

CHEMISTRY (M.S.)

<https://ceps.unh.edu/chemistry/program/ms/chemistry>

Description

The M.S. program provides students with the opportunity to develop a high degree of proficiency in a specialized research area. The program serves as a stepping stone to jobs in industry, professional school, teaching careers, or for those who would like to strengthen their Chemistry knowledge. All students take coursework, carry out original research with a faculty mentor, and submit a thesis. The program has a focus on developing strong writing and oral communication skills. Financial support is typically available through a teaching assistantship.

Requirements

M.S. Degree Requirements

- Demonstration of a broad understanding of undergraduate chemistry by passing a series of basic examinations or satisfactory performance in approved courses.
- Student must present a total of **30 credits** for completion of the MS program. These 30 credits are as follows:
 - 20+ course credits, at least 8 credits of which must be in courses numbered 900 or above.
 - Satisfactory performance in at least three path-specific (analytical, inorganic, organic, or physical) courses, which is a portion of the 20+ course credits required.
 - 6 to 10 credits of CHEM 899 Thesis/Problems research credits.
- Mandatory attendance at Department Seminars and Graduate Research Updates (GRU).
- Satisfactory presentation of a Thesis Research Proposal (TRP) in the second year of residence.
- Preparation, public presentation, and oral defense of a written thesis.
- Student must maintain a GPA of 3.0 to graduate from the MS program.

Faculty Research Advisor and Thesis Committee

Students select a research advisor during the first semester in the program after interviewing at least three faculty members. During each semester thereafter, students conduct independent research under the supervision of the Faculty Research Advisor. In the second year of residence and before the Thesis Research Proposal, a thesis committee is selected. This committee evaluates the student's Thesis Research Proposal and the Thesis Defense.

Code	Title	Credits
Professional Development Courses		
CHEM 800	Introduction to Chemistry Teaching and Research Practices	1
CHEM 801	Modern Tools for Researchers in the Chemical Sciences	1
CHEM 802	Critical Thinking for Chemists	1
CHEM 991	Graduate Presentation Portfolio	1
CHEM 992	Graduate Writing Portfolio	1
CHEM 997	Seminar	1
Program Courses		
CHEM 808	Spectroscopic Investigations of Organic Molecules	3
CHEM 840	Chemical Biology	3
CHEM 855	Advanced Organic Chemistry	3
CHEM 862	Advanced Chemical Analysis Instrumentation	3

CHEM 902	Theoretical Organic Chemistry II	3
CHEM 903	Advanced Inorganic Chemistry I	3
CHEM 904	Advanced Inorganic Chemistry II	3
CHEM #905	Advanced Physical Chemistry I	3
CHEM 911	Synthetic Organic Chemistry I	4
CHEM 925	Surface Chemistry	3
CHEM 927	Chemical Kinetics and Reaction Dynamics	3
CHEM 930	Advanced Optical Methods	3
CHEM #933	Chemical Separations	3
CHEM 934	Chemical Equilibria	3
CHEM 935	Advanced Analytical Chemistry	3
CHEM 995	Colloquium (Course options: A) Inorganic Chemistry; B) Organic Chemistry; C) Theoretical Organic Chemistry; D) Physical Chemistry; E) Analytical Chemistry; F) Chemical Education.)	1-4
Research		
CHEM 899	Thesis/Problems	1-10

Accelerated Master's

This graduate program is approved to be taken on an accelerated basis in articulation with certain undergraduate degree programs.

General Accelerated Master's policy, note that some programs have additional requirements (e.g. higher grade expectations) compared to the policy.

Please see the [Graduate School website](#) and contact the department directly for more information.

Student Learning Outcomes

All Chemistry graduate students will be able to:

Display a comprehensive knowledge of chemistry, with greater depth demonstrated in at least one subdiscipline.

- Chemistry students in the Ph.D. and the M.S. program should have a basic knowledge of the field, with that knowledge being at least the level of the material taught in first-year chemistry and the initial courses in undergraduate sub-disciplinary classes (analytical, inorganic, organic, physical chemistry, and biochemistry).

Ph.D. students should demonstrate focused and deep expertise in their area of scholarly exploration, including an understanding of the current status of the topic. M.S. students should also demonstrate clear focus in scholarly pursuits.

- In the area of specialization, a Ph.D. student's knowledge of the field should, at a minimum, be comparable to special topics classes at the graduate level.
- Students should demonstrate capabilities of searching the literature to become familiar with the current state of the field.

Apply critical thinking skills in the evaluation of scientific work, by analyzing, organizing, and evaluating scientific data and knowledge.

- Careful attention to and critical evaluation of material encountered in the literature, in seminars, and research activity is evidence of scientific maturation.

Generate hypotheses, design strategies, perform studies, and interpret results that lead to new knowledge in the field, including the

- Application of central methods and techniques, including laboratory skills, statistical and computational methods, data gathering, and

record-keeping to deliver detailed information and reproducible results.

- Demonstration of an understanding of the scientific method through the Original Research Proposal and through laboratory research (dissertation).
- Conduct of consequential scientific inquiry that advances a scientific field as required for a dissertation and peer-reviewed publications.

Communicate scientific information with effectiveness to both experts and novices in oral and written form, including methods, results, and conclusions.

- Demonstration of the ability to engage in communication appropriate for the audience.
- Present scientific material with clarity, accuracy, and precision.

Perform research in a professional, ethical, and safe manner.

- Students must participate in and apply knowledge from required training in laboratory safety and the responsible conduct of research; additional specialized training in these areas is encouraged.
- Students should develop skills in applicable professional areas, such as pedagogy, teamwork and team building, and leadership, through mentoring, instructional activity, and workshops.
- Safety and ethical behavior should be demonstrated in all activities, including both instructional and research activity.