIO 208 4
  - BIO 209 4
  - BIO 314 3
  - BIO 331 3
  - BIO 380 4
  - BIO 381 3
  - BIO 383 3
  - BIO 401R 1

**Enrichment Module**
- Take 8 credits:
  - BIO 420 3
  - BIO 445 3
  - BIO 446 3
  - BIO 447 3
  - BIO 448 3
  - BIO 460 4
  - BIO 461 5
  - BIO 499R 1-6
- Take 1 course:
  - BIO 398 1-4
  - BIO 497 3
  - BIO 498R 1-4

**Credit Requirements:**
- Foundations: 40
- Major: 52
- Elective: 28
- Total: 120

**Tracks Available:**
- Fall-Winter: Yes
- Winter-Spring: Yes
- Spring-Fall: Yes

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BS in Biology Education (800)

**Education Core**
- Take these courses:
  - BIO 180 4
  - BIO 181 4
  - BIO 204 4
  - BIO 209 4
  - BIO 275 3
  - BIO 276 3
  - BIO 312 4
  - BIO 321 4
  - BIO 331 3
  - BIO 345 3
  - BIO 346 3
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  - BIO 352 3
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  - BIO 407 3
  - BIO 408 3
  - BIO 409 3
  - BIO 410 3
  - BIO 411 3
  - BIO 412 3
  - BIO 413 2
  - CHEM 482 3
- Take these courses:
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  - BIO 302 4
  - BIO 357 3
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  - BIO 375 3
  - BIO 376 3
  - BIO 377 3
  - BIO 378 3
  - BIO 379 3
  - BIO 380 3
  - BIO 381 3
  - BIO 382 3
  - BIO 383 3
  - BIO 384 3
  - BIO 385 3
  - BIO 386 3
  - BIO 387 3
  - BIO 388 3
  - BIO 389 3
  - BIO 390 3
  - BIO 391 3
  - BIO 392 3
  - BIO 393 3
  - BIO 394 3
  - BIO 395 3
  - BIO 396 3
  - BIO 397 3
  - BIO 398 3
  - BIO 399 3
  - BIO 400 3
  - BIO 401 3
  - BIO 402 3
  - BIO 403 3
  - BIO 404 3
  - BIO 405 3
  - BIO 406 3
  - BIO 407 3
  - BIO 408 3
  - BIO 409 3
  - BIO 410 3
  - BIO 411 3
  - BIO 412 3
  - BIO 413 2
  - CHEM 482 3

**Credit Requirements:**
- Foundations: 40
- Major: 36
- Elective: 1
- Education Core: 23
- Education Minor: 20
- Total: 120

**Tracks Available:**
- Fall-Winter: Yes
- Winter-Spring: Yes
- Spring-Fall: Yes

**Program Notes:**
- No Double Counting of Major Courses
- No Grade Less Than C- in Major Courses

---

Students in this education major are required to take a Science Education Minor (worth 20 credits) for graduation. The possible Minors are: Natural Science Education (130), Chemistry Education (172), Physics Education (178), Earth Science Education (181), or Physical Science Education (182).

*Course has prerequisites not in the Core Courses. Refer to catalog for description.
### BS in Biology Education Composite (805)

<table>
<thead>
<tr>
<th>Education Core</th>
<th>Core Courses</th>
<th>cont. from previous column</th>
<th>Take 1 course:</th>
<th>Program Notes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Take these courses:</td>
<td>Take these courses:</td>
<td></td>
<td></td>
<td>• No Double Counting of Major Courses</td>
</tr>
<tr>
<td>ED 200</td>
<td>ED 180</td>
<td>4</td>
<td>BIO 210</td>
<td></td>
</tr>
<tr>
<td>ED 304</td>
<td>ED 181</td>
<td>4</td>
<td>BIO 312</td>
<td></td>
</tr>
<tr>
<td>ED 448</td>
<td>ED 204</td>
<td>4</td>
<td>BIO 313</td>
<td></td>
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<tr>
<td>ED 461</td>
<td>ED 209</td>
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<tr>
<td>ED 492</td>
<td>ED 221</td>
<td>3</td>
<td>BIO 315</td>
<td></td>
</tr>
<tr>
<td>SPED 360</td>
<td>ED 222</td>
<td>1</td>
<td>BIO 316</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BIO 230</td>
<td>4</td>
<td>BIO 317</td>
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</tr>
<tr>
<td></td>
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<td></td>
<td></td>
<td>• No Grade Less Than C- in Major Courses</td>
</tr>
</tbody>
</table>

**Core Courses**
- BIO 180
- BIO 181
- BIO 204
- BIO 209
- BIO 221
- BIO 222
- BIO 230
- BIO 302
- BIO 303
- BIO 305
- BIO 375
- BIO 378
- BIO 405
- BIO 475
- CHEM 105
- CHEM 106

**Take 1 course:**
- BIO 376

**Take 1 course:**
- MATH 221B

**Program Notes:**
- Once you have completed 24 university credits hours a bold will be placed on your registration until you speak with the Biology Education Program Director.

