### Packet Contents

1.1 *Summary*

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### Course Modification

1.2 GEOL/BIOL 3120/5120 Soils (4 credits); description and prerequisite change

1.4 GEOL 3211/5211 Environmental Hydrology (3 credits); description and prerequisite change

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### New Course

1.7 GEOL 4500/5500 Global Environmental Change (3 credits)

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### Program Modification

1.13 Geology minor

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1.16 *Signatures*
BSU Curriculum Forms

Form 1

Curriculum Modification Summary

College: Arts and Sciences
Department: Center for Environmental, Economic, Earth, and Space Studies; Geology program
Proposer: Tim Kroeger
Proposer’s position: Professor of Geology; coordinator of Geology Program
Describe the modification(s) you propose, and how it (/they) will work to students' advantage. (This description and explanation will be included in Curriculum Report packets forwarded to the Faculty Senate.):

1) One new course is proposed; GEOL 4500/5500, Global Environmental Change, 3-credits.
2) Course descriptions and/or pre-requisites modified for the following courses: GEOL/BIOL 3120/5120, Soils; GEOL 3211/5211, Environmental Hydrology.
3) Addition of GEOL 4500 (new course) as an elective within the Geology Minor Program

GEOL 4500/5500 will address global environmental change, including some of the most significant global challenges facing humanity. There is currently no upper division course at BSU that directly addresses these challenges. Modifications in course prerequisites and descriptions for GEOL/BIOL 3120/5120 and GEOL 3211/5211 better define the course, the preparation required, and make the courses more accessible to ENVR students. Adding GEOL 4500 as an elective within the Geology Minor is consistent with the inclusion of other Earth and planetary science courses within the minor.

Modifications proposed (specify number of each):

__2__ Course Modification(s) (form 2)
__1__ New Course(s) (form 3)
__1__ Course Drop(s) (form 4)
__1__ Program Modification(s) (form 5)
____ New Program(s) (form 6)
____ Program Drop(s) (form 7)

The modifications affect (check):

__ Liberal Education
__ Undergraduate Curriculum
__ Graduate Curriculum
__ Teacher Licensure Program(s)
BSU Curriculum Forms

Form 2

Course Modification Form

Current Course Number(s):
  Undergraduate: GEOL/BIOL 3120
  Graduate: GEOL/BIOL 5120
Proposed Course Number(s), if different:
  Undergraduate:
  Graduate:

Current Course Title: Soils
Proposed Course Title, if different:

Current Course Description: Introduction to principles of soil genesis, classification, physical and chemical properties, and biological significance. Lecture and laboratory. Prerequisites: BIOL 1211 and BIOL 1212 or consent of instructor. May not be offered every year.

Proposed Course Description, if different: Introduction to principles of soil genesis, classification, physical and chemical properties, and biological significance. Lecture and laboratory. Prerequisites: (BIOL 1211 or BIOL 1120) and (GEOL 1110 or BIOL 1212) or consent of instructor. May not be offered every year.

Current Credits: 4
Proposed Credits, if different:

Current Undergraduate Prerequisite(s): BIOL 1211 and BIOL 1212 or consent of instructor. May not be offered every year.

Proposed Undergraduate Prerequisite(s), if different: (BIOL 1211 or BIOL 1120) and (GEOL 1110 or BIOL 1212) or consent of instructor. May not be offered every year.

Current Graduate Prerequisite(s): None

Proposed Graduate Prerequisite(s), if different:

1) Reason(s) for change(s): Course will be more accessible to students completing Environmental Studies B.S. under recently revised ENVR curriculum. Also, to correct orthographic error.

2) May this modified course replace the current course for students remaining in the old curriculum? Yes _X_____ No _____ If not, please drop the current course and submit a new course form for the modification.
3) Do these modifications change any of the following? **For all Yes answers, please provide updated information on the next page.**

- Student Learning Outcomes Yes _____ No _X___
- Major Content Areas Yes _____ No _X___
- Projected Maximum Class Size (Cap) Yes _____ No _X___

4) Current Course fee(s) per student: $ differential tuition of $5.00/credit for: maintenance of laboratory equipment and consumables, field travel,

Proposed Course fee(s) per student, if different: $

for:

5) Service Areas:

This course is a requirement or an elective in the programs/areas listed below. To locate where this course appears please search the online catalog, as follows:

- a) go to [http://www.bemidjistate.edu/academics/catalog/](http://www.bemidjistate.edu/academics/catalog/) and choose the most recent catalog(s),
- b) click on “Areas of Study, and Course Descriptions,”
- c) click on “PDF of Entire Catalog” in upper right,
- d) press Ctrl F, and enter the prefix and number of the course(s) from this form.

