# Curriculum Proposal

## CEEESS 15-16 #2

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| 1.5 | ENVR/CHEM 4101/5101 Environmental Chemistry (3 credits) to ENVR/CHEM 4110/5110 |
| 1.7 | ENVR 4220/5220 Sampling and Analysis (4 credits); description change |
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### Course Drops

| 1.11 | ENVR/CHEM 4102/5102 Environmental Chemistry II (3 credits) |

### Program Modification

| 1.12 | Environmental Studies, B.S. major Ecosystems emphasis |
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| 1.22 | Environmental Studies, B.S. major Environmental Health and Toxicology emphasis |

### New Program

| 1.25 | Environmental Studies, B.S. major Environmental Health and Toxicology emphasis |
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BSU Curriculum Forms

Form 1

Curriculum Modification Summary

College: College of Arts and Sciences
Department: Center for Environmental, Economic, Earth, and Space Studies
Proposer: Dr. Michael J. Murray
Proposer's position: Assistant Professor of Economics and Director of CEEESS

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.):

In order to meet the 60/120 MnSCU mandate, maximize both institutional efficiency and student effectiveness it is proposed to reduce required core courses from 48-49 credits to 43-44 credits. Our proposed curriculum modification is as follows:


2. Add two new emphases to the choices for Required Emphasis. The “Environmental Health and Toxicology Emphasis” is added by merging elements of the dropped “Environmental Chemistry” and “Environmental Toxicology” emphases and the “Industrial Ecology Emphasis” is added by merging elements of the dropped “Environmental Engineering Science” and “Environmental Management” Emphases. This results in an overall reduction in the number of choices for Required Emphasis to 5 (formerly was 8).

3. The following courses are removed from the Required Core Courses:
   a. BIOL 1211 Introductory Biology I (4 cr.)
   b. BIOL 1212, Introductory Biology II (4 cr.);
   c. BIOL 2610, General Ecology (3 cr.);
   d. CHEM 1112, General Chemistry II (4 cr.) or CHEM 2212, Principles of Chemistry II (4 cr.);
   e. POL 3230, Environmental Politics (3 cr.);
   f. SOC 3050, Environmental Sociology (3 cr.).

4. The following courses are added to the Required Core Courses:
   a. ECON 2000, Markets and Resource Allocation; (3 cr.)
   b. ENVR 3300, Environmental Management and Safety (3 cr.);
   c. GEOG 3231, Introduction to GIS (3 cr.);
   d. GEOL 3211, Environmental Hydrology (3 cr.).

5. Students are given a choice between ENVR 4210, Environmental Law and Policy (3 cr.) and ENVR 3600, Environmental Justice and Sustainability (3 cr.) within the Required Core Courses.

6. ENVR 3920, DGS, Seminar in Environmental Controversies (2 credits) is renumbered and renamed to ENVR 3880, Environmental Controversies (2 credits).

7. ENVR 4920, DGS, Senior Seminar (1 credit) is renumbered to ENVR 4880, Senior Seminar (1 credit)

8. Revise the following emphasis areas to accommodate changes within the core curriculum, and the expectations of potential employers and graduate schools: Ecosystem Studies Emphasis, Environmental Policy and Planning Emphasis, and Geohydrology Emphasis.

9. Change course and number of ENVR 4101/CHEM 4101 and ENVR 5101 to ENVR 4110/CHEM 4110 and ENVR 5110 “Environmental Chemistry” (3 credits).
10. Drop ENVR/CHEM 4102/5102 “Environmental Chemistry II” (3 credits).
11. Revise course description of ENVR 4220/5220 Sampling and Analysis (4 credits) to establish a formal laboratory.
12. Create new course, “ENVR 2590, Sustainability, Environmental Studies Perspective” for inclusion in Goal Area 10 of Liberal Education.

The modified CEESES curriculum has been streamlined by reducing number of Emphases from 8 to 5. We will continue to rely on the services of other departments and offer most upper division courses not included in the core curriculum on an alternate year or tri-semester basis. Our interdisciplinary curriculum will provide students with a certain depth of discipline-specific knowledge as well as a minimum level of breadth in other disciplines which will fulfill professional and occupational requirements. This newly modified curriculum will enable CEESES to serve as many students as possible, increase students success rates, provide a higher quality education and produce high quality graduates.

Modifications proposed (specify number of each):

- [ ] 4 Course Modification(s) (form 2)
- [ ] New Course(s) (form 3)
- [ ] Course Drop(s) (form 4)
- [x] 3 Program Modification(s) (form 5)
- [x] 3 New Program(s) (form 6)
- [x] 5 Program Drop(s) (form 7)

The modifications affect (check):

- [x] Liberal Education
- [x] Undergraduate Curriculum
- [x] Graduate Curriculum
- [ ] Teacher Licensure Program(s)
BSU Curriculum Forms

Form 2

Course Modification Form

Current Course Number(s):

Undergraduate: ENVR 3920
Graduate:

Proposed Course Number(s), if different:

Undergraduate: ENVR 3880
Graduate:

Current Course Title: DGS: Seminar in Environmental Controversies
Proposed Course Title, if different: Environmental Controversies

Current Course Description: When taken as Environmental Controversies Seminar, the following description applies: Faculty and student presentations followed by group discussion of classic and current problems, and governmental policies/regulations. Prerequisite: ENVR 2000 or consent of instructor.

Proposed Course Description, if different: Faculty and student presentations followed by group discussion of classic and current problems, and governmental policies/regulations. Prerequisite: ENVR 2000 or consent of instructor.

Current Credits: 2
Proposed Credits, if different:

Current Prerequisite(s): ENVR 2000 or consent of instructor
Proposed Prerequisite(s), if different:

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.

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___

Current Course fee(s) per student: $ none
Proposed Course fee(s) per student, if different: $ none
This course is listed in the following areas as a requirement or an elective:

Non-licensure programs: Required course in B.S. Environmental Studies, Environmental Studies minor, and Wetlands Ecology minor (Biology program)

Teacher Licensure programs: no
Liberal Education: no

The above “service” area programs/departments were notified of this modification on ___-6-14______ (date) by ___e-mail________________ (mail, email, or phone). No response received.

Reason(s) for change(s): Change provides a unique (non-university wide) course number for this course consistent with the proposed name change.
BSU Curriculum Forms

Form 2

Course Modification Form

Current Course Number(s):
Undergraduate: ENVR 4101/CHEM 4101
Graduate: ENVR 5101

Proposed Course Number(s), if different:
Undergraduate: ENVR 4110/CHEM 4110
Graduate: ENVR 5110

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

Current Course Description: Intensive study of biogeochemical cycles of natural and man-made pollutants including transformations, transport, fate and persistence mechanisms. Environmental effects, long-term impacts, and methods of treatment/prevention are discussed.
Prerequisites: CHEM 1112 or CHEM 2212 or consent of instructor.
Proposed Course Description, if different:

Current Credits: 3
Proposed Credits, if different:

Current Prerequisite(s): CHEM 1112 or CHEM 2212 or consent of instructor
Proposed Prerequisite(s), if different:

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.

Do these modifications change any of the following? For all Yes answers, please provide updated information on the next page.

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

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

This course is listed in the following areas as a requirement or an elective:

- Non-licensure programs: B.S. Chemistry; environmental chemistry emphasis. B.S. Environmental Studies, Environmental Health and Toxicology emphasis (new emphasis), Industrial Ecology emphasis (new emphasis), elective within the Environmental Studies minor program. M.S. in Environmental Studies; Environmental Chemistry and Environmental Toxicology specialization areas.

Teacher Licensure programs:
Liberal Education:

The above "service" area programs/departments were notified of this modification on 12/17/12 (date) by e-mail (mail, email, or phone). See attached response.

Reason(s) for change(s):
   Downsizing the curriculum due to the recalibration through university's long term plan.

ENVR 4102/5102 Environmental Chemistry II is dropped from the CESSS curriculum and therefore ENVR 4101/5101 needs to be renumbered as it is no longer part of a course sequence.
BSU Curriculum Forms

Form 2

Course Modification Form

Current Course Number(s)
   Undergraduate: ENVR 4220
   Graduate: ENVR 5220
Proposed Course Number(s), if different:
   Undergraduate:
   Graduate:
 Current Course Title: Sampling and Analysis
Proposed Course Title, if different:

Current Course Description: Methods of sampling and analysis of air, water, soil and other environmental compartments will be described in lecture and experienced in laboratory session. The focus is on regulations and prescribed protocols for environmental field and lab work. Prerequisites: CHEM 1112 or CHEM 2212 or ENVR 2000 or GEOL 1110 or consent of instructor.

Proposed Course Description, if different: Methods of sampling and analysis of air, water, soil and other environmental compartments will be described in lecture and experienced in laboratory session. The focus is on regulations and prescribed protocols for environmental field and lab work. Lecture and laboratory. Prerequisites: CHEM 1112 or CHEM 2212 or ENVR 2000 or GEOL 1110 or consent of instructor.