### Credit Requirements:
- Foundations: 40
- Major: 57
- Education Core: 23
- Total: 120

### Minor in Natural Resources (141)

<table>
<thead>
<tr>
<th>Core Courses</th>
<th>Take 6 credits:</th>
<th>cont. from previous column</th>
<th>Program Notes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Take these courses:</td>
<td></td>
<td></td>
<td>• No Double Counting of Minor Courses</td>
</tr>
<tr>
<td>BIO 208</td>
<td>APS 220</td>
<td>3</td>
<td>BIO 379</td>
</tr>
<tr>
<td>BIO 302</td>
<td>APS 220L</td>
<td>1</td>
<td>BIO 390</td>
</tr>
<tr>
<td>BIO 351</td>
<td>BIO 209*</td>
<td>4</td>
<td>BIO 391</td>
</tr>
<tr>
<td>BIO 362</td>
<td>BIO 210*</td>
<td>3</td>
<td>BIO 392</td>
</tr>
<tr>
<td>BIO 423</td>
<td>BIO 307</td>
<td>3</td>
<td>BIO 393</td>
</tr>
<tr>
<td></td>
<td>BIO 312</td>
<td>4</td>
<td>BIO 408*</td>
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<td></td>
<td>BIO 314</td>
<td>3</td>
<td>BIO 420</td>
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<tr>
<td></td>
<td>BIO 331</td>
<td>3</td>
<td>BIO 446*</td>
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<tr>
<td></td>
<td>BIO 352</td>
<td>3</td>
<td>BIO 447</td>
</tr>
<tr>
<td></td>
<td>cont. in next column</td>
<td></td>
<td>GEOG 230</td>
</tr>
</tbody>
</table>

**Credit Requirements:**
- Total: 23

**Tracks Available:**
- Fall-Winter: Yes
- Winter-Spring: Yes
- Spring-Fall: Yes

### Minor in Biology (143)

<table>
<thead>
<tr>
<th>Core Courses</th>
<th>Take 8 credits:</th>
<th>cont. from previous column</th>
<th>Program Notes:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Take these courses:</td>
<td></td>
<td></td>
<td>• No Double Counting of Minor Courses</td>
</tr>
<tr>
<td>BIO 208</td>
<td>BIO 302</td>
<td>4</td>
<td>BIO 380</td>
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<tr>
<td>BIO 302</td>
<td>BIO 312</td>
<td>4</td>
<td>BIO 390</td>
</tr>
<tr>
<td></td>
<td>BIO 314</td>
<td>3</td>
<td>BIO 391</td>
</tr>
<tr>
<td>OR</td>
<td>BIO 321</td>
<td>4</td>
<td>BIO 392</td>
</tr>
<tr>
<td>Take these courses:</td>
<td></td>
<td></td>
<td>• No Grade Less Than C- in Minor Courses</td>
</tr>
<tr>
<td>BIO 180</td>
<td>BIO 351</td>
<td>3</td>
<td>BIO 393</td>
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<tr>
<td>BIO 181</td>
<td>BIO 352</td>
<td>3</td>
<td>BIO 408</td>
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<td>BIO 355</td>
<td>3</td>
<td>BIO 410*</td>
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<td></td>
<td>BIO 362</td>
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<td>BIO 411*</td>
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<tr>
<td></td>
<td>BIO 375</td>
<td>3</td>
<td>BIO 412*</td>
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<tr>
<td></td>
<td>BIO 376</td>
<td>3</td>
<td>BIO 413*</td>
</tr>
<tr>
<td></td>
<td>BIO 377*</td>
<td>3</td>
<td>BIO 420</td>
</tr>
<tr>
<td></td>
<td>BIO 379*</td>
<td>3</td>
<td>BIO 423</td>
</tr>
<tr>
<td></td>
<td>cont. in next column</td>
<td></td>
<td>BIO 446</td>
</tr>
<tr>
<td></td>
<td>cont. in next column</td>
<td></td>
<td>cont. in next column</td>
</tr>
</tbody>
</table>

**Take 4 credits:**
- CHEM 101
- CHEM 101L
- OR
- CHEM 105

**Take 4 credits:**
- CHEM 101
- CHEM 101L
- OR
- CHEM 105

**Credit Requirements:**
- Total: 20

**Tracks Available:**
- Fall-Winter: Yes
- Winter-Spring: Yes
- Spring-Fall: Yes
## Minor in Biology Education (173)

<table>
<thead>
<tr>
<th>Core Courses</th>
<th>Take 4 credits:</th>
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</tr>
</thead>
<tbody>
<tr>
<td>BIO 180</td>
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<td>4</td>
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<tr>
<td>BIO 181</td>
<td>BIO 302</td>
<td>4</td>
</tr>
<tr>
<td>BIO 204</td>
<td>BIO 331</td>
<td>3</td>
</tr>
<tr>
<td>BIO 209</td>
<td>BIO 376*</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>BIO 447</td>
<td>3</td>
</tr>
</tbody>
</table>

### Program Notes:
- Students wishing to take this education minor are required to combine it with a Science Education Major for graduation.
- The possible majors are: Chemistry Education (810), Earth Science Education (870), or Physics Education (870).
- Course has prerequisites not in the core courses. Refer to catalog for description.

