# Curriculum Proposal

**College:** Science, Engineering and Technology

**Department:** Chemistry and Geology

**Program:** CHEMISTRY MINOR

**Type of Change:** PROGRAM PROPOSALS

**Proposed Change:** Change in Requirements-Course(s) Added

**Title Current:**

**Title Proposed:**

**24-Char. Abbrev:**

Include a course or program description for the Bulletin (30-40 words maximum for courses, 100 for programs):

**No Change**

**Rationale or Justification for change:** See Attached

### For General Education or Cultural Diversity Courses Only

<table>
<thead>
<tr>
<th>GE Category #</th>
<th>GE Category Name (Maximum of 3 Categories)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td></td>
</tr>
<tr>
<td>N/A</td>
<td></td>
</tr>
</tbody>
</table>

*For Writing Intensive Courses, attach a description of the kind and quantity of writing.

*For Upper Division Courses, include a description of the respects in which it is broad and general rather than narrow and specific, and so suitable as GE.

Attach paper copies of the following:

* Syllabus or course outline.
* Course's student learning outcomes associated with each GE competency or CD designation.
* List of strategies to be used to assess students' achievement of each GE competency or CD designation.

### For New Courses

<table>
<thead>
<tr>
<th>Instructional Type:</th>
<th>Lecture</th>
</tr>
</thead>
<tbody>
<tr>
<td>Course will be offered:</td>
<td></td>
</tr>
<tr>
<td>Course is an elective.</td>
<td></td>
</tr>
<tr>
<td>Course is required for program</td>
<td></td>
</tr>
<tr>
<td>Pre- or Co-requisites:</td>
<td></td>
</tr>
<tr>
<td>Other courses are being changed or eliminated. (Explain.)</td>
<td></td>
</tr>
</tbody>
</table>

* Course content or title is similar to courses in other departments. (Attach copy of letter of agreement with other program(s) contacted. Indicate the nature of the discussions and/or resolution of differences or potential conflicts.)

Attach paper copies of the following:

* Syllabus or course outline.
* Course's student learning outcomes.
* A list of resources required to offer and support this course.
* A description of how teaching this course will affect department staffing.
* If 400/500 level course, an explanation of added expectations of graduate students.
### Signature Page

**Department**
- Recommended (Category/ies)
- Not Recommended (Category/ies)

- **[Signature] [Name]**
- **10-17-06**
- **Department Chair**
- **Date**

**Comments:**

**College Curriculum Committee**
- Recommended (Category/ies)
- Not Recommended (Category/ies)

- **[Signature] [Name]**
- **11/2/06**
- **Committee Chair**
- **Date**

**Comments:**

**College Dean**
- Recommended (Category/ies)
- Not Recommended (Category/ies)

- **[Signature] [Name]**
- **11/4/06**
- **Dean**
- **Date**

**Comments:**

**General Education Subcommittee**
- Recommended (Category/ies)
- Not Recommended (Category/ies)

- **General Education Subcommittee Chair**
- **Date**

**Comments:**

**Undergraduate Curriculum and Academic Policy Committee**
- Recommended (Category/ies)
- Not Recommended (Category/ies)

- **UCAP Faculty Chair**
- **3-1-07**

**Comments:**

**Faculty Association Graduate Committee**
- Recommended
- Not Recommended

- **Faculty Association Graduate Chair**
- **Date**

**Comments:**

**Graduate Dean**
- Recommended
- Not Recommended

- **Graduate Dean**
- **Date**

**Comments:**

**Academic Affairs Council**
- Recommended (Category/ies)
- Not Recommended (Category/ies)

- **[Signature] [Name]**
- **3-12-07**
- **Assistant Vice President**
- **Date**

**Comments:**

**Senior Vice President and Vice President for Academic Affairs**
- Approved (Category/ies)
- Not Approved (Category/ies)

- **[Signature] [Name]**
- **3-14-07**
- **Sr. Vice President / Vice Pres. Academic Affairs**
- **Date**

**Comments:**
Chemistry Minor Revision Proposal
10/18/06

Rationale or Justification for change:

Through this revision, our department is striving to more thoroughly prepare our students via a solid background of organic and upper division content. This revision brings the minor into line with those offered at the other MnSCU institutions, especially in regard to total credit hours and content saturation.

a. Student Learning Outcomes:

Please see attached Assessment Plan for Chemistry Minor, first column.

b. Minutes from Department Meeting:

Please see attached

c. Program Assessment Plan:

Please see attached

d. List of Current and Proposed program requirements:

Please see attached

e. Resources required to offer and support program:

No new resources required, program already exists.

f. Effect on Department Staffing:

No new staffing required.

g. Additional library holdings required:

None.

