CHEMISTRY, BA

The mission of the Department of Chemistry 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. The department's 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. The Department of Chemistry prides itself on its 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 undergraduate chemistry major leads to a bachelor of science or a bachelor of arts degree awarded by the College of Letters & Science. The curriculum provides excellent preparation in chemistry, along with a wide breadth of liberal arts coursework. At the same time, the program provides significant opportunities for students to participate in scientific inquiry, within both laboratory courses and research laboratories. Students from other colleges within the university may pursue the chemistry major as an additional major. When pursuing a chemistry major, the undergraduate student must meet university general education requirements and breadth requirements of their own college, along with the specific requirements for the chemistry major.

The chemistry major provides students with the critical thinking and problem-solving skills necessary to be successful in a wide variety of careers in the chemical industries (e.g., consumer and agricultural products, materials, energy, petroleum, paper, food, etc.), as well as environmental, pharmaceutical, and other health-related sciences. Students are also well-prepared for graduate-level work in chemistry, chemical physics, biochemistry, biophysics, materials chemistry, and other related fields. Students who excel in undergraduate chemistry coursework are often able to obtain funding for their graduate work through teaching or research assistantships and fellowships. Combined with a master's program in secondary education, the major qualifies the student to teach chemistry in secondary schools. Chemistry majors have also been successful in a variety of professional programs where they have studied medicine, pharmacy, dentistry, veterinary medicine, business, or law.

HOW TO GET IN

HOW TO GET IN

Students may declare the chemistry major after they have completed General Chemistry (CHEM 104, CHEM 109, or CHEM 116). Transfer students may declare in their first semester at UW-Madison, if they have transfer credit for one of these courses. Students should schedule an appointment with the undergraduate chemistry advisor to declare and develop a course plan toward graduation. To better inform their decision, undecided students who are exploring chemistry along with other majors are encouraged to take an additional chemistry course or two beyond General Chemistry before declaring. Any student interested in chemistry is welcome to schedule an appointment (https://www.chem.wisc.edu/content/undergraduate-advising/) with the advisor to further explore the major.

Students are advised to declare the major no later than the end of their second year. There are many advantages to declaring the chemistry major early, including access to chemistry advising, scholarships available to only majors, and announcements relevant to students studying the chemical sciences. Chemistry majors and chemistry undergraduate researchers also have access to the Undergraduate Study Lounge in the North Tower of the Chemistry building, a space designated specifically for their use. Students who have declared the major become a part of our chemistry community, enabling them to better connect with faculty, staff, and other chemistry majors.

REQUIREMENTS

UNIVERSITY GENERAL EDUCATION REQUIREMENTS

All undergraduate students at the University of Wisconsin–Madison are required to fulfill a minimum set of common university general education requirements to ensure that every graduate acquires the essential core of an undergraduate education. This core establishes a foundation for living a productive life, being a citizen of the world, appreciating aesthetic values, and engaging in lifelong learning in a continually changing world. Various schools and colleges will have requirements in addition to the requirements listed below. Consult your advisor for assistance, as needed. For additional information, see the university Undergraduate General Education Requirements (http://guide.wisc.edu/undergraduate/#requirementsforundergraduatestudytext) section of the *Guide*.

General Education	• Breadth–Humanities/Literature/Arts: 6 credits • Breadth–Natural Science: 4 to 6 credits, consisting of one 4- or 5-credit course with a laboratory component; or two courses providing a total of 6 credits • Breadth–Social Studies: 3 credits • Communication Part A & Part B * • Ethnic Studies * • Quantitative Reasoning Part A & Part B *

* The mortarboard symbol appears before the title of any course that fulfills one of the Communication Part A or Part B, Ethnic Studies, or Quantitative Reasoning Part A or Part B requirements.

COLLEGE OF LETTERS & SCIENCE DEGREE REQUIREMENTS: BACHELOR OF ARTS (BA)

Students pursuing a bachelor of arts degree in the College of Letters & Science must complete all of the requirements below. The College of Letters & Science allows this major to be paired with either a bachelor of arts or a bachelor of science curriculum.

