CHEMISTRY, MS

Banner Code: SC-MS-CHEM

Academic Advising

Email: chemistry@gmu.edu
Website: cbgrad.gmu.edu/aboutthems.pdf

This master’s degree provides advanced training for recent college graduates, professionals in teaching, and technical workers in research organizations who have an interest in chemistry or biochemistry. With a Thesis Option Master’s in Chemistry, the serious student will perform original research and write an M.S. thesis under the direction of a faculty member. This option is for students planning to continue with a Ph.D., or to work in industry, academia, or a national laboratory. The Nonthesis Option is often used by those going on to a professional degree, or to teach chemistry at the secondary school level.

Admissions & Policies

Admissions

University-wide admissions policies can be found in the Graduate Admissions Policies section of this catalog.

To apply for this program, please complete the George Mason University Admissions Application (https://www2.gmu.edu/admissions-aid/applynow).

To be considered for admission to degree status, students must have a bachelor’s degree in chemistry, biochemistry, or a related field from a regionally accredited institution and must meet general admission requirements for graduate study as specified in Graduate Admission Policies. Admission is based on a departmental evaluation of the applicant’s background as evidenced by transcripts, résumés, and letters of recommendation. GRE scores are not required for admission into this program.

Policies

CHEM 500 Selected Topics in Modern Chemistry may not be applied toward the MS degree.

CHEM courses numbered 502 through 510 may be applied toward the degree only with prior written approval of the department.

For policies governing all graduate programs, see AP.6 Graduate Policies.

Requirements

Degree Requirements

Total credits: 30

Students should refer to the Admissions & Policies tab for specific policies related to this program.

Core Courses

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 624</td>
<td>Principles of Chemical Separation</td>
<td>9</td>
</tr>
<tr>
<td>CHEM 660</td>
<td>Protein Biochemistry</td>
<td>9</td>
</tr>
<tr>
<td>CHEM 662</td>
<td>Modern Methods of Drug Discovery</td>
<td>9</td>
</tr>
<tr>
<td>CHEM 651</td>
<td>Environmental Chemistry of Organic Substances</td>
<td>9</td>
</tr>
<tr>
<td>CHEM 641</td>
<td>Solid State Chemistry</td>
<td>9</td>
</tr>
<tr>
<td>CHEM 646</td>
<td>Bioinorganic Chemistry</td>
<td>9</td>
</tr>
<tr>
<td>CHEM 613</td>
<td>Modern Polymer Chemistry</td>
<td>9</td>
</tr>
<tr>
<td>CHEM 614</td>
<td>Physical Organic Chemistry</td>
<td>9</td>
</tr>
</tbody>
</table>

Analytical:

Biochemistry:

Environmental:

Inorganic:

Organic:

Total Credits: 9

1 These listed courses may also be taken as electives beyond the stated credit requirement for each option.

MS without Concentration

General chemistry students who do not wish to pursue a concentration complete the core courses above, the following requirements, and choose either the Thesis Option or the Non Thesis Option:

<table>
<thead>
<tr>
<th>Code</th>
<th>Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 633</td>
<td>Chemical Thermodynamics and Kinetics</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 633</td>
<td>Chemical Thermodynamics and Kinetics</td>
<td>9</td>
</tr>
<tr>
<td>CHEM 633</td>
<td>Chemical Thermodynamics and Kinetics</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 790</td>
<td>Graduate Seminar</td>
<td>6</td>
</tr>
<tr>
<td>CHEM 790</td>
<td>Graduate Seminar</td>
<td>21</td>
</tr>
</tbody>
</table>

Thesis Option

The Thesis Option is designed for students planning to pursue a doctoral degree or a career involving research in the chemical, biochemical, environmental, or pharmaceutical industries.

Students must choose a research laboratory advisor during their first semester in the program and begin working on their thesis project no later than the second semester. The thesis is based on research that must be preapproved by the thesis or advisory committee, which is appointed prior to the first semester of registration in CHEM 799 Master’s Thesis. Students must complete CHEM 799 Master’s Thesis and present a seminar, followed by an oral defense.
Non Thesis Option
The Non Thesis Option is designed for those seeking to go on to professional school, teach chemistry in secondary schools, or pursue other careers in which advanced work in chemistry is necessary or advantageous.

Students selecting this option are not required to complete a laboratory-based thesis. Instead, they must complete a research project or gain teaching experience in undergraduate chemistry labs, as described below.

Any combination of CHEM 670 Teaching Practicum and CHEM 796 Directed Reading and Research may be used to fulfill this requirement. However, CHEM 796 Directed Reading and Research may only be used to fulfill this requirement with prior written approval of the department and must be used to complete a laboratory or library-based research project, or must otherwise enhance the student’s teaching skills.

Non Thesis Option
The Non Thesis Option is designed for those seeking to go on to professional school, teach chemistry in secondary schools, or pursue other careers in which advanced work in chemistry is necessary or advantageous.

Students selecting this option are not required to complete a laboratory-based thesis. Instead, they must complete a research project or gain teaching experience in undergraduate chemistry labs, as described below.