### Credit Requirements:

| Total | 20 |

### Tracks Available:
- Fall-Winter: Yes
- Winter-Spring: Yes
- Spring-Fall: Yes

### Biology Predefined Clusters

#### Recreation Therapy (Recreation Management Majors)

<table>
<thead>
<tr>
<th>Take these courses:</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 264 Anatomy and Physiology I 3</td>
</tr>
<tr>
<td>BIO 264L Anatomy and Physiology I Lab 1</td>
</tr>
<tr>
<td>BIO 265 Anatomy and Physiology II 3</td>
</tr>
<tr>
<td>BIO 265L Anatomy and Physiology II Lab 1</td>
</tr>
</tbody>
</table>

**Take 4 credits:**
- BIO 240 Neurobiology 4
- HS 280 Medical Terminology 2
- HS 349 Sports Medicine 3
- HS 349L Sports Medicine Lab 1
- HS 351 Gerontology 2

**Total Credits:** 12

#### Natural Resource (Recreation Management Majors)

<table>
<thead>
<tr>
<th>Take this course:</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 202 Natural Resource Management 4</td>
</tr>
</tbody>
</table>

**Take 9 credits:**
- BIO 225 Range Management 3
- BIO 302* Ecology I 3
- BIO 307 Wildlife Law and Enforcement 3
- BIO 351 Principles Wildlife Management 3
- BIO 423 Natural Resource Policy 3
- GEOG 230 Introduction to GIS 3

**Total Credits:** 13

#### Neuroscience

<table>
<thead>
<tr>
<th>Take these courses:</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 240 Neurobiology 4</td>
</tr>
<tr>
<td>BIO 485 Advanced Neuroscience 4</td>
</tr>
</tbody>
</table>

**Take 4 credits:**
- BIO 180 Introduction to Biology I 4
- BIO 264 Anatomy and Physiology I 3
- BIO 264L Anatomy and Physiology I Lab 1
- BIO 265 Anatomy and Physiology II 3
- BIO 265L Anatomy and Physiology II Lab 1

**Total Credits:** 12

#### Biological Illustrations (Art Majors)

<table>
<thead>
<tr>
<th>Take these courses:</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 208 General Botany 4</td>
</tr>
<tr>
<td>BIO 460 Human Anatomy 4</td>
</tr>
</tbody>
</table>

**Take 7 credits:**
- BIO 204 Vertebrate and Invertebrate Strategies 4
- BIO 209 An Evolutionary Survey of Plants 4
- BIO 210* Plant Systematics 3
- BIO 221 General Microbiology 3
- BIO 351 General Entomology 3
- BIO 380* Histology with Lab 4
- BIO 445* Ichthyology 3
- BIO 446* Ornithology 3
- BIO 447* Mammalogy 3

**Total Credits:** 15

#### Biological Illustrations (Art Majors)

<table>
<thead>
<tr>
<th>Take these courses:</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 208 General Botany 4</td>
</tr>
<tr>
<td>BIO 460 Human Anatomy 4</td>
</tr>
</tbody>
</table>

**Take 7 credits:**
- BIO 204 Vertebrate and Invertebrate Strategies 4
- BIO 209 An Evolutionary Survey of Plants 4
- BIO 210* Plant Systematics 3
- BIO 221 General Microbiology 3
- BIO 351 General Entomology 3
- BIO 380* Histology with Lab 4
- BIO 445* Ichthyology 3
- BIO 446* Ornithology 3
- BIO 447* Mammalogy 3

**Total Credits:** 15

#### Pre-Profession

<table>
<thead>
<tr>
<th>Take these courses:</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 180 Introduction to Biology I 4</td>
</tr>
<tr>
<td>BIO 181 Introduction to Biology II 4</td>
</tr>
</tbody>
</table>

**Take 5-7 credits:**
- BIO 375 Genetics and Molecular Biology 3
- BIO 376 Cell and Molecular Biology 3
- BIO 460 Human Anatomy with Lab 4
- BIO 461 Principles of Physiology 5
- CHEM 481* Biochemistry I 3

**Total Credits:** 15
## Course Descriptions

### BIO 180 Introduction to Biology I

<table>
<thead>
<tr>
<th>Credits*</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:3:2:0</td>
<td>This course is the first semester of a year-long Introduction to Biology course. It includes the areas of biological chemistry, cellular structure and function, and metabolism. There is a weekly lab in addition to the lecture. This course is a prerequisite for most other upper division courses in Biology. (Fall, Winter, Spring)</td>
</tr>
</tbody>
</table>

