Duluth Campus

Teaching Physical Science B.A.Sc.

Chemistry and Biochemistry, Education, UMD-Physics & Astronomy

College of Education and Human Service Professions

- Program Type: Baccalaureate
- Requirements for this program are current for Fall 2020
- Required credits to graduate with this degree: 136 to 140
- Required credits within the major: 118 to 122
- This program is 9 terms (4½ years) long.
- Degree: Bachelor of Applied Science

Students can choose to complete the chemistry emphasis or the physics emphasis.

Students should utilize a What-if APAS Report as the official tool to see all requirements for degree completion. Due to the complexity of the admission to the block process, students are strongly encourage to meet with their advisor on a regular basis to establish a plan for program completion.

Program Delivery

This program is available:

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

Admission Requirements

Students must complete 45 credits before admission to the program.

Freshman and transfer students students are usually admitted to pre-major status before admission to this major

A GPA above 2.0 is preferred for the following:

- 2.50 already admitted to the degree-granting college
- 2.50 transferring from another University of Minnesota college
- 2.50 transferring from outside the University

Students entering the STEP (5-12 & K-12) licensure programs are bound by the policies in effect at the time of application; admission is based on criteria established by the UMD Dept. of Educ, consistent with MN policies as established by the MN Professional Educator Licensing and Standards Board (PELSB). Students must complete the following to be eligible for admission to Block coursework: a minimum of a 2.5 major and cumulative GPA, lower division and upper division coursework with a grade of a C- or better, liberal education requirements, advanced writing and all requirements outlined online at: https://z.umn.edu/stepapplication. Applications are due the 6th Friday of the semester prior to starting Block I. Application for admission can be only completed spring semesters for fall semester entry into Block I. See advisor if out of sequence. Additionally, refer to the major sub-plans. These courses are additional admission requirements to the degree program.

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

Required prerequisites

Introductory Course (1 cr)

This course will be waived for transfer students with 24 credits taken post high school or students who change to CEHSP from a collegiate unit where it is not required.

Register course for one credit.

UST 1000 - Learning in Community (1.0 - 2.0 cr)

Lower Division Requirements (24 cr)

Astronomy

AST 1040 - Introductory Astronomy [LE CAT, NAT SCI] (3.0 cr)

Biology

BIOL 1011 - General Biology I [LE CAT, NAT SCI] (5.0 cr)

BIOL 1012 - General Biology II [SUSTAIN] (5.0 cr)

Education

EDUC 1101 - Education in Modern Society [LE CAT7, HUMANITIES] (3.0 cr)

Geology

EES 1110 - Geology and Earth Systems [LE CAT, NAT SCI, SUSTAIN] (4.0 cr)

EES 2110 - Reconstructing Earth's Climate History (4.0 cr)

Upper Division Requirements (12 cr)
EDUC 3412 - The Computer in Education (3.0 cr)
EDUC 4234 - Science, Technology, and Society [SUSTAIN] (3.0 cr)
HLTH 3202 - Drug Education (2.0 cr)
Advanced Writing Requirement
WRIT 3140 - Advanced Writing: Human Services (3.0 cr)
or WRIT 3150 - Advanced Writing: Science (3.0 cr)

