## CEEESS 16-17 #18

### Packet Contents

<table>
<thead>
<tr>
<th>1.1</th>
<th>Summary</th>
</tr>
</thead>
</table>

### Course Modification

| 1.2  | ENVR / BIOL 6890 Grants and Contracts (3 credits) **to** Grants and Contracts (2 credits) |

### New Courses

| 1.4  | ENVR 6500 Advanced Graduate Project I (2 credits) |
| 1.7  | ENVR 6600 Advanced Graduate Project II (2 credits) |
| 1.10 | ENVR 6700 Graduate Environmental Seminar (1 credit) |

### Course Drops

| 1.13 | ENVR 6010 Research in Natural Science (3 credits) |
| 1.14 | ENVR 6250 Advanced Environmental Science (3 credits) |

### Program Modification

| 1.15 | Environmental Studies, Master of Science |

| 1.28 | Signatures |
BSU Curriculum Forms

Form 1

Curriculum Modification Summary

College: College of Arts and Sciences
Department: Center for Environmental, Economic, Earth, and Space Studies (CEEESS)
Proposer: Tim Kroeger
Proposer’s position: Interim director, 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.): These proposed revisions help streamline the curriculum for the M.S. in Environmental Studies by reducing the total required credits from the current 35 credits to 30 credits. Additionally, this revision provides more freedom in the graduate students’ selection of courses by eliminating the required emphasis areas; allowing a student and her/his advisor to design a graduate course curriculum that is most appropriate to the student’s interests.

Although not part of this proposal, our department provides a potential avenue to develop a future program modification for high performing undergraduate students to enter the graduate program during their undergraduate senior year to commence their graduate program early. This option would allow the students to enter the job market, with an advanced degree, with only one year beyond the typical undergraduate curriculum. We feel that an accelerated graduate option would be helpful in recruiting undergraduate students into the programs in Environmental Studies and would support 6000-level course enrollments.

Modifications proposed (specify number of each):
1 Course Modification(s) (form 2)
3 New Course(s) (form 3)
2 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
X Graduate Curriculum
___ Teacher Licensure Program(s)
BSU Curriculum Forms

Form 2

Course Modification Form

Current Course Number(s):
  Undergraduate:
  Graduate: ENVR/BIOL 6890
Proposed Course Number(s), if different:
  Undergraduate:
  Graduate:

Current Course Title: Grants and Contracts
Proposed Course Title, if different:

Current Course Description: A practical investigation of grantsmanship with emphases on funding sources, creative writing, effective conduct of project and reporting results. Gives students first-hand practice in all phases of grantsmanship. Review and critique both qualitative and quantitative model proposals.
Proposed Course Description, if different:

Current Credits: 3
Proposed Credits, if different: 2

Current Prerequisite(s): none
Proposed Prerequisite(s), if different:

1) Reason(s) for change(s): Reduction in credits to 2 credits will allow the course to be taught annually on-load—currently is taught on bi-annual basis.

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: $ none
   for:
   Proposed Course fee(s) per student, if different: $ none
   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: Biology M.S. — required in graduate program core.

Teacher Licensure programs:

Liberal Education:

The above “service area” programs/departments were notified of this modification on __9/29/16____ (date) by __email________________ (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 3

New Course Form

Course Number:
Undergraduate: 6500
Graduate: 6500
Course Title: Advanced Graduate Project I
Course Description: Students learn a combination of literature, laboratory, or field techniques and carry out research under the supervision of a faculty advisor. Students will work together to critique and improve course projects during the semester.

Credits: 2
Prerequisite(s): NONE
1. Reason(s) for creating this course: To be included in the new Environmental Studies Graduate curriculum
2. How often will this course be offered? annually
3. What are the student learning outcomes for the course (please precede each outcome with "Students will...")?
   - Students will gain exposure and competency in basic research methods that are applicable to the sciences.
   - Students will also evaluate research methodologies relevant to their individual research areas and present these findings in oral presentations and as a short paper appropriate for inclusion in a methods section of a research proposal.
   - Specifically, students will explore published literature and other sources related to their research projects as their work proceeds during the course.
   - Students will learn how to apply basic methods specific to their research projects. Students will write a short research paper summarizing their results, complete with discussion and conclusions.
   - Students will learn to work within a research team framework.

