**Program Modification Form**

### I Summary of Proposed Changes
- **Department/program**: Chemistry
- **Summary**: CS 250 will replace CS 172 for the BA and BS Chemistry options

### II Endorsements and Approvals
Please obtain the Program Chair/Director's approval and Dean's approval.

<table>
<thead>
<tr>
<th>Requestor:</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phone: 2592</td>
<td>Ed Rosenberg</td>
<td>08/20/2014</td>
</tr>
<tr>
<td>Program Chair/Director:</td>
<td>Christopher Palmer</td>
<td>09/10/14</td>
</tr>
<tr>
<td>Department Dean</td>
<td>Jenny McNulty</td>
<td>09/18/14</td>
</tr>
<tr>
<td>Other affected Programs:</td>
<td>Computer Science</td>
<td>09/22/14</td>
</tr>
</tbody>
</table>

**Are other departments/programs affected by this modification because of**
(a) required courses incl. prerequisites or corequisites,
(b) perceived overlap in content areas
(c) cross-listing of coursework

**Please obtain signature(s) from the Chair/Director of any such department/program (above) before submission**

### III Type of Program Modification
(e.g. adding a writing course required of all majors.) Please X check the appropriate box.

<table>
<thead>
<tr>
<th>Major</th>
<th>Minor</th>
<th>Option</th>
<th>Teaching major/minor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Just substituting one course for a more appropriate one.</td>
</tr>
</tbody>
</table>

### IV Catalog Language
If you are proposing a change to an existing program or major, please cut and paste the requirements as they appear in the current catalog below.

[www.umt.edu/catalog](http://www.umt.edu/catalog)

**Please provide the proposed copy as you wish it to appear in the catalog.**

**See attached**

CS 250 is required of BA and BS chemistry majors and replaces CS 172

**Please explain/justify the new proposal or change.**

CS 172 is a spreadsheet course and most students have enough training in this area. Cs 250 will expose students to actual programming and this will benefit our majors to greater extent

### V Copies and Electronic Submission
Once approved, the original, a paper copy and an electronic file are submitted to the Faculty Senate Office, UH 221 (camie.foos@msou.mt.edu).

### VI Department Summary
Required if several proposals are submitted. In a separate document list program title and proposed change of all proposals.

Revised 11-2009
University of Montana Catalog

Chemistry B.A.

The courses required for the B.A. degree provide a less extensive training in chemistry than do the courses required for the American Chemical Society certified B.S. degree. This is to allow the student to supplement his or her program with courses that meet his or her specific needs. Thus this degree provides the core of traditional preparation in chemistry together with latitude for combination with an interdisciplinary field or the Teacher Preparation program. It is strongly advised that students using this degree obtain faculty advice in planning their program.

Bachelor of Arts - Chemistry

College Humanities & Sciences

Catalog Year: 2014-2015

Degree Specific Credits: 89
Required Cumulative GPA: 2.0

Lower Core Courses

Rule: All subcategories must be completed

General Chemistry

Rule: Complete both courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHMY 141N - College Chemistry I</td>
<td>5 Credits</td>
</tr>
<tr>
<td>CHMY 143N - College Chemistry II</td>
<td>5 Credits</td>
</tr>
</tbody>
</table>

Minimum Required Grade: C-

10 Total Credits Required

Organic Chemistry

Rule: Complete all courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHMY 221 - Organic Chem I</td>
<td>3 Credits</td>
</tr>
<tr>
<td>CHMY 222 - Org Chm I Lab</td>
<td>2 Credits</td>
</tr>
<tr>
<td>CHMY 223 - Organic Chm II</td>
<td>3 Credits</td>
</tr>
<tr>
<td>CHMY 224 - Org Chm II Lab</td>
<td>2 Credits</td>
</tr>
</tbody>
</table>

Minimum Required Grade: C-

10 Total Credits Required
**Physics**

**Rule:** Complete either PHSX 205N-206N and 207N-208N or PHSX 215N-216N and 217N-218N

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>PHSX 205N - College Physics I</td>
<td>4 Credits</td>
</tr>
<tr>
<td>PHSX 206N - College Physics I Laboratory</td>
<td>1 Credits</td>
</tr>
<tr>
<td>PHSX 207N - College Physics II</td>
<td>4 Credits</td>
</tr>
<tr>
<td>PHSX 208N - College Physics II Laboratory</td>
<td>1 Credits</td>
</tr>
<tr>
<td>PHSX 215N - Fund of Physics w/Calc I</td>
<td>4 Credits</td>
</tr>
<tr>
<td>PHSX 216N - Physics Laboratory I w/Calc</td>
<td>1 Credits</td>
</tr>
<tr>
<td>PHSX 217N - Fund of Physics w/Calc II</td>
<td>4 Credits</td>
</tr>
<tr>
<td>PHSX 218N - Physics Laboratory II w/Calc</td>
<td>1 Credits</td>
</tr>
</tbody>
</table>

Minimum Required Grade: C-

10 Total Credits Required

**Mathematics**

**Rule:** Complete all courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>M 171 - Calculus I</td>
<td>4 Credits</td>
</tr>
<tr>
<td>M 172 - Calculus II</td>
<td>4 Credits</td>
</tr>
<tr>
<td>M 273 - Multivariable Calculus</td>
<td>4 Credits</td>
</tr>
</tbody>
</table>

Minimum Required Grade: C-

12 Total Credits Required

**Computer Science**

**Rule:** Complete course

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CSCI 172 - Intro to Computer Modeling</td>
<td>3 Credits</td>
</tr>
</tbody>
</table>