### BIO 181 Introduction to Biology II

<table>
<thead>
<tr>
<th>Credits*</th>
<th>Description</th>
</tr>
</thead>
</table>
| 4:3:2:0  | Total Course Fees: $15.00  
Prerequisite: BIO 180  
This course is the second semester of a year-long Introduction to Biology course. It includes the areas of classical genetics, molecular biology, ecology, and evolution. There is a weekly lab in addition to the lecture. (Fall, Winter, Spring) |

### BIO 182 Introduction to Biology III

<table>
<thead>
<tr>
<th>Credits*</th>
<th>Description</th>
</tr>
</thead>
</table>
| 3:3:0:0  | Prerequisite: BIO 181  
This course is a one-semester introduction to diversity of life on Earth, including prokaryotes, protists, fungi, plants, and animals. This course is designed specifically for students preparing to take the DAT or GRE-Biology Subject Exam. (See Rotation Schedule on page 143) |

### BIO 199 Biology Orientation

<table>
<thead>
<tr>
<th>Credits*</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:1:0:0</td>
<td>The course will be divided into 6 modules as follows: 1: General Overview <em>Required for all students</em> 2: Ecology/Wildlife 3: Graduate Programs / Academic Careers 4: Pre-Professional Careers (med, dent, opt, vet, etc.) 5: Industry Careers (lab, pharmaceutical reps, etc.) 6: Allied Health (chiropractics, PA, OP, PT, etc.) Each student will be expected to attend all of Module 1: General Overview, then select three of the remaining five modules. Modules may be taught by different faculty members. Each module will have its own unique information pertinent to the topics covered and a set of requirements for those students who attend that module. These requirements may include reading assignments, reports, summary sheets, or written papers. (Fall, Winter, Spring)</td>
</tr>
</tbody>
</table>

### BIO 202 Natural Resource Management

<table>
<thead>
<tr>
<th>Credits*</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:3:3:0</td>
<td>This course involves the management of natural resources such as wildlife, fisheries, forests, range, and recreational lands. The orientation of the course will be ecological with emphasis on economic principles, ecosystem interrelationships, and current National Natural Resource Policy. (See Rotation Schedule on page 143)</td>
</tr>
</tbody>
</table>

### BIO 204 Invert/Vertebrate Zoology

<table>
<thead>
<tr>
<th>Credits*</th>
<th>Description</th>
</tr>
</thead>
</table>
| 4:3:3:0  | Total Course Fees: $15.00  
This course covers the comparative organization and evolutionary significance of adaptive morphological, physiological, behavioral, reproductive, and ecological differences in invertebrates and vertebrates. (See Rotation Schedule on page 143) |

### BIO 208 General Botany

<table>
<thead>
<tr>
<th>Credits*</th>
<th>Description</th>
</tr>
</thead>
</table>
| 4:3:2:0  | Total Course Fees: $15.00  
This course is an introduction to Botany including cell structure/function, plant physiology, heredity, evolution, reproduction, and plant anatomy. Lab is required. (Fall, Winter, Spring) |

### BIO 209 An Evolutionary Survey of Plants

<table>
<thead>
<tr>
<th>Credits*</th>
<th>Description</th>
</tr>
</thead>
</table>
| 4:3:3:0  | Total Course Fees: $20.00  
Prerequisite: BIO 181 or BIO 208  
This course is an introduction and overview to the evolution, phylogeny, morphology, anatomy, and life history of various photosynthetic organisms, including cyanobacteria, archaea, protists, algae, and land plants, but also including some non-photosynthetic organisms traditionally considered plants, such as fungi, slime molds, and watermolds. (See Rotation Schedule on page 143) |

### BIO 210 Plant Systematics

<table>
<thead>
<tr>
<th>Credits*</th>
<th>Description</th>
</tr>
</thead>
</table>
| 2:2:3:0  | Total Course Fees: $20.00  
Prerequisite: BIO 208  
A basic course in vascular plant classification, systematics, and nomenclature, including a survey of common or important vascular plant families, with emphasis on flowering plants and the local flora. Students will also learn the skills necessary for plant identification. (See Rotation Schedule on page 143) |

### BIO 221 General Microbiology

<table>
<thead>
<tr>
<th>Credits*</th>
<th>Description</th>
</tr>
</thead>
</table>
| 3:3:0:0  | Corequisite: BIO 222  
In this course, students will study the microorganisms (especially bacteria and viruses), their metabolism and requirements for growth, the methods used to grow and study them, the disease processes caused by them, methods used to control their growth, and the immune response to infection and disease. (Fall, Winter, Spring) |