4. What are the major content areas for the course? Environmental Studies, Research proposal writing, writing manuscripts, using advanced statistical methods
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 n/a
7. What is the projected maximum class size (cap)? 15
8. What qualified faculty will be available to teach this course? All graduate faculty within the Center for Environmental, Economic, Earth and Space Studies.

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: $ n/a
   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.
ENVR 6500 Advanced Graduate Project I

<table>
<thead>
<tr>
<th>Instructor</th>
<th>Dept.</th>
<th>Level</th>
<th>Office</th>
<th>Phone</th>
<th>Email</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bill Sea</td>
<td>Environmen tal Studies</td>
<td>Graduate</td>
<td>S126</td>
<td>755-4103</td>
<td><a href="mailto:bsea@bemidjistate.edu">bsea@bemidjistate.edu</a></td>
</tr>
</tbody>
</table>

Office Hours

TBA

Course Description

Students learn a combination of literature, laboratory, or field techniques and carry out research under the supervision of a faculty advisor. Students will work together to critique and improve course projects during the semester.

Course Objectives – The main purpose of this course is for graduate students to gain exposure and competency in basic research methods that are applicable to the sciences. Students will also evaluate research methodologies relevant to their individual research areas and present these findings in oral presentations and as a short research paper appropriate for inclusion in a methods section of a research proposal. Specifically, students will explore published literature and other sources related to their research projects as their work proceeds during the course. Students will further apply methods specific to their research projects. Students will write a research paper summarizing their results, complete with discussion and conclusions. Students will learn to work within a research team framework.

Required Reading

Course reading will be assigned by instructor for each class discussion and will be selected jointly from students and instructor.

Course Format

Seminar style led by student and instructor each week for two sessions of 50 minutes per week. It is anticipated that students and instructor will meet weekly to present progress.

Grading & Exams

Grading will be based on progress reports evaluated during the semester, and a short term paper outlining the research project, results, discussion and summary. There are no exams in this course.

A: > 90%; B: 80-89.9%; C: 70-79.9%

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.
BSU Curriculum Forms

Form 3

New Course Form

Course Number:
Undergraduate:
Graduate: ENVR 6600
Course Title: Advanced Graduate Project II
Course Description: Students work on further developing a research plan based on a combination of literature, laboratory, or field methods and carrying it out under supervision of a faculty advisor in preparation for completing their thesis. Students will work together to critique and improve course projects during the semester.

Credits: 2
Prerequisite(s):
1. Reason(s) for creating this course: This course is part of the new ENVR graduate program.
2. How often will this course be offered? annually
3. What are the student learning outcomes for the course (please precede each outcome with "Students will...")?
   - Students will evaluate research methodologies relevant to their individual research areas and present these findings in oral presentations and as a short paper appropriate for inclusion in a methods section of a research proposal.
   - Specifically, students will explore published literature and other sources related to their research projects and their work proceeds during the course.
   - Students will further apply methods specific to their research projects. Students will write a short research paper summarizing their results, complete with discussion and conclusions.
   - Students will learn to work within a research team framework

4. What are the major content areas for the course? Environmental Studies
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? n/a
7. What is the projected maximum class size (cap)? 15
8. What qualified faculty will be available to teach this course? All graduate faculty within the Center for Environmental, Economic, Earth and Space Studies are qualified to teach this course.

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?
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: $ n/a
   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. See attached
Office Hours
TBA

Course Description

Students work on further developing a research plan based on a combination of literature, laboratory, or field methods and carrying it out under supervision of a faculty advisor in preparation for completing their thesis. Students will work together to critique and improve course projects during the semester.

Course Objectives – The main purpose of this course is for graduate students to gain further exposure and competency in basic research methods that are applicable to the sciences. Students will also evaluate research methodologies relevant to their individual research areas and present these findings in oral presentations and as a short research paper appropriate for inclusion in a methods section of a research proposal. Specifically, students will explore published literature and other sources related to their research projects as their work proceeds during the course. Students will further apply methods specific to their research projects. Students will write a research paper summarizing their results, complete with discussion and conclusions. Students will strengthen skills necessary for working in research teams.

