07257

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Curriculum Proposal

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

College: Science, Engineering and Technology
Department: Biological Sciences
Program: Environmental Science
Type of Change Proposed: PROGRAM PROPOSALS — Change in Requirements-Course(s) Added
Title Current:
Title Proposed:
24-Char. Abbrev:

(Check all that apply):
- [x] Undergraduate
- [ ] Graduate

CIP #

Proposal # 342
Effective Date of Change:
Academic Year 06-07
(For Office Use Only)

Course Designator and Number	Number of Credits

(if applicable)

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

Current bulletin description should be retained.

Rationale or Justification for change:

Program is being updated to reflect changes in the content or emphasis of several courses, the addition of a new course (ENVR 470), and changes in the preparation needed by the students. The changes also address issues raised by assessment.

For General Education or Cultural Diversity Courses Only

General Education Course:

GE Category # **GE Category Name (Maximum of 3 Categories)**

N/A
N/A
N/A

? For Writing Intensive Courses, attach a description of the kind and quantity of writing.
? For Upper Division Courses, include a description of the respects in which it is broad and general rather than narrow and specific, and so suitable as GE.

Cultural Diversity Course:

(Please check one.)

- [ ] **Core** (At least 75% devoted to topics of race, gender, sexual orientation, age, class, and disabilities as they occur in United States Society.)
- [ ] **Related** (At least 25% devoted to the above topics or to a global perspective on topics related to African American, Asian, Hispanic, and Native American inhabitants of the United States.)

Attach paper copies of the following:
a. Syllabus or course outline.
b. Course's student learning outcomes associated with each GE competency or CD designation.
c. List of strategies to be used to assess students' achievement of each GE competency or CD designation.

For New Courses

(Check all that apply:)
- [ ] Course is an elective.
- [ ] Course is required for program
- [ ] Pre- or Co-requisites:

Instructional Type: Lecture
Grading Format: [ ] Grade [ ] P/N

Course will be offered:
- [ ] Fall Semester
- [ ] Spring Semester
- [ ] Summer Session

- [ ] Other courses are being changed or eliminated. (Explain.)
- [ ] Course content or title is similar to courses in other departments. (Attach copy of letter of agreement with other program(s) contacted. Indicate the nature of the discussions and/or resolution of differences or potential conflicts.)

Attach paper copies of the following:
a. Syllabus or course outline.
b. Course's student learning outcomes.
c. A list of resources required to offer and support this course.
d. A description of how teaching this course will affect department staffing.
e. If 400/500 level course, an explanation of added expectations of graduate students.

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Revised September 2002

Minnesota State University, Mankato

Curriculum Proposal

*****Signature Page*****

Department
X Recommended (Category/ies_____)
__ Not Recommended (Category/ies_____)

Department Chair — Date: 10/19/06

Comments:

College Curriculum Committee
X Recommended (Category/ies_____)
__ Not Recommended (Category/ies_____)

Committee Chair — Date: 11/14/06

Comments:

College Dean
✓ Recommended (Category/ies_____)
__ Not Recommended (Category/ies_____)

Dean — Date: 2/17/07

Comments:

General Education Subcommittee
__ Recommended (Category/ies_____)
__ Not Recommended (Category/ies_____)

General Education Subcommittee Chair — Date

Comments:

Undergraduate Curriculum and Academic Policy Committee
__ Recommended (Category/ies_____)
__ Not Recommended (Category/ies_____)

UCAP Faculty Chair — Date

Comments:

Faculty Association Graduate Committee
__ Recommended
__ Not Recommended

Faculty Association Graduate Chair — Date

Comments:

Graduate Dean
__ Recommended
__ Not Recommended

Graduate Dean — Date

Comments:

Academic Affairs Council
__ Recommended (Category/ies_____)
__ Not Recommended (Category/ies_____)

Assistant Vice President — Date

Comments:

Senior Vice President and Vice President for Academic Affairs
__ Approved (Category/ies_____)
__ Not Approved (Category/ies_____)

Sr. Vice President / Vice Pres. Academic Affairs — Date

Comments:

Additional materials for the Environmental Sciences Undergraduate Program proposal:

a. Student learning outcomes are in the first column of the attached assessment plan.
b. Minutes will be attached once they are approved by the faculty.
c. Program assessment plan is attached.
d. Current and proposed programs are attached.
e. No new resources will be required to offer the revised program.
f. The revised program will not affect departmental staffing.
g. No additional library resources will be needed for this revision.

