

# MASTER OF SCIENCE IN CHEMISTRY

The School of Chemistry of Biochemistry offer thesis and non-thesis programs of study leading to a Master of Science in Chemistry. The M.S. degree (non-thesis option) is a terminal degree. Course work spanning all the traditional areas of Chemistry and Biochemistry, as well as interdisciplinary topics, can be used towards these degrees. For the thesis based degree, original research in the traditional areas of Chemistry and Biochemistry, or variety of interdisciplinary topics, can be used as the basis for the thesis.

Chemistry Website

## Thesis Option

Code	Title	Credit Hours
<b>Area of Specialization</b> <sup>1,2</sup>		<b>12</b>
<b>Second Area of Specialization</b> <sup>1,2</sup>		<b>3</b>
CHEM 8000	Seminar in Chemistry or CETL 8000 Graduate Teaching Assistant Preparation	1
CHEM 7000	Master's Thesis	6
CHEM 7001	Introduction to Research	3
CHEM 8002	Information Resources for Chemists and Biochemists	2
CHEM 8003	Student Seminar	3
Completion of a thesis describing original research		
<b>Total Credit Hours</b>		<b>30</b>

<sup>1</sup> Course must be completed for letter-grade

<sup>2</sup> Up to a total of 6 hours of 4000 level credit, at a grade of B or above, can be used toward this degree from the following list of courses: CHEM 4113, CHEM 4311, CHEM 4341, CHEM 4401, CHEM 4452, CHEM 4485, CHEM 4521, CHEM 4740, CHEM 4759, CHEM 4760, CHEM 4762, CHEM 4765, CHEM 4775, CHEM 4776, and CHEM 4785. CHEM 4000-level special topics courses will be considered on a case-by-case basis. CHEM 4000- and CHEM 6000-level courses, which are largely equivalent, can't both be counted.

## Non-Thesis Option

Code	Title	Credit Hours
<b>Area of Specialization</b> <sup>1,3</sup>		<b>12</b>
<b>Second Area of Specialization</b> <sup>1,3</sup>		<b>6</b>
<b>Course from any Area of Specialization</b> <sup>1,3</sup>		<b>3</b>
<b>Approved Electives</b> <sup>2,3</sup>		<b>3</b>
CHEM 7001	Introduction to Research	3
CHEM 8003	Student Seminar	3
<b>Total Credit Hours</b>		<b>30</b>

<sup>1</sup> Course must be completed for letter-grade

<sup>2</sup> Courses from any area of specialization, CETL 8000, CHEM 8000, CHEM 8001, CHEM 8002. Additionally, with approval from the director of graduate studies CHEM 8901, CHEM 8902, CHEM 8903 and other courses can be used. Three hours maximum of Pass/Fail may be used.

<sup>3</sup> Up to a total of 6 hours of 4000 level credit, at a grade of B or above, can be used toward this degree from the following list of courses: CHEM 4113, CHEM 4311, CHEM 4341, CHEM 4401, CHEM 4452, CHEM 4485, CHEM 4521, CHEM 4740, CHEM 4759, CHEM 4760, CHEM 4762, CHEM 4765, CHEM 4775, CHEM 4776, and CHEM 4785. CHEM 4000-level special topics courses will be considered on a case-by-case basis. CHEM 4000- and CHEM 6000-level courses, which are largely equivalent, can't both be counted.

## Areas of Specialization

Core and elective courses for commonly pursued areas of specialization are listed below. However, alternative course combinations, corresponding to other areas of specialization, may be approved by the director of graduate studies on request. The use of "or" in a listing implies that credit for the two courses can't both be used towards the degree. Courses can be chosen from the core or elective categories subject to any prerequisite requirements being met.

Code	Title	Credit Hours
<b>Inorganic Chemistry Specialization</b>		
Core		
CHEM 6170	Inorganic Chemistry I	3
CHEM 6172	Physical Methods in Inorganic Chemistry	3
Elective		
CHEM 6171	Inorganic Chemistry II	3
CHEM 6181	Chemical Crystallography	3
CHEM 6182	Chemistry of the Solid State	3
CHEM 6183	Organometallic Chemistry	3
CHEM 8813	Special Topics in Inorganic Chemistry	3
<b>Analytical Chemistry Specialization</b>		
Core		
CHEM 6271	Analytical Chemistry I	3
CHEM 6281	Mass Spectrometry	3
Elective		
CHEM 6272	Analytical Chemistry II	3
CHEM 6273	Analytical techniques for chemistry and biology	3
CHEM 6282	Chemical Sensors	3
CHEM 6283	Electroanalytical Chemistry	3
CHEM 6284	Environmental Analytical Chemistry	3
CHEM 6285	Analytical Spectroscopy	3
CHEM 6287	Scanned Probe Techniques	3
CHEM 6288	Analytical Separations	3
CHEM 8823	Special Topics in Analytical Chemistry	3
<b>Organic Chemistry Specialization</b>		
Core		
CHEM 6370	Organic Reaction Mechanisms	3
CHEM 6371	Identification of Organic Compounds	3
CHEM 6372	Physical Organic Chemistry	3
Elective		
CHEM 6373	Organic Synthesis	3
CHEM 6381	Advanced Organic Synthesis	3
CHEM 6382	Computational Methods in Organic Chemistry and Biochemistry	3
CHEM 8833	Special Topics in Organic Chemistry	3

**Physical Chemistry Specialization**

Core		
CHEM 6481	Statistical Mechanics	3
	or CHEM 6755 Theoretical Chemistry of Polymers	
CHEM 6491	Quantum Mechanics	3
	or CHEM 6494 Quantum Chemistry and Molecular Spectroscopy	
Elective		
CHEM 6471	Chemical Thermodynamics and Kinetics	3
CHEM 6482	Chemical Kinetics and Reaction Dynamics	3
CHEM 6483	Chemistry of Electronic Organic Materials	3
CHEM 6484	Chemistry of Optical Organic Materials	3
CHEM 6485	Computational Chemistry	3
CHEM 6492	Molecular Spectroscopy	3
CHEM 8843	Special Topics in Physical Chemistry	3

**Biochemistry Specialization**

Core		
CHEM 6571	Enzymology and Metabolism	3
CHEM 6572	Macromolecular Structure	3
CHEM 6573	Molecular Biochemistry	3
Elective		
CHEM 6501	Biochemistry I	3
CHEM 6502	Biochemistry II	3
CHEM 6581	Protein Crystallography	3
CHEM 6582	Biophysical Chemistry	3
CHEM 6583	Drug Design and Discovery	3
CHEM 6584	Contemporary Biochemistry	3
CHEM 6756	Discovery of Signaling Molecules	3
CHEM 6760	Biocatalysis and Metabolic Engineering	3
CHEM 8853	Special Topics in Biochemistry	3

**Polymer Chemistry Specialization**

Core		
CHEM 6750	Preparation and Reaction of Polymers	3
CHEM 6752	Polymer Characterization	4
Elective		
CHEM 6751	Physical Chemistry of Polymer Solutions	3
CHEM 6757	Advanced Polymer Chemistry	3
CHEM 8873	Special Topics in Polymer Chemistry	3