

# BIOCHEMISTRY BA AND BS

## Biochemistry

College of Science, Engineering and Technology  
Department of Chemistry & Geology  
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Chair: Mary Hadley

Faculty: Brian Groh, Michael J. Lusch, Rebecca Moen, Marie K. Pomije, Jeffrey R. Pribyl, Danaé Quirk Dorr, James Rife, Theresa Salerno, Lyudmyla Stackpool, Daniel Swart, John D. Thoemke, Trent Vorlicek

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.

### Academic Map/Degree Plan at [www.mnsu.edu/programs/#All](http://www.mnsu.edu/programs/#All)

**Accreditation.** The Biochemistry program is accredited by the American Society for Biochemistry and Molecular Biology (ASBMB).

### 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.

**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.

**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, Salerno and Moen 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

Degree completion = 120 credits

#### 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 322 Organic Chemistry I (4)  
CHEM 324 Organic Chemistry II (3)  
CHEM 325 Organic Chemistry II Lab (1)  
CHEM 340 Quantitative Skills for Chemistry and Biochemistry I (1)  
CHEM 460 Biochemistry I (3)  
CHEM 461 Biochemistry II (3)  
CHEM 465 Biochemical Techniques I (1)  
CHEM 466V Biochemical Techniques II (2)  
CHEM 474 Chromatography (2)

#### Capstone

(choose 1 credit from either CHEM 494 or CHEM 495)  
CHEM 494 Biochemistry Capstone Experience (1)  
CHEM 495 Senior Seminar (1)

#### Major Restricted Electives

Upper Division Electives

Choose a minimum of 9 credits of upper division electives from either BIOL or CHEM courses. These electives must be approved by the Biochemistry Advisor. Courses used in the core cannot count as electives.

BIOL 300 - BIOL 499  
CHEM 300 - CHEM 499

#### 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 322 Organic Chemistry I (4)  
CHEM 324 Organic Chemistry II (3)  
CHEM 325 Organic Chemistry II Laboratory (1)  
CHEM 340 Quantitative Skills for Chemistry and Biochemistry I (1)  
CHEM 341 Quantitative Skills for Chemistry and Biochemistry II (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 466V Biochemical Techniques II (2)  
CHEM 474 Chromatography (2)  
CHEM 494 Biochemistry Capstone Experience (1)  
(2 credits of CHEM 498 are required for the major core)  
CHEM 498 Undergraduate Research (1-6)

#### Major Restricted Electives

Upper Division Electives

Choose a minimum of 7 credits from upper division Biology and Chemistry courses with approval from a Biochemistry advisor. Courses used in the core cannot count as electives.  
BIOL 300 - BIOL 499  
CHEM 300 - BIOL 499

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## BIOCHEMISTRY CONTINUED

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### PHYS

(choose 8 credits from either the Principles of Physics sequence or the General Physics courses noted below)

PHYS	211	Principles of Physics I (4)
PHYS	212	Principles of Physics II (4)
PHYS	221	General Physics I (4)
PHYS	223	General Physics III (3)
PHYS	233	General Physics III Laboratory (1)

Required Minor: None.