Please include rationale for any proposed changes to number of program credits:

Through this revision, our department is striving to bring its minor into line with those offered at the other MnSCU institutions in regard to total credit hours.
Curriculum Committees’ Chemistry Minor 
Revision Proposal 

10/18/06

**Current:**

<table>
<thead>
<tr>
<th>Required for Minor (Core, 19 credits)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 201</td>
<td>General Chemistry I (5)</td>
</tr>
<tr>
<td>CHEM 202</td>
<td>General Chemistry II (5)</td>
</tr>
<tr>
<td>CHEM 305</td>
<td>Analytical Chemistry (4)</td>
</tr>
<tr>
<td>CHEM 320</td>
<td>Organic Chemistry I (with lab) (5)</td>
</tr>
</tbody>
</table>

**Proposal:**

<table>
<thead>
<tr>
<th>Required for Minor (Core, 22 credits)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>CHEM 201</td>
<td>General Chemistry I (5)</td>
</tr>
<tr>
<td>CHEM 202</td>
<td>General Chemistry II (5)</td>
</tr>
<tr>
<td>CHEM 305</td>
<td>Analytical Chemistry (4)</td>
</tr>
<tr>
<td>CHEM 320</td>
<td>Organic Chemistry I (with lab) (5)</td>
</tr>
<tr>
<td>CHEM 321</td>
<td>Organic Chemistry II (3)</td>
</tr>
</tbody>
</table>

**Required Electives for Minor (Chem, 3 credits)** 
Choose a minimum of 3 credits from chemistry or biochemistry courses except CHEM 381, CHEM 479, CHEM 482, and CHEM 495.

| CHEM xxx | 300/400 Elective |
| CHEM xxx | 300/400 Elective |

These elective credits must be taken at Minnesota State Mankato for the minor.
# Dept of Chemistry and Geology
## Assessment Plan For Chemistry Minor

<table>
<thead>
<tr>
<th>Student Learning Outcomes (performance, knowledge, attitudes)</th>
<th>Related Univ. Goals</th>
<th>Related College Goals</th>
<th>Method(s) of Assessment (What is the assessment?)</th>
<th>Who Assessed (Students from what courses - population)</th>
<th>When Assessed (dates)</th>
<th>Standard of Mastery/ Criterion of Achievement</th>
<th>What is Hoped to Be Learned?</th>
</tr>
</thead>
</table>
| 1. Students will demonstrate their knowledge of the basic principles of chemistry (kinetics, thermodynamics, quantum mechanics and equilibria) and apply these to chemically relevant problems. | MSUM 2 | CSET 1, 2, 3, 4, 5, 6, 14, 16 | in class problems homework problems examinations laboratory experiments and reports use of ACS generalized exas | kinetics: students enrolled in chem 202, 320. thermo: students enrolled in chem 201, 202. quantum: students enrolled in chem 201. equilibria: students enrolled in chem 201, 202, 305. | kinetics 07-08 09-10 thermo 06-07 08-09 quantum 07-08 09-10 equilib 06-07 08-09 | mastery standards are based on course level. 2xx level: ave score on ACS standardized gen chemistry exam is statistically same as national ave. 3xx level: score on homework probs and exams average 70%, lab experiments and reports average 75% | a. if students are able to use their knowledge from prerequisite courses to build on in upper division courses.  
 b. if our students can apply fundamentals to different situations.  
 c. if students are able to identify the common themes in the various courses.  
 d. how well our students retain and use their knowledge compared to other programs. |