### BIO 222 General Microbiology Lab

<table>
<thead>
<tr>
<th>Credits*</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1:0:2:0  | Corequisite: BIO 221  
In this course, students use the microscope to study different types of microorganisms and learn the methods used to grow, identify, and characterize them. (Fall, Winter, Spring) |

### BIO 225 Range Management

<table>
<thead>
<tr>
<th>Credits*</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:3:0:0</td>
<td>In this course, subject material will focus on: rangeland management history, physical characteristics descriptions of rangelands, rangeland plant physiology, ecology, inventory, monitoring, stocking rates, grazing methods, wildlife livestock distribution, animal nutrition, multiple use management, livestock production on rangelands, rangeland wildlife management, and manipulation of range vegetation. (Fall, Winter, Spring)</td>
</tr>
</tbody>
</table>

### BIO 230 Human Biology

<table>
<thead>
<tr>
<th>Credits*</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:3:2:0</td>
<td>This is an introductory course in human anatomy and physiology for non-science and non-health professions majors. (Fall, Winter, Spring)</td>
</tr>
</tbody>
</table>

### BIO 240 Neurobiology

<table>
<thead>
<tr>
<th>Credits*</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:3:2:0</td>
<td>This is an introductory course in Neuroscience. It covers the elements of Neurobiology by providing an introduction to the nervous system; examines cellular communication, sensory, motor and integrating systems, such as, the neural basis of behavior; and explores the plasticity of neural systems in learning, during development and via hormonal influences. (Fall, Winter, Spring)</td>
</tr>
</tbody>
</table>

### BIO 250 Environmental Biology with Lab

<table>
<thead>
<tr>
<th>Credits*</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>4:3:2:0</td>
<td>This course will use basic ecological principles to examine environmental issues. The environmental issues range from local to global and include direct and indirect human impact on ecosystems. This class includes a 2 hour lab (BIO 250L) to allow hands on understanding of what is covered in lecture. (See Rotation Schedule on page 143)</td>
</tr>
</tbody>
</table>

### BIO 250L Environmental Biology Lab

<table>
<thead>
<tr>
<th>Credits*</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1:0:2:0</td>
<td>This course consists of selected experiments dealing with possible human impact on the ecosystems. (Fall, Winter, Spring)</td>
</tr>
</tbody>
</table>

### BIO 264 Human Anatomy and Physiology I

<table>
<thead>
<tr>
<th>Credits*</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>3:3:0:0</td>
<td>This is the first part of a two semester course to prepare students for further study in the health and medical fields. Specifically designed for students of nursing and the allied health professions. Includes basic biochemistry, structure and function of the cell, tissues, skeleton, muscles, and nervous systems of the body. Not acceptable for biology major credit. (Fall, Winter, Spring)</td>
</tr>
</tbody>
</table>

### BIO 264L Human Anatomy and Physiology I Lab

<table>
<thead>
<tr>
<th>Credits*</th>
<th>Description</th>
</tr>
</thead>
</table>
| 1:0:2:0  | Co-Requisite: BIO 264  
This is the laboratory accompaniment of the first part of a two-semester course studying the anatomy and physiology of the human body. While the lecture mainly focuses on physiology, most of the anatomical learning occurs in this lab. The course is designed for students of nursing and the allied health professions. Students wishing to apply to the nursing program must complete both the lecture and lab components. This course is not acceptable for biology major credit. (Fall, Winter, Spring) |

### BIO 265 Human Anatomy and Physiology II

<table>
<thead>
<tr>
<th>Credits*</th>
<th>Description</th>
</tr>
</thead>
</table>
| 3:3:0:0  | Prerequisite: BIO 264  
This is the second part of a two-semester course to prepare students for further study in the health and medical fields. Specifically designed for students of nursing and the allied health professions. Includes structure and function of the senses, circulatory, lymphatic, respiratory, urinary, digestive, endocrine and reproductive systems. Not acceptable for biology major credit. (Fall, Winter, Spring) |