Current Credits: 4
Proposed Credits, if different:

Current Prerequisite(s): Prerequisites: CHEM 1112 or CHEM 2212 or ENVR 2000 or GEOL 1110 or consent of instructor
Proposed Prerequisite(s), if different:

May this modified course replace the current course for students remaining in the old curriculum? Yes ________  If not, please drop the current course and submit a new course form for the modification.

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

Current Course fee(s) per student: $______
Proposed Course fee(s) per student, if different: $______ Requesting differential tuition of $8.00/credit for: We request differential tuition of $8.00 per credit to support purchase of laboratory supplies and preparation of the provided lab manual. Please see attached request. (Note: Removed from proposal as MnSCU currently has a freeze on differential tuition.)

This course is listed in the following areas as a requirement or an elective:
Non-licensure programs: B.S. Environmental Studies; Environmental Health and Toxicology and Industrial Ecology emphases (new emphases). Elective in B.S. Environmental Studies, Geohydrology Emphasis (this proposal); Environmental Studies Minor program; Elective in B.S. Chemistry; Environmental Chemistry emphasis; Wildlife Biology B.S.; M.S Environmental Studies, Environmental Chemistry, Geohydrology, and Environmental Toxicology specializations.

Teacher Licensure programs:

Liberal Education:

The above “service” area programs/departments were notified of this modification on _1-6-14_and 11-30-15_ (date) by ____e-mail______ (mail, email, or phone). No response received from Chemistry or Biology.

Reason(s) for change(s): Change clearly defines the laboratory component of the course and requests differential tuition to support the consumable laboratory supplies, laboratory manual, and maintenance of equipment used in the course.
BSU Curriculum Forms

Form 2

Course Modification Form

Current Course Number(s):
Undergraduate: ENVR 4920
Graduate:

Proposed Course Number(s), if different:
Undergraduate: ENVR 4880

Current Course Title: Directed Group Study: Senior Seminar
Proposed Course Title, if different: Senior Seminar I

Current Course Description: A series of 2 seminars (1 credit each) will explore 1) the environmental job market and graduate school opportunities (Fall), and 2) current environmental issues/literature (Spring).
Prerequisites: Senior status; Environmental Studies major, and ENVR 3920.

Proposed Course Description, if different: Senior level seminar in which students explore the environmental job market and graduate school opportunities. Prerequisites: Senior status; Environmental Studies major, and ENVR 3881.

Current Credits: 1
Proposed Credits, if different:

Current Prerequisite(s): Senior status; Environmental Studies major, and ENVR 3920.
Proposed Prerequisite(s): Senior status; Environmental Studies major, and ENVR 3881.

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.

Do these modifications change any of the following? For all Yes answers, please provide updated information on the next page.

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<tr>
<th></th>
<th>Yes _____</th>
<th>No _<strong>X</strong></th>
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<tbody>
<tr>
<td>Student Learning Outcomes</td>
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<td></td>
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<tr>
<td>Major Content Areas</td>
<td>Yes _____</td>
<td>No _<strong>X</strong></td>
</tr>
<tr>
<td>Projected Maximum Class Size (Cap)</td>
<td>Yes _____</td>
<td>No _<strong>X</strong></td>
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Current Course fee(s) per student: $ none
for:
Proposed Course fee(s) per student, if different: $
for:

This course is listed in the following areas as a requirement or an elective:
Non-licensure programs: Required in B.S. Environmental Studies, required in Environmental Studies Minor program.
Teacher Licensure programs:

Liberal Education:

The above “service” area programs/departments were notified of this modification on ________ (date) by ____________________ (mail, email, or phone).

Reason(s) for change(s): This change provides a unique course number for each of the two senior seminar courses. The current course number configuration for senior seminar requires that students register two times for ENVR 4920; as senior seminar 1 and senior seminar 2. This requirement is not always accurately understood by students or reflected on students’ DARS reports leading to confusion when graduate plans are prepared.
BSU Curriculum Forms

Form 4

Course Drop Form
(Use this form to drop a course from the university curriculum file.
To drop a course from a program only, use Form 5 Program Modification Form)

Course Number:
Undergraduate: ENVR 4102/CHEM 4102
Graduate: ENVR 5102

Course Title: Environmental Chemistry II (3 credits)

Please list any new or current courses that will universally replace this dropped course for students remaining in the old curriculum: None

This dropped course is listed in the following areas as a requirement or an elective:
Non-licensure programs: Chemistry

Teacher Licensure programs:

Liberal Education:

The above "service" area programs/departments were notified of this modification on 1-6-14 (date) by email (mail, email, or phone). No response from Chemistry.

Reason(s) for dropping this course:
Downsizing the ENVR curriculum due to the university recalibration. ENVR 4102 needs to be dropped from the current curriculum.
BSU Curriculum Forms

Form 5

Program Modification Form

Program to be modified: B.S. Environmental Studies

List all proposed change(s):

1) Removal of the following courses from the Required Core Courses:
   a. BIOL 1211 Introductory Biology I (4 cr)
   b. BIOL 1212, Introductory Biology II (4 cr.); 
   c. BIOL 2610, General Ecology (3 cr);
   d. CHEM 1112, General Chemistry II (4 cr.) or CHEM 2212, Principles of Chemistry II (4 cr.);
   e. POL 3230, Environmental Politics (3 cr.);
   f. SOC 3050, Environmental Sociology (3 cr.).
   g. ENVR 4920 (now 4880) remove 1 of the 2 credits

2) Addition of the following course to the Required Core Courses:
   a. ECON 2000, Markets and Resource Allocation (3 cr);
   b. ENVR 3300, Environmental Management and Safety (3 cr.);
   c. GEOG 3231, Introduction to Geographic Information Systems (3 cr.);
   d. GEOL 3211, Environmental Hydrology (3 cr.).

3) Provide students with a choice within the Required Core Courses between ENVR 4210, Environmental Law and Policy (3 cr.) and ENVR 3600, Environmental Justice and Sustainability (3 cr.).

4) Make the following changes within the Ecosystems Studies Emphasis
   a. Add the following courses:
      i. BIOL 1211, Introductory Biology I (4 cr.);
      ii. BIOL 1212, Introductory Biology II (4 cr.);
      iii. CHEM 1112, General Chemistry II or CHEM 2212, Principles of Chemistry II (4 cr.);
      iv. BIOL 2610, General Ecology (3 cr.);
      v. ENVR 4200, Wastewater Treatment (3 cr.);
      vi. MATH 1170, College Algebra (4 credits) or MATH 1470, Pre-calculus (5 cr.).
   b. Remove the following courses from the Ecosystem Studies Emphasis:
      i. ENVR 3600, Environmental Justice and Sustainability (3 cr.);
      ii. GEOG 3231, Introduction to Geographic Information Systems (3 cr.).
      iii. PHYS 1101, General Physics (4 cr.).
   c. Allow students a choice between BIOL 3361, Limnology 1 (4 cr.) or BIOL 3840/ENVR 3840 (3 cr.), Wetlands Ecology (3 cr.).
   d. Reduce the advisor-approved electives in the emphasis from 9 credits to 3 upper division credits as approved in advance by CEEESS advisor

5) Make the following changes to the Environmental Policy and Planning Emphasis:
   a. Add to the emphasis:
i. ECON 2100, Macroeconomic Principles (3 credits),
ii. ECON 3010, Public Economics (3 cr);

b. Remove the following courses from the emphasis:
   i. ECON 2000, Markets and Resource Allocation (3 credits);
   ii. GEOG 3231, Introduction to Geographic Information Systems (3 cr.)

c. Allow students a choice between the following two courses: BIOL 1120 General Biology (3 cr.) or BIOL 1211 Introduction to Biology I (4 cr.)

d. Allow students a choice between the following two courses: POL 3230, Environmental Politics (3 cr.) or SOC 3050, Environmental Sociology (3 cr.)

e. Allow students a choice between the following courses: POL 3200, Minnesota Politics (3 cr.) or GEOG 3232, Intermediate Geographic Information Systems (3 cr.)

f. Students should select the course not completed in the Environmental Studies core curriculum: ENVR 4210, Environmental Law and Policy (3 cr.) or ENVR 3600, Environmental Justice and Sustainability (3 cr.)

g. Change required CEEESS advisor-approved electives for the Environmental Policy and Planning Emphasis from 0 to 3 upper division credits as approved in advance by CEEESS advisor.

