Duluth Campus

Chemistry B.A.

Chemistry and Biochemistry, Swenson College of Science & Engineering

Swenson College of Science and Engineering

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2021
- Required credits to graduate with this degree: 120
- Required credits within the major: 57 to 65
- Degree: Bachelor of Arts

Chemistry is the study of matter and the physical changes that matter undergoes. Chemical reactions occur every day and in every aspect of life: respiration, metabolism and growth in living systems, combustion in cars and heating plants, pharmaceutical and polymer production, and the conversion of raw materials to usable products.

Chemistry is an important and central subject. Students who are interested in health sciences such as medicine, pharmacy, dentistry, and related fields need to take several semesters of chemistry. Students who like scientific and technical subjects, and who have a solid math and science background from high school, are best prepared to major in chemistry.

Students completing the BA in chemistry generally plan to use chemistry as a study field that complements other areas such as law, library science, technical writing, public relations, or sales. BA students are encouraged to participate in undergraduate research. The major also provides a strong foundation for students planning to go to professional schools, such as medical or pharmacy school.

Honors requirement: Qualified majors may apply after the first semester of their sophomore year. Participants choose a research advisor and complete two semesters of effort on a jointly developed project. Written reports and an oral presentation of the research are also required.

Program Delivery

This program is available:

- via classroom (the majority of instruction is face-to-face)

Admission Requirements

For information about University of Minnesota admission requirements, visit the Office of Admissions website.

General Requirements

The Board of Regents, on recommendation of the faculty, grants degrees from the University of Minnesota. Requirements for an undergraduate degree from University of Minnesota Duluth include the following:

1. Students must meet all course and credit requirements of the departments and colleges or schools in which they are enrolled including an advanced writing course. Students seeking two degrees must fulfill the requirements of both degrees. However, two degrees cannot be awarded for the same major.
2. Students must complete all requirements of the Liberal Education Program.
3. Students must complete a minimum of 120 semester credits.
4. At least 30 of the last 60 degree credits earned immediately before graduation must be awarded by UMD.
5. Students must complete at least half of their courses at the 3xxx-level and higher at UMD. Study-abroad credits earned through courses taught by UM faculty and at institutions with which UMD has international exchange programs may be used to fulfill this requirement.
6. If a minor is required, students must take at least three upper division credits in their minor field from UMD.
7. The minimum cumulative UM GPA required for graduation will be 2.00 and will include only University of Minnesota coursework. A minimum UM GPA of 2.00 is required in each UMD undergraduate major and minor. No academic unit may impose higher grade point standards to graduate.
8. Diploma, transcripts, and certification will be withheld until all financial obligations to the University have been met.

Program Requirements

1. A minor or second major in a different subject is required.
   a. The Biochemistry BS may be declared with the Chemistry BA major. However, this combination

does not satisfy the requirement for a minor or a second major in a different subject.
b. The Biochemistry BA major may be declared.

Learning In Community (1 cr)
Requirement will be waived for transfer students with at least 30 credits taken post high school, for UMD students who started in a UMD collegiate unit where this is not required, and upon request for first-year students with 30 PSEO credits.
UST 1000 - Learning in Community (1.0 - 2.0 cr)
or EHS 1000 - Into the World [GLOBAL PER] (3.0 cr)
or ES 1000 - Global Cultural Perspectives on Environmental Sustainability [GLOBAL PER] (3.0 cr)
or LING 1000 - Language and Culture in the U.S. What does it Mean to Speak American [CDIVERSITY] (3.0 cr)
or PSY 1100 - Living Your Best Life: Applying Positive Psychology [CDIVERSITY] (3.0 cr)

First Year (20 cr)
CHEM 1173/74 and 1175/76 are the preferred courses. High school algebra and high school chemistry is required for CHEM 1173, 1174. This schedule presupposes placement in MATH 1296 as the first course.
Chemistry I with lab
CHEM 1173 - General Chemistry I for Majors [NAT SCI] (4.0 cr)
or CHEM 1153 - General Chemistry I [LE CAT, NAT SCI] (4.0 cr)
CHEM 1174 - General Chemistry I Lab for Majors [NAT SCI] (1.0 cr)
or CHEM 1154 - General Chemistry Lab I [LE CAT, NAT SCI] (1.0 cr)
Chemistry II with lab
CHEM 1175 - General Chemistry II for Majors (4.0 cr)
or CHEM 1155 - General Chemistry II (4.0 cr)
CHEM 1176 - General Chemistry II Lab for Majors (1.0 cr)
or CHEM 1156 - General Chemistry Lab II (1.0 cr)
Math
Calculus I
MATH 1296 - Calculus I [LE CAT, LOGIC & QR] (5.0 cr)
Calculus II
MATH 1297 - Calculus II [LOGIC & QR] (5.0 cr)

Second Year (22 cr)
Organic Chemistry I with lab
CHEM 2541 - Organic Chemistry I (3.0 cr)
CHEM 2543 - Organic Chemistry I Laboratory (1.0 cr)
Organic Chemistry II with lab
CHEM 2542 - Organic Chemistry II (3.0 cr)
CHEM 2544 - Organic Chemistry II Laboratory (1.0 cr)
Quantitative Analysis
CHEM 2222 - Quantitative Analysis (3.0 cr)
CHEM 2223 - Quantitative Analysis Laboratory (1.0 cr)
Physics I Course
Take one of the following course pairs (PHYS 2013 or 2017 and 2014, and 2015 or 2018 and 2016 are strongly encouraged):
PHYS 1001 - Introduction to Physics I [LE CAT, NAT SCI] (5.0 cr)
or PHYS 2013 - General Physics I [LE CAT, NAT SCI] (4.0 cr)
or PHYS 2017 - Honors: General Physics I [NAT SCI] (4.0 cr)
Physics I Lab
PHYS 2014 - General Physics Lab I [NAT SCI] (1.0 cr)
Physics II Course
PHYS 1002 - Introduction to Physics II (5.0 cr)
or PHYS 2015 - General Physics II (4.0 cr)
or PHYS 2018 - Honors General Physics II (4.0 cr)
Physics II Lab
PHYS 2016 - General Physics Lab II (1.0 cr)

Third Year (8 - 16 cr)
Biochemistry
Choose one of the Biochemistry course sets.
Biochemistry with lab
CHEM 3322 - Biochemistry (3.0 cr)
CHEM 3324 - Biochemistry Laboratory (1.0 cr)
or **Biochemistry I and II with lab**
CHEM 4351 - Biochemistry I (3.0 cr)
CHEM 4352 - Biochemistry II (3.0 cr)
CHEM 4363 - Biochemistry Laboratory (2.0 cr)

Physical Chemistry
Choose one of the Physical Chemistry course sets.
Physical Chemistry with lab
CHEM 4633 *{Inactive}*(1.0 cr)
CHEM 4634 *{Inactive}*(3.0 cr)
or **Physical Chemistry I and II with labs**
CHEM 4641 - Thermodynamics and Kinetics (3.0 cr)
CHEM 4643 - Thermodynamics and Kinetics Lab (1.0 cr)
CHEM 4642 - Quantum Mechanics and Spectroscopy (3.0 cr)
CHEM 4644 - Quantum Mechanics and Spectroscopy Laboratory (1.0 cr)

Fourth Year (3 cr)
Inorganic Chemistry
CHEM 3432 - Descriptive Inorganic Chemistry (3.0 cr)

Advanced Writing (3 cr)
WRIT 31xx