* Credit Description (Credit Hours : Lecture Hours per week : Lab Hours per week : Guided Instruction Hours per week)
<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
<th>Total Course Fees</th>
<th>Prerequisites/Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIO 265L</td>
<td>Human Anatomy and Physiology II Lab</td>
<td>(1:0:2:0)</td>
<td>$20.00</td>
<td>This is the laboratory accompaniment of the second part of a two-semester course studying the anatomy and physiology of the human body. The course is designed for students of nursing and the allied health professions. Students wishing to apply to the nursing program must complete both the lecture and lab components. This course is not acceptable for biology major credit. (These students should take BIO 460 and 461 instead of 264 and 265.) (Fall, Winter, Spring)</td>
</tr>
<tr>
<td>BIO 295</td>
<td>Pharmacology</td>
<td>(2:2:0:0)</td>
<td></td>
<td>Prerequisite: BIO 264 and BIO 265 This course is designed for nursing and other health-related profession students. Underlying principles of pharmacology are studied including overviews of physiological and anatomical basics for the interaction of drugs with the human body. Common drugs in clinical medicine are examined, including their therapeutic uses and mechanisms of action. (Fall, Winter, Spring)</td>
</tr>
<tr>
<td>BIO 302 I</td>
<td>Ecology I</td>
<td>(4:3:3:0)</td>
<td>$20.00</td>
<td>Prerequisites: BIO 181 or BIO 208 This course is an introduction to Ecology including climates and distribution of life, adaptations of life to environmental conditions, life history characteristics, population characteristics, competition, predation, and parasitism. Lab is required. (Fall, Winter, Spring)</td>
</tr>
<tr>
<td>BIO 303 II</td>
<td>Ecology II</td>
<td>(2:2:0:0)</td>
<td></td>
<td>Prerequisite: BIO 302 This course is a continued introduction to Ecology including energy and nutrient cycling, community composition, succession, ecosystem function, distribution, and characteristics of major biomes. (See Rotation Schedule on page 143)</td>
</tr>
<tr>
<td>BIO 305</td>
<td>Science Teaching Principles</td>
<td>(2:1:1:0)</td>
<td>$20.00</td>
<td>Course equivalent to CHEM 305, GEOL 305, and PH 305 Prerequisites: ED 200 and (BIO 181 or CHEM 106 or GEOL 112 or PH 106) Prerequisite: BIO 302 This course is designed to be taken in the 1st or 2nd semester of the Sophomore year. Students in this class receive experience in lesson preparation and teaching of general science topics to 6-12 public education students. This class is based on a mix of classroom discussion on various aspects of general and science-specific teaching principles, and preparation and execution of mentor-directed teaching experiences. (See Rotation Schedule on page 143)</td>
</tr>
<tr>
<td>BIO 307</td>
<td>Wildlife Law and Enforcement</td>
<td>(3:3:0:0)</td>
<td>$20.00</td>
<td>This course is an in-depth analysis of legal mandates (Federal and State) from a resource protection paradigm. Environmental law and evidence collection in relation to the atmosphere associated with the judicial system will be covered. Descriptions of field techniques for evidence collection, case investigation, and arrest will be provided. (See Rotation Schedule on page 143)</td>
</tr>
<tr>
<td>BIO 311</td>
<td>Scientific Writing and Communication</td>
<td>(1:1:0:0)</td>
<td>$15.00</td>
<td>The goal of this course is to familiarize students with the principles of effective scientific communication. This course will cover areas of scientific communication that students will need to know to be successful in their careers. Students will learn the basic rules of word, grammar, and punctuation usage; as well as an approach to the style of writing. Students will then apply these principles when writing papers, reports, resumes; and when preparing scientific presentations and posters. (See Rotation Schedule on page 143)</td>
</tr>
<tr>
<td>BIO 312</td>
<td>Invertebrate Zoology</td>
<td>(4:3:3:0)</td>
<td>$20.00</td>
<td>Prerequisites: BIO 181 or BIO 302 This course is an introduction to the diversity, anatomy, physiology, ecology, and evolution of invertebrate animals. (See Rotation Schedule on page 143)</td>
</tr>
<tr>
<td>BIO 314</td>
<td>Marine Biology</td>
<td>(3:3:0:0)</td>
<td>$20.00</td>
<td>Prerequisites: BIO 181 or BIO 302 This course is an introduction to the ecology, diversity, structure, and function of marine communities. (See Rotation Schedule on page 143)</td>
</tr>
<tr>
<td>BIO 321</td>
<td>Biology of Microorganisms</td>
<td>(4:3:2:0)</td>
<td>$20.00</td>
<td>This course is designed for nursing students. The topics covered in this course include microbial diversity, the methods used to study microorganisms, microbial metabolism and genetics, the role of microbiom in causing disease, the immune response, the methods used to control microorganisms, and the use of microorganisms by man. (Fall, Winter, Spring)</td>
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<tr>
<td>BIO 325</td>
<td>Range Ecology Systems Management</td>
<td>(2:3:0:0)</td>
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<td>Areas of discussion in this course include pasture lay out, fence design, water systems, herding effect, grazing systems, leasing, permits, BLM, state ground, private ground, lease ground, forage estimates, photopimetry, energy store, tools of land management, and drought management. (See Rotation Schedule on page 143)</td>
</tr>
<tr>
<td>BIO 331</td>
<td>General Entomology</td>
<td>(3:2:3:0)</td>
<td>$15.00</td>
<td>This course is an introduction to Entomology with lectures and laboratories on insect structure, development, classification, behavior, and control. An insect collection and fieldwork are required. (Fall, Spring)</td>
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<tr>
<td>BIO 351</td>
<td>Principles Wildlife Management</td>
<td>(3:3:0:0)</td>
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<td>This course introduces students to the art and science of wildlife management. This course will provide a foundation course from which students who major in Ecology and Wildlife may build a successful collegiate experience and professional career. It will also provide insight into the wildlife discipline for non-wildlife majors. (See Rotation Schedule on page 143)</td>
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<tr>
<td>BIO 352</td>
<td>Rangelands and Range Plants</td>
<td>(3:2:2:0)</td>
<td>$50.00</td>
<td>Total Course Fees: $50.00 This course requires identification of some 200 species from the intermountain area of the west. Successful students will be able to identify mounted specimens by common, scientific, and family names. Species are taken from a variety of habitats. There is a mandatory field trip. (See Rotation Schedule on page 143)</td>
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<tr>
<td>BIO 360</td>
<td>Principles of Fish Management</td>
<td>(3:3:0:0)</td>
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<td>Prerequisite: BIO 302 This course introduces students to the science of fisheries management and demonstrates how fishery biology principles and methods are applied to management of recreational and commercial fisheries. (See Rotation Schedule on page 143)</td>
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<tr>
<td>BIO 362</td>
<td>Stream Ecology</td>
<td>(3:2:2:0)</td>
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<td>Total Course Fees: $25.00 Prerequisites: BIO 181 or BIO 302 This course is an in-depth examination of stream ecology. Emphasis is placed on the structure and function of running waters. Links to terrestrial and riparian components of applicable ecosystems will be investigated. The political issues that impinge on water issues are explored. (See Rotation Schedule on page 143)</td>
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<tr>
<td>BIO 375</td>
<td>Genetics and Molecular Biology</td>
<td>(3:3:0:0)</td>
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<td>Prerequisites: BIO 181 or BIO 208 This course consists of an investigation of the transmission of heritable material in prokaryotes and eukaryotes. Topics include classical genetics (patterns of inheritance, linkage and chromosome mapping), molecular biology (DNA structure and function, gene expression, biotechnology), and population genetics. (Fall, Winter, Spring)</td>
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<tr>
<td>BIO 376</td>
<td>Cell and Molecular Biology</td>
<td>(3:3:0:0)</td>
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<td>Prerequisites: BIO 181 or BIO 302 This course covers principles, processes, and methodology of molecular and cell biology. Students will gain knowledge of interactions at the cellular level through structure and function of membranes, organelles and cytoskeletal elements, energy metabolism, signal transduction, cell cycle, cell-cell communication, and cellular movement. (Fall, Winter, Spring)</td>
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</table>
BIO 377 Techniques in Biochemistry and Molecular Biology (3:0:6:0)
Total Course Fees: $50.00
Prerequisites: CHEM 106 and (BIO 181 or BIO 208)
This is a comprehensive laboratory course designed to familiarize students with essential laboratory techniques in molecular biology, cellular biology, genetics, and biochemistry. The course topics demand a rigorous but rewarding schedule that enables students to follow several multi-session projects from start to finish. Students successfully completing the course will find they have most of the skills necessary to work as an entry level laboratory technician.
(Fall, Winter, Spring)