| 2. Students will demonstrate their understanding of the chemist's use of numbers by applying their knowledge to make quantifiable comparisons (stoichiometry), to report data and to determine uncertainty and error. | MSUM 2 | CSET 1, 2, 3, 6, 14, 16 | in class problems homework problems examinations laboratory experiments and reports use of ACS generalized exam | students enrolled in chem 201, 202, 305, 320. | every other year 04-05 06-07 | mastery standards are based on course level. 2xx level: ave score on ACS standardized gen chemistry exam is statistically same as national ave. 3xx level: score on homework probs and exams average 70%, lab experiments and reports average 75%, | a. if students are able to use their knowledge from prerequisite courses to build on in upper division courses.  
 b. if our students are able to quantify basic relationships in our courses and laboratories.  
 c. if our students understand the importance of data collection, the proper recording of and reporting of data. |
<table>
<thead>
<tr>
<th>Student Learning Outcomes (performance, knowledge, attitudes)</th>
<th>Related Univ. Goals</th>
<th>Related College Goals</th>
<th>Method(s) of Assessment (What is the assessment?)</th>
<th>Who Assessed (Students from what courses - population)</th>
<th>When Assessed (dates)</th>
<th>Standard of Mastery/ Criterion of Achievement</th>
<th>What is Hoped to Be Learned?</th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Students will demonstrate their understanding of descriptive chemistry (physical properties, bonding, reactivity patterns, redox, and characterization) by applying these ideas to relevant problems.</td>
<td>MSUM 2</td>
<td>CSET 1, 2, 3, 4, 5, 6, 14, 16</td>
<td>in class problems homework problems examinations laboratory experiments and reports use of ACS generalized exam</td>
<td>students enrolled in chem 201, 202, 320.</td>
<td>every other year 05-06 07-08</td>
<td>mastery standards are based on course level. 2xx level: score on ACS standardized general chemistry exam is statistically same as national ave. 3xx level: score on homework probs and examinations average 70%, lab experiments and reports average 75%.</td>
<td>a. if students are able to use their knowledge from prerequisite courses to build on in upper division courses. b. if students are able to identify the common themes in the various courses. c. how well our students retain and use their knowledge compared to other programs.</td>
</tr>
<tr>
<td>4. Students will demonstrate their communication skills by reading scientific works and utilizing appropriate terminology in effective written, oral and pictorial presentations.</td>
<td>MSUM 1, 2, 6</td>
<td>CSET 1, 2, 3, 4, 5, 6, 9, 14, 16</td>
<td>in class discussions examinations homework problems laboratory reports</td>
<td>students enrolled in chem 201, 202, 305, 320.</td>
<td>every third year 06-07</td>
<td>mastery standards are based on course level. 2xx level: scores on writing assignments ave 70 % 3xx level: scores on written lab reports ave 75 %, scores on writing assignments ave 70 %</td>
<td>a. if our students are able to communicate effectively as chemists. b. if spreading writing out among various courses is effective. c. how well our students can use these skills after graduation.</td>
</tr>
<tr>
<td>Student Learning Outcomes (performance, knowledge, attitudes)</td>
<td>Related Univ. Goals</td>
<td>Related College Goals</td>
<td>Method(s) of Assessment (What is the assessment?)</td>
<td>Who Assessed (Students from what courses - population)</td>
<td>When Assessed (dates)</td>
<td>Standard of Mastery/Criterion of Achievement</td>
<td>What is Hoped to Be Learned?</td>
</tr>
<tr>
<td>---------------------------------------------------------------</td>
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<td>---------------------------------</td>
</tr>
<tr>
<td>5. Students will demonstrate their laboratory skills by properly conducting various “wet” laboratory procedures, instrumental techniques and exhibiting a professional laboratory presence.</td>
<td>MSUM 1, 2, 5</td>
<td>CSET 1, 2, 3, 5, 6, 14, 16</td>
<td>laboratory reports team laboratory projects critical reviews</td>
<td>students enrolled in chem 201, 202, 305, 320.</td>
<td>every other year 05-06 07-08</td>
<td>mastery standards are based on course level. 2xx level: scores on lab reports ave 80 % 3xx level: scores on written lab reports rubrics for technique ave 80 %,</td>
<td>a. if we incorporate enough instrument use throughout the program. b. how well our students can use these skills after graduation.</td>
</tr>
<tr>
<td>6. Students will demonstrate an understanding of the use of technology in the chemical fields through appropriate use of databases, search engines, modeling/computational software, spreadsheet software, and computer interfaced instrumentation.</td>
<td>MSUM 2, 5, 6</td>
<td>CSET 1, 2, 3, 4, 5, 6, 9, 14, 16</td>
<td>writing projects poster presentations oral presentations laboratory reports team laboratory projects critical reviews</td>
<td>students enrolled in chem 201, 202, 305, 320.</td>
<td>every other year 06-07 08-09</td>
<td>mastery standards are based on course level. 2xx level: scores on spreadsheet projects ave 75 % 3xx level: scores on lab report rubrics for data analysis ave 80 %,</td>
<td>a. if our students are able to use technology effectively. b. if students are able to apply information learned by laboratory technology to the basic principles. c. how well our students can use these skills after graduation.</td>
</tr>
</tbody>
</table>

