

Biochemistry

College of Science, Engineering and Technology
Department of Chemistry & Geology
241 Ford Hall • 507-389-1963

Chair: Mary Hadley

Lyudmyla Ardanova, Brian Groh, Michael J. Lusch, Marie K. Pomije, Jeffrey R. Pribyl, Danaé Quirk Dorr, James Rife, Theresa Salerno, Daniel Swart, John D. Thoemke, Trent Vorlice

Biochemistry is a discipline which encompasses both biology and chemistry. This rapidly expanding science focuses on the study of the molecular aspects of living organisms. The tools and concepts of biochemistry are important as a foundation for careers in many areas of research and in medicine. Students considering a BA or BS degree in biochemistry should consult a biochemistry advisor for specific information regarding the program. This major is appropriate for students in pre-professional programs such as pre-dental, pre-medical, and pre-pharmacy programs.

Admission to Major. Admission to a program is necessary before a student can enroll in 300- and 400-level courses. To be eligible for admission to the biochemistry program a student must have declared biochemistry as a first major, completed 32 credits, including BIOL 105 and BIOL 106 as well as CHEM 201 and CHEM 202 and achieved a minimum grade point average of 2.0. Students should also have an assigned biochemistry advisor with whom they have discussed the program. Applications for admission to the biochemistry program are available in the department office.

POLICIES/INFORMATION

The first year of coursework for biochemistry majors should include two semesters of chemistry (CHEM 201, CHEM 202), MATH and at least one semester of Biology (BIOL 105). Organic Chemistry should be taken during the second year.

GPA Policy. Students obtaining a major in biochemistry must maintain an overall GPA of 2.2 in all courses required for their selected program with no more than 4 credits of "D" work in chemistry or biochemistry courses.

Students must meet a residency requirement. This means that all students who wish to receive either the Biochemistry BA or the Biochemistry BS from Minnesota State Mankato must complete the biochemistry sequence which consists of CHEM 460, CHEM 461, CHEM 465 and CHEM 466 at Minnesota State Mankato. It is important that this sequence be taken during the third (junior) year for all majors.

Students who complete the requirements for the Biochemistry BS must submit a comprehensive research report in conjunction with completion of CHEM 498. Students are encouraged to contact Professors Rife and Salerno for details regarding the research report prior to enrolling in CHEM 498.

P/N Grading Policy. Courses leading to a major or minor in chemistry or biochemistry may not be taken on a P/N basis, except where P/N grading is mandatory.

The department is recognized by the American Chemical Society and offers a BS (Chemistry) major that is approved by that organization. The BS Biochemistry program follows the ASBMB recommended curriculum for a biochemistry and molecular biology undergraduate major. Anyone considering a biochemistry major should choose a biochemist as an advisor and consult that advisor often throughout the course of study.

BIOCHEMISTRY BA

Required General Education

BIOL 105 General Biology I (4)
CHEM 201 General Chemistry I (5)

Major Common Core

BIOL 106 General Biology II (4)
BIOL 211 Genetics (4)
BIOL 270 Microbiology (4)
BIOL 479 Molecular Biology (4)
CHEM 202 General Chemistry II (5)
CHEM 305 Analytical Chemistry (4)
CHEM 320 Organic Chemistry I (5)
CHEM 321 Organic Chemistry II (3)
CHEM 331 Organic Chemistry II Lab (1)
CHEM 460 Biochemistry I (3)
CHEM 461 Biochemistry II (3)
CHEM 465 Biochemical Techniques I (1)
CHEM 466 Biochemical Techniques II (2)
CHEM 474 Chromatography (2)
CHEM 495 Senior Seminar (1)

Major Restricted Electives

BIOL upper division electives

(Choose 9 credits)

BIOL 300-499 BIOL electives require approval from a Biochemistry advisor

Other Graduation Requirements

Choose at least 2 additional upper division credits to meet graduation requirements.

Required for Bachelor of Arts (BA) degree ONLY: Language (8 credits)

Required Minor: None.

BIOCHEMISTRY BS

Required General Education

BIOL 105 General Biology I (4)
CHEM 201 General Chemistry I (5)

MATH courses (Choose 7-8 credits)

Choose 2 of the following courses. Note that GE-4 requires 1 course so the remaining credits may be considered restricted elective credits.

MATH 121 Calculus I (4)
MATH 122 Calculus II (4)
STAT 154 Elementary Statistics (3)

Major Common Core

BIOL 106 General Biology II (4)
BIOL 211 Genetics (4)
BIOL 270 Microbiology (4)
BIOL 479 Molecular Biology (4)
CHEM 202 General Chemistry II (5)
CHEM 305 Analytical Chemistry (4)
CHEM 320 Organic Chemistry I (5)
CHEM 321 Organic Chemistry II (3)
CHEM 331 Organic Chemistry II Lab (1)
CHEM 440 Physical Chemistry I (3)
CHEM 450 Physical Chemistry Laboratory I (1)
CHEM 460 Biochemistry I (3)
CHEM 461 Biochemistry II (3)
CHEM 465 Biochemical Techniques I (1)
CHEM 466 Biochemical Techniques II (2)
CHEM 474 Chromatography (2)
CHEM 495 Senior Seminar (1)

(Choose 2 credits)

2 credits of CHEM 498 are required for the major core

CHEM 498 Undergraduate Research (1-6)

Major Restricted Electives

Upper Division Electives (Choose 8 credits)

Choose a minimum of 8 credits from upper division Biology and Chemistry courses with approval from a Biochemistry advisor.

BIOL 300-499

CHEM 312-499

BIOCHEMISTRY

Physics

Choose either the Principles of Physics sequence or the General Physics courses noted below.

(Choose 8 credits)

PHYS 211 Principles of Physics I (4)

PHYS 212 Principles of Physics II (4)

(Choose 8 credits)

PHYS 221 General Physics I (4)

PHYS 223 General Physics III (3)

PHYS 233 General Physics III Laboratory (1)

Required Minor: None.