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. Compliance with general regulations governing granting of degrees. 2. Students are expected to make satisfactory progress each semester, including grades of C- or better in all courses required in the major and successfully achieve all standards aligned with assignments in each course.
2. Maintain a minimum 2.5 cumulative and major GPA.
3. Demonstrate acceptable professional performance, including dispositions and teaching skills, in field placement; candidate proficiency is assessed throughout the teacher preparation courses by University faculty, University supervisors, and the cooperating teachers in all field experiences. The field experience assessment forms include knowledge, skills, and dispositions that are aligned to institutional and standards for all field experiences.
4. Abide by the MN PELSB and UMD Dept. of Education Code of Ethics.
5. Obtain an approved background check before being placed practicum, volunteering, or student teaching in schools and agencies.
6. Obtain personal liability insurance before being placed practicum, volunteering, or student teaching in schools and agencies.
7. Seek out advising each term with assigned advisor throughout college career to ensure you are on track for program completion.
8. Adhere to university policies regarding attendance.
9. In addition to the above expectations, students must abide by all university policies (http://d.umn.edu/academic-affairs/academic-policies).
10. Students are required to complete a program clearance process as part of the student teaching application to review their degree status with their advisor and the Accreditation office. Student teaching applications are due the 4th Friday of the semester. Learn more online at: https://z.umn.edu/studentteach. Students must have grades of C- or better in all required courses, and meet the required GPA in the major to be eligible for student teaching.
11. Recommendation for licensure are based on successful completion of all program-related courses; demonstration of satisfactory outcomes required by the program; acceptable performance in field experiences, including student teaching (including final student teaching assessments); submission of the edTPA, completion of UMD Dept. of Education graduate exit survey, and successful completion of all tests required by PELSB.
12. Background Checks: students are required to obtain an approved background check every two years prior to placement in practicum, volunteering, or student teaching in schools and agencies. Proof of complete background check is required prior to any experience in public school and agency settings. Students are required to keep a printed copy of the background check to provide to the school or agency, if necessary.
13. Liability Insurance: students are required to have professional liability insurance purchased through the Education Minnesota Student Membership annually while they are completing field placement. Students can purchase the liability insurance online at: https://z.umn.edu/edmnstudentmembership. A paper copy of the liability insurance MUST be provided to the UMD Department of Education when signing the placement contract each term.

Block Requirements (40 cr)

Application for admission to the blocks must be submitted by the 6th Friday of the spring semester. Applications are available online at: https://z.umn.edu/stepapplication. Application for admission can be completed SPRING SEMESTER ONLY for FALL SEMESTER ENTRY INTO BLOCK 1. Application must be completed the semester prior to starting the blocks.

Block 1 (12 cr)

Typically, all courses must be taken concurrently (alternate schedules by program consent). Students must have personal liability insurance and approved background check while in field placement settings.

EDSE 4204 - Designing Learning Environments and Lessons (3.0 cr)
EDSE 4100 - Teaching in a Diverse Society (3.0 cr)
EDSE 4501 - Adolescent/Adult Development and Learning Theory (3.0 cr)
SPED 3415 - Special Education in the Secondary School (3.0 cr)

Block 2 (15 cr)

All courses must be taken concurrently. Application for student teaching must be made by the 4th Friday of the semester before student teaching. Course deficiencies on Program Clearance Summary form must be cleared before filing application. Block 2 is the time to take the MTLE Content exams. Following the completion of Block 2 prior to starting Block 3 take the MTLE Pedagogy exams.

EDSE 3206 - Apprenticeship: Secondary School (2.0 cr)
EDSE 4214 - Teaching Content-Area Reading (3.0 cr)
EDSE 4255 - Teaching Science: Grades 5-12 (3.0 cr)
EDSE 4525 - Assessment for Secondary Education (3.0 cr)
EDUC 4381 - Teaching Indigenous Students (3.0 cr)
EDUC 4110 - Advanced Earth Science for Teachers (2.0 cr)

Block 3 (13 cr)

All courses must be taken concurrently. Application for student teaching must be made by the 4th Friday of the semester before student teaching. Students must have grades of C- or better in all required courses, meet the required GPA in the major, and complete at least 85% of teaching major courses to be eligible for student teaching. EDSE 4600 (register for 12 cr) Students must complete and submit the edTPA for scoring as outlined in the course requirements of EDSE 4600.

EDSE 4600 - Student Teaching (3.0 - 24.0 cr)
EDUC 4500 - Professional Issues and Ethics (1.0 cr)

Program Sub-plans

Students are required to complete one of the following sub-plans.

