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, and nanotechnology. 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, and physical chemistry as well as chemical biology. 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).

<table>
<thead>
<tr>
<th>Requirements</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fall Deadline</td>
<td>December 1</td>
</tr>
<tr>
<td>Spring Deadline</td>
<td>The program does not admit in the spring.</td>
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<tr>
<td>Summer Deadline</td>
<td>The program does not admit in the summer.</td>
</tr>
<tr>
<td>GRE (Graduate Record Examinations)</td>
<td>Required.</td>
</tr>
</tbody>
</table>

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 (https://grad.wisc.edu/apply/requirements/#english-proficiency).

Other Test(s) (e.g., GMAT, MCAT) n/a

Letters of Recommendation Required 3

There are two tracks leading to the Master of Science in Chemistry. Currently the department does not directly admit students seeking the master's degree via either track, except under special circumstances, such as being employed by a local company or in the military. Ph.D. candidates often obtain a Master's degree on the way to completion of their doctoral degrees. 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. The Graduate Record Exam (GRE) is also required. The Chemistry subject test is required for international applicants and strongly encouraged for domestic students. 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 processes related to funding.

REQUIREMENTS

MINIMUM GRADUATE SCHOOL REQUIREMENTS

Review the Graduate School minimum academic progress and degree requirements (http://guide.wisc.edu/graduate/policiesandrequirementstext), in addition to the program requirements listed below.
MAJOR REQUIREMENTS

MODE OF INSTRUCTION

<table>
<thead>
<tr>
<th></th>
<th>Face to Face</th>
<th>Evening/Weekend</th>
<th>Online</th>
<th>Hybrid</th>
<th>Accelerated</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Yes</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>No</td>
</tr>
</tbody>
</table>

Mode of Instruction Definitions

- **Evening/Weekend**: These programs are offered in an evening and/or weekend format to accommodate working schedules. Enjoy the advantages of on-campus courses and personal connections, while keeping your day job. For more information about the meeting schedule of a specific program, contact the program.
- **Online**: These programs are offered primarily online. Many available online programs can be completed almost entirely online with all online programs offering at least 50 percent or more of the program work online. Some online programs have an on-campus component that is often designed to accommodate working schedules. Take advantage of the convenience of online learning while participating in a rich, interactive learning environment. For more information about the online nature of a specific program, contact the program.
- **Hybrid**: These programs have innovative curricula that combine on-campus and online formats. Most hybrid programs are completed on-campus with a partial or completely online semester. For more information about the hybrid schedule of a specific program, contact the program.
- **Accelerated**: These on-campus programs are offered in an accelerated format that allows you to complete your program in a condensed time-frame. Enjoy the advantages of on-campus courses with minimal disruption to your career. For more information about the accelerated nature of a specific program, contact the program.

CURRICULAR REQUIREMENTS

**Requirements Detail**

<table>
<thead>
<tr>
<th>Requirement</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Minimum Credit</td>
<td>30 credits</td>
</tr>
<tr>
<td>Residence Credit</td>
<td>16 credits</td>
</tr>
<tr>
<td>Minimum Graduate Coursework Requirement</td>
<td>Half of degree coursework (15 credits out of 30 total credits) must be completed graduate-level coursework; courses with the Graduate Level Coursework attribute are identified and searchable in the university's Course Guide (<a href="https://registrar.wisc.edu/course-guide/">https://registrar.wisc.edu/course-guide/</a>).</td>
</tr>
<tr>
<td>Overall Graduate GPA Requirement</td>
<td>3.00 GPA required</td>
</tr>
<tr>
<td>Other Grade Requirements</td>
<td>The Graduate School requires an average grade of B or better in all coursework (300 or above, not including research credits) taken as a graduate student unless conditions for probationary status require higher grades. Grades of Incomplete are considered to be unsatisfactory if they are not removed during the next enrolled semester.</td>
</tr>
<tr>
<td>Assessments and Examinations</td>
<td>There are currently no assessments or examinations required by the chemistry department. Students must meet all Graduate School grade requirements.</td>
</tr>
<tr>
<td>Language Requirements</td>
<td>There are currently no language requirements for the master’s degree in Chemistry.</td>
</tr>
</tbody>
</table>

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 can be from chemistry or related topic areas such as physics, mathematics, computer science, or business. The selection of courses must be approved by the student’s advisor.

