

# CHEMISTRY, M.S.

The mission of the Department of Chemistry at the University of Wisconsin–Madison is to conduct world-class, groundbreaking research in the chemical sciences while offering the highest quality of education to undergraduate students, graduate students, and postdoctoral associates. Our leadership in research includes the traditional areas of physical, analytical, inorganic, and organic chemistry, and has rapidly evolved to encompass environmental chemistry, chemical biology, biophysical chemistry, soft and hard materials chemistry, nanotechnology and chemistry education research. We pride ourselves on our highly interactive, diverse, and collegial scientific environment. Our emphasis on collaboration connects us to colleagues across campus, around the country, and throughout the world.

The Department of Chemistry offers a master of science in chemistry to a limited number of students. Specializations within the program are analytical, inorganic, materials, organic, physical chemistry, chemical biology as well as chemistry education research. Breadth coursework may be taken in other departments including physics, mathematics, computer sciences, biochemistry, chemical engineering, and in fields other than the student's specialization within the Department of Chemistry.

Excellent facilities are available for research in a wide variety of specialized fields including synthetic and structural chemistry; natural product and bio-organic chemistry; molecular dynamics and photochemistry; biophysical, bioanalytical, and bioinorganic chemistry; spectroscopy (including magnetic resonance and microwave), theoretical and experimental chemical physics, chemical dynamics, quantum and statistical mechanics; macromolecular and polymer chemistry, materials science, surface and solid-state chemistry; x-ray crystallography, lasers, and light scattering; and chemical education. Programs are assisted by department computing and instrument centers and by other facilities on campus including those of the Division of Information Technology (DoIT).

Information on the research fields of faculty members is available on the chemistry website (<http://www.chem.wisc.edu/>).

Financial assistance is not guaranteed to master's candidates, but it may be possible to obtain a position as a teaching assistant.

## ADMISSIONS

Please consult the table below for key information about this degree program's admissions requirements. The program may have more detailed admissions requirements, which can be found below the table or on the program's website.

Graduate admissions is a two-step process between academic programs and the Graduate School. **Applicants must meet** the minimum requirements (<https://grad.wisc.edu/apply/requirements/>) **of the Graduate School as well as the program(s)**. Once you have researched the graduate program(s) you are interested in, apply online (<https://grad.wisc.edu/apply/>).

Requirements	Detail
Fall Deadline	December 1
Spring Deadline	The program does not admit in the spring.
Summer Deadline	The program does not admit in the summer.

GRE (Graduate Record Examinations)	Not required.
English Proficiency Test	Every applicant whose native language is not English or whose undergraduate instruction was not in English must provide an English proficiency test score and meet the Graduate School minimum requirements ( <a href="https://grad.wisc.edu/apply/requirements/#english-proficiency">https://grad.wisc.edu/apply/requirements/#english-proficiency</a> ).
Other Test(s) (e.g., GMAT, MCAT)	n/a
Letters of Recommendation Required	3

There are two pathways leading to the Master of Science in Chemistry. Currently the department does not directly admit students seeking the master's degree via either pathway, except under special circumstances, such as being employed by a local company or in the military or UW undergraduate students enhancing their chemistry background. To obtain a master of science (M.S.) degree, the student must meet both the Department of Chemistry and the Graduate School requirements.

Prospective master's candidates are expected to have satisfactorily completed the equivalent in class and lab of the fundamental courses in chemistry offered at UW–Madison, one year of physics, and mathematics through calculus. Students who have not completed all the prerequisites may be admitted in exceptional cases, but any deficiencies must be made up in the first year of graduate study.

A grade point average of 3.0 (on a 4.0 scale) in the last 60 hours of undergraduate work is the minimum required for admission to graduate studies. Students for whom English is not the native language are required to present scores from the Test of English as a Foreign Language (TOEFL) or International English Language Testing System (IELTS). Before teaching assistant appointments can be finalized, students for whom English is a second language must participate in the SPEAK Test, the institutional version of the Test of Spoken English (TSE).