BACHELOR OF ARTS DEGREE REQUIREMENTS

Mathematics	Complete the University General Education Requirements for Quantitative Reasoning A (QR-A) and Quantitative Reasoning B (QR-B) coursework.

Language	• Complete the fourth unit of a language other than English; OR • Complete the third unit of a language and the second unit of an additional language other than English.
L&S Breadth	• 12 credits of Humanities, which must include 6 credits of literature; and • 12 credits of Social Science; and • 12 credits of Natural Science, which must include one 3+ credit Biological Science course and one 3+ credit Physical Science course.
Liberal Arts and Science Coursework	Complete at least 108 credits.
Depth of Intermediate/Advanced work	Complete at least 60 credits at the intermediate or advanced level.
Major	Declare and complete at least one major.
Total Credits	Complete at least 120 credits.
UW-Madison Experience	• 30 credits in residence, overall; and • 30 credits in residence after the 86th credit.
Quality of Work	• 2.000 in all coursework at UW–Madison • 2.000 in Intermediate/Advanced level coursework at UW–Madison

NON–L&S STUDENTS PURSUING AN L&S MAJOR

Non–L&S students who have permission from their school/college to pursue an additional major within L&S only need to fulfill the major requirements. They do not need to complete the L&S Degree Requirements above.

REQUIREMENTS FOR THE MAJOR

MATH & PHYSICS

Code	Title	Credits
Mathematics (1 course)		**4**
MATH 222	Calculus and Analytic Geometry 2	
Physics		**10**
First Introductory Course (1 course)		
PHYSICS 207	General Physics	
PHYSICS 201	General Physics	
PHYSICS 247	A Modern Introduction to Physics	
Second Introductory Course (1 course)		
PHYSICS 208	General Physics	
PHYSICS 202	General Physics	
PHYSICS 248	A Modern Introduction to Physics	
Total Credits		**14**

CHEMISTRY CORE COURSES

Code	Title	Credits
General Chemistry (1 course)		**5**
CHEM 104	General Chemistry II	
CHEM 109	Advanced General Chemistry	
CHEM 115	Chemical Principles I [1]	
Analytical Chemistry (1 course)		**4-5**
CHEM 329	Fundamentals of Analytical Science	
CHEM 116	Chemical Principles II	
CHEM 327	Fundamentals of Analytical Science	
Inorganic Chemistry (1 course)		**4**
CHEM 311	Chemistry Across the Periodic Table	
Organic Chemistry (3 courses) [2]		**8**
CHEM 343	Organic Chemistry I	
CHEM 345	Organic Chemistry II	
CHEM 344	Introductory Organic Chemistry Laboratory	
Physical Chemistry		**8-9**
Part 1 (1 course)		
CHEM 561	Physical Chemistry I	
CHEM 665	Biophysical Chemistry	
CBE 310	Chemical Process Thermodynamics	
M S & E 330	Thermodynamics of Materials	
Part 2 (1 course)		
CHEM 562	Physical Chemistry II	
Part 3 (2 courses)		
CHEM 563	Physical Chemistry Laboratory I	
CHEM 564	Physical Chemistry Laboratory II	
Total Credits		**29-31**

ADVANCED CHEMISTRY AND LABORATORY

Code	Title	Credits
Advanced Non-laboratory Coursework		**5**
CHEM 116	Chemical Principles II (1 credit counts towards requirements) [3]	
CHEM/ M S & E 421	Polymeric Materials	
CHEM/CBE 505	Aspects of Industrial Chemistry and Business Fundamentals	
CHEM 509	Senior Seminar	
CHEM 511	Advanced Inorganic Chemistry	
CHEM 524	Chemical Instrumentation (2 credits count towards requirement) [4]	
CHEM 547	Advanced Organic Chemistry	
CHEM 555	Study Abroad in Advanced Chemistry	
CHEM 575	Advanced Topics in Chemistry	
CHEM 605	Spectrochemical Measurements	
CHEM 629	Atmospheric Chemical Mechanisms	
CHEM 654	Materials Chemistry of Polymers	
BIOCHEM 501 or BIOCHEM 50	Introduction to Biochemistry General Biochemistry I	
BIOCHEM 508	General Biochemistry II	
BIOCHEM/ NUTR SCI 510	Nutritional Biochemistry and Metabolism	
BIOCHEM 625	Mechanisms of Action of Vitamins and Minerals	