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

- **Research Master's Degree Track**
  - 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 you join a research group do not count toward the degree. The credits from CHEM 607 Laboratory Safety and CHEM 901 Seminar-Teaching of Chemistry do not count toward the degree.
  - These tracks are internal to the program and represent different pathways a student can follow to earn this degree. Track names do not appear in the Graduate School admissions application, and they will not appear on the transcript.

- **Coursework Master's Degree Track**
  - 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 you join a research group do not count toward the degree. The credits from CHEM 607 Laboratory Safety and CHEM 901 Seminar-Teaching of Chemistry do not count toward the degree.
  - These tracks are internal to the program and represent different pathways a student can follow to earn this degree. Track names do not appear in the Graduate School admissions application, and they will not appear on the transcript.

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

GRADUATE PROGRAM HANDBOOK

The Graduate Program Handbook (http://chem.wisc.edu/content/graduate) is the repository for all of the program’s policies and requirements.

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**

With program approval, students are allowed to count no more than 15 credits of coursework numbered 300 or above taken as a UW–Madison Special student toward the residence and degree credit requirements; if those 15 credits of coursework taken as a UW–Madison Special student are numbered 700 or above, they are allowed to count toward the minimum graduate coursework requirement. Coursework earned five or more years prior to admission to a master’s degree is not allowed to satisfy requirements.

**PROBATION**

The Graduate School regularly reviews the record of any student who earned grades of BC, C, D, F, or Incomplete in a graduate course (300 or above), or grade of U in research credits. This review could result in academic probation with a hold on future enrollment or in being suspended from the Graduate School.

**ADVISOR / COMMITTEE**

Every graduate student is required to have an advisor. To ensure that students are making satisfactory progress toward a degree, the Graduate School expects them to meet with their advisor on a regular basis.

An advisor generally serves as the thesis advisor. In many cases, an advisor is assigned to incoming students. Students can be suspended from the Graduate School if they do not have an advisor. An advisor is a faculty member, or sometimes a committee, from the major department responsible for providing advice regarding graduate studies.

A committee often accomplishes advising for the students in the early stages of their studies.

**CREDITS PER TERM ALLOWED**

15 credits

**TIME CONSTRAINTS**

Master’s degree students who have been absent for five or more consecutive years lose all credits that they have earned before their absence. Individual programs may count the coursework students completed prior to their absence for meeting program requirements; that coursework may not count toward Graduate School credit requirements.

**OTHER**

All admitted Ph.D. graduate students receive tuition remission and a stipend, guaranteed for 10 semesters, as long as progress to the degree is made.

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**PROFESSIONAL DEVELOPMENT**

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**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  
Brunold, Thomas  
Burke, Steven  
Burstyn, Judith (Chair)  
Cavagnero, Silvia  
Choi, Kyoung-Shin  
Coon, Joshua  
Ediger, Mark  
Fredrickson, Daniel  
Gellman, Samuel  
Hamers, Robert  
Hermans, Ivo  
Jin, Song  
Landis, Clark  
McMahon, Robert  
Moore, John  
Nathanson, Gilbert  
Record, Thomas  
Schmidt, Jordan  
Schomaker, Jennifer  
Schwartz, David  
Shakhashiri, Bassam  
Silbert, Edwin (Associate Chair)  
Smith, Lloyd  
Stahl, Shannon  
Weisshaar, James  
Weix, Daniel  
Woods, Claude
Wright, John
Yethiraj, Arun
Yoon, Tehshik
Zanni, Martin

ASSOCIATE PROFESSORS
Boydston, Andrew
Garand, Etienne
Goldsmith, Randall

ASSISTANT PROFESSORS
Buller, Andrew
Martell, Jeffrey
Wickens, Zachary

AFFILIATE PROFESSORS
Forest, Katrina (Professor of Bacteriology)
Ge, Ying (Associate Professor of Cell and Regenerative Biology)
Gilbert, Pupa (Professor of Physics)
Golden, Jennifer (Assistant Professor of Pharmacy)
Gong, Shaqin Sarah (Professor of Biomedical Engineering)
Gopalan, Padma (Professor of Materials Science and Engineering)
Hoskins, Aaron (Associate Professor of Biochemistry)
Jackson, Catherine (Professor of History of Science)
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)
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)
Fry, Charles (Director of the NMR Laboratory)
Guzel, Ilia (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)