6) Make the following changes to the Geohydrology Emphasis
   a. Remove the following courses:
      i. GEOL 1120, Historical Geology (4 credits);
      ii. GEOL 3211, Environmental Hydrology (3-credits);
      iii. MATH 2472, Calculus II (5 credits)
   b. Add the following course: GEOL 3700, Environmental Geophysics (3 credits)
   c. Allow students a choice between the following two courses: BIOL 1120 General Biology (3 cr.) or BIOL 1211 Introduction to Biology I (4 cr.)
   d. Allow students a choice between ENVR 4220, Sampling and Analysis (4 credits) or GEOG 3232, Intermediate GIS (3 credits)
   e. Require students to select 2 of the following 3 courses: GEOL 3400, Glacial and Pleistocene Geology (3 credits), GEOL/BIOL 3120 Soils (4 credits), and GEOL 3600, Stratigraphy and Sedimentation.
   f. Allow students a choice between MATH 1470, Precalculus (5 credits) or MATH 2471, Calculus I (5-credits).
   g. Allow students a choice between PHYS 1101, General Physics (4-credits) or PHYS 2101, Physics I (5 credits).
   h. Increase upper division electives approved by CEEESS advisor from 2 to 3 upper division credits as approved in advance by CEEESS advisor

7) Drop the following emphases (see attached Program Drop forms) from program: Environmental Toxicology Emphasis; Environmental Chemistry Emphasis; Environmental Engineering Science Emphasis; Environmental Management Emphasis; Outdoor Education Emphasis.

8) Establish two new emphases (see attached new program forms): Industrial Ecology Emphasis and Environmental Health and Toxicology Emphasis.

9) Drop ENVR/CHEM 4102/5102, Environmental Chemistry II (3 cr.) from curriculum (see attached drop form).

10) Renumber ENVR/CHEM 4101 and ENVR 5101 as ENVR/CHEM 4110 and ENVR 5110 (see attached course modification form)
11) Revise course description of ENVR 4220/5220, Sampling and Analysis to specifically include the laboratory component and request differential tuition to support laboratory component (see attached course modification form).

Reason(s) for the change(s): Changes reflect degree requirement credit reduction to 120 credits. Reduction of number of choices in Required Emphases is required to ensure that all upper division courses are offered on a 3 or 4 semester rotation and reductions in staffing/course offerings. Two new emphases are creating by merging essential elements of four of the dropped emphases.

Note: If a course from another department/program was added to 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 of their course(s) on 1-6-14 (date) by ___e-mail________ (mail, email, or phone). The following programs were notified of the curriculum changes:

Physics, Biology, Chemistry, Sociology, Physical Education, Political Science, Geography, Mathematics. Responses were received from Sociology, Physical Education, Political Science, Geography, Mathematics; those responses are attached at the end of this curriculum revision request. Sociology and Geography agreed to waive prerequisite courses for SOC 3050 (Environmental Sociology) and GEOG 3231 (Introduction to GIS).

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.)
Environmental Studies, B.S. major

Required Credits: **89 74-80**  
Required GPA: **2.25**

**I REQUIRED CORE COURSES**  

*Notes: Students who select the Environmental Management Emphasis should select ENVR 4970 Internship (3 credits) Internship rather than ENVR 4990 Thesis (3 credits) Senior Thesis.*

**COMPLETE THE FOLLOWING COURSES:**

- BIOL 1211 *Introductory Biology I* (4 credits)
- BIOL 1212 *Introductory Biology II* (4 credits)
- BIOL 2610 *General Ecology* (3 credits)
- ECON 2000 *Introduction to Environmental Science* (3 credits)
- ENVR 3300 *Environmental Management and Safety* (3 credits)
- ENVR 4210 *Environmental Law and Policy* (3 credits)
- GEOG 3231 *Introduction to Geographic Information Systems* (3 credits)
- GEOL 1110 *Physical Geology* (4 credits)
- GEOL 3211 *Environmental Hydrology* (3 credits)
- POL 3230 *Environmental Politics* (3 credits)
- SOC 3050 *Environmental Sociology* (3 credits)

**COMPLETE THE FOLLOWING COURSE:**

- ENVR 3880 3920 DGS: Seminar in Environmental Controversies (2 credits)
- ENVR 3880 *Environmental Controversies* (2 credits)

**COMPLETE ONE OF THE FOLLOWING COURSES:**

- ENVR 4970 *Internship* (3 credits)  
  or ENVR 4990 *Thesis* (3 credits)

**COMPLETE THE FOLLOWING COURSE:**

- ENVR 4920 *Directed Group Study: Senior Seminar* (1 credit)
- ENVR 4880 *Senior Seminar* (1 credit)

**SELECT 1 OF THE FOLLOWING COURSES:**

- CHEM 1111 *General Chemistry I* (4 credits)
- CHEM 2211 *Principles of Chemistry I* (4 credits)
SELECT 1 OF THE FOLLOWING COURSES:

- CHEM 1112 General Chemistry II (4 credits)
- CHEM 2212 Principles of Chemistry II (4 credits)

SELECT 1 OF THE FOLLOWING COURSES:

- ECON 3040 Environmental Economics (3 credits)
- ENVR 3040 Environmental Economics (3 credits)

SELECT 1 OF THE FOLLOWING COURSES:

- ENVR 3600 Environmental Justice and Sustainability (3 credits)
- ENVR 4210 Environmental Law and Policy (3 credits)

COMPLETE ONE OF THE FOLLOWING COURSES:

- ENVR 4970 Internship (3 credits)
  or ENVR 4990 Thesis (3 credits)

SELECT 1 OF THE FOLLOWING COURSES:

- SOC 3001 Social Statistics (3 credits)
- STAT 2610 Applied Statistics (4 credits)

CREDITS IN ENVR CORE CURRICULUM = 38-39

Suggested Semester Schedule for Environmental Studies major, B.S.

The following is a list of Environmental Studies Major Courses arranged by year. This schedule is intended to help students plan their courses in an orderly fashion; however, these are only suggestions and this schedule is flexible.

Freshman

- BIOL 1211 Introductory Biology I (4 credits)
- BIOL 1212 Introductory Biology II (4 credits)
- MATH 1170 College Algebra (4 credits)
- MATH 1470 Precalculus (5 credits)
  or MATH 2471 Calculus I (5 credits)
- Liberal Education requirements

Sophomore
- BIOL 2610 General Ecology (3 credits)
- ENVR 2000 Introduction to Environmental Science (3 credits)
- Select one chemistry sequence:
  1. CHEM 1111 General Chemistry I (4 credits)
     CHEM 1112 General Chemistry II (4 credits)
  2. CHEM 2211 Principles of Chemistry I (4 credits)
     CHEM 2212 Principles of Chemistry II (4 credits)
- GEOL 1110 Physical Geology (4 credits)
- PHYS 1101 General Physics I (4 credits)
- SOC 3001 Social Statistics (3 credits)
  or STAT 2610 Applied Statistics (4 credits)
- Liberal Education requirements

Junior

- ENVR 3920 DGS: Seminar in Environmental Controversies (2 credits)
- ENVR 4210 Environmental Law and Policy (3 credits)
- POL 3230 Environmental Politics (3 credits)
- ECON 3040 Environmental Economics (3 credits)
  or ENVR 3040 Environmental Economics (3 credits)
- SOC 3050 Environmental Sociology (3 credits)
- Emphasis courses
- Liberal Education requirements

Senior

- ENVR 4920 Directed Group Study: Senior Seminar (1 credit)
- ENVR 4970 Internship (3 credits)
  or ENVR 4990 Thesis (3 credits)
- Complete Emphasis courses
- Complete Liberal Education requirement
ECOSYSTEM STUDIES EMPHASIS

COMPLETE THE FOLLOWING COURSES:

- BIOL 1211 Introductory Biology I (4 credits)
- BIOL 1212 Introductory Biology II (4 credits)
- BIOL 2610 General Ecology (3 credits)
- BIOL 3361 Limnology I (4 credits)
- ENVR 3600 Environmental Justice and Sustainability (3 credits)
- ENVR 4200 Wastewater Treatment (3 credits)
- ENVR 4400 Environmental Microbiology (3 credits)
- ENVR 4500 Environmental Toxicology (4 credits)
- GEOG 3231 Introduction to Geographic Information Systems (3 credits)
- PHYS 1101 General Physics I (4 credits)

SELECT 1 OF THE FOLLOWING COURSES:

- MATH 1170 College Algebra (4 credits)
- MATH 1470 Precalculus (5 credits)

SELECT 1 OF THE FOLLOWING COURSES:

- CHEM 1112 General Chemistry II (4 credits)
- CHEM 2212 Principles of Chemistry II (4 credits)

SELECT 1 OF THE FOLLOWING COURSES:

- BIOL 3630 Conservation Biology (3 credits)
- GEOG 3630 Conservation Biology (3 credits)

SELECT 9 3 SEMESTER CREDITS OF UPPER DIVISION ELECTIVES APPROVED IN ADVANCE BY CEESS ADVISOR.

