The University Of Toledo
Graduate Program Requirement Revision

* denotes required fields

Contact Person*: Mark Mason
Phone: 530-1532 (xxx-xxxx) Email: mark.mason5@utoledo.edu

Present

College*: Coll Nat Sci and Mathematics
Dept/Academic Unit*: Chemistry
Program Code*: CHEM

*Program Name* M.S. Chemistry (Two track)
Minimum number of credit hours for completion(if changed):
30

List all courses which comprise the certificate or degree and identify term offered (summer/fall/spring):

see attachment

Identify delivery method (Online/in class/off campus): varied

Choose File | No file chosen

Proposed effective term*: 201340 (e.g. 201140 for 2011 Fall)

Proposed

College*: Coll Nat Sci and Mathematics
Dept/Academic Unit:
Program Code*: CHEM

Program Name M.S. Chemistry (Three track)
Minimum number of credit hours for completion(if changed):
36

PSM IN GREEN CHEMISTRY AND ENGINEERING TRACK

List all courses which comprise the certificate or degree and identify term offered (summer/fall/spring):

Identify delivery method (Online/in class/off campus): varied

File Type

ProposedCourseList

Program Approval:

Department Curriculum Authority: Xiehe Hu Date 2013/04/08
Department Chairperson: Ronald E. Viola Date 2013/10/03
College Curriculum Authority or Chair: Anthony Quinn Date 2013/10/22
College Dean: Brian P. Ashburner Date 2013/10/24
Graduate Council:
Dean of Graduate Studies:
Office of the Provost:

Administrative Use Only

Effective Date: (YYYY/MM/DD)
CIP Code:
Subsidy Taxonomy:
Program Code:
Instructional Level:

Date Added: Council Approved: 1/26/13 1/21/14
To Provost: 2.7.14
Professional Science Master's Degree in Green Chemistry and Engineering

**Justification for PSM track:** This degree option is intended for students who want to concentrate their M.S. studies on green chemistry principles and incorporate aspects of green engineering, business, and other professional skills components into their M.S. degree program in chemistry. The PSM Degree in Green Chemistry and Engineering is not intended to be a traditional research-based M.S. degree and students will not be provided assistantship support. This M.S. degree track in chemistry, and the corresponding M.S. degree track in chemical engineering, is designed to be revenue generating. The proposed modifications to the current M.S. Degree in Chemistry for the proposed PSM track are guided by the Green Chemistry and Commerce Council’s position statement on incorporation of green chemistry and green engineering into higher education.

**Current Requirements for M.S. Degree in Chemistry, Thesis Track:** The current minimum curriculum requirements for an M.S. in Chemistry degree for students completing a thesis are as follows:

<table>
<thead>
<tr>
<th>Coursework</th>
<th>Minimum of four 6000-level courses in chemistry (16 hr)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Students must demonstrate breadth by taking one graduate course in each of three different subdivisions: analytical, biochemistry, inorganic, materials, organic, physical chemistry</td>
</tr>
<tr>
<td>Thesis Colloquium</td>
<td>CHEM 6920, Chemistry Colloquium (1 hr; 4 hr max)</td>
</tr>
<tr>
<td>Chemistry Seminar</td>
<td>CHEM 6930, Chemistry Seminar (1 hr min)</td>
</tr>
<tr>
<td>Thesis Research</td>
<td>CHEM 6960, Thesis Research (4 hr min)</td>
</tr>
<tr>
<td>Thesis and Oral Defense</td>
<td>Required</td>
</tr>
<tr>
<td>Minimum Total:</td>
<td>30 hr</td>
</tr>
</tbody>
</table>

*We propose no changes to the above for students seeking the M.S. in Chemistry via the thesis option.*

**Current Requirement for M.S. Degree in Chemistry, Non-Thesis Track:** The current minimum curriculum requirements for an M.S. in Chemistry degree for students taking the non-thesis track are as follows:

- Minimum of five 6000-level courses in chemistry: 20+ hr
- Students must demonstrate breadth by taking one graduate course in each of three different subdivisions: analytical, biochemistry, inorganic, materials, organic, physical chemistry

<table>
<thead>
<tr>
<th>Additional 6000-level courses in chemistry or a related discipline</th>
<th>8 hr</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 6920: Chemistry Colloquium</td>
<td>0–2 hr</td>
</tr>
<tr>
<td>CHEM 6940: Graduate Readings in Chemistry</td>
<td>2 hr</td>
</tr>
</tbody>
</table>

Minimum Total: 32 hr

*CHEM 6930 (Chemistry Seminar) and CHEM 6960 (Thesis Research) cannot be applied to the 32 hour minimum required for this degree option.*
Proposed Requirements for M.S. Degree in Chemistry, PSM in Green Chemistry and Engineering Track:
We propose the following modifications to the above degree tracks for students pursuing an M.S. in Chemistry via the PSM track.

Students must complete a total of **36** hours of course work as follows:

<table>
<thead>
<tr>
<th>Required</th>
<th>credit hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 6200 Green Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>CHEM 6210 Environmental Chemistry</td>
<td>3</td>
</tr>
<tr>
<td>CHEE 6010¹ Green Engineering Principles for Chemical Processes</td>
<td>3</td>
</tr>
<tr>
<td>CHEE 6110 Green Engineering Applications in Chemical Industries</td>
<td>3</td>
</tr>
<tr>
<td>BUAD 6600 Supply Chain Management</td>
<td>3</td>
</tr>
<tr>
<td>EFSB 6690 Technology Commercialization</td>
<td>3</td>
</tr>
<tr>
<td><strong>OR</strong></td>
<td></td>
</tr>
<tr>
<td>EFSB 6590 New Venture Creation</td>
<td>3</td>
</tr>
<tr>
<td>CHEM/CHEE 6970 Graduate Industrial Internship</td>
<td></td>
</tr>
</tbody>
</table>

*Graduate electives in chemistry and/or chemical engineering** 12

**Total** 36

*Select 12 credits from graduate coursework in traditional areas of chemistry or chemical engineering. Up to 4 credit hours of 6000-level coursework in a related discipline (e.g., environmental sciences, physics) may be applied to the minimum 12 credit hours of electives if approved by the manager of the PSM program. Up to 2 credit hours of independent research project (Special Topics: CHEM 6980; CHEE 6980) may also be applied if approved by the manager of the PSM program. Research seminar (CHEM 6930) and colloquium (CHEM 6920) cannot be applied towards the 36 hour minimum for the PSM degree.

¹Required for non-chemical engineering majors