BIO 378 Molecular Lab Pedagogy (2:0:4:0)
Total Course Fees: $50.00
Prerequisite: BIO 305
This is a comprehensive laboratory course designed specifically for biology education majors in order to familiarize them with essential laboratory techniques and equipment used in teaching high school honors, AP, and college biology. Cellular biology, molecular biology, genetics, and biochemistry will be the focus of the content of the labs learned in this class. Students will also learn about developing labs and writing lab reports at the high school level as well as becoming certified in laboratory safety.
(See Rotation Schedule on page 143)

BIO 379 Range and Wildlife Inventory, Analysis, and Technique (3:0:6:0)
Total Course Fees: $30.00
Prerequisites: BIO 181 or BIO 302 and MATH 221B
This course covers microscopic anatomy of cells and tissues and their relationship to the function of the cell.
(See Rotation Schedule on page 143)

BIO 381 Pathophysiology (3:3:0:0)
Prerequisites: CHEM 101 or CHEM 105 and ((BIO 461 or BIO 264 and BIO 265))
This course is a study of the derangement of bodily function as seen in diseased states.
(Fall, Winter, Spring)

BIO 383 Human Embryology (3:3:0:0)
Prerequisites: BIO 180 or BIO 265
This course is intended to provide a foundation of understanding for the processes involved in creating gametes and their participation in the process of conception. A discussion will then continue to discover the processes important in the development of a fully formed and functional fetus. This course will examine the cellular and morphological development of most of the major human body systems. The study of human embryology is important to provide a logical framework for understanding structure and function in the study of anatomy and physiology.
(See Rotation Schedule on page 143)

BIO 390 Fire Ecology (2:2:0:0)
Prerequisite: BIO 302
This course will focus on fire history, safety, terms, behavior, current and past policies, general effects of fire on soils, watersheds, and animal and plant communities.
(See Rotation Schedule on page 143)