CBE 440	Chemical Engineering Materials	
CBE 540	Polymer Science and Technology	
CBE 547	Introduction to Colloid and Interface Science	
Additional Laboratory Work		**3**
CHEM 346	Intermediate Organic Chemistry Laboratory	
CHEM 512	Advanced Synthesis and Laboratory Techniques	
CHEM 524	Chemical Instrumentation (1 credit counts towards requirement) [4]	
CHEM 681 & CHEM 682	Senior Honors Thesis and Senior Honors Thesis	
CHEM 691 & CHEM 692	Senior Thesis and Senior Thesis	
CHEM 699	Directed Study	
BIOCHEM 681 & BIOCHEM 682	Senior Honors Thesis and Senior Honors Thesis	
BIOCHEM 691 & BIOCHEM 692	Senior Thesis and Senior Thesis	
BIOCHEM 699	Special Problems	
CBE 599	Special Problems	
Total Credits		**8**

RESIDENCE AND QUALITY OF WORK

- 2.000 GPA in all CHEM and major courses
- 2.000 GPA in at least 15 upper-level credits in the major in residence. Upper-level work includes CHEM 346, CHEM/M S & E 421, CHEM/CBE 505, CHEM 509, CHEM 511, CHEM 512, CHEM 524, CHEM 547, CHEM 555, CHEM 561, CHEM 562, CHEM 563, CHEM 564, CHEM 575, CHEM 605, CHEM 629, CHEM 654, CHEM 665, CHEM 681, CHEM 682, CHEM 691, CHEM 692, CHEM 699, BIOCHEM 501, BIOCHEM 507, BIOCHEM 508, BIOCHEM/NUTR SCI 510, BIOCHEM 625, BIOCHEM 681, BIOCHEM 682, BIOCHEM 691, CHEM 692, BIOCHEM 699, CBE 310, CBE 440, CBE 540, CBE 547, CBE 599, and M S & E 330.
- 15 credits in CHEM, taken on the UW–Madison campus

HONORS IN THE MAJOR

Students may declare Honors in the Chemistry Major in consultation with the chemistry major advisor (https://www.chem.wisc.edu/content/undergraduate-advising/). To be admitted to the Honors Program in Chemistry, students must have declared a major in chemistry and achieved a 3.200 overall GPA. They must also have achieved a 3.200 GPA in all CHEM courses taken and courses accepted for the major.

HONORS IN THE CHEMISTRY MAJOR REQUIREMENTS

To earn Honors in the Major in Chemistry, students must satisfy both the requirements for the major (above) and the following additional requirements:

- Earn a 3.300 overall university GPA
- Earn a 3.300 GPA for all CHEM courses and all major courses
- Complete an additional 3 credits, for a total of 8 credits, of advanced non-laboratory work. This requirement is met by the same credits and courses that are accepted for "Advanced Non-laboratory Work" in the regular major.
- Complete a two-semester Senior Honors Thesis in CHEM 681 Senior Honors Thesis and CHEM 682 Senior Honors Thesis, for a total of 6 credits.

FOOTNOTES

[1] Enrollment in CHEM 115 and CHEM 116 is by invitation only. Entering first-year students are invited to apply. Candidates are selected based on their high school record, placement test scores, and application responses.

[2] CHEM 343 must be taken first, followed by CHEM 345. CHEM 344 may be taken concurrently with or after CHEM 345.

[3] One credit from CHEM 116 counts towards the required 5 credits of Advanced Non-laboratory Coursework.

[4] Only 2 of the 3 credits from CHEM 524 count towards Advanced Non-laboratory Coursework. The remaining 1 credit counts towards the Additional Laboratory Work requirement.