## FUNDING

## GRADUATE SCHOOL RESOURCES

Resources to help you afford graduate study might include assistantships, fellowships, traineeships, and financial aid. Further funding information (<https://grad.wisc.edu/funding/>) is available from the Graduate School. Be sure to check with your program for individual policies and restrictions related to funding.

## REQUIREMENTS

## MINIMUM GRADUATE SCHOOL REQUIREMENTS

Review the Graduate School minimum academic progress and degree requirements (<http://guide.wisc.edu/graduate/#policiesandrequirements>), in addition to the program requirements listed below.

## MAJOR REQUIREMENTS

### MODE OF INSTRUCTION

Face to Face	Evening/ Weekend	Online	Hybrid	Accelerated
Yes	No	No	No	No

#### Mode of Instruction Definitions

**Accelerated:** Accelerated programs are offered at a fast pace that condenses the time to completion. Students typically take enough credits aimed at completing the program in a year or two.

**Evening/Weekend:** Courses meet on the UW–Madison campus only in evenings and/or on weekends to accommodate typical business schedules. Students have the advantages of face-to-face courses with the flexibility to keep work and other life commitments.

**Face-to-Face:** Courses typically meet during weekdays on the UW–Madison Campus.

**Hybrid:** These programs combine face-to-face and online learning formats. Contact the program for more specific information.

**Online:** These programs are offered 100% online. Some programs may require an on-campus orientation or residency experience, but the courses will be facilitated in an online format.

## CURRICULAR REQUIREMENTS

#### Requirement Detail

Minimum  
Credit  
Requirement

Minimum  
Residence  
Credit  
Requirement

Minimum  
Graduate  
Coursework  
Requirement

15 credits must be graduate-level coursework. Details can be found in the Graduate School's Minimum Graduate Coursework (50%) policy (<https://policy.wisc.edu/library/UW-1244> (<https://policy.wisc.edu/library/UW-1244/>)).

Overall  
Graduate  
GPA  
Requirement

3.00 GPA required. This program follows the Graduate School's GPA Requirement policy (<https://policy.wisc.edu/library/UW-1203> (<https://policy.wisc.edu/library/UW-1203/>)).

Other Grade  
Requirements

n/a

Assessments  
and  
Examinations

There are currently no assessments or examinations required by the chemistry department for the coursework-based M.S. degree. Research-based M.S. degree requires either a thesis or a written document approved by the research advisor. Students must meet all Graduate School grade requirements.

Language  
Requirements

None.

## REQUIRED COURSES

Of the 30 credits required for the Master's degree, at least 24 must be completed in the chemistry department. The remaining 6 credits must be a STEM course, approved by your advisor. This may include courses in chemistry, physics, or other physical sciences; courses from the many

biological disciplines including pharmacy- and medical-related courses; courses in engineering; or courses with a computer science, statistics, math, or computational focus. The selection of courses must be approved by the student's advisor.

There are two paths leading to the Master of Science in Chemistry.

### Research Master's Degree Track <sup>1</sup>

The Research M.S. requires 30 credits, at least 15 of which must come from research or advanced lab work. A thesis or written final report, submitted to the advisor, is also required. The research credits obtained before the student joins a research group does not count toward the degree. The credits from CHEM 607 Laboratory Safety, CHEM 980 Seminar: Review of Current Research, and CHEM 901 Seminar-Teaching of Chemistry do not count toward the degree.

1

These pathways are internal to the program and represent different curricular paths a student can follow to earn this degree. Pathway names do not appear in the Graduate School admissions application, and they will not appear on the transcript.

### Coursework Master's Degree Track <sup>1</sup>

The coursework M.S. requires 30 credits, no more than 8 of which may be from research or advanced lab work. The research credits obtained before the student joins a research group does not count toward the degree. The credits from CHEM 607 Laboratory Safety, CHEM 980 Seminar: Review of Current Research, and CHEM 901 Seminar-Teaching of Chemistry do not count toward the degree.

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## POLICIES

### GRADUATE SCHOOL POLICIES

The Graduate School's Academic Policies and Procedures (<https://grad.wisc.edu/acadpolicy/>) provide essential information regarding general university policies. Program authority to set degree policies beyond the minimum required by the Graduate School lies with the degree program faculty. Policies set by the academic degree program can be found below.