CREDITS IN ECOSYSTEMS EMPHASIS: 38-40

TOTAL CREDITS IN ENVIRONMENTAL SCIENCE, B.S. WITH ECOSYSTEMS EMPHASIS = 76-79
Suggested Semester Schedule for Environmental Studies major, B.S.  (Ecosystem Studies)

The following is a list of Environmental Studies Major Courses arranged by year. This schedule is intended to help students plan their courses in an orderly fashion; however, these are only suggestions and this schedule is flexible.

### Freshman
- BIOL 1211 Introductory Biology I (4 credits)
- BIOL 1212 Introductory Biology II (4 credits)
- GEOL 1110 Physical Geology (4 credits)
- ENVR 2000 Introduction to Environmental Science (3 credits)
- ECON 2000 Markets and Resource Allocation (3 credits)
- MATH 1470 Precalculus (5 credits) or MATH 1170 College Algebra (4 credits) or MATH 2471 Calculus 1 (5 credits)
- Liberal Education requirements

### SOPHOMORE (with the emphasis already selected)
- CHEM 1112 General Chemistry II (4 credits) or CHEM 2212 Principles of Chemistry II (4 credits)
- ENVR 2610 General Ecology (3 credits)
- ENVR 3880 Environmental Controversies (2 credits)
- ECON 3040 Environmental Economics (3 credits)
- SOC 3001 Social Statistics (3 credits) or STAT 2610 Applied Statistics (4 credits)
- Liberal Education requirements

### JUNIOR
- ENVR 3600 Environmental Justice and Sustainability (3 credits)
- GEOL 3211 Environmental Hydrology (3 credits)
- ENVR 4200 Wastewater Treatment (3)
- ENVR 4210 Environmental Microbiology (4 credits)
- GEOG 3231 Introduction to GIS (3 credits)
- Liberal Education requirements

### SENIOR
- ENVR 4400 Environmental Toxicology (3 credits)
- ENVR 3300 Environmental Management and Safety (3 credits)
- ENVR 4881 Senior Seminar 1 (1 credit)
- BIOL 3840 Wetlands Ecology (3 credits) or BIOL 3361 Limnology 1 (4 credits)
- BIOL 3630 Conservation Biology (3 credits)
- Elective
  - GEOL 3120 Soils (4 credits)
  - BIOL 3723 Ecosystem Ecology (3 credits)
  - BIOL 4623 Forest Ecology (3 credits)
- ENVR 4970 Internship (3 credits) or ENVR 4990 Thesis (3 credits)
- Liberal Education requirements
ENVIRONMENTAL POLICY AND PLANNING EMPHASIS

COMPLETE THE FOLLOWING COURSES:

- ECON 2000 Markets and Resource Allocation (3 credits)
- ECON 2100 Macroeconomic Principles (3 credits)
- ECON 3010 Public Economics (3 credits)
- ECON 3230 Benefit/Cost Analysis (3 credits)
- ENVR 3600 Environmental Justice and Sustainability (3 credits)
- GEOG 3231 Introduction to Geographic Information Systems (3 credits)
- GEOG 2400 Introduction to Planning (3 credits)
- GEOG 3560 Introduction to Geographic Information Systems (3 credits)
- POL 1200 Introduction to American Politics (3 credits)
- POL 3200 Minnesota Politics (3 credits)
- POL 3210 Public Administration (3 credits)

SELECT 1 OF THE FOLLOWING COURSES:

- BIOL 1120 General Biology (3 credits)
- BIOL 1211 Introduction to Biology I (4 credits)

SELECT 1 OF THE FOLLOWING COURSES:

- POL 3230 Environmental Politics (3 credits)
- SOC 3050 Environmental Sociology (3 credits)

SELECT 1 OF THE FOLLOWING COURSES:

- POL 3200 Minnesota Politics (3 credits)
- GEOG 3232 Intermediate Geographic Information Systems (3 credits)

SELECT COURSE NOT COMPLETED PREVIOUSLY IN CORE

- ENVR 3600 Environmental Justice and Sustainability (3 credits)
- ENVR 4210 Environmental Law and Policy (3 credits)

SELECT 3 SEMESTER CREDITS OF UPPER DIVISION ELECTIVES APPROVED IN ADVANCE BY CESS ADVISOR.

CREDITS IN ENVIRONMENTAL POLICY AND PLANNING EMPHASIS: 36-37

TOTAL CREDITS IN ENVIRONMENTAL SCIENCE, B.S. WITH ENVIRONMENTAL POLICY AND PLANNING EMPHASIS = 74-76
Suggested Semester Schedule for Environmental Studies major, B.S. (Environmental Policy And Planning)

The following is a list of Environmental Studies Major Courses arranged by year. This schedule is intended to help students plan their courses in an orderly fashion; however, these are only suggestions and this schedule is flexible.

Freshman

- ENVR 2000 Introduction To Environmental Science (3 credits)
- ECON 2000 Markets and Resource Allocation (3 credits)
- GEOL 1110 Physical Geology (4 credits)
- ECON 2100 Macroeconomic Principles (3 credits)
- POL 1200 Introduction To American Politics (3 credits)
- CHEM 1111 General Chemistry I (4 credits) or CHEM 2211 Principles of Chemistry I (4 cr)
- Liberal Education requirements

Sophomore

- BIOL 1120 General Biology (3 credits) or BIOL 1211 Introduction to Biology I (4 cr)
- SOC 3001 Social Statistics (3 credits) or STAT 2610 Applied Statistics (4 credits)
- ECON 3040 or ENVR 3040 Environmental Economics (3 credits)
- GEOG 2400 Introduction to Planning (3 credits)
- GEOG 3231 Introduction to GIS (3 credits)
- POL 3200 Minnesota Politics (3 credits) or GEOG 3232 Intermediate GIS (3 credits)
- Liberal Education requirements

Junior

- ECON 3230 Benefit/Cost Analysis (3 credits)
- ENVR 3300 Environmental Management and Safety (3 credits)
- GEOL 3211 Environmental Hydrology (3 credits)
- ENVR 3880 Environmental Controversies (2 credits)
- ENVR 4210 Environmental Law and Policy (3 credits)
- POL 3230 Environmental Politics (3 cr) or SOC 3050 Environmental Sociology (3 cr)
- POL 3210 Public Administration (3 credits)
- GEOG 3310 Land Use Analysis And Planning (3 credits)
- Liberal Education requirements

Senior

- ECON 3010 Public Economics (3 credits)
- ENVR 3600 Environmental Justice and Sustainability (3 credits)
- ENVR 4880 Senior Seminar 1 (1 credit)
- ENVR 4970 Internship (3 credits) or ENVR 4990 Thesis (3 credits)
GEOHYDROLOGY EMPHASIS

COMPLETE THE FOLLOWING COURSES:

- ENVR 4050 Geochemistry (3 credits)
- GEOL 1120 Historical Geology (4 credits)
- GEOL 2110 Mineralogy and Petrology (4 credits)
- GEOL 3211 Environmental Hydrology (3 credits)
- GEOL 3212 Hydrogeology (3 credits)
- GEOL 3400 Glacial and Pleistocene Geology (3 credits)
- MATH 2471 Calculus I (5 credits)
- MATH 2472 Calculus II (5 credits)
- PHYS 1101 General Physics I (4 credits)

SELECT 1 OF THE FOLLOWING COURSES:

- ENVR 4220 Sampling and Analysis (4 credits)
- GEOG 3232 Intermediate Geographic Information Systems (3 credits)

SELECT 2 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)

SELECT 1 OF THE FOLLOWING COURSES:

- MATH 1470 Precalculus (5 credits)
- MATH 2471 Calculus I (5 credits)

SELECT 2 OF THE FOLLOWING COURSES:

- PHYS 1101 General Physics I (4 credits)
- PHYS 2101 Physics I (5 credits)

SELECT 2 3 SEMESTER CREDITS OF UPPER DIVISION ELECTIVES APPROVED IN ADVANCE BY CEESS ADVISOR.
CREDITS IN GEOHYDROLOGY EMPHASIS: 37-41

TOTAL CREDITS IN ENVIRONMENTAL SCIENCE, B.S. WITH GEOHYDROLOGY EMPHASIS = 75-80

Suggested Semester Schedule for Environmental Studies major, B.S. (Geohydrology Emphasis)

The following is a list of Environmental Studies Major Courses arranged by year. This schedule is intended to help students plan their courses in an orderly fashion; however, these are only suggestions and this schedule is flexible.