UNIVERSITY DEGREE REQUIREMENTS

Total Degree	To receive a bachelor's degree from UW–Madison, students must earn a minimum of 120 degree credits. The requirements for some programs may exceed 120 degree credits. Students should consult with their college or department advisor for information on specific credit requirements.
Residency	Degree candidates are required to earn a minimum of 30 credits in residence at UW–Madison. "In residence" means on the UW–Madison campus with an undergraduate degree classification. “In residence” credit also includes UW–Madison courses offered in distance or online formats and credits earned in UW–Madison Study Abroad/Study Away programs.
Quality of Work	Undergraduate students must maintain the minimum grade point average specified by the school, college, or academic program to remain in good academic standing. Students whose academic performance drops below these minimum thresholds will be placed on academic probation.

LEARNING OUTCOMES

LEARNING OUTCOMES

1. Identify, formulate and solve integrative problems using appropriate information and approaches.
2. Demonstrate an understanding of basic chemical transformations, including the ability to predict chemical reactivity and properties.
3. Recognize the relationship between structure, bonding and the properties of molecules and materials.
4. Model chemical systems and experimental data using relevant quantitative, mathematical and computational methods.
5. Design, conduct and analyze experiments safely and successfully.
6. Locate, evaluate and use information in the chemical literature.

7. Communicate chemical knowledge effectively through written reports, oral presentations and visual aids.
8. Work collaboratively with others, both chemists and those from other disciplines, to solve problems and create new knowledge.
9. Recognize how chemistry relates to contemporary issues in our society.
10. Understand professional and ethical responsibility.

FOUR-YEAR PLAN

FOUR-YEAR PLAN

This Four-Year Plan is only one way a student may complete an L&S degree with this major. Many factors can affect student degree planning, including placement scores, credit for transferred courses, credits earned by examination, and individual scholarly interests. In addition, many students have commitments (e.g., athletics, honors, research, student organizations, study abroad, work and volunteer experiences) that necessitate they adjust their plans accordingly. Informed students engage in their own unique Wisconsin Experience by consulting their academic advisors, Guide, DARS, and Course Search & Enroll for assistance making and adjusting their plan.

First Year

Fall	Credits	Spring	Credits
CHEM 109 or 103[1]	4-5	300-level Chemistry course OR	3-5
MATH 221	5	CHEM 104 (if needed)[2]	
Communications A (complete during first year)	3	MATH 222	4
Foreign Language (if required)	4	Ethnic Studies	3
		L&S Breadth	3
	16		**15**

Second Year

Fall	Credits	Spring	Credits
CHEM 343[3]	3	CHEM 345	3
PHYSICS 207	5	CHEM 344	2
L&S Breadth	3	PHYSICS 208	5
Communications B (consult with advisor about timing)[4]	3-4	Research (optional)[5]	1-3
		L&S Breadth	3
	15		**15**

Third Year

Fall	Credits	Spring	Credits
CHEM 329[6]	4	Physical Chemistry Part I[7]	3-4
MATH 234 (recommended, but not required))	4	CHEM 311	4
Research (optional)[5]	1-3	Advanced Non-laboratory Coursework[8]	3
L&S Breadth	3	Research (optional)[5]	1-3
INTER-LS 210 (optional)	1	L&S Breadth	3
	14		**15**

Fourth Year

Fall	Credits	Spring	Credits
CHEM 562	3	CHEM 564	1
CHEM 563	1	Research or other Additional Lab Work[10]	1-3
Research or other Additional Lab Work[9]	1-3	Advanced Non-laboratory Coursework (if needed)	3
Advanced Non-laboratory Coursework	3	L&S Breadth	3
L&S Breadth	3	L&S Breadth	3
L&S Breadth	3	Elective[11]	3
	15		**15**

Total Credits 120

1 CHEM 103 General Chemistry I/CHEM 104 General Chemistry II is a two-semester sequence in General Chemistry. Students with a strong high school chemistry background (usually two years) and placement into at least first semester calculus are eligible for CHEM 109 Advanced General Chemistry. CHEM 109 is an advanced, fast-paced option that covers General Chemistry in one semester. CHEM 109 is offered only in the fall semesters and an honors level section is available. An additional option is the CHEM 115 Chemical Principles I/CHEM 116 Chemical Principles II sequence, which is a small honors sequence for exceptionally well-prepared students. Enrollment in this sequence is by invitation only, and the two courses cover both general and analytical chemistry.