Required Reading
Course reading will be assigned by instructor for each class discussion and will be selected jointly from students and instructor.

Course Format
Seminar style led by student and instructor each week for two sessions of 50 minutes per week. It is anticipated that students and instructor will meet weekly to present progress.

Grading & Exams
Grading will be based on progress reports evaluated during the semester, and a short term paper outlining the research project, results, discussion and summary. There are no exams in this course.

A: > 90%; B: 80-89.9%; C: 70-79.9%

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.
BSU Curriculum Forms

Form 3

New Course Form

Course Number: Undergraduate: Graduate: ENVR 6700

Course Title: **Graduate Environmental Seminar**

Course Description: This course exposes graduate students to a range of topics within environmental science. In a seminar format, students will discuss environmental problems in a deeper context and present progress reports on their thesis research. Faculty and guests will make presentations for students to discuss. Students must enroll in ENVR 6700 a minimum of twice over two semesters. Students may enroll for credit up to 4 times.

Credits: 1

Prerequisite(s): none

1. Reason(s) for creating this course: This course is part of the new ENVR graduate curriculum
2. How often will this course be offered? Once or twice per academic year
3. What are the student learning outcomes for the course (please precede each outcome with "Students will...")?
   - Students will develop a better understanding of environmental concepts related to and beyond those covered by their research.
   - Students will improve public speaking skills by making research presentations focused on current status of their research and related to concepts covered in the course.
   - Students will write 2-3 summary short papers integrating concepts covered in the course. Students will critique papers and presentations made by other students in the course.

4. What are the major content areas for the course? Environmental Studies, effective scientific communication, collaboration techniques

5. Is this course repeatable for credit, and if so, what is the maximum number of credits that can be earned? Yes/4 credits
6. If this course is intended primarily for off-campus delivery (not offered on campus), what delivery mechanism will be used? n/a
7. What is the projected maximum class size (cap)? 15
8. What qualified faculty will be available to teach this course? All graduate faculty within the Center for Environmental, Economic, Earth and Space Studies

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).  n/a

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. See attached syllabus.
ENVR 6700 Graduate Seminar

<table>
<thead>
<tr>
<th>Instructor</th>
<th>Dept.</th>
<th>Level</th>
<th>Office</th>
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<td><a href="mailto:bsea@bemidjistate.edu">bsea@bemidjistate.edu</a></td>
</tr>
</tbody>
</table>

Office Hours

TBA

Course Description
This course exposes graduate students to a range of topics within environmental science. In a seminar format, students will discuss environmental problems in a deeper context. Faculty and guests will make presentations for students to discuss.

Course Objectives – This course has been developed to provide students with exposure to a range of areas in environmental science. The course also will allow students during their research to present their research to a broader audience and to expose to students from guest environmental scientists and biologist. Specifically, students will develop a better understanding of environmental concepts related to and beyond those covered by their research. Students will make professional-level presentations focused on current status of their research related to concepts covered in the course. Students will write 2-3 summary short papers integrating concepts covered in the course. Students will critique papers and presentations made by other students in the course.

Required Reading
Course reading will be assigned for each class discussion and will be selected jointly from students and instructor.

Course Format
Seminar style led by students and instructor for one session of 50 minutes each week.

Grading & Exams
Grading will be based on class participation, leading seminar-style discussion sessions, and oral presentations and 2-3 short papers.

A: > 90%; B: 80-89.9%; C: 70-79.9%

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.
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:
Graduate: ENVR 6010

Course Title: Research in Natural Science (3 credits)

New or current courses that will universally replace this dropped course for students remaining in the old curriculum: ENVR 6500 & ENVR 6600 (new courses proposed in this revision package).

This dropped 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:

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

Non-licensure programs: Environmental Studies, Master of Science

Teacher Licensure programs:

Liberal Education:

The above “service area” programs/departments were notified of this modification on _______ (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.

