Duluth Campus

Biochemistry and Molecular Biology B.S.

Chemistry and Biochemistry

Swenson College of Science and Engineering

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2011
- Required credits to graduate with this degree: 120
- Required credits within the major: 86
- This program requires summer terms.
- Degree: Bachelor of Science

Biochemistry and molecular biology is the study of life at the molecular level. This field is both a life science and a chemical science, exploring the chemistry of living organisms and the molecular basis for the processes that occur in living cells. The Department of Chemistry and Biochemistry provides classroom and laboratory learning opportunities and research experiences across the discipline to meet the needs of students in engineering, liberal arts and preprofessional programs as well as those of students who wish to pursue careers or graduate studies in chemistry or related disciplines.

Honors Requirements: The Department of Chemistry and Biochemistry honors program helps outstanding biochemistry and molecular biology majors become competent, independent research workers, encourages student interest in the discipline, and aids in the transition from student to working scientist. Qualified majors may apply after the first semester of their sophomore year. Participants choose a research adviser and complete two semesters 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

Requirements for the B.S. in biochemistry and molecular biology include:

* A minor from another area of study is required.

* Students who earn a B.S. in biochemistry and molecular biology (BMB) will have met the requirements for the B.A. in chemistry and

for the chemistry minor. The B.A. in chemistry may be declared as an additional degree with the B.S. BMB, however, this combination does not satisfy the college degree requirement for a second major or minor. A minor in chemistry cannot be declared with the B.S. BMB. The B.S. BMB major/B.S. chemistry major combination does satisfy the college degree requirement.

* Students earning a B.S. degree who wish to have their program certified by the American Chemical Society must take advanced courses that include additional hours of laboratory work.

Year One (30 cr)

High school algebra and high school chemistry are required for CHEM 1153/1154 and CHEM 1161.

This schedule presupposes placement into MATH 1296.
BIOL 1011 - General Biology I [LE CAT, NAT SCI] (5.0 cr)
BIOL 1012 - General Biology II [SUSTAIN] (5.0 cr)
MATH 1296 - Calculus I [LE CAT, LOGIC & QR] (5.0 cr)
MATH 1297 - Calculus II [LOGIC & QR] (5.0 cr)
CHEM 1161 *{Inactive}*[LE CAT4, NAT SCI] (5.0 cr)
or CHEM 1153 - General Chemistry I [LE CAT, NAT SCI] (4.0 cr)
CHEM 1154 - General Chemistry Lab I [LE CAT, NAT SCI] (1.0 cr)
CHEM 1162 *{Inactive}*(5.0 cr)
or CHEM 1155 - General Chemistry II (4.0 cr)
CHEM 1156 - General Chemistry Lab II (1.0 cr)

Year Two (23-24 cr)

BIOL 3100 - Cell Biology (3.0 cr)
CHEM 2541 - Organic Chemistry I (3.0 cr)
CHEM 2542 - Organic Chemistry II (3.0 cr)
CHEM 2543 - Organic Chemistry I Laboratory (1.0 cr)
PHYS 2011 *{Inactive}*[LE CAT4, NAT SCI] (4.0 cr)
PHYS 2012 *{Inactive}*(4.0 cr)
CHEM 2544 - Organic Chemistry II Laboratory (1.0 cr)
or CHEM 2545 - Organic Chemistry II Laboratory for B.S. Chemistry Majors (2.0 cr)
CHEM 2222 - Quantitative Analysis (3.0 cr)
CHEM 2223 - Quantitative Analysis Laboratory (1.0 cr)
or CHEM 2242 *{Inactive}*(4.0 cr)

Year Three (20 cr)

BIOL 2201 - Genetics (3.0 cr)
BIOL 4231 - Molecular Biology (3.0 cr)
BIOL 4232 - Molecular Biology Laboratory (2.0 cr)
CHEM 4351 - Biochemistry I (3.0 cr)
CHEM 4352 - Biochemistry II (3.0 cr)
CHEM 4363 - Biochemistry Laboratory (2.0 cr)
CHEM 4633 *{Inactive}*(1.0 cr)
CHEM 4634 *{Inactive}*(3.0 cr)
or CHEM 4641 - Thermodynamics and Kinetics (3.0 cr)
CHEM 4642 - Quantum Mechanics and Spectroscopy (3.0 cr)
CHEM 4643 - Thermodynamics and Kinetics Lab (1.0 cr)
CHEM 4644 - Quantum Mechanics and Spectroscopy Laboratory (1.0 cr)

Year Four (7 cr)

CHEM 3432 - Descriptive Inorganic Chemistry (3.0 cr)
CHEM 4184 - Undergraduate Seminar I (1.0 cr)
CHEM 4185 - Undergraduate Seminar II (1.0 cr)
CHEM 4373 - Physical Biochemistry: Statistical Bio-Thermodynamics (3.0 cr)

Elective (3 cr)

Take 3 or more credit(s) from the following:
•CHEM 4242 - Instrumental Analysis (3.0 cr)
•CHEM 4436 - Inorganic Chemistry (3.0 cr)
•BIOL 3502 - General Microbiology (4.0 cr)
•BIOL 4503 *{Inactive}*(4.0 cr)
•IBS 5101 *{Inactive}*(3.0 cr)
•MATH 5233 - Mathematical Foundations of Bioinformatics (3.0 cr)
•BMS 5201 - Topics in Biochemistry (3.0 cr)
•BMS 5202 - Cellular and Molecular Biology (3.0 cr)
•BMS 5545 - Immunology (3.0 cr)

Information current as of March 28, 2024

Advanced Writing (3 cr)
WRIT 31xx Advanced Writing

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