2 Students who took CHEM 109 in their first semester will not need CHEM 104. Instead, they may proceed to the next level of chemistry courses sooner by taking CHEM 311 Chemistry Across the Periodic Table or CHEM 329 Fundamentals of Analytical Science or CHEM 343 Organic Chemistry I in the second semester of their first year. In this case, some subsequent chemistry courses may also be taken sooner than shown in this plan.

3 Students must declare a major by the time they reach 86 credits. Students interested in chemistry may declare the major after completing general chemistry (CHEM 104, CHEM 109, or CHEM 116).

4 Communications B can be satisfied later through a chemistry course, CHEM 346 Intermediate Organic Chemistry Laboratory, if taken for 2 credits. CHEM 346 will also count towards additional lab work needed for the chemistry major.

5 Research can be taken for credit by enrolling in CHEM 299 Directed Study (for students with less than 54 earned credits) or CHEM 699 Directed Study (for students with 54 or more earned credits). CHEM 299 does not satisfy additional lab credits required for the major, while CHEM 699 does. Alternatively, research may be conducted as a volunteer or for pay. Students must search for and be accepted into a research group before beginning research.

6 According to L&S policy, students must complete at least 60 credits at the intermediate or advanced level.

7 Options include CHEM 561 Physical Chemistry I, CHEM 665 Biophysical Chemistry, CBE 310 Chemical Process Thermodynamics (only for students also majoring in Chemical & Biological Engineering), and M S & E 330 Thermodynamics of Materials (only for students also majoring in Materials Science & Engineering).

[8] Five advanced non-laboratory credits are required for the major. Please see the Requirements tab in the Guide for a list of courses that count towards this requirement.

[9] Three credits of additional lab work are required for the major. These credits can be satisfied by research (CHEM 699, for example) or by courses. Please see the Requirements tab in the Guide for a complete list of options. CHEM 346 is one option, and when taken for 2 credits also satisfies Comm-B. CHEM 346 is ONLY offered in FALL semester, with most students taking it in their fourth year. Students not planning to take CHEM 346 should plan to take their Comm-B earlier through one of their other required breadth courses.

[10] CHEM 524 Chemical Instrumentation and CHEM 512 Advanced Synthesis and Laboratory Techniques are options that are only offered in the spring semesters. CHEM 524 (3 credits) satisfies 1 additional lab work credit and 2 advanced non-laboratory credits.

[11] Please refer to the Requirements tab in Guide for additional College of Letters & Science Breadth and Degree requirements as well as Residence and Quality of Work requirements for the major.

ADVISING AND CAREERS

ADVISING AND CAREERS

ADVISING

The chemistry advisor provides advising for chemistry majors and prospective chemistry majors. Both appointments and drop-in hours are available. See Undergraduate Advising (https://www.chem.wisc.edu/undergraduate-advising/) on the Department of Chemistry website for more details.

The Chemistry website also provides information about introductory chemistry courses (https://chem.wisc.edu/introductory-chemistry-courses-and-placement/) and placement for continuing and new undergraduate students (https://chem.wisc.edu/new-undergraduate-students/) interested in taking a chemistry course. Students with enrollment and course access questions should visit the enrollment inquiries (https://chem.wisc.edu/enrollment-inquiries/) page. If further assistance is needed, students may visit the Undergraduate Chemistry Office (room 1351 Chemistry) during normal business hours, email (undergrad@chem.wisc.edu), or call 608-263-2424.

Chemistry majors interested in getting involved in research should explore the undergraduate research (https://undergradresearch.chem.wisc.edu/) pages on the chemistry website. Students needing additional information may contact the undergraduate research director by email (chem_ugr_research@chem.wisc.edu).

COURSE SELECTION AND SEQUENCING

The Requirements (https://guide.wisc.edu/undergraduate/letters-science/chemistry/chemistry-bs/#requirementstext) page provides the minimum requirements necessary for completing the chemistry major. This section provides additional advisory information about course selection and sequencing.