Freshman

- BIOL 1211 Introductory Biology I (4 credits)
- GEOL 1110 Physical Geology (4 credits)
- CHEM 1111 General Chemistry I (4 credits) or
  - CHEM 2211 Principles of Chemistry I (4 credits)
- ENVR 2000 Introduction to Environmental Science (3 credits)
- ECON 2000 Markets and Resource Allocation (3 credits)
- MATH 1470 Precalculus (5 credits) or
  - MATH 2471 Calculus 1 (5 credits)
- Liberal Education requirements

SOPHOMORE (with the emphasis already selected)

- GEOL 2110 Mineralogy And Petrology (4 credits)
- GEOG 3231 Introduction to GIS (3 credits)
- ENVR 3300 Environmental Management and Safety (3 credits)
- ENVR 3880, Environmental Controversies (2 credits)
- ECON 3040 Environmental Economics (3 credits) or
  - ENVR 3040 Environmental Economics (3 credits)
- PHYS 1101 General Physics 1 (4 credits) or
  - PHYS 2101 Physics 1 (5 credits)
- SOC 3001 Social Statistics (3 credits) or
  - STAT 2610 Applied Statistics (4 credits)
- Liberal Education requirements

JUNIOR

- GEOL 3211 Environmental Hydrology (3 credits)
- ENVR 4050 Geochemistry (3 credits)
- GEOL 3212 Hydrogeology (3 credits)
- ENVR 4220 Sampling and Analysis (4 credits) or
  - GEOG 3232, Intermediate GIS (3-credits)
- ENVR 4881 Senior Seminar 1 (1 credit)
- Elective 1
  - BIOL 1120 General Biology (3 credits) or
BIOL 1211 Introduction to Biology I (4 credits)

Liberal Education requirements

SENIOR

- GEOL 3700 Environmental Geophysics (3 credits)
- ENVR 4210 Environmental Law and Policy (3 credits)
or
  - ENVR 3600 Environmental Justice and Sustainability (3 credits)
- ENVR 4882 Senior Seminar 2 (1 credit)
- Elective 2
  - GEOL 3120 Soils (4 credits)
  - GEOL 3400 Glacial and Pleistocene Geology (3 credits)
  - GEOL 3600 Stratigraphy and Sedimentation (3 credits)
- ENVR 4970 Internship (3 credits) or
  - ENVR 4990 Thesis (3 credits)
- Liberal Education requirements
BSU Curriculum Forms

Form 6

New Program Form

Type of Program to be established: Environmental Health and Toxicology Emphasis of the B.S. in Environmental Studies

Type of Program to be established:

_____ M.S.
_____ M.A.
_____ B.S.
_____ B.S./T.L.
_____ B.A.
_____ Minor

_____ Field of Emphasis: Stand Alone
_____ Field of Emphasis in: B.S. in Environmental Studies
_____ Other:

Program name: Environmental Studies, B.S. major Environmental Health and Toxicology Emphasis

Reason(s) for new program:
1. This program merges essential elements of the Environmental Chemistry Emphasis and Environmental Toxicology Emphasis into one new Emphasis of Environmental Health and Toxicology. It will provide students with a certain depth of discipline-specific knowledge as well as a minimum level of breadth in other disciplines.

2. This new emphasis will fulfill professional and occupational requirements, and prepare students with a more marketable degree.

3. Provide students with options to take various listed upper division courses since all of the ENVR 4000-level courses are only offered either once every three semesters or once every other year. This will allow our existing faculty to offer those upper division courses in less frequent arrangement which will not delay students’ completion of their program. Instead, it allows CEEESS to serve as many students as possible to increase the rates at which students succeed, provide a high quality education and produce quality graduates.

Student learning outcomes for the program (please use the same format as for other programs in the department): Students will:

1) demonstrate the ability to understand and distinguish environmental problems related to Environmental Health and Toxicology.
2) formulate reasonable hypotheses;
3) design experiments and statistical procedures.
4) evaluate data and test hypotheses.
5) demonstrate higher level of performance as seniors as compared to sophomores on the program level student learning outcomes assessment rubric.
6) effectively present their results and recommendations in oral and written formats.
7) gain specialized knowledge related to environmental health and toxicology.

How will the student learning outcomes be assessed (e.g., major field test, student portfolio, departmental rubric, department-developed examination questions, etc.)? The Environmental Studies program requires that students complete a departmentally developed general pre-post exam on the environmental studies
curriculum. Papers, oral presentations, or posters that are required within ENVR 3880 and ENVR 4982 are graded using a common rubric. Students complete a thesis or internship report that is related to their chosen emphasis; these assignments are graded with a common rubric.

Note: If courses from other departments are required for this program, please notify the chairs of those departments. Chemistry, Biology, & Math. No response was received from Chemistry or Biology; Math response is 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 draft catalog copy of proposed program.
Alert: Contact Academic Affairs (Patrick Guilfoile) regarding approval downstate (required for all of the above except for a minor where there is an existing major).

ENVIRONMENTAL HEALTH AND TOXICOLOGY EMPHASIS

COMPLETE THE FOLLOWING COURSES

- BIOL 1211 Introductory Biology I (4 credits)
- BIOL 1212 Introductory Biology II (4 credits)
- ENVR 4220 Sampling and Analysis (4 Credits)
- ENVR 4400 Environmental Microbiology (3 Credits)
- ENVR 4500 Environmental Toxicology (4 Credits)

COMPLETE 1 OF THE FOLLOWING COURSES

- CHEM 1112 General Chemistry II (4 Credits)
- CHEM 2212 Principles of Chemistry II (4 Credits)

COMPLETE 1 OF THE FOLLOWING COURSES

- CHEM 3507 Analytical Chemistry (3 Credits)
- CHEM 4411 Biochemistry I (3 Credits)

COMPLETE 1 OF THE FOLLOWING COURSES

- CHEM 3570 Analytical Chemistry Lab (1 Credit)
- CHEM 4471 Biochemistry I Lab (1 Credit)

COMPLETE 1 OF THE FOLLOWING COURSES

- ENVR 4050 Geochemistry (3 Credits)
- ENVR 4110 Environmental Chemistry (3 Credits)
- CHEM 4110 Environmental Chemistry (3 Credits)

COMPLETE 1 OF THE FOLLOWING COURSES

- MATH 1470 Precalculus (5 credits)
- MATH 2471 Calculus I (5 credits)

SELECT 3 SEMESTER CREDITS OF UPPER DIVISION ELECTIVES APPROVED IN ADVANCE BY CEEESS ADVISOR.

CREDITS IN ENVIRONMENTAL HEALTH AND TOXICOLOGY EMPHASIS: 38

TOTAL CREDITS IN ENVIRONMENTAL SCIENCE, B.S. WITH ENVIRONMENTAL HEALTH AND TOXICOLOGY EMPHASIS = 76-77

**Suggested Semester Schedule for Environmental Studies Major (Environmental Health And Toxicology Emphasis)**

The following is a list of Environmental Studies Major Courses arranged by year. This schedule is intended to help students plan their courses in an orderly fashion; however, these are only suggestions and this schedule is flexible.

**Freshman:**
- ENVR 2000 *Introduction To Environmental Science* (3 credits)
- BIOL 1211 *Introductory Biology I* (4 credits)
- BIOL 1212 Introductory Biology II (4 credits)
- GEOL 1110 *Physical Geology* (4 credits)
- ECON 2000 Markets and Resource Allocation (3 credits)
- MATH 1470 Precalculus (5 credits)
  or MATH 2471 Calculus 1 (5 credits)

Liberal Education Requirements

**Sophomore:**
- ENVR 3880, Environmental Controversies (2 credits)
- CHEM 2211 *Principles of Chemistry I* (4 credits)
  or CHEM 1111 General Chemistry I (4 Credits)
- CHEM 2212 Principles of Chemistry II ( 4 Credits)
  or CHEM 1112 General Chemistry II (4 Credits)
- SOC 3001 *Social Statistics* (3 credits)
  or STAT 2610 *Applied Statistics* (4 credits)
- ECON 3040 *Environmental Economics* (3 credits)
  or ENVR 3040 *Environmental Economics* (3 credits)
- ENVR 4210 Environmental Law and Policy (3 credits)
  or ENVR 3600 Environmental Justice and Sustainability (3 credits)

Liberal Education Requirements
Junior:
CHEM 3507 Analytical Chemistry (3 Credits)
   or CHEM 4411 Biochemistry I (3 Credits)
CHEM 3570 Analytical Chemistry Lab (1 Credit)
   or CHEM 4471 Biochemistry I Lab (1 Credit)
ENVR 3300 Environmental Management and Safety (3 credits)
GEOG 3231 Introduction to GIS (3 credits)
GEOL 3211 Environmental Hydrology (3 credits)
ENVR 4220 Sampling and Analysis (4 Credits)
Liberal Education Requirements

Senior:
ENVR 4880 Senior Seminar 1 (1 credit)
ENVR 4400 Environmental Microbiology (3 Credits)
ENVR 4050 Geochemistry (3 Credits)
   or ENVR 4110 Environmental Chemistry (3 Credits)
   or CHEM 4110 Environmental Chemistry (3 Credits)
ENVR 4970 Internship (3 credits)
   or ENVR 4990 Thesis (3 credits)
ENVR 4500 Environmental Toxicology (4 Credits)
Elective Courses (3 credits)
Liberal Education Requirements
BSU Curriculum Forms

New Program Form
Type of Program to be established: Industrial Ecology Emphasis

Type of Program to be established:

- ______ M.S.
- ______ M.A.
- ______ B.S.
- ______ B.S./T.L.
- ______ B.A.
- ______ Minor
- ______ Field of Emphasis: Stand Alone
- ______ Field of Emphasis in: B.S. Environmental Studies
- ______ Other:

Program name: Environmental Studies, B.S. major Industrial Ecology Emphasis

Reason(s) for new program:

1. The Environmental Engineering Science and Environmental Management Emphases are being merged into one new “Industrial Ecology Emphasis.” The combined emphasis will provide students with a certain depth of discipline-specific knowledge as well as a minimum level of breadth in other disciplines.