**Non-licensure programs:**
- Aquatic Biology, B.S. major, Wetlands Ecology Emphasis
- Wildlife Biology, B.S. major
- Earth Science minor
- Environmental Studies, B.S. major, Geohydrology Emphasis
- Geography, B.S. major, Physical Geography Emphasis
- Geology minor

**Teacher Licensure programs:**

**Liberal Education:**

The above “service area” programs/departments were notified of this modification on _November 9, 2016_ (date) by _e-mail__________________ (mail, email, or phone).

Please check one of the items below:

_____ No comments were received from other programs or departments within one week of the notification.

__X__ Comments were received within one week of the notification, and are attached.
BSU Curriculum Forms

Form 2

Course Modification Form

Current Course Number(s):
Undergraduate: GEOL 3211
Graduate: GEOL 5211

Proposed Course Number(s), if different:
Undergraduate:
Graduate:

Current Course Title: Environmental Hydrology
Proposed Course Title, if different:

Current Course Description: Factors affecting the occurrence and availability of ground and surface waters. Water budgets and the hydrologic cycle, watershed behavior and flood prediction. Types of aquifers and confining beds, aquifer properties, groundwater flow, introduction to groundwater chemistry; water law and management. Prerequisites: GEOL 1110 or GEOL 1120, MATH 1170 or equivalent, or consent of instructor.

Proposed Course Description, if different: The course provides a basic understanding of the principles and processes governing the movement of water through the hydrologic cycle, including atmospheric moisture flow, surface runoff, infiltration, and groundwater flow. Environmentally relevant applications based on case studies will be studied. The course include coverage of contemporary global issues related to water resources, sustainable development, and climate change. Prerequisites: GEOL 1110 and MATH 1170 or equivalent, or consent of instructor.

Current Credits: 3
Proposed Credits, if different:

Current Prerequisite(s): GEOL 1110 or GEOL 1120, MATH 1170 or equivalent, or consent of instructor

Proposed Prerequisite(s), if different: GEOL 1110 and MATH 1170 or equivalent, or consent of instructor

Current Graduate Prerequisite(s): None

Proposed Graduate Prerequisite(s), if different:
1) Reason(s) for change(s): Change in course description more accurately reflects the current course content. Additionally, the required prerequisite concepts are not well covered in GEOL 1120; therefore that course is no longer included as a suitable prerequisite.

2) May this modified course replace the current course for students remaining in the old curriculum? Yes _X____  No _____ If not, please drop the current course and submit a new course form for the modification.

3) Do these modifications change any of the following?  For all Yes answers, please provide updated information on the next page.  
   Student Learning Outcomes Yes _____  No _X___  
   Major Content Areas Yes _____  No _X___  
   Projected Maximum Class Size (Cap) Yes _____  No _X___

4) Current Course fee(s) per student: $ for:  
   Proposed Course fee(s) per student, if different: $ for:

5) Service Areas:  
   This course is a requirement or an elective in the programs/areas listed below. To locate where this course appears please search the online catalog, as follows:  
   a) go to http://www.bemidjistate.edu/academics/catalog/ and choose the most recent catalog(s),  
   b) click on “Areas of Study, and Course Descriptions,”  
   c) click on “PDF of Entire Catalog” in upper right,  
   d) press Ctrl F, and enter the prefix and number of the course(s) from this form. 

   Non-licensure programs:  
   Aquatic Biology, B.S. major, Wetlands Ecology Emphasis  
   Aquatic Biology, B.S. major, Fisheries Biology Emphasis  
   Aquatic Biology, B.S. major, Aquatic Systems Emphasis  
   Chemistry, B.S. major, Environmental Chemistry Emphasis  
   Earth Science minor  
   Environmental Studies, B.S. major, Geohydrology Emphasis  
   Environmental Studies, B.S. major, Industrial Ecology Emphasis  
   Environmental Studies, B.S. major, Environmental Policy and Planning Emphasis  
   Environmental Studies, B.S. major, Environmental Health and Toxicology Emphasis  
   Environmental Studies, B.S. major, Ecosystem Emphasis  
   Sustainability minor  
   Geography, B.S. major, Physical Geography Emphasis  
   Geology minor

   Teacher Licensure programs:  
   Science Education, B.S. major, Earth and Space science Specialty (Teacher Licensure)

   Liberal Education:
The above “service area” programs/departments were notified of this modification on 11/30/16 (date) by _email_ (mail, email, or phone).