- In addition to MATH 222 Calculus and Analytic Geometry 2, it is highly recommended that majors also take MATH 234 Calculus--Functions of Several Variables and MATH 320 Linear Algebra and Differential Equations. The extra math is especially helpful to students when they take the required physical chemistry courses.
- PHYSICS 207 / PHYSICS 208 is the preferred physics sequence for most chemistry majors, while PHYSICS 201 / PHYSICS 202 is recommended for engineering students. PHYSICS 247 / PHYSICS 248 is intended for students considering a major in physics, astronomy-physics, or AMEP (applied mathematics, engineering, and physics).
- Chemistry majors are strongly encouraged to take either CHEM 329 or CHEM 116 (as opposed to CHEM 327) to satisfy their analytical chemistry requirement, because research is an integral part of these two courses. Both CHEM 329 and CHEM 116 come with honors credit, but students do not need to be part of an honors program to enroll.
- Most chemistry majors take CHEM 561 or CHEM 665 for Physical Chemistry Part 1. Students also majoring in chemical and biological engineering take CBE 310 instead. M S & E 330 is recommended only for students also majoring in materials science and engineering.
- It is recommended that CHEM 563 be taken after Physical Chemistry Part I and that CHEM 564 be taken after CHEM 562. Especially strong students needing to complete physical chemistry in two semesters may take CHEM 563 concurrently with CHEM 561 (or CHEM 665) and CHEM 564 concurrently with CHEM 562.

CAREER SERVICES

The chemistry major prepares graduates for a wide variety of careers in the chemical and related industries (e.g., consumer and agricultural products, materials, energy, petroleum, paper, and food), as well as environmental, pharmaceutical, and other health-related sciences. Combined with a master's program in secondary education, the major qualifies the student to teach chemistry in secondary schools. The major prepares students for graduate-level work in chemistry, chemical physics, biochemistry, biophysics, materials chemistry, and other related fields. Students who excel in undergraduate chemistry coursework are able to obtain funding for graduate studies in chemistry and related sciences through teaching or research assistantships and fellowships. Some chemistry major graduates go on to professional schools to study medicine, pharmacy, dentistry, veterinary medicine, business, or law.

Students are encouraged to begin their career planning early and to take advantage of the numerous resources offered by SuccessWorks (https://successworks.wisc.edu/) at the College of Letters & Science (see below). Information about careers, internships, resumes, cover letters, job search strategies, interviewing, and graduate school preparation are all available through SuccessWorks. Students can also register for Handshake (https://wisc.joinhandshake.com/login/), an online resource for students to make connections with potential employers. Current career, research, and internship opportunities of specific interest to chemistry students can be found on the Career Services (https://chem.wisc.edu/career-services/) pages of the chemistry website.

L&S CAREER RESOURCES

Every L&S major opens a world of possibilities. SuccessWorks (https://successworks.wisc.edu/) at the College of Letters & Science helps students turn the academic skills learned in their major, certificates, and other coursework into fulfilling lives after graduation, whether that means jobs, public service, graduate school or other career pursuits.

In addition to providing basic support like resume reviews and interview practice, SuccessWorks offers ways to explore interests and build career skills from their very first semester/term at UW all the way through graduation and beyond.

Students can explore careers in one-on-one advising, try out different career paths, complete internships, prepare for the job search and/or

graduate school applications, and connect with supportive alumni and even employers in the fields that inspire them.

- SuccessWorks (https://careers.ls.wisc.edu/)
- Set up a career advising appointment (https://successworks.wisc.edu/make-an-appointment/)
- Enroll in a Career Course (https://successworks.wisc.edu/career-courses/) - a great idea for first- and second-year students:
  - INTER-LS 210 L&S Career Development: Taking Initiative (1 credit)
  - INTER-LS 215 Communicating About Careers (3 credits, fulfills Comm B General Education Requirement)
- Learn about internships and internship funding (https://successworks.wisc.edu/finding-a-job-or-internship/)
  - INTER-LS 260 Internship in the Liberal Arts and Sciences
- Activate your Handshake account (https://successworks.wisc.edu/handshake/) to apply for jobs and internships from 200,000+ employers recruiting UW-Madison students
- Learn about the impact SuccessWorks has on students' lives (https://successworks.wisc.edu/about/mission/)