______ Comments were received within one week of the notification, and are attached.

Reason(s) for dropping this course: Course is replaced by graduate project courses.
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:
Graduate: ENVR 6250

Course Title: Advanced Environmental Science (3 credits)

New or current courses that will universally replace this dropped course for students remaining in the old curriculum: None

This dropped 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:
1) go to http://www.bemidjistate.edu/academics/catalog/ and choose the most recent catalog(s),
2) click on “Areas of Study, and Course Descriptions,”
3) click on “PDF of Entire Catalog” in upper right,
4) press Ctrl F, and enter the prefix and number of the course(s) from this form.

Non-licensure programs: Environmental Studies, Master of Science

Teacher Licensure programs:

Liberal Education:

The above “service area” programs/departments were notified of this modification on ______ (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.

______ Comments were received within one week of the notification, and are attached.

Reason(s) for dropping this course: Not included in new graduate curriculum (proposed here), therefore will not be offered regularly.
BSU Curriculum Forms

Form 5

Program Modification Form

Program to be modified: Environmental Studies, Master of Science

List all proposed change(s):

Course modification:
Reduce ENVR/BIOL 6890 from 3 credits to 2 credits

Drop from required core:
ENVR 6010 Research in Natural Science (3 credits)
ENVR 6250 Advanced Environmental Science (3 credits)
ENVR 6920 Directed Group Study: Seminar (2 credits)

Add the following courses to the core
ENVR 6500 Advanced Graduate Project I (2 credits)
ENVR 6600 Advanced Graduate Project II (2 credits)
ENVR 6700 Graduate Seminar (1 credit)*

Change required thesis credits to 6 credits (currently is 2 credits)

Drop required specializations.
Add nine credits of required electives (to be selected from existing courses).

Reason(s) for the change(s):

The change is required to streamline the M.S. program to make it more desirable for current undergrads and graduate students. The removal of emphasis areas allows for more individual flexibility. Further, the M.S. option may be desirable for undergrads seeking to further their education. Under the current M.S. program, all of the 5000 level classes are cross listed with undergrad courses. Thus a BSU alum wishing to pursue a M.S. degree would have to repeat much of the same courses (albeit with greater expectations). This requirement makes BSU an undesirable option for current Environmental Studies graduates. This program modification removes this constraint and streamlines the process for our existing students.

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 ___n/a______ (date) by _______n/a__________ (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.

______ 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.)
Copy showing marked changes

Master of Science - Environmental Studies

The Master of Science program accommodates individual student needs and backgrounds and provides students with several curricular and research opportunities. The interdisciplinary curriculum focuses on the natural and social sciences as they relate to environmental problem solving. Each graduate student is required to select a specialization, complete course work requirements, and conduct a research project leading to a thesis.

Center for Environmental, Earth and Space Studies, Economics, and Sociology

The Center provides a focus for (1) applied environmental research by faculty and students and (2) the interdisciplinary academic Environmental Studies program. Applied environmental research in the Center focuses on both generic and regional problems related to pollution impacts and abatement, and natural resource utilization and protection. Special features of the Center include: laboratories and equipment devoted to ecological, chemical, microbiological, and toxicological studies. Working with the Center, students have opportunities to interact with authorities across disciplines through seminars, conferences, and cooperative research.

Preparation Requirements

Bachelor's degree from regionally accredited U.S. or approved international college or university, with course work equivalent to a major or minor in the natural or social sciences. One-page letter of intent stating the Environmental Studies Specialization you want to pursue, your academic background, your professional work experience (if any), and any additional information you believe will assist those reviewing your application. Graduate Record Exam (GRE) minimum scores of 152 in verbal reasoning, 155 in quantitative reasoning, and an Analytical score of 4.5 or higher on a 0-6 scale. For the application to be complete, the Graduate Record Exam (GRE) is required.

University Requirements

See Section IV. Policies and Procedures for degree requirements. The Graduate Record Examination General Test is required of all applicants.