Please check one of the items below:

__X__ No comments were received from other programs or departments within one week of the notification.

Comment received from: Liberal Studies, Chemistry.

__X__ Comments were received within one week of the notification, and are attached.
BSU Curriculum Forms
Form 3
New Course Form

Course Number:
  Undergraduate: GEOL 4500
  Graduate: GEOL 5500

Course Title: Global Environmental Change

Undergraduate Course Description: This class offers an interdisciplinary introduction to the principles of climate, ecosystems, and biogeochemistry needed to understand human impacts on the natural environment. We will also discuss global change prediction and the scientific bases for global change assessments and policy measures. Key topics are the physical climate system and its variability, the carbon cycle and related biogeochemistry and ecosystem processes, land use issues, the interactions among climate, ecosystems, and biogeochemistry, and the impact of global change on societally relevant parameters. Common threads in all of these topics will pervade the whole semester; these include the use of observations and models, the consideration of multiple scales of change (temporal and spatial), the interaction of human behaviors and choices with natural systems, and the linkages among aspects of global change science (may not be offered every year). Prerequisites: ENVR 2000 or GEOG 2100 or Consent of Instructor.

Graduate Course Description: This class offers an interdisciplinary introduction to the principles of climate, ecosystems, and biogeochemistry needed to understand human impacts on the natural environment. We will also discuss global change prediction and the scientific bases for global change assessments and policy measures. Key topics are the physical climate system and its variability, the carbon cycle and related biogeochemistry and ecosystem processes, land use issues, the interactions among climate, ecosystems, and biogeochemistry, and the impact of global change on societally relevant parameters. Common threads in all of these topics will pervade the whole semester; these include the use of observations and models, the consideration of multiple scales of change (temporal and spatial), the interaction of human behaviors and choices with natural systems, and the linkages among aspects of global change science (may not be offered every year). Prerequisites: Consent of Instructor

Credits: 3

Prerequisite(s):
  Undergraduate: ENVR 2000 or GEOG 2100 or Consent of Instructor
  Graduate: Consent of Instructor

1. Reason(s) for creating this course: Global environmental change and its associated problems are becoming some of the most significant challenges facing humanity. Whether specifically addressing climate change or increasingly more broadly environmental change, these kinds of
courses are becoming an integral component of environmental curricula at most universities in the United States and throughout the entire world.

2. How often will this course be offered? *Every two years or more frequently if there is demand.*

3. What are the student learning outcomes for the course (please precede each outcome with "Students will...")?
   a. Students will describe the significance and limitations of seminal Global Environmental theories.
   b. Students will understand both the need for and challenges to interdisciplinary and transdisciplinary approaches to complex global problems.
   c. Students will select and defend conceptual and methodological approaches for a research project of their choosing.
   d. Students will develop skills for oral and written presentation of knowledge learned in the course.

4. What are the major content areas for the course?

   Interdisciplinary treatment of
   - Climate Change
   - Nitrogen Cycling
   - Soil Conservation
   - Water Resources
   - Carbon Imbalance
   - Ecosystem Integrity
   - Global Politics

5. Is this course repeatable for credit, and if so, what is the maximum number of credits that can be earned? *No*

6. If this course is intended primarily for off-campus delivery (not offered on campus), what delivery mechanism will be used?

7. What is the projected maximum class size (cap)? *15*

8. What qualified faculty will be available to teach this course? Dr. *William Sea*

   NOTE WELL: Department and dean, in approving this proposal, attest both to the adequacy of the qualifications of faculty here named, and to their availability to teach the course at the frequency specified above, without excessive overload or disruption to other curriculum.