PEOPLE

PEOPLE

Faculty: https://chem.wisc.edu/faculty/
Staff: https://chem.wisc.edu/people/staff/
Chemistry Learning Center: https://clc.chem.wisc.edu/meet-the-staff/
Student Services and Advising: https://chem.wisc.edu/undergraduate-education/

WISCONSIN EXPERIENCE

WISCONSIN EXPERIENCE

RESEARCH

There are many research opportunities for undergraduates in the Department of Chemistry. When conducting research, students will have the opportunity to work alongside world-class faculty, staff, and graduate students to gain hands-on research experiences that will supplement their liberal arts education and prepare students for future careers. We have researchers involved in all the core areas of chemistry: analytical, chemical biology, chemical education, inorganic, materials, organic, physical, and theoretical. Many of our researchers conduct research across disciplines, including medicine, pharmacy, biology, engineering, energy, environmental sciences, and physics. Although preference is given to chemistry majors in good academic standing, any student interested in conducting chemistry research can seek out opportunities in our department. Students have the option of volunteering in a research lab or conducting research for course credit by enrolling in CHEM 299 Directed Study, CHEM 699 Directed Study, CHEM 681/CHEM 682 Senior Honors Thesis, or CHEM 691/CHEM 692 Senior Thesis. Students can also gain research experiences through the elective courses CHEM 260 Entering Research I, CHEM 346 Intermediate Organic Chemistry Laboratory, and CHEM 512 Advanced Synthesis and Laboratory Techniques as well as the required course CHEM 329 Fundamentals of Analytical Science. In some cases, experienced undergraduates may be paid to conduct research. For additional information about undergraduate research, including how to get involved, please visit the department's Undergraduate Research (https://undergradresearch.chem.wisc.edu/) page.

STUDENT ORGANIZATIONS

A number of student organizations are available for students interested in the chemical sciences.

- Alpha Chi Sigma (AXS) (http://alphachisigmauw.com/) is a national, co-ed, professional chemistry organization that was founded at UW–Madison in 1902. The UW–Madison chapter has an active membership of about 40 students, both graduate and undergraduate. The organization also has two houses, at 619 and 621 North Lake Street, which house nearly half of the members. The houses are the primary locations for events like tutoring, chapter dinners, meetings, and social events.
- The UW–Madison student chapter of NOBCChE (https://www.nobcche.org/) (National Organization for the Professional Advancement of Black Chemists and Chemical Engineers) seeks to encourage students of color to pursue graduate and professional degrees in chemistry, chemical engineering, and other chemistry-related fields. Members participate in professional development through national conference presentations, networking, and community service activities.
- SACNAS (https://win.wisc.edu/organization/sacnas/) (the Society for the Advancement of Hispanics/Chicanos and Native Americans) is a society of scientists dedicated to fostering the success of Hispanic/Chicano and Native American scientists – from college students to professionals—to attain advanced degrees, careers, and positions of leadership in science.

CERTIFICATION/LICENSURE

CERTIFICATION/LICENSURE

ACS CERTIFIED DEGREE

The UW–Madison Department of Chemistry is approved by the American Chemical Society (ACS) to certify the degrees of graduating students who have completed the curriculum and professional training recommended by ACS for chemistry bachelor's degree graduates. Certification indicates that the student has completed rigorous course work that provides them with the skills needed for a successful career in science.

Students graduating with the chemistry major from UW–Madison already meet most of the requirements for ACS certification. They can obtain the certification by electing to take specific courses that satisfy both the requirements of the major and the ACS guidelines. Additional requirements for certification are:

- A course in biochemistry, satisfied by BIOCHEM 501 Introduction to Biochemistry or BIOCHEM 507 General Biochemistry I (3 credits). A course in chemical biology will also satisfy this requirement. For example, CHEM 575 Advanced Topics in Chemistry is often offered in the spring semesters with the topic "Chemical Biology" and will satisfy this requirement.
- At least 375 total laboratory hours, which can be satisfied by the combination of all the required core laboratory courses (in organic, inorganic, analytical and physical chemistry) plus one laboratory credit from any of the following courses: CHEM 346 Intermediate Organic Chemistry Laboratory, CHEM 512 Advanced Synthesis and Laboratory Techniques, CHEM 524 Chemical Instrumentation (3 credit course, but only one credit is a lab credit), CHEM 681/CHEM 682 Senior Honors Thesis, or CHEM 691/ CHEM 692 Senior Thesis.