Course Work Requirements

I. Required Core
ENVR 6010 Research in Natural Science (3 credits)
ENVR 6250 Advanced Environmental Science (3 credits)
ENVR 6300 Advanced Project in Literature (2 credits)
ENVR 6400 Advanced Project in Methodology (2 credits)
ENVR 6500 Advanced Graduate Project I (2 credits)
ENVR 6600 Advanced Graduate Project II (2 credits)
ENVR 6700 Graduate Seminar (1 credit)
*Must be taken two times over two semesters for 2 credits
ENVR 6890 Grants and Contracts (3 credits)
ENVR 6920 Directed Group Study: Seminar (2 credits)
ENVR 6990 Thesis (2 credits)
SCI 6350 Computer Applications in Statistics (3 credits)
ENVR 6350 Computer Applications in Statistics (3 credits)

Subtotal 20 15 Credits

II. Required Specializations—Select one Required Electives

Select, with the consent of thesis advisor, at least 9 credits of graduate level course work in Environmental Studies, Geology, or related field. Course options include:

ECON/ENVR 5040 Environmental Economics (3 credits)
ENVR 5050 Geochemistry (3 credits)
ENVR 5110 Environmental Chemistry (3 credits)
ENVR 5200 Wastewater Treatment (3 credits)
ENVR 5210 Environmental Law and Policy (3 credits)
ENVR 5220 Sampling and Analysis (4 credits)
ENVR 5230 Air Pollution Technology (4 credits)
ENVR 5240 Waste Management (4 credits)
ENVR 5260 Risk Assessment and Auditing (3 credits)
ENVR 5300 Environmental Management and Safety (3 credits)
ENVR 5400 Environmental Microbiology (3 credits)
ENVR 5500 Environmental Toxicology (4 credits)
ENVR 5600 Environmental Justice and Sustainability (3 credits)
ENVR / BIOL 5840 Wetlands Ecology (3 credits)
ENVR 6700 Graduate Seminar (1 credit)
*May be repeated two additional times for 2 additional elective credits
ENVR 6920 Directed Group Study: Seminar (2 credits)
GEOL / BIOL 5120 Soils (4 credits)
GEOL 5211 Environmental Hydrogeology (3 credits)
GEOL 5212 Hydrogeology (3 credits)
GEOL 5400 Glacial and Pleistocene Geology (3 credits)
GEOL 5500 Topics in Paleontology (3 credits)
GEOL 5600 Stratigraphy and Sedimentation (3 credits)
GEOL 5700 Environmental Geophysics (3 credits)

Subtotal 9 credits

Note: Asterisked (*) courses have prerequisites not included in the program.

A. Environmental Chemistry
   ENVR 5050 Geochemistry (3 credits)
   ENVR 5110 Environmental Chemistry (3 credits)
   *ENVR 5220 Sampling and Analysis (4 credits)
   Electives approved by Center advisor (2 credits)

B. Environmental Ecology
   BIOL 5620 Conservation Biology (3 credits)
   ENVR 5200 Wastewater Treatment (3 credits)
   ENVR 5400 Environmental Microbiology (3 credits)
   ENVR 5500 Environmental Toxicology (4 credits)
   Electives approved by Center advisor (2 credits)

C. Environmental Management
   ENVR 5200 Wastewater Treatment (3 credits)
   *ENVR 5230 Air Pollution Technology (4 credits)
   ENVR 5240 Waste Management (4 credits)
   ENVR 5300 Environmental Management and Safety (3 credits)
   Electives approved by Center advisor (1 credit)

D. Environmental Policy and Planning
   ECON/ENVR 5040 Environmental Economics (3 credits)
   ENVR 5600 Environmental Justice and Sustainability (3 credits)
   POL 5230 Environmental Politics (3 credits)
   SOC 5050 Environmental Sociology (3 credits)
   Electives approved by Center advisor (3 credits)

E. Environmental Toxicology
   ENVR 5101 Environmental Chemistry I (3 credits)
   *ENVR 5220 Sampling and Analysis (4 credits)
   *ENVR 5260 Risk Assessment and Auditing (3 credits)
   ENVR 5500 Environmental Toxicology (4 credits)
   Electives approved by Center advisor (1 credit)

F. Geohydrology
   ENVR 5050 Geochemistry (3 credits)
   *ENVR 5220 Sampling and Analysis (4 credits)
   GEOL 5211 Environmental Hydrogeology (3 credits)
   GEOL 5212 Hydrogeology (3 credits)
   Electives approved by Center advisor (2 credits)