2. This new emphasis will fulfill professional and occupational requirements, and prepare students with a more marketable degree.

3. Provide students with options to take various listed upper division courses since all of the ENVR 4000 level courses are offered either once every 3 semesters or once every other year. This will allow our existing faculty to offer those upper division courses in less frequent arrangement which will not delay students completion of their program. Instead it allows the CEESSES to serve as many students as possible, increase the rates at which students succeed, provide a high quality education and produce quality graduates.

Student learning outcomes for the program (please use the same format as for other programs in the department): Students will: 1) demonstrate the ability to understand and distinguish environmental problems related to Industrial Ecology. 2) formulate reasonable hypotheses. 3) design experiments and statistical procedures. 4) evaluate data and test hypotheses. 5) demonstrate higher level of performance as seniors as compared to sophomores on the program level student learning outcomes assessment rubric. 6) effectively present their results and recommendations in oral and written formats. 7) gain specialized knowledge related to Industrial Ecology.

How will the student learning outcomes be assessed (e.g., major field test, student portfolio, departmental rubric, department-developed examination questions, etc.)? The Environmental Studies program requires that students complete a departmentally developed general pre-post exam on the environmental studies curriculum. Papers, oral presentations, or posters that are required within ENVR 3880 and ENVR 4982...
are graded using a common rubric. Students complete a thesis or internship report that is related to their chosen emphasis; these assignments are graded with a common rubric.

Note: If courses from other departments are required for this program, please notify the chairs of those departments. The following programs were notified on 1-6-14: Chemistry, Math. Chemistry did not respond, Math’s response is 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 draft catalog copy of proposed program.
Alert: Contact Academic Affairs (Patrick Guilfoile) regarding approval downstate (required for all of the above except for a minor where there is an existing major).

INDUSTRIAL ECOLOGY EMPHASIS

COMPLETE THE FOLLOWING COURSES

- ENVR 4200 Wastewater Treatment (3 Credits)
- ENVR 4220 Sampling and Analysis (4 Credits)
- ENVR 4240 Waste Management (4 Credits)
- ENVR 4260 Risk Assessment and Auditing (3 Credits)
- GEOL 3212 Hydrogeology (3 Credits)
- GEOL 3700 Environmental Geophysics (3 credits)

SELECT 1 OF THE FOLLOWING COURSES

- CHEM 1112 General Chemistry II (4 credits)
- CHEM 2212 Principles of Chemistry II (4 credits)

SELECT 1 OF THE FOLLOWING COURSES:

- BIOL 1120 General Biology (3 credits)
- BIOL 1211 Introduction to Biology I (4 credits)

SELECT 1 OF THE FOLLOWING COURSES

- ENVR 4050 Geochemistry (3 credits)
- ENVR 4110 Environmental Chemistry (3 credits)
- CHEM 4110 Environmental Chemistry (3 credits)

SELECT 1 OF THE FOLLOWING COURSES

- ENVR 4230 Air Pollution Technology (4 Credits)
• ENVR 4500 Environmental Toxicology (4 Credits)

SELECT 1 OF THE FOLLOWING COURSES

• MATH 1470 Precalculus (5 credits)
• MATH 2471 Calculus I (5 credits)
• 3 or more credits of electives as approved in advance by CEEESS advisor

CREDITS INDUSTRIAL ECOLOGY EMPHASIS: 37-40

TOTAL CREDITS IN ENVIRONMENTAL SCIENCE, B.S. WITH INDUSTRIAL ECOLOGY EMPHASIS = 75-79

Industrial Ecology – Potential Course Schedule*

*CEESS faculty could help students plan course schedule different than the one below but please keep in mind that almost all advance courses (i.e. courses numbered 3000 and higher) are offered on tri- or four-semester rotation.

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BSU Curriculum Forms

New Program Form

Type of Program to be established:

_____ M.S.*
_____ M.A.*
_____ Applied Masters**
_____ B.S.
_____ B.S./T.L.
_____ B.A.
__X__ Minor

Field of Emphasis: Stand Alone
Field of Emphasis in:
_____ Other:

Program name: Sustainability Minor

Reason(s) for new program:

1. Student interest in sustainability is strong. BSU has become a regional leader in the field of sustainability. Environmental Stewardship is one of three Signature Themes guiding university decisions.
2. Another BSU Signature Theme, Civic Engagement, would be a requirement of the minor, and one of the significant differences between this minor and the Environmental Studies Minor.
3. The themes of Stewardship and Civic Engagement are found throughout the Master Academic Plan.
4. Any major would be able to take courses that would increase their knowledge of how to create a sustainable world and increase their chances of employment.
5. BSU would fulfill its obligation to “make climate neutrality and sustainability a part of the curriculum and other educational experience for all students” as stated in the American College and University Presidents Climate Commitment signed by BSU President Emeritus Jon Quistgaard.

Student learning outcomes for the program (please use the same format as for other programs in the department):

Outcome 1: Students will be able to understand the cause and effects of environmental problems.

(Statement: Intellectual Development, Outcome A: Higher Order Thinking and Outcome B: Knowledge...
Outcome 2: Students will be able to identify possible solutions to environmental problems.

*(Dimension 1: Intellectual Development, Outcome A: Higher Order Thinking and Outcome B: Knowledge...)*

Outcome 3: Students will be able to describe sustainability from multiple perspectives.

*(Dimension 1: Intellectual Development, Outcome B: Knowledge...; Dimension 2: Understanding of Self/Relating to Others, Outcome C: Human Diversity)*

Outcome 4: Students will be able to communicate how sustainability applies to their chosen major.

*(Dimension 2: Understanding of Self/Relating to Others, Outcome A: Values and Outcome B: Communication)*

Outcome 5: Students will be able to further the sustainability goals of a local organization.

*(Dimension 3: Outcome A: Readiness for Career, Outcome B: Responsible Citizenship)*

How will the student learning outcomes be assessed (e.g., major field test, student portfolio, departmental rubric, department-developed examination questions, etc.)?

The outcomes will be assessed in several different classes using various methods such as rubrics, journals, and exam questions.

**Note:** If courses from other departments are required for this program, please notify the chairs of those departments.
The home department/program was notified that this new program will require courses from their area on 12/13/2013 by email.

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.

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

Alert: Attach draft catalog copy of proposed program.
Alert: Contact Academic Affairs (Patrick Guilfoile) regarding approval downstate (required for all of the above except for a minor where there is an existing major).
Sustainability Minor

Required Credits: 22-23

Required GPA: 2.00

I REQUIRED COURSES
COMPLETE THE FOLLOWING COURSES:

- ENVR 2000 Introduction to Environmental Science (3 credits)
- UNIV 3910 or 4910 Directed Independent Study, Mentorship (1 or 2 credits)
- UNIV 3970 or 4970 Internship, Sustainability in Action (3 credits)
- ENVR 3600 Environmental Justice & Sustainability (3 credits)

II REQUIRED ELECTIVES
Select 12 credits from the following courses

- ECON 3040 Environmental Economics (3 credits)
  or ENVR 3040 Environmental Economics (3 credits)
- SOC 3050 Environmental Sociology (3 credits)
- GEOG 2400 Introduction to Planning (3 credits)
- ENVR 4210 Environmental Law & Policy (3 credits)
- TADT 1315 Energy and Power Technology (3 credits)
- TADT 4385 Sustainability and Emerging Technologies (4 credits)
- ENVR 4220 Sampling and Analysis (4 credits)
- ENVR 4230 Air Pollution Technology (4 credits)
- ENVR 4240 Waste Management (4 credits)
- ENVR 4260 Risk Assessment And Auditing (3 credits)
- GEOL 3211 Environmental Hydrology (3 credits)

Or a course approved by Director of Center for Environmental, Economic, Earth, and Space Studies.
Erika Bailey-Johnson

From: Patrick Donnay
Sent: Thursday, December 19, 2013 9:53 AM
To: Erika Bailey-Johnson
Subject: RE: proposed Sustainability Minor

Erika,

We are fine with us. (I had to run it by Tom Beech who is Dept chair.)

