# Biology Curriculum Checklist
## Fall 2017 – Spring 2018

<table>
<thead>
<tr>
<th>Completed</th>
<th>Course Number &amp; Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
<td>BIOL 2000 Molecules &amp; Cells <em>(fall/spring)</em></td>
<td>3</td>
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<tr>
<td>☐</td>
<td>BIOL 2010 Ecology &amp; Evolution <em>(fall/spring)</em></td>
<td>3</td>
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<td>☐</td>
<td><strong>NOTE</strong>: there is no AP substitution for BIOL 2010 (Ecology &amp; Evolution)</td>
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<tr>
<td>☐</td>
<td>BIOL 2040 Investigations in Molecular Cell Biology Lab <em>(fall/spring)</em></td>
<td>3</td>
</tr>
<tr>
<td>☐</td>
<td><strong>NOTE</strong>: Taken after BIOL 2000</td>
<td></td>
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<tr>
<td>☐</td>
<td>Category A: Genes &amp; Genomes</td>
<td>4</td>
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<tr>
<td>☐</td>
<td>One from the following:</td>
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<tr>
<td>☐</td>
<td>- BIOL 3150 Introduction to Genomics <em>(fall/spring)</em></td>
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<tr>
<td>☐</td>
<td>- BIOL 3190 Genetics &amp; Genomics <em>(fall/spring)</em></td>
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<tr>
<td>☐</td>
<td>Category B: Organismal &amp; Systems Biology</td>
<td>3-4</td>
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<tr>
<td>☐</td>
<td>One from the following:</td>
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<tr>
<td>☐</td>
<td>- BIOL 3030 Introduction to Physiology <em>(fall/spring)</em></td>
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<td>☐</td>
<td>- BIOL 3210 Plant Biology <em>(spring)</em></td>
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<td>☐</td>
<td>- BIOL 4320 Developmental Biology <em>(fall)</em></td>
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<td>☐</td>
<td>- BIOL 4340 Human Physiology with Lab <em>(fall/spring)</em></td>
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<td>☐</td>
<td>- BIOL 4590 Introduction to Neuroscience <em>(fall)</em></td>
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<td>☐</td>
<td>One Advanced Experience Course <em>(see listing on reverse side)</em></td>
<td>2-3</td>
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<td>☐</td>
<td><strong>NOTE</strong>: Undergraduate Research can also be used to satisfy the Advanced Experience requirement if the student completes two semesters. Regardless, at least two semesters must be completed to have a maximum of 3 credits applied towards the Biology major, although additional credits can be applied to the overall credits required to graduate.</td>
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<tr>
<td>☐</td>
<td>Additional Biology Electives <em>(numbered 3000 and above – see listing on reverse)</em></td>
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<tr>
<td>☐</td>
<td><strong>Biology Majors are encouraged to take more electives than the required number for graduation.</strong></td>
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<tr>
<td>☐</td>
<td>BS Majors – Total of 30 credits for all biology courses.</td>
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<td>☐</td>
<td>BA Majors – Total of 33 credits for all biology courses</td>
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<tr>
<td>☐</td>
<td><em>(9 credits can be from BA Elective List)</em></td>
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## Biology courses are 3 credits unless otherwise noted.

### CO-REQUISITES

#### BS MAJORS

**Chemistry (15-16 credits)**
- ☐ General Chemistry 1 & 2 with Labs (CHEM 1109-1110; 1111-1112)
- ☐ Organic Chemistry 1 with Lab (CHEM 2231-2232)
- ☐ Organic Chemistry 2 with Lab (CHEM 2233-2234) or Biological Chemistry (BIOL 4350) or Biochemistry 1 (CHEM 4461)

**NOTE**: Biochemistry courses (BIOL 4350 or CHEM 4461) used to replace Organic Chemistry 2 cannot be applied as a biology elective.

**Quantitative (4 course equivalents; 6-18 credits)**
- ☐ Calculus 1 (MATH 1100) or AP or equivalent
- ☐ Calculus 2 (MATH 1101) or AP or Biostatistics (BIOL 2300 or ECON 1151)
- ☐ Two Additional Courses from this list:
  - Intro Physics 1 (calculus-based) with Lab (PHYS 2100)
  - Intro Physics 2 (calculus-based) with Lab (PHYS 2101)
  - Biostatistics (BIOL 2300) or Statistics (ECON 1151; MATH 3353)
  - Computer Science 1 (CSCI 1101)
  - Computer Science 2 (CSCI 1102)
  - Calculus 2 (MATH 1101)
  - MATH courses numbered 2000 or higher

**NOTE**: Biology BS majors who are in the pre-med program should take Physics 1&2 with labs and consider adding statistics.

#### BA MAJORS

**Chemistry (8 credits)**
- ☐ General Chemistry 1 & 2 with Labs (CHEM 1109-1110; 1111-1112)

**Quantitative (credits depend on math background)**
- ☐ Calculus 1 (MATH 1100) or AP credit

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**Calculus Placement & Sequencing Notes**

Calculus 1 requirement is satisfied by MATH 1100 or an AP score of 4 or 5 on the AB exam.