Subtotal 15 Credits
III Thesis

**ENVR 6990 Thesis (6 credits)**

Subtotal 6 credits

**Total Semester Credits Required for Degree 35 30 Credits**

**COMPETENCY REQUIREMENT**

All graduate students in Environmental Studies are required to demonstrate competency in the computer application of statistics. This requirement is to be satisfied by the completion of the following course with a grade of B or better: **ENVR 6350 Computer Applications in Statistics, 3 credits.**

**Written Examination**

All major programs require satisfactory completion of a final written examination, which needs to be successfully completed prior to scheduling the oral examination. Please consult with your academic advisor for requirements specific to your area of study.
Clean Copy of Program

**Master of Science - Environmental Studies**

The Master of Science program accommodates individual student needs and backgrounds and provides students with several curricular and research opportunities. The interdisciplinary curriculum focuses on the natural and social sciences as they relate to environmental problem solving. Each graduate student is required to select a specialization, complete course work requirements, and conduct a research project leading to a thesis.

**Center for Environmental, Earth and Space Studies, Economics, and Sociology**

The Center provides a focus for (1) applied environmental research by faculty and students and (2) the interdisciplinary academic Environmental Studies program. Applied environmental research in the Center focuses on both generic and regional problems related to pollution impacts and abatement, and natural resource utilization and protection. Special features of the Center include: laboratories and equipment devoted to ecological, chemical, microbiological, and toxicological studies. Working with the Center, students have opportunities to interact with authorities across disciplines through seminars, conferences, and cooperative research.

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**Preparation Requirements**

Bachelor's degree from regionally accredited U.S. or approved international college or university, with course work equivalent to a major or minor in the natural or social sciences. One-page letter of intent stating the Environmental Studies research you want to pursue, your academic background, your professional work experience (if any), and any additional information you believe will assist those reviewing your application. For the application to be complete, the Graduate Record Exam (GRE) is required.

**University Requirements**

See [Section IV. Policies and Procedures](#) for degree requirements. The Graduate Record Examination General Test is required of all applicants.

**Course Work Requirements**

**I. Required Core**

<table>
<thead>
<tr>
<th>Course Code</th>
<th>Course Title</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENVR 6300</td>
<td>Advanced Project in Literature</td>
<td>2</td>
</tr>
<tr>
<td>ENVR 6400</td>
<td>Advanced Project in Methodology</td>
<td>2</td>
</tr>
</tbody>
</table>
II. Required Electives

Select, with the consent of thesis advisor, at least 9 credits of graduate level course work in Environmental Studies, Geology, or related field. Course options include:

- CEEN 5040 Environmental Economics (3 credits)
- ENVR 5050 Geochemistry (3 credits)
- ENVR 5110 Environmental Chemistry (3 credits)
- ENVR 5200 Wastewater Treatment (3 credits)
- ENVR 5210 Environmental Law and Policy (3 credits)
- ENVR 5220 Sampling and Analysis (4 credits)
- ENVR 5230 Air Pollution Technology (4 credits)
- ENVR 5240 Waste Management (4 credits)
- ENVR 5260 Risk Assessment and Auditing (3 credits)
- ENVR 5300 Environmental Management and Safety (3 credits)
- ENVR 5400 Environmental Microbiology (3 credits)
- ENVR 5500 Environmental Toxicology (4 credits)
- ENVR 5600 Environmental Justice and Sustainability (3 credits)
- ENVR / BIOL 5840 Wetlands Ecology (3 credits)
- ENVR 6700 Graduate Seminar (1 credit)

*May be repeated two additional times for 2 additional elective credits

III Thesis
**ENVR 6990** Thesis (6 credits)

**Subtotal 6 credits**

**Total Semester Credits Required for Degree 30 Credits**

**COMPETENCY REQUIREMENT**
All graduate students in Environmental Studies are required to demonstrate competency in the computer application of statistics. This requirement is to be satisfied by the completion of the following course with a grade of B or better: **ENVR 6350** Computer Applications in Statistics, 3 credits.

