

# Biochemistry

**Director:** Associate Professor K. Fox (Chemistry)

**Faculty:** Associate Professors S. Horton (Biological Sciences), J. Kehlbeck (Chemistry); Assistant Professor M. Paulick (Chemistry), Lecturer B. Cohen (Biological Sciences)

**Requirements for the Major:** Eleven courses in biology and chemistry: Biology 101, 102, 225 and 380; Chemistry 101, 102, 231, 232, 240, 351, 382; and three additional courses, two to be chosen from Biology 354, 355, 363, 378, 384 and Physics 200, and the third to be chosen from among the other biology courses in the subcellular or organismal areas or Biology 243, Chemistry 330 or 340. In addition, mathematics through Math 115 and two terms of physics are required. Note that acceptance to graduate school may require additional courses and/or undergraduate research experience.

**Requirements for Honors:** Students eligible for honors in biochemistry must fulfill the College-wide criteria and satisfactorily complete a thesis, traditionally based on the results of original research, that receives the approval of the subcommittee for biochemistry and the appropriate College committee. It is customary, but not required, that students enroll in three honors research courses, typically during the senior year.

**Requirements for the Minor and Interdepartmental Majors:** It is not normally permitted to minor in biochemistry or to have an ID major in which biochemistry is a component.

## Course Selection Guidelines

Descriptions of courses from the Departments of Biology and Chemistry can be found under the department listings. Biochemistry 380 and 382 comprise a two-term biochemistry sequence required for biochemistry majors. Either Biochemistry 380 or 382 can be taken first. Students who have completed Biochemistry 335 cannot enroll in Biochemistry 380/382 and vice-versa.

Since Biochemistry is an interdisciplinary major, students are not required to complete a cluster as part of the General Education requirements. For detailed advising suggestions see the advising website at [www.advising.union.edu](http://www.advising.union.edu) under Department-Specific Advising Tips.

*Placement:* AP credit is awarded as per current Biology and Chemistry Department guidelines.

*Courses for non-majors:* Biochemistry 335 is a survey course for non-biochemistry majors who have fulfilled the necessary prerequisites as listed below. It is not appropriate for non-science majors looking to fulfill general education requirements.

*Senior Writing Requirement:* The senior writing requirement may be fulfilled in several ways:

By completing a senior thesis in conjunction with senior research (Biology 497, 498, 499 or Chemistry 491, 492, 493).

By selecting the biology senior seminar that emphasizes cellular/molecular topics, Biology 489.

Only in the event that neither of the above options is available, a student could satisfy the WS requirement by writing a research paper requiring extensive background reading in conjunction with taking Biology 380, Chemistry 382 or one of the upper level, molecularly-based biochemistry electives, in addition to the regular course work. Students pursuing this option must consult the Director of Biochemistry before the beginning of the senior year to make arrangements.

## Courses

**BCH-335. Survey of Biochemistry** (Same as BIO-335 and CHM-335) (Winter; Cohen). A survey of topics in biochemistry including buffers, protein structure, lipid structure, carbohydrate structure, enzyme mechanism, and enzyme kinetics. The pathways by which biomolecules are synthesized and degraded will be investigated. Specifically we will look at carbohydrate, lipid and nitrogen metabolism. Medical applications will be emphasized throughout the course. Prerequisites: Biology 225 and Chemistry 231; Chemistry 232 is recommended. Not open to students who have completed either BCH 380 or BCH 382.

**BCH-380. Biochemistry: Membranes, Nucleic Acids, and Carbohydrates** (Same as BIO-380) (Fall; Cohen). An in-depth investigation into some of the macromolecules which are essential to life's processes. The course focuses on non-protein molecules and their unique chemical properties. Three lab hours each week. Prerequisites: Biology 225 and Chemistry 232 or permission of the instructor. Not open to students who have completed BCH 335.

**BCH-382. Biochemistry: Structure and Catalysis** (Same as BIO-382 and CHM-382) (Winter; Fox, Paulick). Structure and function of proteins/enzymes including purification, mechanism, kinetics, regulation, metabolism, and a detailed analysis of several classic protein systems. Four lab hours each week. Prerequisite: Chemistry 232. Not open to students who have completed BCH 335.