



Minnesota State University, Mankato HOLD and CLEAR buttons only compatible with Acrobat V. 4 and 5  
**Curriculum Proposal**

RECEIVED 08-46  
 NOV

Please type or select the requested information. Print completed forms, add appropriate paper attachments, and route through MSU's curricular process for recommendations and decisions.

(Check all that apply):		Proposal #	80
College: Science, Engineering and Technology	<input type="checkbox"/> Undergraduate	Effective Date of Change:	
Department: Chemistry and Geology	<input type="checkbox"/> Graduate	Academic Year	07-08
Program: Chemistry BA	CIP #	(For Office Use Only)	
Type of Change	PROGRAM PROPOSALS	Course Designator and Number	Number of Credits
Proposed:	Change in Requirements-Course(s) Added		
Title Current:			
Title Proposed:			
24-Char. Abbrev:			(if applicable)

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

Same

Rationale or Justification for change:

Contingent on 3 semester Physics (221,222,223) Proposal, see attached

**\*\*\*For General Education or Cultural Diversity Courses Only\*\*\***

<b>General Education Course:</b>		<b>Cultural Diversity Course:</b>
GE Category #	GE Category Name (Maximum of 3 Categories)	(Please check one.)
N/A		<input type="checkbox"/> Core (At least 75% devoted to topics of race, gender, sexual orientation, age, class, and disabilities as they occur in United States Society.)
N/A		<input type="checkbox"/> Related (At least 25% devoted to the above topics or to a global perspective on topics related to African American, Asian, Hispanic, and Native American inhabitants of the United States.)
N/A		
? 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:		
a. Syllabus or course outline.		
b. Course's student learning outcomes associated with each GE competency or CD designation.		
c. List of strategies to be used to assess students' achievement of each GE competency or CD designation.		

**\*\*\*For New Courses\*\*\***

(Check all that apply):	Instructional Type: Lecture	Course will be offered:
<input type="checkbox"/> Course is an elective.	Grading Format: <input type="checkbox"/> Grade <input type="checkbox"/> P/N	<input type="checkbox"/> Fall Semester
<input type="checkbox"/> Course is required for program		<input type="checkbox"/> Spring Semester
<input type="checkbox"/> Pre- or Co-requisites:		<input type="checkbox"/> Summer Session
<input type="checkbox"/> Other courses are being changed or eliminated. (Explain.)		
<input type="checkbox"/> 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:		
a. Syllabus or course outline.		
b. Course's student learning outcomes.		
c. A list of resources required to offer and support this course.		
d. A description of how teaching this course will affect department staffing.		
e. If 400/500 level course, an explanation of added expectations of graduate students.		



Minnesota State University, Mankato  
Curriculum Proposal

\*\*\*Signature Page\*\*\*

**Department**

Recommended (Category/ies \_\_\_\_\_)  
 Not Recommended (Category/ies \_\_\_\_\_)

B. Groh  
Department Chair

10-19-07  
Date

Comments:

**College Curriculum Committee**

Recommended (Category/ies \_\_\_\_\_)  
 Not Recommended (Category/ies \_\_\_\_\_)

[Signature]  
Committee Chair

10/30/07  
Date

Comments:

**College Dean**

Recommended (Category/ies \_\_\_\_\_)  
 Not Recommended (Category/ies \_\_\_\_\_)

[Signature]  
Dean

10/31/07  
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 \_\_\_\_\_)

[Signature]  
UCAP Faculty Chair

12/16/07  
Date

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 \_\_\_\_\_)

Brenda Flannery  
Assistant Vice President

12/20/07  
Date

Comments:

**Senior Vice President and Vice President for Academic Affairs**

Approved (Category/ies \_\_\_\_\_)  
 Not Approved (Category/ies \_\_\_\_\_)

[Signature]  
Sr. Vice President / Vice Pres. Academic Affairs

12/20/07  
Date

Comments:

# Chemistry BA Major Revision Proposal

10/16/07

This proposal accommodates changes proposed by the 3 semester Physics (221,222,223) proposal, and is contingent thereon.