Minimum Required Grade: C-

3 Total Credits Required

**Upper Core Courses**

**Rule:** All subcategories must be completed

**Analytical Chemistry**

**Rule:** Complete all of the following courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHMY 311 - Analytical Chem-Quant Analysis</td>
<td>4 Credits</td>
</tr>
</tbody>
</table>

CHMY 421 - Advanced Instrument Analysis
Minimum Required Grade: C-

4 Credits
8 Total Credits Required

Physical Chemistry
Rule: Complete all of the following courses

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHMY 371 - Phys Chem-Qntm Chm &amp; Spctrscopy</td>
<td>4 Credits</td>
</tr>
<tr>
<td>CHMY 373 - Phys Chem-Kntcs &amp; Thrmodynamics</td>
<td>4 Credits</td>
</tr>
</tbody>
</table>
Minimum Required Grade: C-

8 Total Credits Required

Advanced Electives
Rule: Complete 15 credits of advanced electives
Note: Complete 15 credits of advanced electives approved by Chemistry Adviser
Minimum Required Grade: C-

15 Total Credits Required

Modern Foreign Language
Rule: Complete 10 credits of modern foreign language
Minimum Required Grade: Pass

10 Total Credits Required

Ethics
Rule: Complete the following course

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHMY 302E - Chem Lit and Science Writing</td>
<td>3 Credits</td>
</tr>
</tbody>
</table>
Minimum Required Grade: C-

3 Total Credits Required
University of Montana Catalog

Chemistry B.S.

(American Chemical Society Certified)
The courses required for the B.S. degree provide a solid education in chemistry for the professional chemist and in preparation for graduate work in most areas of chemistry. These requirements meet the latest certification standards of the American Chemical Society.

Bachelor of Science - Chemistry

College Humanities & Sciences  Catalog Year: 2014-2015
Degree Specific Credits: 94
Required Cumulative GPA: 2.0

Lower Core Courses
Rule: All courses in all subcategories listed are required

45 Total Credits Required

General Chemistry

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Minimum Required Grade: C-

10 Total Credits Required

Organic Chemistry

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<tr>
<td>CHMY 224 - Org Chm II Lab</td>
<td>2 Credits</td>
</tr>
</tbody>
</table>

Minimum Required Grade: C-

10 Total Credits Required

Physics

Course

PHSX 215N - Fund of Physics w/Calc I
PHSX 216N - Physics Laboratory I w/Calc
PHSX 217N - Fund of Physics w/Calc II
PHSX 218N - Physics Laboratory II w/Calc

Minimum Required Grade: C-

Credits
4 Credits
1 Credits
4 Credits
1 Credits

10 Total Credits Required

Mathematics

Course

M 171 - Calculus I
M 172 - Calculus II
M 273 - Multivariable Calculus

Minimum Required Grade: C-

Credits
4 Credits
4 Credits
4 Credits

12 Total Credits Required

Computer Science

Course

CSCI 172 - Intro to Computer Modeling

Credits
3 Credits

3 Total Credits Required

Upper Division Core Courses

Rule: All courses in all subcategories listed are required

33 Total Credits Required

Analytical Chemistry

Course

CHMY 311 - Analytical Chem-Quant Analysis
CHMY 421 - Advanced Instrument Analysis

Minimum Required Grade: C-

Credits
4 Credits
4 Credits

8 Total Credits Required

Physical Chemistry
Inorganic Chemistry

Course
CHMY 401 - Advanced Inorganic Chemistry
CHMY 402 - Advanced Inorganic Chem Lab
CHMY 403 - Descriptive Inorganic Chem
Minimum Required Grade: C-
Credits
3 Credits
2 Credits
3 Credits
8 Total Credits Required

Biochemistry

Course
BCH 480 - Advanced Biochemistry I
BCH 486 - Biochemistry Research Lab
Minimum Required Grade: C-
Credits
3 Credits
3 Credits
6 Total Credits Required

Mathematics

Course
M 311 - Ordinary Diff Equations/System
Minimum Required Grade: C-
Credits
3 Credits
3 Total Credits Required

Advanced Electives

Rule: Choose 3 to 9 credits from the listed courses.

Note: 3 credits maximum of CHMY 492 or CHMY 499 may be applied toward degree requirements.
Other classes in chemistry, physics, geology, biochemistry, or mathematics may be used to meet the Advanced Electives requirement with approval of the Chemistry Adviser.
2 additional Advanced Electives of at least 3 credits each may be substituted for the Modern Language requirement with approval of the Chemistry Adviser.

Course
CHMY 391 - Special Topics/Expmtl Crse
CHMY 442 - Aquatic Chemistry
Credits
1 To 9 Credits
3 Credits
CHMY 445 - Indstrl Chm & Its Impct on Soc  3 Credits
CHMY 465 - Organic Spectroscopy  3 Credits
CHMY 491 - Special Topics/Expmntl Crse  1 To 9 Credits
CHMY 492 - Independent Study  1 To 9 Credits
CHMY 499 - Senior Thesis/capstone  3 Credits

Minimum Required Grade: C-

Modern Foreign Language
Rule: Complete 2 semesters (10 credits) of a modern language or 2 additional advanced elective courses

Note: 2 Advanced Elective courses worth at least 3 credits each may be substituted for the Modern Foreign Language requirement with approval from the Chemistry Adviser.

Minimum Required Grade: Pass  10 Total Credits Required

Ethics
Rule: Complete the following course

<table>
<thead>
<tr>
<th>Course</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHMY 302E - Chem Lit and Science Writing</td>
<td>3 Credits</td>
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</table>

Minimum Required Grade: C-

3 Total Credits Required

Registrar's Office
University of Montana Catalog
Lommasson Center 201
Fax: (406) 243-4807
Phone: (406) 243-2995