BIO 391 Weed Ecology (2:2:0:0)
Prerequisites: BIO 181 or BIO 302
This course will evaluate the ecological and economic impacts of invasive species in a variety of habitats. Students will learn what governs their invasions and treatment feasibility.
(See Rotation Schedule on page 143)

BIO 392 Range and Wildland Restoration (2:2:0:0)
Prerequisite: BIO 302
Restoration ecology is the study of the restoration of degraded and damaged ecosystems. This course will examine the current state of knowledge in this area through case studies and project design/implementation.
(See Rotation Schedule on page 143)

BIO 393 Range and Wildland Plant Ecology (4:3:2:0)
Total Course Fees: $20.00
Prerequisite: BIO 302
The purpose of this course is to elaborate on information gained in ecology (BIO 302). Students will explore plants’ complex interactions with their environments, looking often to adaptations which enable species to exploit particular ecological niches. Understanding such interactions will require the incorporation of concepts drawn from various other fields including: geology, chemistry, climatology, and mathematics.
(See Rotation Schedule on page 143)

BIO 398 Occupational Internship (1:4:0:0)
Internship Fees: $81.50 (LDS) $163 (non-LDS) per credit
Exempt from tuition, but charged this independent course fee
This course is designed to award university credit for occupational training-based internships in any biomedical or ecological field. This course is meant for students engaged in operational duties of a facility. Students wishing to engage in research-based internship training are encouraged to enroll in the department’s research internship (BIO 498R).
(Fall, Winter, Spring)

BIO 401R Readings in Biology (1:1:0:0)
Repeatable Course: May earn maximum of 3 credits
This course consists of selected readings in biology.
(Fall, Winter, Spring)

BIO 405 Science Teaching Methods (3:2:3:0)
Course equivalent to CHEM 405, GEO 405, and PH 403
Prerequisites: BIO 305 or CHEM 305 or PH 305 or GEO 305
Concurrent Requisite: ED 461
General science teaching methods needed for certification in secondary education in the field of biology are taught. The course focuses on classroom and laboratory techniques specific to science teaching. Practical experience in teaching laboratories, lectures and demonstrations will be emphasized. As part of a practicum experience, students will build and teach a science unit which demonstrates their understanding and application of inquiry, nature of science, and the use of a multitude of other teaching, learning, and assessment strategies.
(See Rotation Schedule on page 143)

BIO 408 Advanced Botany (4:3:3:0)
Prerequisite: BIO 208
This course covers advanced topics in plant structure and function. Advanced concepts in plant morphology, anatomy, and physiology are studied. Previous or concurrent enrollment in organic chemistry is required.
(See Rotation Schedule on page 143)

BIO 410 Immunology (3:3:0:0)
Prerequisite: BIO 321
This course is an introduction to the functions of the cells and proteins that make up the immune system of the body. The topics that will be discussed include innate immunity, structure and function of immune system molecules, the genetics of the immune system, lymphocyte development and activation, failure of immunity, and immune system diseases.
(Fall, Winter, Spring)

BIO 411 Medical Microbiology (3:3:0:0)
Prerequisite: BIO 321
This course includes the study of bacteriology, mycology, and virology. The major areas of emphasis will focus on host-parasitic interactions between humans and bacteria. Paradigms in bacterial virulence factors will be stressed.
(See Rotation Schedule on page 143)

BIO 412 Virology (3:3:0:0)
Prerequisite: BIO 321
This is an introductory course on viruses that explores the characteristics common to all viruses. Particular emphasis will be placed on the replication strategies used by various animal viruses as well as the interactions between these viruses and the host cells they infect.
(See Rotation Schedule on page 143)
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<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credit Hours</th>
<th>Lecture Hours</th>
<th>Lab Hours</th>
<th>Guided Instruction Hours</th>
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<td>Advanced Microbiology Lab</td>
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<td>BIO 420</td>
<td>Principles of Ummology</td>
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<td>Natural Resource Policy</td>
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<td>Mammalogy</td>
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<td>Insect Systematics</td>
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<td>BIO 455</td>
<td>Rangeland Inventory and Analysis Lab</td>
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<td>BIO 460</td>
<td>Human Anatomy with Lab</td>
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<td>BIO 461</td>
<td>Principles of Physiology</td>
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<td>BIO 462</td>
<td>Head and Neck Anatomy</td>
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<td>BIO 466</td>
<td>Rangeland Vegetation Improvement</td>
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<td>Evolutionary Science</td>
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<td>BIO 468</td>
<td>Advanced Neuroscience</td>
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<td>BIO 475</td>
<td>Special Problems</td>
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<td>BIO 489R</td>
<td>Research and Occupational Internship</td>
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* Credit Description (Credit Hours : Lecture Hours per week : Lab Hours per week : Guided Instruction Hours per week)
Some courses will not appear in this rotation schedule because they are offered every semester.

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<tr>
<th>Course ID</th>
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Although unforeseen circumstances may result in occasional changes to this schedule, every attempt is made to adhere to it.