9. What additional library and other resources need or should be provided for this course, that are not already available? *None*
10. What special personal property or service fee(s) would be charged to students taking this course? These charges would be for 1) items that are retained by the student and have an educational or personal value beyond the classroom, or 2) services that are on the student’s behalf (see MnSCU Board Policy 5.11).
   Amount per student: $
   For:

11. Attach a sample syllabus for the course. Note: if this course is double-numbered (u-grad/grad), the syllabus must include an additional component for graduate students.
Global Environmental Change GEOL 4500/5500  
Course will be offered as ENVR 4930/5930 during Spring Semester, 2017

<table>
<thead>
<tr>
<th>Instructor</th>
<th>Dept.</th>
<th>Meeting Times</th>
<th>Office</th>
<th>Phone</th>
<th>Email</th>
</tr>
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<tbody>
<tr>
<td>Bill Sea</td>
<td>Environmental</td>
<td>MWF 1:00 pm</td>
<td>S126</td>
<td>755-4103</td>
<td><a href="mailto:bsea@bemidjistate.edu">bsea@bemidjistate.edu</a></td>
</tr>
<tr>
<td></td>
<td>Studies</td>
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</table>

**Course Description:** This class offers an interdisciplinary introduction to the principles of climate, ecosystems, and biogeochemistry needed to understand human impacts on the natural environment. We will also discuss global change prediction and the scientific bases for global change assessments and policy measures. Key topics are the physical climate system and its variability, the carbon cycle and related biogeochemistry and ecosystem processes, land use issues, the interactions among climate, ecosystems, and biogeochemistry, and the impact of global change on societally relevant parameters. Common threads in all of these topics will pervade the whole semester; these include the use of observations and models, the consideration of multiple scales of change (temporal and spatial), the interaction of human behaviors and choices with natural systems, and the linkages among aspects of global change science.

**Statement**

Desertification, lack of fertile soils to feed a rapidly growing world population, insufficient water quality and availability, atmospheric nitrogen deposition and climate change are together impacting ecosystems and their ability to provide goods and services for humans. It is striking that all of these environmental issues intersect a few common resources: soils, water, food, energy, and biodiversity. Through a combination of lectures, discussions, problem sets and field trips we will examine both the nature of these resources and implications for important environmental issues of today and in the future.

**Student learning outcomes for this course:**

a. Students will describe the significance and limitations of seminal Global Environmental theories.

b. Students will understand both the need for and challenges to interdisciplinary and transdisciplinary approaches to complex global problems.

c. Students will select and defend conceptual and methodological approaches for a research project of their choosing.

d. Students will develop skills for oral and written presentation of knowledge learned in the course.

**Required Textbook:**


Specific required weekly reading assignments will be made available to you.
Course Format
This course takes a broad interdisciplinary approach to environmental issues related to many aspects of soil science. It is anticipated that the 1:00 pm Mondays and Wednesday sessions will use a lecture/discussion format to provide a solid background to concepts and theoretical development of global environmental change. The 1 pm Friday sessions will largely be student-centered, student-led discussions on topics chosen each week by a team of students, with consultation of the instructor. We will thoroughly discuss what all this means.

Finally, we will have one major one-day field trip to the U. S. Forest Service Center for Research on Ecosystem Change (Grand Rapids) and the Marcell Experimental Forest assisted by Dr. Randy Kolka, a Research Soil Scientist at the USFS. Highlights include, but will not be limited to, the $60 million U.S. Department of Energy funded SPRUCE project currently underway in the Marcell.

*It is also anticipated that we will have several guests to our class to be scheduled at their convenience.*

Students wishing to take this course at the graduate level see me for expectations and options.

Graduate Students
Each graduate student shall meet with the instructor during the first week to discuss expectations for additional work required to obtain graduate credit.

There are a number of options for graduate students to satisfy this requirement, which may include but not be limited to a combination of two or more of the following:

1. More in depth research oriented and/or analytically oriented course project
2. Intensive application, analysis, synthesis and evaluation of course materials
3. Additional independent learning beyond the expectations of the undergraduates
4. Mentor/Supervise undergraduate group projects
5. Lead and/or assist critical discussions of literature
6. Assist in the teaching of a section of course, under the supervision of instructor.

Grading & Exams
There will be a midterm (25%) and a final exam (30%) based on readings, lectures, and small group discussions. The likely format of exams will be some combination of essays, short answer, and problem solving. It is anticipated that essay questions will be provided well in advance of the exam date to assist the student.

Group projects (teams of 3-5 students) on a soils-related topic over the entire semester will consist of a short written report (details to come later) and a final in-class presentation (25% total).

