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 Curriculum Checklist
Fall 2018 – Spring 2019

Completed | Course Number & Title | Credits
---|---|---
☐ | BIOL 2000 Molecules & Cells (fall/spring) | 3
☐ | BIOL 2010 Ecology & Evolution (fall/spring) | 3
  | NOTE: there is no AP substitution for BIOL 2010 (Ecology & Evolution) | |
☐ | BIOL 2040 Investigations in Molecular Cell Biology Lab (fall/spring) | 3
  | NOTE: Taken after BIOL 2000 | |
☐ | Category A: Genes & Genomes | 4
  | One from the following:
  | • BIOL 3150 Introduction to Genomics (fall/spring)
  | • BIOL 3190 Modern and Classical Genetics (fall)
  | • BIOL 3050 Genetics (Summer only) | |
☐ | Category B: Organismal & Systems Biology | 3-4
  | One from the following:
  | • BIOL 3030 Introduction to Physiology (fall/spring/summer)
  | • BIOL 3210 Plant Biology (spring)
  | • BIOL 4320 Developmental Biology (fall)
  | • BIOL 4340 Human Physiology with Lab (spring) – 4 credits
  | • BIOL 4590 Introduction to Neuroscience (fall) | |
☐ | One Advanced Experience Course (see listing on reverse side) | 2-3
  | NOTE: Undergraduate Research can be used to satisfy the Advanced Experience requirement only if the student completes two semesters. | |
☐ | 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
☐ 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)
  • 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
  • NOTE: Student in pre-med program should take Physics (calc) 1&2 with lab

BA MAJORS

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

Quantitative (4 credits)
☐ Calculus 1 (MATH 1100) or AP

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
- 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 4340) – 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)*
- 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 2018**

### 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)
  - Virus Infections & Cellular Transport (BIOL 5330)
  - Cancer as a Metabolic Disease (BIOL 5420)
  - DNA Viruses and Cancer (BIOL 5630)

- **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)**
  - 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 (BIOL5430)

- **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)
- Animals (HIST 4222)
- Science and Religion in American History (HIST 4891)

### 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)