Pat

Dr. Patrick Donnay
Bemidji State University
218 755 3899
pdonnay@bemidjistate.edu

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From: Erika Bailey-Johnson
Sent: Friday, December 13, 2013 4:53 PM
To: Tim Kroeger; Debra Peterson; Patrick Donnay; Mark Lawrence; Bonnie Higgins; Steven Sundahl; James McCracken
Subject: RE: proposed Sustainability Minor

Me again! Mark pointed out that I forgot the attachment. Sorry about that.

Erika

---

From: Erika Bailey-Johnson
Sent: Friday, December 13, 2013 2:08 PM
To: Tim Kroeger; Debra Peterson; Patrick Donnay; Mark Lawrence; Bonnie Higgins; Steven Sundahl; James McCracken
Subject: proposed Sustainability Minor

Good Friday!

I have been working with the Environmental Studies department since last fall on a Sustainability Minor (attached). You can see there is at least one course in your department included. Some of the courses have prerequisites (see below). Are you comfortable with students being able to enter into the following courses with the “consent of the instructor”? (I don't know the status of the TADT courses, but would assume there is a prerequisite for the 4385 course?)

If you could get back to me by the end of next week, I'd really appreciate it!

Erika

---

ECON or ENVR 3040 -Environmental Economics (3 credits)

**ECON 3040 Environmental Economics (3 credits)**

Examines environmental problems as consequence of market's failure to accurately value environmental resources. Alternative private and public policies are examined in terms of their
Erika Bailey-Johnson

From: Debra Peterson
Sent: Friday, December 13, 2013 2:25 PM
To: Erika Bailey-Johnson
Subject: Re: proposed Sustainability Minor

Sounds great! We are happy to be included. Deb

From: Erika Bailey-Johnson
Sent: Friday, December 13, 2013 2:08 PM
To: Tim Kroeger; Debra Peterson; Patrick Donnay; Mark Lawrence; Bonnie Higgins; Steven Sundahl; James McCracken
Subject: proposed sustainability minor

Good Friday!

I have been working with the Environmental Studies department since last fall on a sustainability minor (attached). You can see there is at least one course in your department included. Some of the courses have prerequisites (see below). Are you comfortable with students being able to enter into the following courses with the “consent of the instructor”? (I don’t know the status of the TADT courses, but would assume there is a prerequisite for the 4385 course?)

If you could get back to me by the end of next week, I’d really appreciate it!

Erika

ECON or ENVR 3040 - Environmental Economics (3 credits)
ECON 3040 Environmental Economics (3 credits)
Examines environmental problems as consequence of market’s failure to accurately value environmental resources. Alternative private and public policies are examined in terms of their effectiveness in improving the efficiency and equity with which water, air and other resources are allocated. Prerequisite: ECON 2000 or consent of instructor. Also offered under ENVR 3040.

SOC 3050 - Environmental Sociology (3 credits)
SOC 3050 Environmental Sociology (3 credits)
Examines the relationship between society and the environment. Emphasis on political and economic institutions and the consumer lifestyle and values. Considers how the treadmill of production affects ecosystems and discusses possible solutions to environmental problems. Prerequisites: SOC 1104 or consent of instructor.

POL 3230 - Environmental Politics (3 credits)
POL 3230 Environmental Politics (3 credits)
Surveys the dynamics of the policy process that produce our environmental policies. An analysis of actors, institutions, and organizations that shape U.S. environmental law and policy. Prerequisite: POL 1200 or consent of instructor. Might not be offered every year.
**Erika Bailey-Johnson**

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<tr>
<td>To:</td>
<td>Erika Bailey-Johnson, Shawn Strong, David Towley, James McCracken; Lyle Meulebroeck; Mahmoud AlOdeh; Timothy Brockman</td>
</tr>
<tr>
<td>Subject:</td>
<td>FW: proposed Sustainability Minor</td>
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<tr>
<td>Attachments:</td>
<td>Sustainability Minor with course descriptions.docx</td>
</tr>
</tbody>
</table>

Hi Erika,

The prerequisite for TADT 4385 - Sustainability and Emerging Technologies (4 credits) is Junior status or consent of the instructor. There should be no problems with adding this course or the TADT 1315 Energy and Power Technology. Please note the correct name on TADT 1315.

Thanks,
Tim Brockman

Dr. Tim Brockman, Associate Professor  
Coordinator, Industrial Technology Program  
Department of Technology, Art and Design

227 Bridgeman Hall  
1500 Birchmont Drive NE #34  
Bemidji, MN 56601-2699

Office: 218-755-4128  
Department Main Office: 218-755-2950  
Fax: 218-755-4011

tbrockman@bemidjistate.edu  
www.bemidjistate.edu

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**From:** James McCracken  
**Sent:** Monday, December 16, 2013 8:22 AM  
**To:** Timothy Brockman  
**Subject:** FW: proposed Sustainability Minor

Tim-

Important information for you on Sustainability minor.

Jim
BSU Curriculum Forms

Form 7

Program Drop Form

Program to be dropped: Environmental Toxicology Emphasis of the B.S. in Environmental Studies

Reason(s) for dropping it: The Environmental Toxicology Emphasis is being merged with the Environmental Chemistry emphasis to form a new Environmental Health and Toxicology Emphasis. This merger is needed due to 1. Faculty reductions through retirement, and 2. Increased demand for environmental green job market. The proposed emphasis merger will continue to provide quality graduates for an increasingly knowledge-based society.

Alert: Contact Academic Affairs (Patrick Guilfoile) regarding notification downstate.
BSU Curriculum Forms

Program Drop Form
Program to be dropped: **Environmental Chemistry Emphasis** of the B.S. in Environmental Studies.

**Reason(s)** for dropping it: The Environmental Chemistry Emphasis is being merged with the Environmental Toxicology Emphasis to form a new Environmental Health and Toxicology Emphasis. This merger is needed due to:
1. Faculty retrenchment through retirement and,
2. Increased demand for environmental green job market. The proposed emphasis merger will continue to provide quality graduates for an increasingly knowledge-based society.

**Alert:** Contact Academic Affairs (Patrick Guilfoile) regarding notification downstate.
BSU Curriculum Forms

Form 7

Program Drop Form

Program to be dropped: **Environmental Engineering Science Emphasis** of B.S. in Environmental Studies

**Reason(s) for dropping it:** The Environmental Engineering Science Emphasis is being combined with the Environmental Management Emphases to form a new Industrial Ecology Emphasis. This merger is needed due to:

1. Faculty retrenchment through recalibration, and
2. Increased demand for environmental green job market. The proposed merger of emphases will continue to provide quality graduates for an increasingly knowledge-based society.

**Alert:** Contact Academic Affairs (Patrick Guilfoile) regarding notification downstate.
BSU Curriculum Forms

Form 7

Program Drop Form

Program to be dropped: Environmental Management Emphasis of the B.S. in Environmental Studies

Reason(s) for dropping it: The Environmental Management Emphasis is being combined with the Environmental Engineering Science Emphasis and Geohydrology Emphasis to form a new "Industrial Ecology and Geohydrology Emphasis."

This merger is needed due to:

1. Faculty retrenchment through recalibration, and
2. Increased demand for environmental green job market. The proposed merger of emphases will continue to provide quality graduates for an increasingly knowledge-based society.

Alert: Contact Academic Affairs (Patrick Guilfoile) regarding notification downstate.
BSU Curriculum Forms

Form 7

Program Drop Form

Program to be dropped: Outdoor Education Emphasis of the B.S. in Environmental Studies

Reason(s) for dropping it: Many Required Core and Required Electives under "Outdoor Education Emphasis" will no longer be offered by Health and Physical Education programs due to:

1. Faculty retrenchment through retirement and recalibration
2. Low enrollment

Alert: Contact Academic Affairs (Patrick Guilfoile) regarding notification downstate.
BSU Curriculum Forms

Form 8

Signatures

Dr. Timothy J. Kroeger / Professor of Geology and Director / CEEESS 1/24/14
Proposer / Title / Date

Dr. Timothy J. Kroeger / Director CEEESS / 1/24/14
Chair or Director / Department or Program / Date

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 curriculum revision has been approved by vote of the faculty members of the Center for Environmental, Economic, Earth, and Space Studies.

Colleen Greer / Arts and Sciences / 4/17/15
Dean / College / Date

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

Rev. 3/25
Notification response from Geography Program.

Tim,

Yes we can waive the geog 1224 as we have done in the past. - jeff ueland

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From: Tim Kroeger  
Sent: Wednesday, January 08, 2014 3:09 PM  
To: Jeffrey Ueland  
Subject: RE: Geography prerequisites & High Alt Ballooning

Jeff:

Thanks for the information. I’ll update our curriculum revision with the new course numbers.

In the past the Geography program has been willing to waive the pre-requisite of Introduction to Map Use for ENVR students who desire to enroll in Introduction to GIS. Are your faculty willing to continue that policy?