The remainder of the grade (20%) will be based on problem sets and/or short reports of in-class labs (10%), a report on the major field trip to the Marcell Experimental Forest (date to TBD) (5%), and in class activities and participation (5%).
A >= 92
90 <= A < 92
86 <= B+ < 90
81 <= B < 86
80 <= B- < 81
76 <= C+ < 80
71 <= C < 76
70 <= C- < 71
66 <= D+ < 70
61 <= D < 66
60 <= D- < 61
F < 60

Regular attendance in this class is expected!

**Class Policies**
1. Discussion of controversial topics is expected to be polite and respectful at all times.
2. Mobile phones and other digital devices should be turned off and put away during class.
3. Upon request, this document can be made available in alternate formats. (See Alternate Formats and Accommodations below)

**BSU Statement of Academic Integrity**
Students are expected to practice the highest standards of ethics, honesty, and integrity in all of their academic work. Any form of academic dishonesty (e.g. plagiarism, cheating, misrepresentation) may result in disciplinary action. Possible disciplinary actions include failure for part or all of the course, as well as suspension from the University.

**Students with Special Needs**
We would like to make sure that all the materials, discussions and activities that are part of the course are accessible to you. If you would like to request accommodations or other services, please forward your request as soon as possible. It is possible to contact Disability Services, Decker Hall 202. Phone: 218-755-3883 or email address Disabilityservices@bemidjistate.edu. Also available through the Minnesota Relay Service at 1-800-627-3529.

Students who are experiencing mental health concerns or stressful events that may lead to diminished academic performance can contact The Student Center for Health & Counseling at 755-2024 or http://www.bemidjistate.edu/students/services/health_counseling/.

This syllabus and the schedule listed below are subject to change at the discretion of the instructor. Any changes will be updated on the D2L course website.
<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Reading Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sept 3</td>
<td><strong>No Class Monday</strong></td>
<td>Chapter 1 <em>Instrumental Record</em> Assign</td>
</tr>
<tr>
<td></td>
<td>Climate in Context</td>
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<td></td>
<td>Time Scales, Systems and Feedbacks</td>
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<tr>
<td>Sept 10</td>
<td>A Scientific Framework for Thinking About Climate Change</td>
<td>Chapter 5 <em>Chapman and Davis 2010 Empirical Data Assign, Topo Relief Assign</em></td>
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<tr>
<td></td>
<td>Climate Archives and Data</td>
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<td>Sept 17</td>
<td>Learning from Climates Past</td>
<td>Chapter 6 <em>Deconto Climate Cycles Assign</em></td>
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<td></td>
<td>CO2 and Long-Term Climate</td>
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<td></td>
<td>Plate Tectonics and Long-Term Climate</td>
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<tr>
<td>Sept 24</td>
<td>The World Ocean</td>
<td>Chapter 3 <em>Chatti et al 2005 Gas Hydrates Assign</em></td>
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<td>El Nino</td>
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<td>Methane hydrates</td>
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<td>Greenhouse Climate</td>
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<td>Oct 1</td>
<td>Insolation Control of Ice Sheets</td>
<td>Freedman Artic Ice Hoffman et al 1998</td>
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<td>Snowball Earth</td>
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<td>Oct 8</td>
<td>The Character of the Atmosphere</td>
<td>Chapter 2 <em>ATM Circ Assign</em></td>
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<tr>
<td>Oct 15</td>
<td>The Carbon Cycle and How It Influences Climate</td>
<td>Chapter 4 <em>Carbon Footprint Assign</em> Schwartz</td>
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<td>Oct 22</td>
<td>A Century of Warming and Some Consequences Humans and Preindustrial Climate</td>
<td>Chapter 7 <em>Stott et al. 2010</em></td>
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<td>Oct 29</td>
<td>More Consequences: The Sensitive Arctic and Sea-Level Rise</td>
<td>Chapter 8 <em>Bradley 2003a Sea Level Assign</em></td>
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<td>Climate Models and the Future</td>
<td>Chapter 9 <em>Bradley 2003a</em></td>
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<td>Nov 5</td>
<td>GSA-Guest Lecture(s)</td>
<td>Chapter 10 <em>Inconvenient Truth Assign</em> PetM Assign Inconvenient Truth Assign*</td>
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<td>Nov 12</td>
<td>Energy and the Future Student Presentations</td>
<td>Chapter 10 <em>GeoEng Assign Geoengineering</em></td>
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<td>Test for GeoEng Robock 2011</td>
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<tr>
<td>Nov 19</td>
<td>Student Presentations</td>
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<td></td>
<td><strong>Wed 21st No Class, Thanksgiving</strong></td>
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<tr>
<td>Nov 26</td>
<td>Student Presentations</td>
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<tr>
<td>Dec 3</td>
<td>Student Presentations</td>
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<td>Dec 19</td>
<td><strong>Final Exam Tuesday Dec 11th 8:30pm to 11:00pm</strong></td>
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</table>
Form 5

