
Biochemistry

BS DEGREE PROGRAM

The biochemistry program is the result of a joint effort of the Departments of Biological Sciences and Chemistry to provide students interested in this area with a curriculum in the interdisciplinary science of biochemistry. The program, strengthened by mathematics and physics, attempts to unite those aspects of biology and chemistry relevant to the subcellular study of the life process. Administration of the program is by the biochemistry committee, composed of members of the departments of Biological Sciences and Chemistry. Flexibility in course requirements allows students to shape individual curricula within the framework of the overall program. Toward this goal, each student receives individual guidance by members of the committee.

Requirements for Biochemistry Major

BCHM (or BIOL) 301, 302, 304, 480
BIOL 113, 114, 115
CHEM 107 and 108 (or 111), 231, 335, 332,
351, 461, 465
PHYS 121, 122 (or 131, 132)
MATH 221, 222

Plus 12 additional credits, four in biology, four in chemistry and four in any department of the Division of Science and Mathematics (four credits of BCHM 497 or 499 may be used as Science/Math divisional credits). BIOL 491, 496, and 497, and CHEM 391 and 397 may not be used to fulfill the electives.

Electives should be approved by the adviser. Biochemistry majors may not take BCHM 301, 302 and 304 (or BIOL 301, 302, 304) or CHEM 461 and 465 on a Pass/Fail basis. They may, however, elect to take a total of not more than eight credits of their other courses and electives required for the major with the pass/fail grading options.

It is important to declare a major in biochemistry as soon as possible and to plan carefully the sequence in which the courses should be taken. A brochure that describes a suggested sequence is available from the Harpur College academic advising office or from any of the members of the biochemistry committee. Consent of the biochemistry committee and/or the student's adviser is required for any substitutions or waivers of the requirements.

Honors Program in Biochemistry

An honors program in biochemistry is available to declared biochemistry majors who have demonstrated excellence in laboratory research. To qualify for honors, students must have completed four credits of BCHM 497 and, then with approval of their adviser, apply to the biochemistry committee to be enrolled in BCHM 499 (Honors Research in Biochemistry) at the beginning of their senior year. Before graduation, the student must complete a thesis, the form of which is decided by the adviser with approval of the biochemistry committee. This thesis must be defended before a thesis committee composed of the student's adviser, a faculty member selected by the student and his adviser, and a faculty member selected by the biochemistry committee. At graduation, recipients of honors receive recognition of their accomplishments for Distinguished Independent Research in Biochemistry. Each year one or two outstanding senior biochemistry majors are honored as recipients of the Award for Excellence in Biochemistry. They are selected on the basis of their academic excellence and research capability.

COURSE OFFERINGS

NOTE: Unless otherwise noted, all undergraduate courses carry 4 credits and are offered every year.

BCHM 301 (also BIOL 301). MOLECULAR BIOLOGY
Structure and function of nucleic acids. Mechanism and regulation of DNA replication, transcription and protein synthesis in prokaryotic and eukaryotic cells. Viral replication, recombinant DNA techniques. Three lectures and a fourth lecture or discussion section per week. Prerequisites: BIOL 113, 114, 115, CHEM 111 (or 107 or 108), 231. Corequisite: CHEM 332.

BCHM 302 (also BIOL 302). BIOCHEMISTRY
Cellular constituents, their role in life process. Water, structure and function of proteins/enzymes, vitamins, hormones, other biomolecules. Metabolism of carbohydrates, lipids, nitrogenous compounds. Energetic and regulatory consideration of metabolism. Three lectures and a fourth lecture or discussion section per week. Prerequisites: BIOL 113, 115, CHEM 111 (or 107 and 108), 231 and 332.

BCHM 303 (also BIOL 303). MOLECULAR BIOLOGY LABORATORY *2 credits*
Molecular biology laboratory techniques: sterile technique and manipulation of microorganisms, preparation of DNA libraries, subcloning DNA into vectors, detection of specific DNA and RNA sequences with nucleic acid and immunochemical probes, and sequencing of DNA. One one-hour lecture and one four-hour laboratory per week. Pre- or corequisite: BCHM 301 (BIOL 301).

BCHM 304 (also BIOL 304). BIOCHEMISTRY LABORATORY *2 credits*
Biochemistry laboratory techniques: isolation and purification of macromolecules, characterization of enzymes,

chromatography, other methods of analysis. One lecture, one four-hour laboratory per week. Prerequisite or corequisite: BCHM 302 (or BIOL 302).

BCHM 480. SENIOR SEMINAR IN BIOCHEMISTRY

2 credits

Students present seminars on current or anticipated trends in research in biochemical sciences. Prerequisites: BCHM (or BIOL) 301 or 302.

BCHM 492. PRACTICUM IN COLLEGE TEACHING

Independent study by assisting in a course. Various assignments directed by instructor including laboratory instruction. May be repeated for total of no more than 8 credits. Credit may not be earned in conjunction with course in which student is currently enrolled. Does not satisfy major or all-college requirements. Prerequisites: consent of instructor and departmental approval. P/F only.

BCHM 497. INDEPENDENT STUDY IN BIOCHEMISTRY

variable credit

Individual research in biochemical sciences under direct supervision of participating faculty. Prior to registration, approval for enrollment must be obtained from instructor and director of biochemistry program. Prerequisite: BCHM (or BIOL) 301, or BCHM (or BIOL) 302.

BCHM 499. HONORS RESEARCH IN BIOCHEMISTRY

variable credit

Honors research in one area of biochemical sciences, under direct supervision of faculty member having expertise in area. Requires degree of sophistication beyond BIOL 497: required for honors in biochemistry. Approval for enrollment must be obtained from student's adviser and biochemistry committee. Prerequisites: BCHM 497 and demonstrated facility in biochemical research.