### MAJOR-SPECIFIC POLICIES

#### PRIOR COURSEWORK

##### Graduate Work from Other Institutions

With program approval, students are allowed to count no more than 12 credits of graduate coursework from other institutions. Coursework earned five or more years prior to admission to a master's degree is not allowed to satisfy requirements.

##### UW–Madison Undergraduate

Up to 7 credits numbered 300 or above from a UW–Madison undergraduate career are allowed to count toward the minimum graduate degree credit requirement; if those 7 credits are numbered 700 or above from a UW–Madison undergraduate career, they are allowed to count toward the minimum graduate coursework requirement. **All credits so counted** must be over and above the minimum credits that were required

by the original undergraduate degree. Coursework earned five or more years prior to admission to a master's degree is not allowed to satisfy requirements.

### **UW–Madison University Special**

This program follows the Graduate School's policy for Transfer from UW–Madison University Special Student Career at UW–Madison. (<https://policy.wisc.edu/library/UW-1216/>)

### **PROBATION**

This program follows the Graduate School's Probation policy. (<https://policy.wisc.edu/library/UW-1217/>)

### **ADVISOR / COMMITTEE**

This program follows the Graduate School's Advisor policy (<https://policy.wisc.edu/library/UW-1232/>) and the Graduate School's Committees policy (<https://policy.wisc.edu/library/UW-1201/>).

### **CREDITS PER TERM ALLOWED**

15 credits

### **TIME LIMITS**

This program follows the Graduate School's Time Limits policy. (<https://policy.wisc.edu/library/UW-1221/>)

### **GRIEVANCES AND APPEALS**

These resources may be helpful in addressing your concerns:

- Bias or Hate Reporting (<https://doso.students.wisc.edu/bias-or-hate-reporting/>)
- Graduate Assistantship Policies and Procedures (<https://hr.wisc.edu/policies/gapp/#grievance-procedure>)
- Hostile and Intimidating Behavior Policies and Procedures (<https://hr.wisc.edu/hib/>)
  - Office of the Provost for Faculty and Staff Affairs (<https://facstaff.provost.wisc.edu/>)
- Dean of Students Office (<https://doso.students.wisc.edu/>) (for all students to seek grievance assistance and support)
- Employee Assistance (<http://www.eao.wisc.edu/>) (for personal counseling and workplace consultation around communication and conflict involving graduate assistants and other employees, post-doctoral students, faculty and staff)
- Employee Disability Resource Office (<https://employeeabilities.wisc.edu/>) (for qualified employees or applicants with disabilities to have equal employment opportunities)
- Graduate School (<https://grad.wisc.edu/>) (for informal advice at any level of review and for official appeals of program/departmental or school/college grievance decisions)
- Office of Compliance (<https://compliance.wisc.edu/>) (for class harassment and discrimination, including sexual harassment and sexual violence)
- Office of Student Conduct and Community Standards (<https://conduct.students.wisc.edu/>) (for conflicts involving students)
- Ombuds Office for Faculty and Staff (<http://www.ombuds.wisc.edu/>) (for employed graduate students and post-docs, as well as faculty and staff)
- Title IX (<https://compliance.wisc.edu/titleix/>) (for concerns about discrimination)

Students should contact the department chair or program director with questions about grievances. They may also contact the L&S Academic Divisional Associate Deans, the L&S Associate Dean for Teaching and Learning Administration, or the L&S Director of Human Resources.

### **OTHER**

n/a

## PROFESSIONAL DEVELOPMENT

### **GRADUATE SCHOOL RESOURCES**

Take advantage of the Graduate School's professional development resources (<https://grad.wisc.edu/pd/>) to build skills, thrive academically, and launch your career.