Tim

From: Jeffrey Ueland  
Sent: Wednesday, January 08, 2014 8:35 AM  
To: Tim Kroeger  
Subject: RE: Geography prerequisites & High Alt Ballooning

Tim,

Good to be back and finally back in the office.

First the curriculum issues you addressed in your first email.

1. The course number for geog 2231 has been changed to 5231/5231 Introduction to GIS. Prereqs are the same.
2. Geog 3630 had no changes.
3. Geog 2400 Intro to planning is the same. Geog 3310 has been changed to 3560/5560 and is now called metropoitan land use planning. same prereques. We had several changes in our planning sequence, so if you want more info or to chat about the changes, let me know.
4. Geog 2232 was changed in number and name. It is now 3232 and called intermediate gis with 3231 as a prereq.

As for the ballooning, it sounds interesting and i suspect the students would think so as well. lets chat a bit at startup and see how we can make it work.

cheers and hope all is well - jeff ueland
From: Tim Kroeger  
Sent: Monday, January 06, 2014 1:32 PM  
To: Jeffrey Ueland  
Subject: RE: Geography prerequisites

Jeff:

Welcome back to the land of the cold!

We’re resubmitting the ENVR curriculum revision that we previously submitted in 2012. I wanted to touch base with you to inquire about the status of the GEOG curriculum revision that you had submitted. I thought I saw that revision on the faculty senate agenda last fall but since I’m not serving on the faculty senate this year I haven’t been keeping track of curriculum approvals. If the revision has been approved I would like to include the new course numbers and names in ENVR revised curriculum. Additionally, if the revised courses have prerequisites, we would like to know if the GEOG faculty would be willing to waive all or some of the prerequisites for students majoring in ENVR as you have done in the past.

Here is a quick summary of the ENVR revision as it affects GEOG courses.

1) We are proposing to include GEOG 2231 (or its equivalent) in the ENVR core curriculum. That course will then be removed from any emphasis in which it is currently listed.

2) GEOG 3630, Conservation Biology, (cross-listed with biology) is retained within the Ecosystems Emphasis

3) GEOG 2400, Introduction to planning and GEOG 3310, Land Use analysis and planning, are required in the Environmental Policy and Planning Emphasis.

4) GEOG 2232, Techniques in GIS, is an option within the Policy and Planning and Geohydrology emphases.

Sincerely,

Tim
Notification response from Mathematics Program.

Hi Tim, thanks for the update. I will inform our departmental members.
Derek
Dr. Derek Webb
Professor of Statistics and Mathematics
Department Chair
Department of Mathematics and Computer Science
Bemidji State University
304 Hagg Sauer Hall
1500 Birchmont Dr. NE 23
Bemidji, MN 56601-2699

Office: 218-755-2846
Fax: 218-755-2822
email: dwebb@bemidjistate.edu

From: Tim Kroeger
Sent: Monday, January 06, 2014 2:39 PM
To: Derek Webb
Subject: ENVR curriculum revision

Derek:

We have an ENVR curriculum revision ready for submission. I've included a summary our inclusion of MATH and STAT within that curriculum.

1) STAT 2610 is retained as an option within the ENVR core curriculum
2) MATH 1170 or MATH 1470 is required in the Ecosystem Studies Emphasis. Previously there was no math requirement within this emphasis.
3) The following emphasis areas, which required math courses are dropped. Environmental Engineering Science, Environmental Chemistry, Environmental Management, Environmental Toxicology.
4) MATH 1470 or MATH 2471 will be required for the Geohydrology Emphasis. This is a reduction in the requirement from MATH 2472.
5) Two new emphasis areas, Industrial Ecology and Environmental Health and Toxicology will both require students to complete either MATH 1470 or MATH 2471.

We will continue to encourage students to complete math through Calculus 2 if they express any desire to continue into graduate programs.

Please contact me if you have any questions.
Sincerely, Tim
Notification response from Sociology Program
Tim,

Yes we are willing to waive the prereq for 3050. Am glad that stats is still an option in the core. Deb

*Sent from my Verizon Wireless 4G LTE DROID*

Tim Kroeger <TKroeger@bemidjistate.edu> wrote:

Deb:
We’re resubmitting the curriculum revision that was previously submitted in 2012. I know we’ve talked about some of these changes before but I wanted to make sure you were informed of our final version.

In the past, Sociology has been willing to waive the prerequisites of SOC 1104 for ENVR students enrolling in SOC 3050. Are your faculty still OK with continuing that policy?

I’m including a summary of the changes as they affect Sociology.

1) SOC 3050, Environmental Sociology, is dropped from the ENVR core curriculum. SOC 3050 is included as an option within the Environmental Policy and Planning Emphasis.
2) SOC 3001, Social Statistics, no change—is retained as an option in the core.

FYI
On the Lib-ed side, I’ve included a new sustainability course in both geology and ENVR, revised GEOL 1110 to be included as a companion course in Area 10, and a new Geology course in goal area 3.

Sincerely,
Tim
Tim Kroeger, Ph.D.
Professor of Geology and Director of CEEESS
Bemidji State University
#27, 1500 Birchmont Dr. NE
Bemidji MN 56601
(218)755-2783
Notification response from Political Science Program

Tim,

Thank you very much for the notice. I hope you are well.

Tom

Sent from my iPhone

On Jan 7, 2014, at 12:03 PM, "Tim Kroeger" <TKroeger@bemidjistate.edu> wrote:

Tom:

I sent this earlier to Patrick by mistake; I apologize for that.

We are resubmitting the ENVR curriculum revision that we’d previously submitted in 2012.

Here is a summary of the changes as they affect Political Science.

1) POL 3230, Environmental Politics, is dropped from the ENVR core curriculum. The course is included as an option within the Environmental Policy and Planning Emphasis area.

2) POL 3200, Minnesota Politics is dropped as a requirement within the Environmental Policy and Planning area. However, it is retained as an elective choice within the Environmental Policy and Planning Emphasis.

3) POL 1200 and POL 3210, no change; both continue to be required within the Environmental Policy and Planning emphasis.

Let me know if you have any questions.

Sincerely,

Tim

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Tim Kroeger, Ph.D.
Professor of Geology and Director of CEEESS
Bemidji State University
#27, 1500 Birchmont Dr. NE
Bemidji MN 56601
(218)755-2783
Donna:

We have the ENVR curriculum revision ready for submission. As we talked about in December, we are dropping the Outdoor Education Emphasis area from our curriculum.

Sincerely,

Tim

Tim Kroeger, Ph.D.
Professor of Geology and Director of CEEESS
Bemidji State University
#27, 1500 Birchmont Dr. NE
Bemidji MN 56601
(218)755-2783
From: Michael Murray  
Sent: Thursday, September 24, 2015 11:41 AM  
To: Robin Gullickson <RGullickson@bemidjistate.edu>  
Subject: Fw: ENVR Curriculum proposal  
Importance: High

Hi Robin, see below. Mike

From: Michael Murray  
Sent: Friday, April 10, 2015 1:08 PM  
To: Colleen Greer; Martin Tadlock; Patrick Guilfoile  
Cc: Paul Kivi; Tim Kroeger; Wendy Greenberg; Carl Isaacson; Dragoljub Bilanovic; Miriam RiosSanchez  
Subject: ENVR Curriculum proposal

Dear Martin, Colleen, Patrick,

Please find attached the revisions to the ENVR curriculum. The following modifications are made in the curriculum proposal that are summarized below. Thanks! Mike

The Environmental Studies Program proposes to amend the Proposed Curriculum in the following ways:

1. Drop ENVR 4920 II (senior sem II) from the core and keep only 4920 I. This removes 1 credit from all emphases.

2. Remove BIOL 1211 (4 credits) from the core, and place it in the Environmental Toxicology and Ecosystem Studies emphases. In the Industrial Ecology, Geohydrology, and Policy and Planning emphases, create a listing saying “Select 1 of the following courses: BIOL 1120 or BIOL 1211”. This change removes 1 credit from 3 emphases.
3. In Ecosystem Studies, change “4 semester credits of upper division credits...” to “3 semester credits of upper division electives as approved in advance by CEEESS advisor”. This change drops the number of credits to 76-80 for this emphasis. For what it’s worth, I think we should add “in advance” to the electives section in all emphases.

4. In Industrial Ecology, under the final listing of Select 1 of the following courses: MATH 1470 or MATH 2471, add a line that says “or 3 or more credits of electives as approved in advance by CEEESS advisor”. This drops the number of credits to 75-78 in this emphasis.

5. In Environmental Health and Toxicology, change “5 semester credits” to “select 3 or more credits of...” This reduces the number of credits to 76-79 in this emphasis.

6. All told then, these changes would make our major 75-80 credits, down from 77-81 in the most recent proposal and down from 84 in the current catalog.

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Michael J. Murray, Ph.D.
Assistant Professor of Economics
Economics Program Coordinator
Bemidji State University
Bemidji MN 56601
mmurray@bemidjistate.edu
218-755-2910