Program Modification Form

Program to be modified: Geology Minor Program

List all proposed change(s):
1) Addition of GEOL 4500, Global Environmental Change (new course) as an elective within part II (required electives) of the Geology Minor.

2) Remove the listing of GEOL 4910 from the list of required elective options.

Reason(s) for the change(s):
1) GEOL 4500 is a new course proposed as a Geology course within this packet. Its inclusion in the Geology minor curriculum as an elective is consistent with the inclusion of other Earth and planetary science courses in the curriculum.
2) Non-content specific inclusion of directed studies courses in the minor program is not desired. Students may still include upper division directed studies courses within the minor through course substitution with approval of academic advisor and geology program coordinator.

Note: In order to avoid hidden prerequisites, if a course is being dropped from this program (but not from the entire curriculum), please check for which remaining courses may include this dropped course as a prerequisite. Course prerequisites may be found in the online catalog (http://www.bemidjistate.edu/academics/catalog/). Remedies for hidden prerequisites may be found under Curriculum Forms at (http://www.bemidjistate.edu/faculty_staff/faculty_association/forms/).

Note: If a course from another department/program was either added to or dropped from this program, please notify the chair/coordinator of that course's department/program and indicate the following:
The course’s home department/program was notified of the addition or dropping of their course(s) on _________ (date) by __________________ (mail, email, or phone).

Please check one of the items below:
______ No comments were received from other programs or departments within one week of the notification.
______ Comments were received within one week of the notification, and are attached.

Note: If this is a joint program, the signatures of both department chairs (and both deans, if different colleges) must be provided.

Alert: Attach a copy of the current program showing the marked changes. Please copy the current program from the online catalog (http://www.bemidjistate.edu/academics/catalog/) and paste it into Word. Then use either the Track Changes feature under Tools, or the underline and strikethrough Font feature under Format. (Please note that the Track Changes feature may be easily switched on and off by holding down the Ctrl+Shift+E keys.)
Geology minor

Required Credits: 24
Required GPA: 2.00

I REQUIRED COURSES

COMPLETE THE FOLLOWING COURSES:

- GEOL 1110 Physical Geology (4 credits)
- GEOL 1120 Historical Geology (4 credits)
- GEOL 2110 Mineralogy And Petrology (4 credits)

Select one of the following courses:

- GEOL 3120 Soils (4 credits)
  or BIOL 3120 Soils (4 credits)
- GEOL 3400 Glacial And Pleistocene Geology (3 credits)
- GEOL 3600 Stratigraphy And Sedimentation (3 credits)

II REQUIRED ELECTIVES

SELECT 9-11 ADDITIONAL CREDITS FROM THE FOLLOWING:

- GEOL 2730 Introduction To Planetary Science (4 credits)
- GEOL 3120 Soils (4 credits)
  or BIOL 3120 Soils (4 credits)
- GEOL 3211 Environmental Hydrology (3 credits)
- GEOL 3212 Hydrogeology (3 credits)
- GEOL 3400 Glacial And Pleistocene Geology (3 credits)
- GEOL 3500 Topics In Paleontology (3 credits)
- GEOL 3600 Stratigraphy And Sedimentation (3 credits)
- GEOL 3700 Environmental Geophysics (3 credits)
- GEOL 4910 Directed Independent Study (3 credits)
- GEOL 4500 Global Environmental Change (3 credits)
Geology minor

Required Credits: 24
Required GPA: 2.00

I REQUIRED COURSES

COMPLETE THE FOLLOWING COURSES:

- GEOL 1110 Physical Geology (4 credits)
- GEOL 1120 Historical Geology (4 credits)
- GEOL 2110 Mineralogy and Petrology (4 credits)

Select one of the following courses:

