### 2016-2017 Biology Curriculum Checklist

<table>
<thead>
<tr>
<th>Course Number &amp; Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOL 2000 Molecules &amp; Cells <em>(fall/spring)</em></td>
<td>3</td>
</tr>
<tr>
<td>BIOL 2010 Ecology &amp; Evolution <em>(fall/spring)</em></td>
<td>3</td>
</tr>
<tr>
<td>BIOL 2040 Investigations in Molecular Cell Biology Lab <em>(fall/spring)</em></td>
<td>3</td>
</tr>
<tr>
<td>Category A: Genes &amp; Genomes</td>
<td>3-4</td>
</tr>
<tr>
<td>One from the following:</td>
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<tr>
<td>• BIOL 3150 Introduction to Genomics <em>(fall/spring)</em></td>
<td></td>
</tr>
<tr>
<td>• BIOL 3190 Genetics &amp; Genomics <em>(fall/spring)</em> – 4 credits</td>
<td></td>
</tr>
<tr>
<td>Category B: Organismal &amp; Systems Biology</td>
<td>3-4</td>
</tr>
<tr>
<td>One from the following:</td>
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<tr>
<td>• BIOL 3030 Introduction to Physiology <em>(fall/spring)</em></td>
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<tr>
<td>• BIOL 3210 Plant Biology <em>(spring)</em></td>
<td></td>
</tr>
<tr>
<td>• BIOL 4320 Developmental Biology <em>(spring)</em></td>
<td></td>
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<tr>
<td>• BIOL 4330 Human Physiology with Lab <em>(spring)</em> – 4 credits</td>
<td></td>
</tr>
<tr>
<td>• BIOL 4590 Introduction to Neuroscience <em>(fall)</em></td>
<td></td>
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</tbody>
</table>

**One Advanced Experience Course (see listing on reverse side)**

*NOTE:* 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.

**Additional Biology Electives**(numbered 3000 and above – see listing on reverse)

Biology Majors are encouraged to take more electives than the required number for graduation.

- BS Majors – Total of **30 credits** for all biology courses.
- BA Majors – Total of **33 credits** for all biology courses

*(9 credits can be from BA Elective List)*

**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

### 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.
### 2016-17 BIOLOGY ELECTIVES

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

#### Fall 2016
- Introduction to Physiology (BIOL 3030)
- Cell Biology (BIOL 3040)
- Introduction to Genomics (BIOL 3150)
- Genetics & Genomics (BIOL 3190) – **4 credits**
- Introduction to Bioinformatics (BIOL 4200)
- Human Anatomy with Lab (BIOL 4260) – **4 credits**
- Biological Chemistry (BIOL 4350)
- Molecular & Cell Physiology of Exercise (BIOL 4520)
- Principles of Immunology (BIOL 4570)
- Introduction to Neuroscience (BIOL 4590)
- Biochemistry 1 (CHEM 4461)
- Behavioral Neuroscience (PSYC 2285)*
- Agroecology (EESC 3310) *

#### Spring 2017
- Introduction to Physiology (BIOL 3030)
- Cell Biology (BIOL 3040)
- Introduction to Genomics (BIOL 3150)
- Genetics & Genomics (BIOL 3190) – **4 credits**
- Plant Biology (BIOL 3210)
- Microbiology (BIOL 4140) – **4 credits if taken with BIOL 4150 Lab**
- Developmental Biology (BIOL 4320)
- Human Physiology with Lab (BIOL 4340) – **4 credits**
- Biological Chemistry (BIOL 4350)
- Molecular Biology (BIOL 4400)
- Cancer Biology (BIOL 4510)
- Biochemistry 2 (CHEM 4462)
- Introduction to Biological Membranes (CHEM 5570)
- Behavioral Neuroscience (PSYC 2285)*
- Neurophysiology (PSYC 3384)*

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

### ADVANCED EXPERIENCE COURSES

#### Fall 2016
- **Seminars (3 credits)**
  - Cellular Differentiation (BIOL 5090)
  - Environmental Disruptors of Development (BIOL 5130)
  - Virus Infections & Cellular Transport (BIOL 5330)
  - Topics in Biomechanics (BIOL 5380)
  - Cancer as a Metabolic Disease (BIOL 5420)
  - Synthetic Biology (BIOL 5440)—**2 credits**
  - Biology of the Nucleus (BIOL 5700)
- **Advanced Labs (3 credits)**
  - Research in Molecular Cell Biology Lab (BIOL 4801)
  - Research in Molecular Microbiology Lab (BIOL 4810)
  - Research in Molecular Biology Lab (BIOL 4830)
  - Investigations in Cellular Re-Programming (BIOL 4890)
  - Advanced Lab in Cell Imaging (BIOL 5450)—**2 credits**

#### Spring 2017
- **Seminars (3 credits)**
  - Recombinant DNA Technology (BIOL 5060)
  - Immunity & Infectious Disease (BIOL 5230)
  - Cancer as a Metabolic Disease (BIOL 5420)
  - Genomics and Personalized Medicine (BIOL 5430)
  - Topics in Microbial Pathogens (BIOL 5460)
  - DNA Viruses and Cancer (BIOL 5630)
  - Advanced Topics in Biochemistry (CHEM 5582)
- **Advanced Labs (3 credits)**
  - Research in Molecular Cell Biology Lab (BIOL 4801)
  - Research in Evolutionary Genomics (BIOL 4802)
  - Research in Molecular Genetics Lab (BIOL 4870)
  - Research in Biomechanics Lab (BIOL 4880)
  - Advanced Lab in Cell Imaging (BIOL 5450)—**2 credits**

### Approved Biology BA Electives

#### Fall 2016
- Philosophy of Science (PHIL 5593)
- Psychopharmacology (PSYC 3386)
- Neurobiology of Eating & Eating Disorders (PSYC 3388)
- Law, Medicine & Ethics (THEO 3598)
- HIV, AIDS & Ethics (THEO 5498)

#### Spring 2017
- Neurobiological Basis of Learning & Memory (PSYC 3383)
- Brain Systems: Motivation & Emotion (PSYC 5585)
- Cognitive Neuroscience: Exploring Mind & Brain (PSYC 3371)
- Environmental Law & Policy (ENVS 2256)
- Sustainable Agriculture (ENVS 3315)
- Metaphysics (PHIL 5529)

### 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)