



Chemistry

Department of Natural Sciences
College of Arts, Sciences, and Letters

The Program

Chemistry is the study of matter and the changes it can undergo. As such, the subject is the central science and many of the challenges of the twenty-first century will be solved through chemistry. It provides the tools for understanding life processes, environmental issues, materials, and drug interactions. The University of Michigan–Dearborn degree in chemistry is approved by the American Chemical Society and includes coursework in the areas of analytical, biochemistry, inorganic, organic, and physical chemistry.

The curriculum will prepare the student for a career as a chemist and also serve as appropriate intellectual training for persons interested in pharmacy or one of the health professions or in teaching.

Students interested in chemistry may also elect to major in biochemistry or in the chemistry track of the environmental science program. Students who wish to enter into high school teaching should consider the chemistry/instructional track program, through which they can obtain secondary education certification in addition to the B.S. degree in five years.

Preparation

A good high school preparation for the chemistry program includes a four years of mathematics and English, courses in chemistry, physics, and biology, as well as good written and oral communication skills and a knowledge of computers.

Opportunities for Research Experience

UM–Dearborn students are encouraged to work with faculty members on research projects both during the academic terms and during the summer. Recently students have completed projects involving the determination of caffeine and acetylsalicylic acid (aspirin) in non-prescription analgesics, the preconcentration and determination of molybdate and vanadate using chelating ion exchange and atomic absorption, determination and speciation of copper and nitrate and nitrite in natural waters, and bifunctional cross-linking of the lens crystalline. Students present their results at department, local, and national conferences. Some have been co-authors on published manuscripts. Students who have participated in research have found their experience invaluable either in their employment or in graduate or professional school. Some graduate schools now expect undergraduate research for admission.

Cooperative Education

The cooperative education program allows students to earn academic credit while being paid a salary by their co-op employer. Employers include BASF, Ford Motor Company, and Dupont Automotive. The Department of Natural Sciences also has several co-op positions. Many students in co-op positions receive offers of full-time employment upon graduation.

Employment and Future Studies

UM–Dearborn chemistry graduates have found employment in a wide variety of subject areas including education (high school and university), industry (basic and applied research, analysis), the law (patent law, product safety), health sciences (medicine, dentistry, pharmacy), and research in government or industrial laboratories. Examples include pharmaceutical research at Eli Lilly and Pfizer, chemistry research at Dow Chemical Company, DuPont, the Ford Scientific Research Labs, General Motors, J.B. Ashtin Group, Molecular Simulations Inc., National Sanitation Foundation, Ovonic Battery Company, and faculty positions at universities such as Notre Dame.

Graduates of the chemistry program have obtained degrees at a number of prestigious graduate and professional schools including Princeton, the University of Michigan, University of Pennsylvania, Rice University, Michigan State University, The Ohio State University, and Indiana University.

Facilities

Modern chemistry relies on instrumental techniques. In every chemistry laboratory course and research experience, UM–Dearborn students gain first-hand experience with these techniques. Our instrument holdings include a 400 MHz nuclear magnetic resonance spectrometer, atomic absorption spectrometers, high-performance liquid chromatographs, gas chromatographs, differential scanning calorimeter, potentiostats, fourier-transform infrared spectrometers, gas chromatograph/mass spectrometer, LCQ mass spectrometer, and electrochemical analyzer.

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The Chemistry Curriculum

Credit Hours

Prerequisite		40
Chem 134	General Chemistry IA or	4
Chem 144	General Chemistry IB	4
Chem 136	General Chemistry IIA or	4
Chem 146	General Chemistry IIB	4
Chem 225	Organic Chemistry I	3
Chem 226	Organic Chemistry II	3
Chem 227	Organic Chemistry Lab	2
Biol 140	Molecular/Cellular Biology	4
Phys 150	General Physics I	4
Phys 151	General Physics II	4
Math 115	Calculus I	4
Math 116	Calculus II	4
Math 215	Calculus III	4
Required Courses		28
Chem 303	Inorganic Chemistry I	3
Chem 344	Quantitative Analysis	4
Chem 368	Physical Chemistry I	3
Chem 370	Principles of Biochemistry	3
Chem 403	Inorganic Chemistry II	3
Chem 447	Instrumental Methods of Analysis	4
Chem 450	Advanced Organic Synthesis/Char Lab	1
Chem 452	Advanced Inorganic Synthesis/Char Lab	1
Chem 469	Physical Chemistry II	3
Chem 481	Physicochemical Measurements	2
Chem 493	Presentations in Chemistry	1
Elective Courses —choose one course from:		
Chem 348	Environmental Chemistry	3
Chem 349	Environmental Chemistry Lab	1
Chem 352	Introduction to Toxicology	3
Chem 390	Current Topics in Chemistry	1-3
Chem 426	Advanced Organic Chemistry	3
Chem 436	Intro. to Polymer Chemistry	3
Chem 470	Biochemistry I	3
Chem 471	Biochemistry II	3
Chem 472	Biochemistry Laboratory I	1
Chem 473	Biochemistry Laboratory II	1
Chem 490	Topics in Chemistry	1-3
Chem 497	Seminar in Chemistry	1
Independent Study		
Chem 495	Off-Campus Research Participation	1-3
Chem 498	Readings in Chemistry	1-3
Chem 499	Laboratory Research in Chemistry	1-3

Degree-seeking students are required to fulfill the required courses in effect at the time admitted or readmitted to the program. Since these are subject to change, students should see an advisor for current requirements.

Cognates

Chemistry concentrators must complete at least six credit hours of courses numbered 300 or above offered in biochemistry, biological sciences, environmental science, geology, mathematics, microbiology, physics, or statistics.

The Faculty

Samia Al-Qaisi, Ph.D., Lecturer. Inorganic chemistry.

Angela Allen, M.S., Lecturer IV. Organic chemistry.

Krisanu Bandyopadhyay, Ph.D., Assistant Professor. Physical chemistry

Ali Bazzi, Ph.D., Professor. Analytical and environmental chemistry.

Mark R. DeCamp, Ph.D., Associate Professor. Organic chemistry.

Yiwei Deng, Ph.D., Associate Professor. Analytical and environmental chemistry.

Craig J. Donahue, Ph.D., Associate Professor. Inorganic chemistry.

Daniel B. Lawson, Ph.D., Associate Professor. Physical chemistry.

Simona Marincean, Ph.D., Assistant Professor. Organic Chemistry.

M. Kazem Mostafapour, Ph.D., Associate Professor. Biochemistry.

Charlotte A. Otto, Ph.D., Professor. Biochemistry and science education

Sheila R. Smith, Ph.D., Associate Professor. Bio-inorganic chemistry.

Ogie Stewart, Ph.D., Lecturer IV. Physical chemistry.

For More Information

For more information about a degree in chemistry, contact the Department of Natural Sciences

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Chemistry Advisors:

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Chemistry Instructional Advisor:

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To request an application or obtain more information about admission to the University:

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