

# Biochemistry and Molecular Biology

## *Interdisciplinary*

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.

## 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 - Five-and-one-quarter (5.25) units:*

- BIOL 115 Energy in Living Systems
- BIOL 116 Information in Living Systems
- CHEM 121 and 124 Introductory Chemistry and Introductory Chemistry II or CHEM 122 Chemical Principles
- CHEM 123 and Introductory Chemistry Lab I and CHEM 126 Introductory Chemistry Lab II
- CHEM 231, 232 Organic Chemistry and Organic Chemistry II
- CHEM 233 Organic Chemistry Lab
- CHEM 256 Biochemistry
- BIOL 263 Molecular Biology and Genomics - MUST be completed by the end of junior year
- CHEM 335 Chemical Kinetics and Thermodynamics

*In addition to the requirements listed above for both majors, students majoring in biochemistry must complete two-and-one-quarter (2.25) units from the following courses:*

- CHEM 234 Organic Chemistry Lab II

- CHEM 341 Instrumental Analysis
- CHEM 371 Advanced Lab: Biochemistry
- Three advanced lab courses from: BIOL 264, CHEM 370, 372, 373, 374 and CHEM 375 (required as an advanced lab course)
- One course from: BIOL 109Y-110Y, 233, 238, 245, 255, 266, 315, 321, 333, 358

*In addition to the requirements listed above for both majors, students majoring in molecular biology must complete two-and-one-quarter (2.25) units from the following courses:*

- BIOL 109Y-110Y Introduction to Experimental Biology
- BIOL 264 Gene Manipulation
- Two additional lecture/discussion courses in biology at the 200- or 300-level. At least one course must be taken from the "cellular and molecular biology" category (BIOL 238, 255, 266, 315, 321, 333, 375)
- Two advanced labs from: BIOL 234, 239, 256, 267, 322, 346 or CHEM 371. Two semesters of Research in Biology (BIOL 385/386) can count toward this requirement.

## SENIOR EXERCISE

Students majoring in biochemistry perform the Senior Exercise under the supervision of the Department of Chemistry. Students majoring in molecular biology perform the Senior Exercise under the supervision of 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 codirectors by the end of the drop-add period in the fall of the senior year. Honors are 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

BIOL 109Y: Introduction to Experimental Biology

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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 315: Cell Signaling  
BIOL 321: Evolutionary 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