**Written Examination**

All major programs require satisfactory completion of a final written examination, which needs to be successfully completed prior to scheduling the oral examination. Please consult with your academic advisor for requirements specific to your area of study.
Department document from proposal

Master of Science - Environmental Studies

The Master of Science program accommodates individual student needs and backgrounds and provides students with several curricular and research opportunities. The interdisciplinary curriculum focuses on the natural and social sciences as they relate to environmental problem solving. Each graduate student is required to complete course work requirements, and conduct research leading to a thesis.

Center for Environmental, Economic, Earth and Space Studies

The Center provides a focus for (1) applied environmental research by faculty and students and (2) the interdisciplinary academic Environmental Studies program. Applied environmental research in the Center focuses on both generic and regional problems related to pollution impacts and abatement, and natural resource utilization and protection. Special features of the Center include: laboratories and equipment devoted to ecological, geological, chemical, microbiological, and toxicological studies. Working with the Center, students have opportunities to interact with authorities across disciplines through seminars, conferences, and cooperative research.

Preparation Requirements

Bachelor’s degree from regionally accredited U.S. or approved international college or university, with course work equivalent to a major or minor in the natural or social sciences. One-page letter of intent stating the field of Environmental Studies research you want to pursue, your academic background, your professional work experience (if any), and any additional information you believe will assist those reviewing your application. For the application to be complete, the Graduate Record Exam (GRE) is required.

University Requirements

See Section IV. Policies and Procedures for degree requirements. The Graduate Record Examination General Test is required of all applicants.

Course Work Requirements

I. Required Core
ENVR 6010 Research in Natural Science (3 credits)
ENVR 6250 Advanced Environmental Science (3 credits)
ENVR 6300 Advanced Project in Literature (2 credits)
ENVR 6400 Advanced Project in Methodology (2 credits)
ENVR 6500 Advanced Graduate Project I (2 credits)
ENVR 6600 Advanced Graduate Project II (2 credits)
ENVR 6700 Graduate Seminar (1 credit; must be taken a minimum of two times in two semesters for 2 credits; may be repeated up to 4 times for credit)
ENVR 6890 Grants and Contracts (2 credits)
ENVR 6920 Directed Group Study: Seminar (2 credits)
ENVR 6990 Thesis (2 credits)
ENVR 6350 Computer Applications in Statistics (3 credits)

Subtotal 15 Credits

II. Required Specializations – Select one

Note: Asterisked (*) courses have prerequisites not included in the program.

A. Environmental Chemistry
   ENVR 5050 Geochemistry (3 credits)
   ENVR 5101 Environmental Chemistry I (3 credits)
   ENVR 5102 Environmental Chemistry II (3 credits)
   *ENVR 5220 Sampling and Analysis (4 credits)
   Electives approved by Center advisor (2 credits)

B. Environmental Ecology
   BIOL 5620 Conservation Biology (3 credits)
   ENVR 5200 Wastewater Treatment (3 credits)
   ENVR 5400 Environmental Microbiology (3 credits)
   ENVR 5500 Environmental Toxicology (4 credits)
   Electives approved by Center advisor (2 credits)

C. Environmental Management
   ENVR 5200 Wastewater Treatment (3 credits)
   *ENVR 5230 Air Pollution Technology (4 credits)
   ENVR 5240 Waste Management (4 credits)
   ENVR 5300 Environmental Management and Safety (3 credits)
   Electives approved by Center advisor (1 credit)

D. Environmental Policy and Planning
   ECON/ENVR 5040 Environmental Economics (3 credits)
   ENVR 5600 Environmental Justice and Sustainability (3 credits)
   POL 5230 Environmental Politics (3 credits)
   SOC 5050 Environmental Sociology (3 credits)
   Electives approved by Center advisor (3 credits)

E. Environmental Toxicology
   ENVR 5101 Environmental Chemistry I (3 credits)
   *ENVR 5220 Sampling and Analysis (4 credits)
   *ENVR 5260 Risk Assessment and Auditing (3 credits)
   ENVR 5500 Environmental Toxicology (4 credits)
   Electives approved by Center advisor (1 credit)

F. Geohydrology
   ENVR 5050 Geochemistry (3 credits)
   *ENVR 5220 Sampling and Analysis (4 credits)
   GEOL 5211 Environmental Hydrogeology (3 credits)
II Required Electives