*What will department or program do with results of information? This information will be used to review and determine whether the department is meeting accreditation needs, student needs and professional opportunity needs. If necessary, we will make adjustments to teaching methods, emphases or curriculum to maintain our quality.
Department of Chemistry and Geology
Department Meeting Minutes
October 11, 2006

Present: Boyd, Groh, Hadley, Hoppie, Losh, Lusch, Pribyl, Quirk-Dorr, Rambo, Rife, Salerno, Swart, Thoemke

Meeting called to order at 8:04 a.m.

Groh requested faculty to check the fall schedule for errors.

Veteran’s Day: Marg from Biology has drafted a letter to VP Olson expressing concerns about the impact of a holiday that falls on different days of the week each year on lab scheduling. It was suggested that the Chemistry department do so also. Salerno mentioned a possibility of offices closed, but classes in session.

Groh thanked faculty who attended the Ford Lectureship Tuesday evening.

Major Fair: will take place Oct. 25 10:30-1:30 for students who have not declared a major.

Curriculum: Swart reported.

BA major: There is a concern that a student could get through a BA major without taking a 400 level lab. A stop-gap measure would be to include a requirement that they must have 2 credits at the 400 level with a laboratory component. Discussion followed.

    Swart moved, Hadley seconded to approve changing 412 to 312. Motion carried.
    Rife moved, Swart seconded, to approve the proposed change to the BA major, listing the courses that would meet the requirements. They are: 360, 407, 415, 423, 424, 437, 450, 451, 465, 466, 474, and 475.

    BA minor: There was a concern that transfer students could declare a MSU chemistry minor w/without having any chemistry at MSU. Pribyl moved, Hadley seconded, to approve the proposed revision. Discussion followed. Ammendment by Thoemke: elective credits must be taken at MSU. Motion carried.

GPA Policy will be discussed at next week’s department meeting.

Pribyl mentioned that the discussion regarding engineering general chemistry is ongoing.

Meeting adjourned 8:57 a.m.

Respectfully submitted

Patricia Rambo
College of Science, Engineering and Technology
Curriculum Committee Meeting Minutes
WA 303, Tuesday, October 31, 2006

Present:  Harry Petersen (AMET), Beth Lavoie (Biology), Jim Rife (Chemistry/Geology),
Gregg Asher (CIS), Julio Mandojana (ECET), Brian Wasserman (IDCM), Dan Singer
(Math/Statistics), Karen Chou (ME/CivE), Youwen Xu (Physics/Astronomy), Mahbubur Syed
(UCAP Representative for CSET).
Guests:    David Haglin (CIS), Bill Hudson (ECET)

