

## Biochemistry

College of Science, Engineering and Technology  
Department of Chemistry & Geology  
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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 the 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) and two semesters of biology (BIOL 105, BIOL 106). Organic Chemistry should be taken during the second year. 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 or Salerno for details regarding the research report prior to enrolling in CHEM 498.

**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 Support Courses for Major

BIOL	105	General Biology I (4)
BIOL	106	General Biology II (4)
BIOL	211	Genetics (4)
BIOL	270	Microbiology (4)
BIOL	479	Molecular Biology (4)

#### Required for Major

CHEM	201	General Chemistry I (5)
CHEM	202	General Chemistry II (5)
CHEM	305	Analytical Chemistry (4)
CHEM	320	Organic Chemistry I (with lab) (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)

#### Required Electives (9 credits)

(Choose a minimum of 9 credits with approval from the advisor)

BIOL	300/400	Elective
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**Required for Bachelor of Arts (BA) degree ONLY:** Language (8 credits)

**Required Minor:** None.

### BIOCHEMISTRY BS

#### Required Support Courses

BIOL	105	General Biology I (4)
BIOL	106	General Biology II (4)
BIOL	211	Genetics (4)
BIOL	270	Microbiology (4)
BIOL	479	Molecular Biology (4)
PHYS	211	Principles of Physics I (4) <b>AND</b>
PHYS	212	Principles of Physics II (4) <b>OR</b>
PHYS	221	General Physics I (4) <b>AND</b>
PHYS	223	General Physics III (3) <b>AND</b>
PHYS	233	General Physics III Laboratory (1)
(Choose a minimum of 7 credits from the following)		
MATH	121	Calculus I (4)
MATH	122	Calculus II (4)
STAT	154	Elementary Statistics (3)

#### Required for Major

CHEM	201	General Chemistry I (5)
CHEM	202	General Chemistry II (5)
CHEM	305	Analytical Chemistry (4)
CHEM	320	Organic Chemistry I (with lab) (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)
CHEM	498	Undergraduate Research (2)

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## BIOCHEMISTRY

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**Required Electives (Chemistry or Biology, 8 credits)**

(Choose a minimum of 8 credits with approval from the advisor)

CHEM/BIOL     300/400 Elective

**Required Minor: None.**