The biochemistry course satisfies three of the five credits of advanced non-laboratory work required for the chemistry major, while two credits from CHEM 524 also count towards the advanced work. CHEM 346, CHEM 512, 1 credit of CHEM 524, CHEM 681/CHEM 682, and CHEM 691/CHEM 692 all count towards the three additional lab credits required for the major.

Note that neither CHEM 299 Directed Study nor CHEM 699 Directed Study can be used to satisfy the lab hours needed for ACS certification. However, CHEM 699 can be used to satisfy additional lab credits needed for the chemistry major.

PROFESSIONAL CERTIFICATION/LICENSURE DISCLOSURE (NC-SARA)

The United States Department of Education (via 34 CFR Part 668 (https://www.ecfr.gov/current/title-34/subtitle-B/chapter-VI/part-668/?toc=1)) requires institutions that provide distance education to disclose information for programs leading to professional certification or licensure. The expectation is that institutions will determine whether each applicable academic program meets state professional licensure requirements and provide a general disclosure of such on an official university website.

Professional licensure requirements vary from state-to-state and can change year-to-year; they are established in a variety of state statutes, regulations, rules, and policies; and they center on a range of educational requirements, including degree type, specialized accreditation, total credits, specific courses, and examinations.

UW-Madison has taken reasonable efforts to determine whether this program satisfies the educational requirements for certification/licensure in states where prospective and enrolled students are located and is disclosing that information as follows.

Disclaimer: This information is based on the most recent annual review of state agency certification/licensure data and is subject to change. All students are strongly encouraged to consult with the individual/office listed in the Contact Information box on this page and with the applicable state agency for specific information.

The requirements of this program meet certification/licensure requirements in the following states:

Wisconsin

The requirements of this program do not meet certification/licensure requirements in the following states:

Not applicable

Updated: 1 June 2024

RESOURCES AND SCHOLARSHIPS

RESOURCES AND SCHOLARSHIPS

ACADEMIC RESOURCES

A number of resources are available to students seeking assistance with their chemistry courses. Students are strongly encouraged to attend instructor and TA office hours or the Help Desk for the course.

The Chemistry Learning Center (CLC) (https://clc.chem.wisc.edu/) supports students in introductory chemistry courses (CHEM 103, CHEM 104, and CHEM 108) and in some sections of organic chemistry. The center welcomes as many students as possible but unfortunately does not have sufficient resources to support all students seeking help. The center is funded to work with specific groups of students, such as first-generation low-income students, underrepresented students, students on academic probation, students with disabilities, students who have trouble understanding English, new transfer students, recently returning veterans, and students at risk of failing the course. These are general guidelines and the center considers each student seeking assistance on a case-by-case basis, taking into account available program space. Program eligibility is usually determined by an interview with a staff member.

Further assistance may be sought from various tutoring services on campus, including the Greater University Tutoring Services (GUTS) (http://www.guts.wisc.edu/), University Housing Tutoring, and the College of Engineering Undergraduate Learning Center (ULC) (https://www.engr.wisc.edu/academics/student-services/ulc/). Alpha Chi Sigma (AXS) (http://alphachisigmauw.com/) is a co-ed professional chemistry fraternity that also offers tutoring. For students seeking more individualized tutoring, the Department of Chemistry maintains a list of private tutors (https://chem.wisc.edu/academic-support/) available for hire.

SCHOLARSHIPS

Through the generosity of alumni and other friends of the department, the Department of Chemistry is able to offer scholarships and summer research support. In 2023, the department awarded more than 40 scholarships totaling over $191,000.

Any student who is a chemistry major or is conducting research with a chemistry faculty member is eligible to apply for the scholarships. Awards are based on both merit and financial need. Students may apply for academic year scholarships and/or summer research support. Learn more about chemistry scholarships (https://chem.wisc.edu/scholarships-fellowships-awards/) and how to apply.