

CHEMISTRY (ACS CERTIFIED)

The Bachelor of Science in Chemistry at the University of Michigan-Dearborn is fully accredited by the American Chemical Society (ACS). This program is designed primarily for students who intend to go into Chemistry as a profession or who plan to continue their studies at the graduate level. A student may earn a Bachelor of Science degree in chemistry by completing the prerequisite, major courses and by fulfilling the Dearborn Discovery Core (DDC) and graduation requirements.

Dearborn Discovery Core (General Education)

All students must satisfy the University's Dearborn Discovery Core requirements (http://catalog.umd.umich.edu/undergraduate/gen_ed_ddc/), in addition to the requirements for the major. Students must also complete all CASL Degree Requirements. (<http://catalog.umd.umich.edu/undergraduate/college-arts-sciences-letters/>)

Prerequisites to the Major

A solid background in mathematics is essential to success in any of the scientific disciplines. Incoming students who intend to major in Chemistry should have completed at least three years of high school mathematics. First year students should plan to enroll in MATH 105, MATH 115, or MATH 116 based on the results of their math placement tests. The CHEM 134 and CHEM 136 sequence is a prerequisite to many other courses in the Natural Sciences Department; students should complete this sequence as soon as possible.

Chemistry majors must complete the following 42 credit hours of prerequisite courses. These courses should be completed early in the student's four-year curriculum.

Code	Title	Credit Hours
CHEM 134 & CHEM 136	General Chemistry IA and General Chemistry IIA (OR)	8
CHEM 225 & CHEM 226 & CHEM 227	Organic Chemistry I and Organic Chemistry II and Organic Chemistry Laboratory	10
BIOL 140	Intro Molec & Cellular Biology	4
PHYS 150 & PHYS 151	General Physics I and General Physics II ¹	8
MATH 115	Calculus I	4
MATH 116	Calculus II	4
MATH 215	Calculus III	4
Total Credit Hours		42

¹ The physics prerequisite may also be satisfied by completing PHYS 125 and PHYS 126 and an upper-level physics course, such as PHYS 305. The upper level PHYS course used in this substitution cannot be used toward the cognate requirement.

Major Requirements

Code	Title	Credit Hours
Required Courses		
CHEM 303	Inorganic Chemistry I	4

CHEM 344	Quantitative Analysis	4
CHEM 368	Physical Chemistry I	4
CHEM/BCHM/BIOL 370	Principles of Biochemistry	4
CHEM 403	Inorganic Chemistry II	4
CHEM 447	Instrumental Methods of Analysis	4
CHEM 453	Advanced Synthesis and Characterization Laboratory – Research Experience	4
CHEM 469	Physical Chemistry II	4
CHEM 481	Physicochemical Measurements	2

Elective Courses

Select 4 elective credits from:		4
CHEM/ESCI 348	Environmental Chemistry	
CHEM/ESCI 352	Introduction to Toxicology	
CHEM 390	Current Topics in Chemistry	
CHEM 426	Advanced Organic Chemistry	
CHEM/BCHM 430	Bioinorganic Chemistry	
CHEM 435	Green Chemistry	
CHEM 436	Polymer Chemistry	
CHEM 437	Nano-Biotechnology	
CHEM/BCHM/BIOL 472	Biochemistry Laboratory I	
CHEM/BCHM/BIOL 473	Biochemistry Laboratory II	
CHEM 490	Topics in Chemistry	

Total Credit Hours **38**

Notes:

- At least 16 of the 38 upper level hours in CHEM must be elected at UM-Dearborn.
- CHEM 470 and CHEM 471 can be used in place of CHEM 370, however, CHEM 470 alone cannot be used for this substitution. Students cannot take both CHEM 370 and CHEM 470 or CHEM 471 or any combination to fulfill major, cognate or minor requirements.
- A maximum of 6 hrs. of independent study/research in any Dept. of Natural Sciences discipline may count towards the 120 hours required to graduate.

Minor or Integrative Studies Concentration Requirements

A minor or concentration consists of 12 credit hours of upper-level courses in chemistry (CHEM). A maximum of one credit hour of independent study/research may be used to fulfill the requirement (CHEM 495, CHEM 498, CHEM 499)

- A minimum GPA of 2.0 is required for the minor/concentration. The GPA is based on all coursework required within the minor (excluding prerequisites).
- The use of transfer credit, field placements, internships, seminars, S/E graded courses, and independent study/research courses is limited to 3 credits in a 12 credit hour minor/concentration and 6 credits in a 15 credit hour and above minor/concentration.

- Courses within a minor/concentration cannot be taken as Pass/Fail (P/F).
- Minors requiring 12 credits may share one course with a major. Minors requiring 15 credits or more may share two courses with a major. This does not apply to concentrations for the Integrative Studies major.

Learning Goals

1. Master a broad set of fundamentals in the basic areas of the chemical discipline namely organic, inorganic, analytical, and physical.
2. Understand the objectives of chemical experiments, properly and safely carry out the experiments, and appropriately record and analyze results.
3. Communicate orally and in writing scientific concepts to other scientists and to the general public.
4. Skillfully utilize the chemical literature.
5. Have the ability to effectively pursue career objectives in an advanced professional or graduate school education, a scientific career in government or industry, or a career in teaching.