Select with the consent of the thesis advisor a minimum of 9 credits of graduate level course work in Environmental Studies, Geology, or related field. Course options include:

- ENVR 5040/ECON 5040 (3 credits)
- ENVR 5050 GEOCHEMISTRY (3 credits)
- ENVR 5110 ENVIRONMENTAL CHEMISTRY (3 credits)
- ENVR 5200 WASTEWATER TREATMENT (3 credits)
- ENVR 5210 ENVIRONMENTAL LAW AND POLICY (3 credits)
- ENVR 5220 SAMPLING AND ANALYSIS (4 credits)
- ENVR 5230 AIR POLLUTION TECHNOLOGY (4 credits)
- ENVR 5240 WASTE MANAGEMENT (4 credits)
- ENVR 5260 RISK ASSESSMENT AND AUDITING (3 credits)
- ENVR 5300 ENVIRONMENTAL MANAGEMENT AND SAFETY (3 credits)
- ENVR 5400 ENVIRONMENTAL MICROBIOLOGY (3 credits)
- ENVR 5500 ENVIRONMENTAL TOXICOLOGY (4 credits)
- ENVR 5600 ENVIRONMENTAL JUSTICE AND SUSTAINABILITY (3 credits)
- ENVR 5840/BIOL 5840 WETLANDS ECOLOGY (3 credits)
- ENVR 6700, Graduate seminar (1 credit). May be repeated 2 times for elective credit.
- GEOL 5120/BIOL 5120, SOILS (4 credits)
- GEOL 5211, ENVIRONMENTAL HYDROLOGY (3 credits)
- GEOL 5212, HYDROGEOLOGY (3 credits)
- GEOL 5400, GLACIAL AND PLEISTOCENE GEOLOGY (3 credits)
- GEOL 5500, TOPICS IN PALEONTOLOGY (3 credits)
- GEOL 5600, STRATIGRAPHY AND SEDIMENTATION (3 credits)
- GEOL 5700, ENVIRONMENTAL GEOPHYSICS (3 credits)

Subtotal 9 credits

III Thesis

ENVR 6990 Thesis (6 credits)

Subtotal 6 credits

Total credits toward degree, 30 credits

COMPETENCY REQUIREMENT

All graduate students in Environmental Studies are required to demonstrate competency in the
computer application of statistics. This requirement is to be satisfied by the completion of the following course with a grade of B or better: ENVR 6350 Computer Applications in Statistics, 3 credits.

**Written Examination**

All major programs require satisfactory completion of a final written examination, which needs to be successfully completed prior to scheduling the oral examination. Please consult with your academic advisor for requirements specific to your area of study.
BSU Curriculum Forms

Form 8

Signatures

Michael J Murray / Chair / 2.14.17
Proposer / Title / Date

Michael J Murray / CEEESS / 2.14.17
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).

Colleen Greer / Arts and Sciences / 2.14.17
Dean / College / Date

[Note: at this point, packet goes to Academic Affairs Office.]
Attachment 1. Response from Biology program regarding reduction for ENVR/BIOL 6890 from 3 credits to 2 credits.

Hi Tim,

Biology is fine with reducing Grants & Contracts to 2 credits. However, we will not be able to regularly teach the course in the fall. If we can't able to do so, then that would be great. Thanks.

Elizabeth Rye, Ph.D.
Dean, Biology
Biology Dept.
University of Utah
155 S. 1300 E.

From: Tim Kingery
Sent: Thursday, September 10, 2015 1:15 PM
To: Elizabeth Rye <rvey@bio.utah.edu>
Subject: Re: Grants & Contracts

Elizabeth,

I understand that our faculty members are interested in reducing the credits for grants and contracts (ENVR/BIOL 6890) from 3 credits to 2 credits in order to more flexibly offer the course annually. They feel that an annual offering of 6000 level courses will be necessary if the 6-1-2 model program is implemented that program is included in their curriculum revision.

I've attached a copy of the course modification form.

Sincerely,
Tim

Tim Kingery, Ph.D.
Professor of Geology
155 S. 1300 E.
115 @ U.

[Attached file: Course Modification Form]