1. The meeting was called to order at 8:06 AM.
2. The minutes of 10-24-2006 meeting was approved as written.
3. Karen Chou thanked Jim Rife and Gregg Asher for chairing the 10-24-06 meeting.
4. David Haglin and Bill Hudson attended in order to clarify any confusion in the proposal CIS
and ECET submitted. Bill Hudson also brought some of the previously required documentation
to the committee for reviewing.
5. The committee reviewed 165 proposals. 164 proposals were approved contingent upon the
required materials submitted in proper format. Please see attached spreadsheet for details.
Proposal 07168 was tabled for insufficient of information.
3. Jim Rife left at 9 AM, and Beth Lavoie left at 9:20 AM, due to prior commitment.
4. Several members of the committee suggested UCAP to allow “Class action” for simple
proposals such as change of designators or change of prerequisites. It would save the related
parties a lot of work.
5. Two proposals were delivered to us yesterday (10-30-06) afternoon at 4 PM. Many
committee members did not have a chance to review the proposal. They are general
education proposals. We may vote on these proposals using email if possible.

Meeting adjourned at 9:50 am.

Respectfully submitted,

Youwen Xu, Secretary
**Curriculum Committee**

**Proposal Review Summary**

<table>
<thead>
<tr>
<th>Dept.</th>
<th>Type</th>
<th>Description</th>
<th>M</th>
<th>S</th>
<th>Appr</th>
<th>Comments/need</th>
</tr>
</thead>
<tbody>
<tr>
<td>CIS</td>
<td>Change in Requirements-</td>
<td>see list</td>
<td></td>
<td></td>
<td></td>
<td>withdrew</td>
</tr>
<tr>
<td>CIS</td>
<td>Courses Added</td>
<td></td>
<td></td>
<td></td>
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<td>CIS</td>
<td>Change in Requirements-</td>
<td>List of deleted courses</td>
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<tr>
<td>CS</td>
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<tr>
<td>CS</td>
<td>Redesign: Bulletin Copy Changes</td>
<td>Computer Science</td>
<td>YX</td>
<td>GA</td>
<td>Yes</td>
<td>Combine with 0776</td>
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<tr>
<td>CS</td>
<td>Redesign: Changes in Courses</td>
<td>Computer Science</td>
<td>YX</td>
<td>GA</td>
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<tr>
<td>CIS</td>
<td>Program redesign-name change</td>
<td>From manage. Of inform sys. To Inform. Sys.</td>
<td>YX</td>
<td>GA</td>
<td>Yes</td>
<td></td>
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<tr>
<td>Chem/Geo</td>
<td>Change in Req- Courses(s) added</td>
<td>Chemistry BA</td>
<td>GA</td>
<td>JM</td>
<td>Yes</td>
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<tr>
<td>Chem/Geo</td>
<td>Change in Req- Courses(s) added</td>
<td>Chemistry Minor</td>
<td>GA</td>
<td>JM</td>
<td>Yes</td>
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<tr>
<td>CS</td>
<td>Redesign-Change in Bulletin</td>
<td>Computer Science</td>
<td>YX</td>
<td>GA</td>
<td>Yes</td>
<td>Combine with 0776</td>
</tr>
<tr>
<td>Math/Stats</td>
<td>Redesign-Add/Delete Program Q Statistics</td>
<td></td>
<td>GA</td>
<td>JM</td>
<td>Yes</td>
<td>Excess information is provided</td>
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<tr>
<td>Math/Stats</td>
<td>Prog. Redesign-added courses</td>
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<td>GA</td>
<td>JM</td>
<td>Yes</td>
<td>Need outcome assessment plan</td>
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<tr>
<td>Biology</td>
<td>Change in Req.-Course(s) Added</td>
<td></td>
<td>JM</td>
<td>HP</td>
<td>Yes</td>
<td>Side by side prog. Comparison</td>
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<tr>
<td>Biology</td>
<td>Change in Req.-Course(s) Added</td>
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<td>JM</td>
<td>HP</td>
<td>Yes</td>
<td>Side by side prog. Comparison</td>
</tr>
<tr>
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<td>Change in Req.-Courses(s) added</td>
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<td>JM</td>
<td>HP</td>
<td>Yes</td>
<td>Side by side prog. Comparison</td>
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<tr>
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<td>Change in Req.-Course(s) Added</td>
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<td>Side by side prog. Comparison</td>
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<td>COMS 202 to ISYS202</td>
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<td>202W?</td>
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