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.

Biology Curriculum Checklist
Fall 2018 – Spring 2019 (updated 10/24/18)

<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 (fall/spring)</td>
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<tr>
<td>☐</td>
<td>BIOL 2010 Ecology &amp; Evolution (fall/spring)</td>
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<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 (fall/spring)</td>
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<td><strong>NOTE:</strong> Taken after BIOL 2000</td>
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<tr>
<td>☐</td>
<td><strong>Category A: Genes &amp; Genomes</strong></td>
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<td>One from the following:</td>
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<tr>
<td></td>
<td>• BIOL 3150 Introduction to Genomics (fall/spring)</td>
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<tr>
<td></td>
<td>• BIOL 3190 Modern and Classical Genetics (spring)</td>
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<tr>
<td></td>
<td>• BIOL 3050 Genetics (Summer only)</td>
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<td>☐</td>
<td><strong>Category B: Organismal &amp; Systems Biology</strong></td>
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<td>One from the following:</td>
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<td>• BIOL 3030 Introduction to Physiology (fall/spring/summer)</td>
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<td></td>
<td>• BIOL 3210 Plant Biology (spring)</td>
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<td></td>
<td>• BIOL 4320 Developmental Biology (fall)</td>
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<td></td>
<td>• BIOL 4330 Human Physiology with Lab (spring) – 4 credits</td>
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<tr>
<td></td>
<td>• BIOL 4590 Introduction to Neuroscience (fall)</td>
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<tr>
<td>☐</td>
<td><strong>One Advanced Experience Course (see listing on reverse side)</strong></td>
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<td></td>
<td><strong>NOTE:</strong> Undergraduate Research can be used to satisfy the Advanced Experience requirement only if the student completes two semesters.</td>
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</tr>
<tr>
<td>☐</td>
<td><strong>Additional Biology Electives</strong> (numbered 3000 and above – see listing on reverse)</td>
<td></td>
</tr>
</tbody>
</table>

**BS Majors** – Total of 30 credits for all biology courses.  Total: _______

**BA Majors** – Total of 33 credits for all biology courses  (9 credits can be from BA Elective List)  Total: _______

**CO-REQUISITES**

**BS MAJORS**

- Chemistry
  - ☐ 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
  - ☐ Calculus 1 (MATH 1100) or AP
  - ☐ Calculus 2 (MATH 1101) or AP or Statistics (BIOL 2300, ECON 1151, MATH 3353)
  - ☐ Two Additional Courses from this list:
    - Intro Physics 1 (calculus-based) with Lab (PHYS 2100)
    - Intro Physics 2 (calculus-based) with Lab (PHYS 2101)
    - Statistics (BIOL 2300, ECON 1151, MATH 3353)
    - Econometrics Methods (ECON 2228)
    - Computer Science 1 (CSCI 1101)
    - Computer Science 2 (CSCI 1102)
    - Database Systems and Application (CSCI2257)
    - Calculus 2 (MATH 1101)
    - MATH courses numbered 2000 or higher

**BA MAJORS**

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

- Quantitative
  - ☐ 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.
### 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**
- Modern and Classical Genetics (BIOL 3190) – **4 credits**
- Virology (BIOL 4090)
- Human Anatomy with Lab (BIOL 4260) – **4 credits**
- Developmental Biology (BIOL 4320)
- Molecular Biology (BIOL 4400)
- Molecular & Cell Physiology of Exercise (BIOL 4520)
- Introduction to Neuroscience (BIOL 4590)
- Biochemistry 1 (CHEM 4461)
- Behavioral Neuroscience (PSYC 2285)*

**NOTE:** Biological Chemistry will ONLY be offered SPRING term 2018-2019 year

#### Spring
- Introduction to Physiology (BIOL 3030)**
- Cell Biology (BIOL 3040)
- Introduction to Genomics (BIOL 3150) – **4 credits**
- Plant Biology (BIOL 3210)
- Advanced Cell Biology (BIOL 4020)
- Deep Sea Biology (BIOL 4030)
- Microbiology (BIOL 4140) – **4 credits if taken with BIOL 4150 Lab**
- Introduction to Bioinformatics (BIOL 4200)
- Human Physiology with Lab (BIOL 4330) – **4 credits**
- Biological Chemistry (BIOL 4350)
- Behavioral Ecology (BIOL 4450)
- Cancer Biology (BIOL 4510)
- Principles of Immunology (BIOL 4570)
- Behavioral Neuroscience (PSYC 2285)*
- Sustainable Agriculture (ENVS 3315)*
- Introduction to Mass Spectrometry (CHEM 3356)
- Biochemistry 2 (CHEM 4462)
- Introduction to Computational Chemistry (CHEM 5522)

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

**Also offered in Summer 2019**

#### ADVANCED EXPERIENCE COURSES

##### Fall
- **Seminars (3 credits)**
  - Topics in Developmental Biology (BIOL 5040) – **2 credits**
  - The Microbiome (BIOL 5050)
  - Environmental Disruptors of Development (BIOL 5130)
  - Vaccine Development & Public Health (BIOL 5150)
  - Cancer as a Metabolic Disease (BIOL 5420)

##### Spring
- **Seminars (3 credits)**
  - Nobel Prize Winning Res in Medicine or Physiology (BIOL 5010)
  - Recombinant DNA Technology (BIOL 5060)
  - Phages: Viruses that rule the Planet (BIOL 5065)
  - Microbial Community Ecology (BIOL 5071) – **2 credits**
  - 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 (BIOL 5430)

##### 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 (BIOL 4890)
- Advanced Lab in Cell Imaging (BIOL 5450) – **2 credits**

##### Spring
- **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 (PSYC 3388)
- HIV, AIDS & Ethics (THEO 5498)
- Metaphysics (PHIL 5529)

##### Spring
- Cognitive Neuroscience: Exploring Mind & Brain (PSYC 3371)
- Environmental Law & Policy (ENVS 2256)
- Animals (HIST 4222)
- Science and Religion in American History (HIST 4891)