

# Master of Science in Chemistry

Graduate studies in Chemistry at KU are intended to prepare graduate students for any of the multitude of career pathways available to individuals who hold a doctorate in the Chemical Sciences. Graduate studies differ from the undergraduate experience in that each activity and requirement of the graduate program is designed to prepare students to become independent, creative practitioners of Chemistry.

Chemists at KU still make new materials and find new and exciting applications for these compounds, and study how chemical reactions occur. We apply this knowledge to developing compounds that fight disease, to creating cleaner and more efficient chemical processes for industry and to applying chemistry in other manners that benefit society. Striving for a Ph.D. or M.S. degree is about creating and completing an independent, original research project in the chemical sciences. For KU students, this experience becomes the foundation for their future careers in the increasingly diverse scientific enterprise.

Research in Chemistry graduate programs used to take place exclusively in the laboratory. At KU, students apply a broader definition of the term laboratory to include many other types of research environments:

- Medical facilities where researchers study the efficacy of therapeutic agents and analyze the results of clinical trials,
- Computer laboratories where the modeling of molecular structure, chemical reactions and phase changes are contributing enormously to our understanding of the complex systems around us,
- Fields and streams where environmental chemists strive to understand how chemicals derived from natural processes and human activity impact the quality and diversity of life, and
- Classrooms where individuals study strategies for improving student learning of scientific concepts.

## Graduate Program

For a student wishing to earn a **Doctor of Philosophy (Ph.D.)** degree or a **Master's of Science (M.S.)** degree in chemistry, the selection of a graduate school is one of the most important career decisions you will make. Your choice will not only determine where you will be during the next several years, but will lay the foundation for your future.

At the University of Kansas, we feel that our program provides exceptional and diverse opportunities for the student interested in a career in cutting-edge research, higher education or any one of a number of chemically related positions requiring an advanced degree. We have a department of outstanding faculty, each of whom is dedicated to providing mentoring to graduate students and guiding them during their journey from undergraduate to colleague.

## Admission to Graduate Studies

### Admission Requirements

- All applicants must meet the requirements outlined in the Admission to Graduate Study (<https://policy.ku.edu/graduate-studies/admission-to-graduate-study/>) policy.
- Bachelor's degree: A copy of official transcripts showing proof of a bachelor's degree (and any post-bachelor's coursework or degrees)

from a regionally accredited institution, or a foreign university with equivalent bachelor's degree requirements is required.

- English proficiency: Proof of English proficiency (<https://gradapply.ku.edu/english-requirements/>) for non-native or non-native-like English speakers is required. There are two bands of English proficiency, including Admission and Full proficiency. For applicants to online programs, Full proficiency is required.

## Graduate Admission

### Prerequisites

Before beginning graduate work, students should have completed a bachelor's degree in chemistry or a related field.

### Application

Applications for admission are accepted online through the Office of Graduate Studies. Applications must include academic transcripts from all post-secondary schools attended, as well as recommendation letters from 3 individuals familiar with the applicant's academic background and abilities. Additional materials include a resume/CV and a personal statement describing the applicant's qualifications and reasons for pursuing a graduate degree in chemistry. Please refer to the Department of Chemistry graduate admissions webpage (<https://chem.ku.edu/graduate-admissions/>) for more information on our department's graduate admissions.

Non-native speakers of English must meet the English proficiency requirements (<https://gradapply.ku.edu/english-requirements/>).

Although the preferred submission deadline is December 1, applications must be received by **April 15** to be considered for admission in the fall semester.

To apply, complete the online graduate application (<https://gradapply.ku.edu/apply/>) and upload all requested documents.

### Procedure

Completed applications are reviewed by a committee of faculty members from the Department of Chemistry. Offers of admission depend on favorable evaluation of the application materials and an expectation that the student will attain an undergraduate grade-point average of B or higher in chemistry and all other natural science and mathematics courses. Admission to the graduate program is contingent upon completion of a bachelor's degree in chemistry (or a related field) and all other general admission requirements.

## M.S. Degree Requirements

The Master of Science in Chemistry requires a total of 30 hours and allows for the following degree completion options:

1. Thesis-based Master's Degree
2. Coursework Focused Master's Degree

### Course Requirements

The following courses are required for all students in the Chemistry MS program. These courses must be completed with a grade of B or higher.

Code	Title	Hours
<b>Research &amp; Responsible Scholarship Requirement</b>		
CHEM 700	Responsible Scholarship in the Chemical Sciences	1
CHEM 701	Laboratory Safety in the Chemical Sciences	1
<b>Distribution Courses</b>		
Each student must complete a distribution requirement consisting of two courses selected from the following list of introductory courses in the 5 major areas of study:		6
CHEM 720	Fundamentals and Methods of Analytical Chemistry	
CHEM 730	Coordination and Organometallic Chemistry	
CHEM 740	Principles of Organic Reactions	
CHEM 750	Introduction to Quantum Mechanics	
CHEM 760	Introduction to Chemistry in Biology	
<b>Advanced Courses</b>		
Each student must complete 4 courses at the 700 level or above in chemistry or a related area. The list of courses to be completed must be agreed upon by the student and the student's research advisor and approved by the Graduate Affairs Committee before the beginning of the student's second semester in the program. (Changes to the list can only be made with the approval of the student, the research advisor, and the Graduate Affairs Committee.) Note: These 4 courses represent a minimal set and do not preclude the student, with consultation of the research advisor, from taking additional courses in support of the research effort.		12
<b>Additional Hours</b>		
The minimum total number of credit hours required for the master's degree is 30. Additional credit hours not met through the requirements above may be satisfied through any combination of research courses (e.g., CHEM 800 or CHEM 899) and specialized courses in chemistry or in related fields such as physics, mathematics, microbiology, biochemistry, or chemical engineering. Courses from outside the department cannot be from more than 2 departments and must be approved by the student's research advisor (thesis-track only) and the Graduate Affairs Committee.		10
<b>Total Hours</b>		<b>30</b>

## Research Skills & Responsible Scholarship

For students in the Chemistry MS program, this requirement is satisfied by completion of the courses in the Research Skills & Responsible Scholarship section in the course grid above.

## Thesis-based Master's Degree

Students who wish to learn new research skills to attain competitive research positions in industry should complete a Master's thesis. Completion of a Master's degree with a thesis may also be of interest to students who wish to strengthen their portfolio for admission to graduate or professional schools that emphasize research.

The candidate must complete a thesis that demands the solution of some research problem in chemistry. At the time of the completion of the thesis, the candidate must pass an oral thesis defense (examination) administered by a committee of three members of the department's Graduate Faculty. The student must be enrolled in Master's Thesis (CHEM 899) during the semester of their defense.

## Coursework Focused Master's Degree

The coursework focused Master's degree is intended for students seeking professional development for career advancement. This degree may be of interest to educators and students planning to apply for programs that do not require a background in laboratory research (e.g. Law, Health Sciences). There are no additional requirements beyond the 30 credit hours of courses. Although there is no research requirement for the coursework focused Master's degree, this does not preclude students from engaging in research. Students currently in the Ph.D. program must obtain approval from the Graduate Affairs Committee to pursue this degree.

At the completion of this program, students will be able to:

- Independently devise, implement and complete research projects.
- Demonstrate knowledge of literature in their field and beyond.
- Understand ethical and safety responsibilities.