THESIS-BASED MASTER OF SCIENCE IN CHEMISTRY

Student Learning Outcomes

The Department of Chemistry offers two master of science degrees. The non-thesis M.S. program has an emphasis on coursework, while the thesis-based degree has an emphasis on both coursework and original research. Graduating chemistry M.S. students will be exposed to the most recent advances in chemical sciences. In addition, thesis-based M.S. students will experience the excitement of performing guided research.

Students, who have received a grade of B- (2.7) or better in graduate coursework taken as part of a degree program at another institution, may transfer up to 6 credit hours of this work on approval of a majority of the student’s committee. A written request for this approval must be submitted within one year of full admission to the program.

The following student learning outcomes are expected for our educational process:

At the end of their studies, students will:

- Have an extensive knowledge of the basic areas of chemistry (inorganic, organic, physical, analytical, and biochemistry) with an extensive knowledge in at least one area.
- Have done extensive research through a project.
- Have the ability to recognize scientific problems, formulate questions and answers, and carry out strategies for solving them.
- Have the ability to read, understand, and use scientific literature.
- Have the ability to communicate scientific information clearly and precisely, both written and oral forms.
- Have some understanding of the principles and applications of modern instrumentation, computation, experimental design, and data analysis.

Coursework

The emphasis of this program is research. A minimum of 31 credit hours (including research and thesis) is required. Full-time, research M.S. students should be able to complete the formal coursework requirement no later than the end of their second year. Thesis M.S. students are required to complete:

1. Three credit hours in one of the following Physical Chemistry courses:

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<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tbody>
<tr>
<td>CHEM 5531</td>
<td>Classical Thermodynamics</td>
<td></td>
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<tr>
<td>CHEM 5533</td>
<td>Quantum Chemistry</td>
<td></td>
</tr>
<tr>
<td>CHEM 5534</td>
<td>Molecular Spectroscopy</td>
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2. Three credit hours in Organic Chemistry:

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<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
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<tr>
<td>CHEM 5521R</td>
<td>Mechanisms Of Organic Reactions</td>
<td>3</td>
</tr>
<tr>
<td>or CHEM 5522</td>
<td>Synthetic Organic Chemistry</td>
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3. Six additional credit hours from graduate level chemistry courses numbered CHEM 5521R - CHEM 5899, excepting CHEM 5520R, CHEM 5530, and CHEM 5541R.

4. Two additional graduate-level courses for a minimum of 6 credit hours.

5. One credit hour seminar presentation (CHEM 5611).

6. In addition to the formal course work requirements, a minimum of 6 credit hours of research and thesis (CHEM 5599) are required. Research and thesis (CHEM 5599) work must be done under the direction of the student’s research advisor.

7. Up to 6 credit hours of directed studies (CHEM 5590) may be applied toward the degree requirements. Additional coursework may be substituted for part or all of CHEM 5590 on approval of the student’s supervisory committee.

The selected courses must be approved by the student’s supervisory committee. Students who receive a grade of C+ (2.3) or lower in more than two courses applicable to the M.S. program or who have a GPA lower than 3.0 on courses (not including CHEM 5590, CHEM 5599 or any undergraduate courses) applicable toward the M.S. degree after completing 18 or more credit hours of such courses, will be terminated from the degree program.

Students, who have received a grade of B- (2.7) or better in graduate coursework taken as part of a degree program at another institution, may transfer up to 6 credit hours of this work on approval of a majority of the student’s committee. A written request for this approval must be submitted within one year of full admission to the program.
Seminar Presentation (CHEM 5611)

Students must present a one-hour seminar based on their thesis research project. This seminar will include an exhaustive review of the literature pertinent to their project, a description of the objectives, the proposed methodology, and the significance of this research. Students must register for CHEM 5611 and present this seminar during the semester following selection of their research advisor and committee.

Thesis Defense

The candidate’s thesis must be prepared following all of the guidelines required by the UMKC School of Graduate Studies. All supervisory committee members must receive a final draft of the thesis for approval of form and content at least two weeks before submission to the Dean of the School of Graduate Studies. Candidates should submit preliminary drafts of their thesis to their supervisory committee well in advance of this deadline. After the thesis is certified for acceptance by the Dean of the School of Graduate Studies, the student must present an oral defense of his/her research in the form of a thesis seminar. The supervisory committee will make a final determination of the acceptability of the thesis immediately following this presentation. Only minor changes may be made to the thesis at this point.

Time Constraints and Financial Assistance

Full-time thesis M.S. students are required to complete all of the requirements for their degree within four years. In compelling circumstances, and on the written recommendation of a majority of the Supervisory Committee, a single extension for up to one year may be requested for approval by the Chair of the Department of Chemistry. Part-time thesis M.S. students are required to complete all of their requirements for their degree within seven years.

Full-time thesis M.S. students may receive financial support from the Department of Chemistry for a maximum of two-and-one-half years. Students from countries having an official language other than English, and who wish to be supported as GTAs, must meet the UMKC standards for international students to become certified as GTAs. Full information on that process can be found here: Policy on Award of Teaching Assistantships (http://catalog.umkc.edu/general-graduate-academic-regulations-information/international-graduate-student-academic-regulations).

Research Advisor and Supervisory Committee

Full-time students must select a research advisor from the graduate faculty of the Department of Chemistry and a supervisory committee by the end of their first regular (i.e., fall or spring) semester on campus. Part-time students must select their research advisor and supervisory committee by the end of their third year after enrollment in their first course as an M.S. student at UMKC.

The research advisor becomes the chairperson of the supervisory committee, which includes at least two additional members of the chemistry graduate faculty. Students and their supervisory committee shall plan a program of study which, when met, will qualify students for the M.S. degree. This program of study must be approved by the supervisory committee, the department chair, and the principal graduate advisor prior to the completion of 15 hours of coursework applicable to the degree. The supervisory committee is responsible for conducting the final thesis examination for students in the thesis program.