- GEOL 3120 Soils (4 credits)
  or BIOL 3120 Soils (4 credits)
- GEOL 3400 Glacial and Pleistocene Geology (3 credits)
- GEOL 3600 Stratigraphy and Sedimentation (3 credits)

II REQUIRED ELECTIVES

SELECT 9-11 ADDITIONAL CREDITS FROM THE FOLLOWING:

- GEOL 2730 Introduction to Planetary Science (4 credits)
- GEOL 3120 Soils (4 credits)
  or BIOL 3120 Soils (4 credits)
- GEOL 3211 Environmental Hydrology (3 credits)
- GEOL 3212 Hydrogeology (3 credits)
- GEOL 3400 Glacial and Pleistocene Geology (3 credits)
- GEOL 3500 Topics in Paleontology (3 credits)
- GEOL 3600 Stratigraphy and Sedimentation (3 credits)
- GEOL 3700 Environmental Geophysics (3 credits)
- GEOL 4500 Global Environmental Change (3 credits)
BSU Curriculum Forms

Form 8

Signatures

Tim Kroeger, Professor of Geology, 12/3/16
Proposer / Title / Date

Tim Kroeger, Interim Director, CEEESS, 12-3-16
Chair or Director / Department or Program / Date

Elizabeth Rave, Chair Biology Department
(GEOL 3120 is cross listed with biology program)

Note: "All departmental recommendations [on curriculum] must be reviewed and approved by the department’s faculty."--IFO/MnSCU Master Agreement 2009-2011, 20.A.3 (p. 80).

This proposal was approved by the faculty of the Center for Environmental, Economic, Earth, and Space Studies on December 5, 2016

Colleen Greer / Arts and Sciences
Dean / College / Date

[Note: at this point, packet goes to Academic Affairs Office.]
Tim,

It looks fine to me. Good luck.

Jeff

Jeff Leland
Associate Professor and Chair
United States Military Academy
West Point, NY 10996

From: Tim Kroeger
Sent: Monday, December 2, 2013 11:28 AM
To: Jeffrey Leland
Subject: geology curriculum revisions

I want to echo what you said yesterday but I received a note indicating it was unfeasible. So here it is again.

We are proposing some minor changes in the geology curricula for the 10th and Environmental Hydrology courses that include change in prerequisites and course descriptors. Since both of these courses are included within parts of the geology curriculum, we are required to notify you of the proposed changes.

I've attached the "New-It" component of all the curriculum modifications forms for both courses for you and your department to review.

Sincerely,

Tim

Tim J. Kroeger, PhD
Professor of Geology
Interim Director, CEESSS
W27, 1550 Brookhart Dr. NE
Bemidji, MN 56601

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Biology is fine with the proposed changes to the prerequisites for Soils.

Elizabeth Rave, Ph.D.
Dept. of Biology
Bemidji State University
Bemidji, MN 56602
(218) 750-2783

From: Tim Kroeger
Sent: Wednesday, November 27, 2013 1:30 PM
To: Elizabeth Rave<br>Ecology@bemidjistate.edu
Subject: pre-reqs for soils

Elizabeth:

Here is the revised proposal for modifying the prerequisites for GEOIL/OLC 3220/5220. Miriam Ruiz-Sanchez may want to modify the pre-reqs for GEOIL 3311, Environmental Hydrology—she told me that she would work on it on Friday.

Sincerely,

Tim

Tim J. Kroeger, PhD
Professor of Geology
Interim Director, CEESSS
W27, 1550 Brookhart Dr. NE
Bemidji, MN 56601
I don't see anything that would concern CEE.

Sincerely,
Tim

Tim J. Kroeger, PhD
Professor of Geology
Interim Director, CEESS
#27, 1500 Birchmont Dr. NE
Bemidji MN 56601

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We’re good with the change.

Elizabeth Rave, Ph.D.
Professor of Biology
Bemidji State University
Bemidji, MN 56601
(218) 755-2785

On Dec 9, 2016, at 2:21 PM, Tim Kroeger <tkroeger@bemidjistate.edu> wrote:

   Liz:

   Could you send a note indication that Biology is OK with the Environmental Hydro prerequisite and description change?

   Thanks,
   Tim

   Tim J. Kroeger, PhD
   Professor of Geology
   Interim Director, CEESS
   #27, 1500 Birchmont Dr. NE
   Bemidji MN 56601