## LEARNING OUTCOMES

1. Articulates, critiques, and elaborates the theories, research methods, and approaches to inquiry in an area of chemistry.
2. Identifies sources and assembles evidence pertaining to questions or challenges in an area of chemistry.
3. Demonstrates understanding of chemical science in a historical, social, or global context.
4. Demonstrates the ability to select and utilize appropriate methodologies and practices to solve chemical problems.
5. Evaluates and synthesizes information pertaining to questions and challenges in an area of chemistry.
6. Communicates clearly in both written and oral formats.
7. Recognizes and applies principles of ethical and professional conduct.

## PEOPLE

### **PROFESSORS**

Berry, John  
 Bertram, Timothy  
 Blackwell, Helen  
 Boydston, AJ  
 Brunold, Thomas  
 Burstyn, Judith (Chair)  
 Cavagnero, Silvia  
 Choi, Kyoung-Shin  
 Coon, Joshua  
 Ediger, Mark  
 Fredrickson, Daniel  
 Gellman, Samuel  
 Hamers, Robert  
 Hermans, Ive  
 Jin, Song  
 Landis, Clark  
 McMahon, Robert  
 Moore, John  
 Nathanson, Gilbert  
 Record, Thomas  
 Schmidt, Jordan  
 Schomaker, Jennifer  
 Schwartz, David  
 Shkhashiri, Bassam

Sibert, Edwin (Associate Chair)  
Smith, Lloyd  
Stahl, Shannon  
Weaver, Susanna Widicus  
Weix, Daniel  
Woods, Claude  
Yethiraj, Arun  
Yoon, Tehshik  
Zanni, Martin

## ASSOCIATE PROFESSORS

Boydston, Andrew  
Garand, Etienne  
Goldsmith, Randall

## ASSISTANT PROFESSORS

Buller, Andrew  
Martell, Jeffrey  
Pazicni, Sam  
Stowe, Ryan  
Wang, Tina  
Wickens, Zachary  
Yang, Yang

## AFFILIATE PROFESSORS

Feng, Dawei (Assistant Professor in Materials Science and Engineering)  
Forest, Katrina (Professor of Bacteriology)  
Ge, Ying (Professor of Cell and Regenerative Biology)  
Gilbert, Pupa (Professor of Physics)  
Golden, Jennifer (Assistant Professor of Pharmacy)  
Gong, Shaoqin Sarah (Professor of Biomedical Engineering)  
Gopalan, Padma (Professor of Materials Science and Engineering)  
Hoskins, Aaron (Associate Professor of Biochemistry)  
Kuech, Thomas (Professor of Chemical and Biological Engineering)  
Li, Lingjun (Professor of Pharmacy)  
Lynn, David (Professor of Chemical and Biological Engineering)  
Mecozzi, Sandro (Professor of Pharmacy)  
Middlecamp, Catherine (Professor, Nelson Institute for Environmental Studies)  
Pedersen, Joel (Professor of Soil Science)  
Schreier, Marcel (Assistant Professor in Chemical and Biological Engineering)  
Tang, Weiping (Professor of Pharmacy)  
Yu, Lian (Professor of Pharmacy)

## CHEMISTRY ELECTRONICS SHOP

Thompson, Blaise (Instrument Tech)

## CHEMISTRY MACHINE SHOP

Martin, Mathew (Instrument Maker-Advanced)  
Mullarkey, James (Instrument Maker-Advanced)  
Myers, Steven (Machine Shop Supervisor)  
Schneider, Kendall (Instrument Maker-Advanced)

## PAUL BENDER CHEMISTRY INSTRUMENTATION CENTER (CIC)

Clewett, Cathy (Senior Instrument Technologist)

Fry, Charles (Director of the NMR Laboratory)  
Guzei, Iliia (Director of the X-Ray Laboratory)  
Hofstetter, Heike (Associate Director of the NMR Laboratory)  
Shanks, Robert (Senior Instrument Technologist)  
Vestling, Martha (Director of the Mass Spectrometry Laboratory)

## RESEARCH SUPPORT STAFF

Bates, Desiree (Computational Chemistry Leader)  
Drier, Tracy (Master Glassblower)  
McGuire, Paul (High Performance Computing Systems Administrator)  
Silver, Alan (Computer Systems Administrator)