Current:

**Required General Education (8-9 credits):**

MATH 121      Calculus I (4)  
PHYS 211      Principles of Physics I (4) or  
PHYS 221      General Physics I (5)

**Required Support Courses (4-5 credits):**

PHYS 212      Principles of Physics II (4) or  
PHYS 222      General Physics II (5)

**Required for Major (Core, 31 credits):**

CHEM 201      General Chemistry I (5)  
CHEM 202      General Chemistry II (5)  
CHEM 305      Analytical Chemistry (4)  
CHEM 320      Organic Chemistry I w/ lab (5)  
CHEM 321      Organic Chemistry II (3)  
CHEM 331      Organic Chemistry II Lab (1)  
CHEM 381      Introduction to Research (2)  
CHEM 412      Intermediate Inorganic (2)  
CHEM 440      Physical Chemistry I (3)  
CHEM 495      Senior Seminar (1)

**Required Electives for Major (CHEM, 6 credits):**

Choose a minimum of 6 credits of chemistry or biochemistry courses **EXCEPT** CHEM 479 and CHEM 482. These electives must include at least one of the following courses:

CHEM 360      CHEM 407      CHEM 415  
CHEM 423      CHEM 424      CHEM 437  
CHEM 450      CHEM 451      CHEM 465  
CHEM 466      CHEM 474      CHEM 475

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

**Required for BA Degree ONLY:**

Language      (8)

Total Credits:    57 - 59

Contingent Proposal:

**Required General Education (8 credits):**

MATH 121      Calculus I (4)  
PHYS 211      Principles of Physics I (4) or  
**PHYS 221      General Physics I (4)**

**Required Support Courses (4 credits):**

PHYS 212      Principles of Physics II (4) or  
**PHYS 223      General Physics III (3) and**  
**PHYS 233      General Physics III Lab (1)**

**Required for Major (Core, 31 credits):**

CHEM 201      General Chemistry I (5)  
CHEM 202      General Chemistry II (5)  
CHEM 305      Analytical Chemistry (4)  
CHEM 320      Organic Chemistry I w/ lab (5)  
CHEM 321      Organic Chemistry II (3)  
CHEM 331      Organic Chemistry II Lab (1)  
CHEM 381      Introduction to Research (2)  
CHEM 412      Intermediate Inorganic (2)  
CHEM 440      Physical Chemistry I (3)  
CHEM 495      Senior Seminar (1)

**Required Electives for Major (CHEM, 6 credits):**

Choose a minimum of 6 credits of chemistry or biochemistry courses **EXCEPT** CHEM 479 and CHEM 482. These electives must include at least one of the following courses:

CHEM 360      CHEM 407      CHEM 415  
CHEM 423      CHEM 424      CHEM 437  
CHEM 450      CHEM 451      CHEM 465  
CHEM 466      CHEM 474      CHEM 475

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

**Required for BA Degree ONLY:**

Language      (8)

Total Credits:    57

Department of Chemistry and Geology  
Minutes  
Thursday, April 19, 2007

**Present:** Boyd, Carrison, Groh, Hadley, Losh, Lusch, Quirk Dorr, Rambo, Rife, Salerno, Swart, Thoemke, Vorlicek

**Minutes:** Minutes of April 12, 2007 (Pribyl) were approved

**Announcements:**

1. Distinguished Alumni Jena Thompson, ('96) will be on campus tomorrow - Friday, April 20
2. The deadline to submit Student Learning Outcomes and Assessment Data to the Assessment Committee for the 2006-2007 report is Monday, April 23 at 5 pm.

**Physics Course Proposal Response:** The departmental response to the physics course proposal was distributed. After discussion, revisions were recommended. The response was approved as amended and will be forwarded.

**3M Equipment:** The equipment that 3M is considering donating was discussed. A request was made for faculty that is interested in traveling to 3M to notify Dr. Groh soon.

**Fixed Term Sabbatical Replacement Search:** The timeline was discussed in regard to phone interviews and on campus interviews.

**Teaching Schedule Draft:** The draft was distributed and discussed.

**Committee Assignments:** Committee suggestions have been received. Next week the committee assignments will be discussed in detail.