Calculus 1 & 2 can be satisfied by completing MATH 1101 or an AP score of 4 or 5 on the BC exam.

Calculus 1 & 2 can be taken concurrently with Physics 1 & 2. Biology majors typically begin and/or complete calculus during freshman year.
### BIOLOGY ELECTIVES

**Biology Electives are 3 credits each unless otherwise noted.**

**Fall**
- Introduction to Physiology (BIOL 3030)
- Cell Biology (BIOL 3040)
- Introduction to Genomics (BIOL 3150) – 4 credits
- Genetics & Genomics (BIOL 3190) – 4 credits
- Human Anatomy with Lab (BIOL 4260) – 4 credits
- Human Physiology with Lab (BIOL 4340) – 4 credits
- Developmental Biology (BIOL 4320)
- Biological Chemistry (BIOL 4350)
- Molecular & Cell Physiology of Exercise (BIOL 4520)
- Introduction to Neuroscience (BIOL 4590)
- Biochemistry 1 (CHEM 4461)
- Behavioral Neuroscience (PSYC 2285)*
- Human Metabolism/Dis & Entrepreneurship (CHEM 5511)

**Spring**
- Introduction to Physiology (BIOL 3030)
- Cell Biology (BIOL 3040)
- Introduction to Genomics (BIOL 3150) – 4 credits
- Genetics & Genomics (BIOL 3190) – 4 credits
- Plant Biology (BIOL 3210)
- Microbiology (BIOL 4140) – 4 credits if taken with BIOL 4150 Lab
- Introduction to Bioinformatics (BIOL 4200)
- Human Anatomy with Lab (BIOL 4260) – 4 credits
- Human Physiology with Lab (BIOL 4340) – 4 credits
- Biological Chemistry (BIOL 4350)
- Behavioral Ecology (BIOL 4450)
- Molecular Biology (BIOL 4400)
- Cancer Biology (BIOL 4510)
- Principles of Immunology (BIOL 4570)
- Biochemistry 2 (CHEM 4462)
- Behavioral Neuroscience (PSYC 2285)*
- Introduction to Paleobiology (EESC 3330)*
- Introduction to Computational Chemistry (CHEM 5522)

*Only two of these electives outside the department may be counted toward the Biology B.S. major.*

### ADVANCED EXPERIENCE COURSES

**Fall**
- **Seminars (3 credits)**
  - Genetics in Contemporary Society (BIOL 4041)
  - Vaccine Development & Public Health (BIOL 5150)
  - Inflammation in Health & Disease (BIOL 5160)
  - Virus Infections & Cellular Transport (BIOL 5330)
  - Literature for Neurological Diseases (BIOL 5370)
  - Cancer as a Metabolic Disease (BIOL 5420)
  - Biology of the Nucleus (BIOL 5700)
- **Advanced Labs (3 credits)**
  - Research in Evolutionary Genomics (BIOL 4802)
  - Research in Molecular Microbiology Lab (BIOL 4810)
  - Research in Molecular Biology Lab (BIOL 4830)
  - Investigations in Cellular Re-Programming (BIOL4890)
  - Advanced Lab in Cell Imaging (BIOL 5450)— 2 credits

**Spring**
- **Seminars (3 credits)**
  - Recombinant DNA Technology (BIOL 5060)
  - Microbial Community Ecology (BIOL 5071)—2 credits
  - Environmental Disruptors of Development (BIOL 5130)
  - Immunity & Infectious Disease (BIOL 5230)
  - Literature for Neurological Diseases (BIOL 5370)
  - Topics in Biomechanics (BIOL 5380)
  - Cancer as a Metabolic Disease (BIOL 5420)
  - Genomics and Personalized Medicine (BIOL5430)
  - Synthetic Biology (BIOL 5440)—2 credits
  - Topics in Microbial Pathogens (BIOL5460)
  - DNA Viruses and Cancer (BIOL 5630)
- **Advanced Labs (3 credits)**
  - Research in Molecular Biology Lab (BIOL 4830)
  - Research in Molecular Genetics Lab (BIOL 4870)
  - Advanced Lab in Cell Imaging (BIOL 5450)— 2 credits

### Approved Biology BA Electives

**Fall**
- Philosophy of Science (PHIL 5593)
- Neurobiology of Eating & Eating Disorders (PSYC3388)
- HIV, AIDS & Ethics (THEO 5498)
- Metaphysics (PHIL 5529)

**Spring**
- Cognitive Neuroscience: Exploring Mind & Brain (PSYC 3371)
- Environmental Law & Policy (ENVS 2256)
- Sustainable Agriculture (ENVS 3315)
- Neurobiology of Motivation & Emotion (PSYC 3385)

### University Core Requirements

- Arts (1 course)
- Literature (1 course)
- Philosophy (2 courses)
- Writing (1 course)
- Cultural Diversity (1 course)
- Math (1 course)
- Social Science (2 courses)
- History (2 courses)
- Natural Science (2 courses)
- Theology (2 courses)