

Biochemistry and Molecular Biology

Interdisciplinary

Requirements

The intersection of chemistry and biology provides a creative focus for understanding the molecular processes of life. Kenyon's biology and chemistry departments administer an interdisciplinary program offering two majors, biochemistry and molecular biology. Each major combines courses from both departments.

The Curriculum

The biochemistry major provides a chemistry-based curriculum with a significant biology component. The molecular biology major combines a substantial chemistry background with detailed studies in cellular and molecular biology. Both majors prepare students for postgraduate studies in biomedical sciences.

An oversight committee for biochemistry and molecular biology, composed of faculty members from the chemistry and biology departments, administers the program and determines requirements for the Senior Exercise and for the Honors Program. Students interested in these majors should contact either of the program codirectors, Chris Gillen or Sheryl Hemkin.

Requirements for the Majors

The biochemistry major and the molecular biology major have many requirements in common. In addition, each of the majors has its own set of required courses.

Courses required for BOTH Majors (5.75 units) through the class of 2015

All 100- and 200-level courses on this list must be completed by the end of junior year.

- BIOL 115 Energy in Living Systems (.5 unit)
- BIOL 116 Information in Living Systems (.5 unit)
- CHEM 121 or 122, and CHEM 124 or 125; Introductory Chemistry (1 unit)
- CHEM 123 and 126; Introductory Chemistry Lab (.5 unit)
- CHEM 231,232 Organic Chemistry (1 unit)
- CHEM 233,234 Organic Chemistry Lab (.5 unit)
- CHEM 256 Biochemistry (.5 unit)
- BIOL 263 Molecular Biology and Genomics (.5 unit)

- BIOL 264 Gene Manipulation (lab) (.25 unit)
- CHEM 335 Chemical Kinetics and Thermodynamics (.5 unit)

Courses required for BOTH Majors (5.75 units) starting with the class of 2016

All 100- and 200-level courses on this list must be completed by the end of junior year.

- BIOL 115 Energy in Living Systems (.5 unit)
- BIOL 116 Information in Living Systems (.5 unit)
- CHEM 121 and 124 or CHEM 122; Introductory Chemistry (1 unit)
- CHEM 123 and 126; Introductory Chemistry Lab (.5 unit)
- CHEM 231,232 Organic Chemistry (1 unit)
- CHEM 233,234 Organic Chemistry Lab (.5 unit)
- CHEM 256 Biochemistry (.5 unit)
- BIOL 263 Molecular Biology and Genomics (.5 unit)
- BIOL 264 Gene Manipulation (lab) (.25 unit)
- CHEM 335 Chemical Kinetics and Thermodynamics (.5 unit)

Additional Courses required for the Major in Biochemistry (1.75 units)

In addition to the requirements listed above (under courses required for both majors), students majoring in biochemistry must complete the following courses:

- CHEM 341 Instrumental Analysis (.5 unit)
- CHEM 371 Advanced Laboratory, Biochemistry (.25 unit)
- Two advanced lab courses from: CHEM 370, 372, 373, 374, and 375 (.5 unit of CHEM 375 must be completed to count as an advanced lab)
- One course from: BIOL 109Y-110Y, 233, 238, 245, 255, 266, 321, 333, 358, or 375 (.5 unit)
- The Senior Exercise, under the supervision of the Department of Chemistry

Additional Courses required for the Major in Molecular Biology (1.75 units)

In addition to the requirements listed above (under courses required for both majors), students majoring in molecular biology must complete the following courses:

- BIOL 109Y-110Y Introduction to Experimental Biology (.5 unit)

- Two additional lecture/discussion courses in biology at the 200- or 300-level (1 unit). At least one course must be taken from the "cellular and molecular biology" category (BIOL 238, 255, 266 , 321, 333, 375)
- One advanced laboratory from: BIOL 234, 239, 256, 267, 322, 346, or CHEM 371 (.25 unit)
- The Senior Exercise, under the supervision of the Department of Biology

Senior Exercise

Students majoring in biochemistry perform the Senior Exercise under the supervision of the Department of Chemistry. Molecular biology majors perform the Senior Exercise with the Department of Biology. For details, please refer to each department's Senior Exercise requirements listed in the course catalog.

Honors

Honors thesis projects may be conducted under the direct supervision of a faculty member in either department (biology or chemistry) for either major (molecular biology or biochemistry). Discussion between the student and research advisor regarding the department in which honors will be conducted should begin by the spring of the junior year, and a preliminary decision should be made by the end of the semester. A final decision will be made in consultation with the program co-directors by the end of the drop-add period in the fall of the senior year. Honors is awarded according to the degree with which the student graduates, regardless of the department under which the honors process is conducted.

Planning for GRE

Majors planning to take the GRE in Biochemistry, Cell, and Molecular Biology should consider selecting BIOL 266 as an elective.

Courses

COURSES THAT MEET THE REQUIREMENTS FOR THIS CONCENTRATION:

BIOL 109Y: Introduction to Experimental Biology

BIOL 110Y: Introduction to Experimental Biology

BIOL 115: Energy in Living Systems

BIOL 116: Information in Living Systems

BIOL 233: Plant Biology

BIOL 234: Laboratory Experience in Plant Biology

BIOL 238: Microbiology

BIOL 239: Experimental Microbiology

BIOL 245: Environmental Plant Physiology

BIOL 255: Genetic Analysis

BIOL 256: Experimental Genetic Analysis

BIOL 263: Molecular Biology and Genomics

BIOL 264: Gene Manipulation
BIOL 266: Cell Biology
BIOL 267: Experimental Cell Biology
BIOL 321: Developmental Biology
BIOL 322: Experiments in Developmental Biology
BIOL 333: Environmental Toxicology
BIOL 346: Introduction to Microscopy and Image Analysis
BIOL 358: Neurobiology
BIOL 375: Virology
CHEM 121: Introductory Chemistry
CHEM 122: Chemical Principles
CHEM 123: Introductory Chemistry Lab I
CHEM 124: Introductory Chemistry II
CHEM 126: Introductory Chemistry Lab II
CHEM 231: Organic Chemistry I
CHEM 232: Organic Chemistry II
CHEM 233: Organic Chemistry Lab I
CHEM 234: Organic Chemistry Lab II
CHEM 256: Biochemistry
CHEM 335: Chemical Kinetics and Thermodynamics
CHEM 341: Instrumental Analysis
CHEM 370: Advanced Lab: Computational Chemistry
CHEM 371: Advanced Lab: Biochemistry
CHEM 372: Advanced Lab: Inorganic
CHEM 373: Advanced Lab: Organic
CHEM 374: Advanced Lab: Spectroscopy
CHEM 375: Chemical Research