Chemistry

The Bachelors of Applied Sciences (B.A.Sc.) degree in teaching Physical Sciences with an emphasis in Chemistry prepares students to teach General Science (grades 5-8) and Chemistry (grades 9-12). The major aligns to the Minnesota Professional Educator Licensing and Standards Board (PELSB) standards for General Science in grades 5-8 and Chemistry in grades 9-12 in Minnesota. The B.A.Sc. degree in teaching physical science, chemistry emphasis, is offered by the Department of Education in conjunction with the Department of Chemistry and Biochemistry. This major prepares students to teach all science areas in grades 5 through 8 and to teach chemistry in grades 9 through 12.

The below sub-plan requirements are a part of the total admission requirement that should be completed prior to admission to the degree program. These are considered prerequisites to the blocks.

Lower Division Requirements (37 cr)

Chemistry I

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)

Chemistry II

CHEM 1155 - General Chemistry II (4.0 cr)
CHEM 1156 - General Chemistry Lab II (1.0 cr)

Quantitative Analysis

CHEM 2222 - Quantitative Analysis (3.0 cr)
CHEM 2223 - Quantitative Analysis Laboratory (1.0 cr)

Organic Chemistry I and II

CHEM 2541 - Organic Chemistry I (3.0 cr)
CHEM 2543 - Organic Chemistry I Laboratory (1.0 cr)
CHEM 2542 - Organic Chemistry II (3.0 cr)
CHEM 2544 - Organic Chemistry II Laboratory (1.0 cr)

Mathematics

MATH 1290 - Calculus for the Natural Sciences [LE CAT2, LOGIC & QR] (5.0 cr)
or MATH 1296 - Calculus I [LE CAT, LOGIC & QR] (5.0 cr)

Physics I and II

PHYS 1001 - Introduction to Physics I [LE CAT, NAT SCI] (5.0 cr)
PHYS 1002 - Introduction to Physics II (5.0 cr)

Upper Division Requirements (4 cr)

CHEM 3322 - Biochemistry (3.0 cr)
CHEM 3324 - Biochemistry Laboratory (1.0 cr)

Physics

The Bachelors of Applied Sciences (B.A.Sc.) degree in teaching Physical Sciences with an emphasis in Physics prepares students to teach General Science (grades 5-8) and Physics (grades 9-12). The major aligns to the Minnesota Professional Educator Licensing and Standards Board (PELSB) standards for General Science in grades 5-8) and Chemistry in grades 9-12 in Minnesota. The B.A.Sc. degree in teaching physical sciences, physics emphasis, is offered by the Department of Education in conjunction with the Department of Physics. This major prepares students to teach all science areas in grades 5 through 8 and to teach physics in grades 9 through 12. One semester of computer programming is recommended for students completing this major.

The below sub-plan requirements are a part of the total admission requirement that should be completed prior to admission to the degree program. These are considered prerequisites to the blocks.

Lower Division Requirements (40 cr)

Chemistry

CHEM 1113 - Introduction to General, Organic, and Biological Chemistry I [LE CAT, NAT SCI] (5.0 cr)
CHEM 1114 - Introduction to General, Organic, and Biological Chemistry II (5.0 cr)

Mathematics

MATH 1296 - Calculus I [LE CAT, LOGIC & QR] (5.0 cr)
MATH 1297 - Calculus II [LOGIC & QR] (5.0 cr)

Physics

Physics I

PHYS 2013 - General Physics I [LE CAT, NAT SCI] (4.0 cr)
or PHYS 2017 - Honors: General Physics I [NAT SCI] (4.0 cr)

Phys I lab

PHYS 2014 - General Physics Lab I [NAT SCI] (1.0 cr)

Physics II

PHYS 2015 - General Physics II (4.0 cr)
or PHYS 2018 - Honors General Physics II (4.0 cr)
PHYS 2016 - General Physics Lab II (1.0 cr)

Additional Physics

PHYS 2021 - Relativity and Quantum Physics (4.0 cr)
PHYS 2022 - Classical Physics (4.0 cr)
PHYS 2033 - Classical and Quantum Physics Lab (2.0 cr)

Upper Division Requirements (5 cr)

PHYS 3061 - Instrumentation (3.0 cr)
PHYS 4110 - Physics for Science Teachers (2.0 cr)