Any combination of CHEM 670 Teaching Practicum and CHEM 796 Directed Reading and Research may be used to fulfill this requirement. However, CHEM 796 Directed Reading and Research may only be used to fulfill this requirement with prior written approval of the department and must be used to complete a laboratory or library-based research project, or must otherwise enhance the student’s teaching skills.

Non Thesis Option
Select 3 credits of the following:

<table>
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</thead>
<tbody>
<tr>
<td>CHEM 670</td>
<td>Teaching Practicum</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 796</td>
<td>Directed Reading and Research</td>
<td></td>
</tr>
</tbody>
</table>

Additional Chemistry Electives
Select 3 credits of CHEM designated courses

Total Credits 6

MS with Concentration in Biochemistry (BC)
Students who wish to pursue an optional concentration in biochemistry complete the core courses above, the following requirements, and choose either Thesis Option or the Non Thesis Option:

Additional Core Course

<table>
<thead>
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</thead>
<tbody>
<tr>
<td>CHEM 633</td>
<td>Chemical Thermodynamics and Kinetics</td>
<td>3</td>
</tr>
</tbody>
</table>

Chemistry Electives
Select 3 credits of CHEM designated courses

Seminar

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</tr>
</thead>
<tbody>
<tr>
<td>CHEM 790</td>
<td>Graduate Seminar</td>
<td>3</td>
</tr>
</tbody>
</table>

Thesis or Non Thesis
Select the Thesis Option or the Non Thesis Option

Total Credits

Thesis Option
The Thesis Option is designed for students planning to pursue a doctoral degree or a career involving research in the chemical, biochemical, environmental, or pharmaceutical industries.

Students must choose a research laboratory advisor during their first semester in the program and begin working on their thesis project no later than the second semester. The thesis is based on research that must be preapproved by the thesis or advisory committee, which is appointed prior to the first semester of registration in CHEM 799 Master’s Thesis. Students must complete CHEM 799 Master’s Thesis and present a seminar, followed by an oral defense.

Non Thesis Option
The Non Thesis Option is designed for those seeking to go on to professional school, teach chemistry in secondary schools, or pursue other careers in which advanced work in chemistry is necessary or advantageous.

Students selecting this option are not required to complete a laboratory-based thesis. Instead, they must complete a research project or gain teaching experience in undergraduate chemistry labs, as described below.

Any combination of CHEM 670 Teaching Practicum and CHEM 796 Directed Reading and Research may be used to fulfill this requirement. However, CHEM 796 Directed Reading and Research may only be used to fulfill this requirement with prior written approval of the department and must be used to complete a laboratory or library-based research project, or must otherwise enhance the student’s teaching skills.

Non Thesis Option
Select 3 credits of the following:

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<td>Directed Reading and Research</td>
<td></td>
</tr>
</tbody>
</table>

Biochemistry Electives
Select 6 credits of electives in biochemistry or related fields with approval from the department

Total Credits 6

Accelerated Master’s
Chemistry, BS/Chemistry, Accelerated MS
Overview
This bachelor’s/accelerated master’s degree program allows academically strong undergraduates with a commitment to research to obtain both the Chemistry, BS and the Chemistry, MS degrees within an accelerated timeframe. Upon completion of this 144 credit program, students will be exceptionally well prepared for entry into a professional school or a PhD program in chemistry or a related discipline. Students are eligible to enter this program and enroll in graduate courses after successfully completing 90 undergraduate credits, inclusive of prerequisites, toward the Chemistry, BS degree. This flexibility makes it possible for students to complete graduate coursework during their final year.

For more detailed information, see AP6.7 Bachelor’s/Accelerated Master’s Degrees. For policies governing all graduate degrees, see AP6 Graduate Policies.
Application Requirements
Applicants to all graduate programs at George Mason University must meet the admission standards and application requirements for graduate study as specified in the Graduate Admission Policies section of this catalog. Application information for this accelerated master’s program can be found here (https://www2.gmu.edu/admissions-aid/how-apply/accelerated-masters).

Successful applicants will have an overall undergraduate GPA of at least 3.00. Additionally, they will have completed 36 credits of CHEM courses with a GPA of at least 3.00.

Accelerated Option Requirements
At the beginning of the student’s final undergraduate semester, students must submit a bachelor’s/accelerated master’s transition form (available from the Office of the University Registrar (http://registrar.gmu.edu)) to the College of Science’s Office of Academic and Student Affairs (https://cos.gmu.edu/about/contact-us). Students must begin their master’s program in the semester immediately following conferral of the bachelor’s degree.

Students must maintain an overall GPA of 3.00 or higher in graduate coursework and should consult with their faculty advisor to coordinate their academic goals within the chemistry and biochemistry concentrations.

Reserve Graduate Credit
While still in undergraduate status, a maximum of 6 additional graduate credits may be taken as reserve graduate credit and applied to the master’s program. Reserve graduate credits do not apply to the undergraduate degree.