

# 2024-25 Biochemistry Curriculum Checklist

(updated 10/31/2024)

Biochemistry is an interdisciplinary major that is administered jointly by the Biology and Chemistry Departments. Students interested in the biochemistry major may consult Prof. Eric Folker (578 Higgins).

## Required Courses

### BIOLOGY

- BIOL 2000** Molecules & Cells (*fall/spring*)
- BIOL 2010** Ecology & Evolution (*fall/spring*) **OR** **BIOL 3030** Comparative Vertebrate Physiology (*fall/spring*)  
**OR** **BIOL 4330** Human Physiology (*spring only*)
- BIOL 2040** Investigations in Molecular Cell Biology (*fall/spring*)
- One course in **cellular sciences** from the following list
  - BIOL 3040 Cell Biology (*fall/spring*)
  - BIOL 3090 Foundations of Microbiology (*spring only*)
  - BIOL 4140 Microbiology (*fall only*)
- One course in **genetics or genomics** from the following list
  - BIOL 3050 Genetics (*fall only*)
  - BIOL 3060 Foundations in Genetics (*summer only*)
  - BIOL 3150 Introduction to Genomics (*spring only*)

### CHEMISTRY COURSES

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|--|---|
| <input type="checkbox"/> CHEM1109/1111 General Chemistry I with Lab<br>(or CHEM1117/1119) ( <i>fall only</i> ) | <input type="checkbox"/> CHEM1110/1112 General Chemistry II with Lab<br>(or CHEM1118/1120) ( <i>spring only</i> ) |
| <input type="checkbox"/> CHEM2231/2233 Organic Chemistry I with Lab<br>(or CHEM2241) ( <i>fall only</i> )      | <input type="checkbox"/> CHEM2232/2234 Organic Chemistry II with Lab<br>(or CHEM2242) ( <i>spring only</i> )      |
| <input type="checkbox"/> CHEM 3351/3353 Analytical Chemistry/Lab ( <i>fall only</i> )                          | <input type="checkbox"/> CHEM 4473 Physical Chem/Biochem Majors ( <i>spring only</i> )                            |

### BIOCHEMISTRY COURSES

**Option 1 (Biology) – may be taken in any order:**

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| <input type="checkbox"/> BIOL4350 Biological Chemistry ( <i>spring only</i> ) | <input type="checkbox"/> BIOL4400 Molecular Biology ( <i>spring only</i> ) |
|---|--|

**Option 2 (Chemistry) – to be taken in sequence:**

- |   |   |
|---|---|
| <input type="checkbox"/> CHEM4461 Biochemistry 1 ( <i>fall only</i> ) | <input type="checkbox"/> CHEM4462 Biochemistry 2 ( <i>spring only</i> ) |
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### MATHEMATICS COURSES

- Calculus II: MATH 1101, MATH 1103 or MATH 1105 (*if credit through AP Calc BC, take another advanced math course*)

## PHYSICS COURSES

- PHYS 2100 Intro to Physics I with Lab (calc-based)       PHYS 2101 Intro to Physics II with Lab (calc-based)

## ADVANCED ELECTIVES (2 courses, minimum of 5 credits total)

*Students planning to pursue a science career are urged to become involved in Undergraduate Research or take an Advanced Laboratory course.*

### Fall 2024

#### Lecture/Seminar Options:

- Virology (BIOL 4090)
- Inflammation and Disease (BIOL 4120)
- Introduction to Bioinformatics (BIOL 4200)
- Metabolic Regulation and Human Disease (BIOL 4290)
- Nobel Winning Res in Medicine or Physio (BIOL 5010) (2 cr)
- Topics in Developmental Biology (BIOL 5040) (2 cr)
- Microbiomes/Human Disease (BIOL 5100) (2 cr)
- Environmental Disruptors of Development (BIOL 5130)
- Glycobiology and Human Disease (BIOL 5200)
- Molecular Basis of Disease (BIOL5390) (2 cr)
- Cancer as a Metabolic Disease (BIOL 5420)
- Biology of the Nucleus (BIOL 5700)
- NMR Spectroscopy (CHEM 5539)
- Principles of Chemical Biology (CHEM 5560)

#### Advanced Labs Options:

- Research in Phylogenetics (BIOL4075)
- Research in Molecular Biology Lab (BIOL 4830)
- Investigations in Cellular Re-Programming (BIOL 4890)
- Two semesters of Undergraduate Research

### Spring 2025

#### Lecture/Seminar Options:

- Developmental Biology (BIOL 3320)
- Cancer Biology (BIOL 4510)
- Principles of Immunology (BIOL 4570)
- Nobel Winning Res in Medicine or Physio (BIOL5010) (2 cr)
- Microbial Community Ecology (BIOL 5071) (2 cr)
- Environmental Disruptors of Development (BIOL 5130)
- Seminar in Cellular Dynamics (BIOL 5180) (2 cr)
- Immunity and Infectious Disease (BIOL 5230)
- Cancer as a Metabolic Disease (BIOL 5420)
- Genomics & Personalized Medicine (BIOL 5430)
- Drug Discovery and Medicinal Chemistry (CHEM 5510)
- Synthetic Biology: at the interface of Biology, Chemistry, and Engineering (CHEM 5513)
- Magnetic Resonance in Biology (CHEM 5540)
- Chemical Genomics and Proteomics (CHEM 5541)
- Polymer Chemistry (CHEM5548)
- Principles and Methods in Biophysical Chemistry (CHEM5561)

#### Advanced Labs Options:

- Research in Molecular Biology Lab (BIOL 4830)
- Two semesters of Undergraduate Research