**Goals for 2007 – 2008:** The department will formulate a draft for the 2007-2008 departmental goals. The draft will be modified in the fall. A committee may be assigned to assist the department in meeting areas that may be identified as areas of improvement.

Submitted

Danaè R. Quirk Dorr

Approved, April 26, 2007

08-46

## Dept of Chemistry and Geology Assessment Plan For Chemistry BA

Student Learning Outcomes (performance, attitudes, knowledge, attitudes)	Related Univ. Goals	Related College Goals	Method(s) of Assessment (What is the assessment?)	Who Assessed (Students from what courses - population)	When Assessed (dates)	Standard of Mastery/ Criterion of Achievement	What is Hoped to Be Learned?
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 exams	<u>kinetics</u> : students enrolled in chem 202, 320, 321, 412. <u>thermo</u> : students enrolled in chem 201, 202, 412. <u>quantum</u> : students enrolled in chem 201. <u>equilibria</u> : students enrolled in chem 201, 202, 305, 412.	<u>kinetics</u> 07-08 09-10  <u>thermo</u> 06-07 08-09  <u>quantum</u> 07-08 09-10  <u>equilib</u> 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 -4xx 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 exams	students enrolled in chem 201, 202, 305, 320, 321, 331.	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%, ave score on ACS standardized organic exam is statistically same as national ave.	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.

Student Learning Outcomes (performance, knowledge, attitudes)	Related Univ. Goals	Related College Goals	Method(s) of Assessment (What is the assessment?)	Who Assessed (Students from what courses - population)	When Assessed (dates)	Standard of Mastery/ Criterion of Achievement	What is Hoped to Be Learned?
3. Students will demonstrate their understanding of descriptive chemistry (physical properties, bonding, reactivity patterns, redox, and characterization) by applying these ideas to 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 exams	students enrolled in chem 201, 202, 320, 321, 331, 412.	every other year  05-06  07-08	mastery standards are based on course level. 2xx level: score on ACS standardized general chemistry exam is statistically same as national ave. 3xx -4xx level: score on homework probs and examinations average 70%, lab experiments and reports average 75%, score on ACS standardized organic exam is statistically same as national ave.	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.
4. Students will demonstrate their communication skills by reading scientific works and utilizing appropriate terminology in effective written, oral and pictorial presentations.	MSUM 1, 2, 6	CSET 1, 2, 3, 4, 5, 6, 9, 14, 16	in class discussions examinations homework problems laboratory reports writing projects posters oral presentations	students enrolled in chem 201, 202, 305, 320, 321, 331, 381, 495.	every third year  06-07	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 % 381: grant proposals average 75 % on rubric 4xx level: scores on written lab reports ave 75 %, scores on writing assignments ave 70 % 495: all students present oral and poster presentations with a passing grade.	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.

Student Learning Outcomes (performance, knowledge, attitudes)	Related Univ. Goals	Related College Goals	Method(s) of Assessment (What is the assessment?)	Who Assessed (Students from what courses - population)	When Assessed (dates)	Standard of Mastery/ Criterion of Achievement	What is Hoped to Be Learned?
5. Students will demonstrate their laboratory skills by properly conducting various "wet" laboratory procedures, instrumental techniques and exhibiting a professional laboratory presence.	MSUM 1, 2, 5	CSET 1, 2, 3, 5, 6, 14, 16	laboratory reports team laboratory projects	students enrolled in chem 201, 202, 305, 320, 331.	every other year 05-06 07-08	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 %, 4xx level: scores on written lab reports rubrics for technique ave 80 %.	a. if we incorporate enough instrument use throughout the program. b. how well our students can use these skills after graduation.
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.	MSUM 2, 5, 6	CSET 1, 2, 3, 4, 5, 6, 9, 14, 16	writing projects poster presentations oral presentations laboratory reports team laboratory projects	students enrolled in chem 201, 202, 305, 320, 331, 381, 495.	every other year 06-07 08-09	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 %, 4xx level: scores on lab report rubrics for instrument driven exps or computational exps ave 75 %.	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.

\*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.