OUTCOMES Environmental Science (BS)	Related College Goals	Related University Goals	Method of Assessment	Who Assessed	When Assessed	Standard of Mastery	What is Hoped To be Learned
Knowledge and Understanding Learn core content in scientific disciplines underlying environmental problems more specifically: Understand basic ecology, ecosystem dynamics: form, function, organization, population dynamics, ecological system, community relationships, etc. Understand key environmental factors associated with transport, fates and effects of pollutants in ecosystem and global change impacts on resources and ecosystem health Demonstrate an understanding of human impacts on the environment with emphasis on biodiversity, solid and hazardous waste, air and water resources, pollution and key treatment options. Acquire knowledge on current scientific theories, concepts and principles of natural and human induced environmental processes. Understand the basic principles of environmental assessment. Understand the importance of environmental law, ethics and policy. Understand basic goals of major environmental laws at the federal and state level plus the roles of environmental groups and private citizens.	1	2	Select questions on exams in specific courses	Juniors & Seniors	Spring every year, student takes test during regular 200-300 Or 400 level class time	70% of Students score 70% or better on test questions	Determine what portion of the students are achieving 70% or higher for each outcome. Is the Standard of Mastery achieved? Report the results to the Department and we will decide steps to be taken.

OUTCOMES Environmental Science (BS)	Related College Goals	Related University Goals	Method of Assessment	Who Assessed	When Assessed	Standard of Mastery	What is Hoped To be Learned
IN-DEPTH **Knowledge** Understand the purpose, scope and limitation of key methods by which environmental and related information can be gathered, processed and interpreted. Learn advance science skills including scientific measurements, statistical data analysis and hypothesis building Be trained in a specialized area of environmental science (second major)	1,2,3	2	Essay questions	Seniors in courses (need to select 400 level courses)	Same as above	Same as above	Same as above

OUTCOMES Environmental Science (BS)	Related College Goals	Related University Goals	Method of Assessment	Who Assessed	When Assessed	Standard of Mastery	What is Hoped To be Learned
SKILLS Demonstrate the ability to apply the scientific method to hypothesis building, and the design, oversight and completion of a research project with proper quality control/quality assurance. Be capable of understanding scientific and technical reports, analyze quantitative data and qualitative case studies related to environmental science and be able to draw reasonable conclusions from their analysis. **ATTITUDES** Students should be able to demonstrate the following qualities: Continue to pursue knowledge with a passion Be involved in local/regional issues without a reward (grade) Demonstrate the ability to apply skills listed above to environmental problems of local, regional, state, national or global significance and to describe their work in written and oral forms.	2	2	Test questions about experiment	Seniors In courses (need to select 400 level courses	Same as above	Same as above	Same as above

OUTCOMES Environmental Science (BS)	Related College Goals	Related University Goals	Method of Assessment	Who Assessed	When Assessed	Standard of Mastery	What is Hoped To be Learned
ATTITUDES Students should be able to demonstrate the following qualities: Continue to pursue knowledge with a passion Be involved in local/regional issues without a reward (grade)	8,9,10	2, 5	Enrollment in 499, URC participation, grant applications, volunteer in community Student survey about attitudes given after test.	All students in the program (departmental data used) Seniors in courses (need to select 400 level courses)	Same as above	Collect baseline data for several years to determine a baseline.	

Current

Environmental Sciences

College of Science, Engineering & Technology
Department of Biological Sciences
242 Trafton Science Center S • 507-389-2786
Web site: www.mnsu.edu/dept/biology

Program Coordinator: Beth Proctor, Ph.D.
507-389-5697

Environmental science is an applied science designed to study those factors that impact our environment. Major areas of environmental concern include, but are not limited to, water (surface and ground water) quality, air quality, and solid and hazardous waste issues. This program is designed to encourage students to use the resources of all the colleges of Minnesota State Mankato. The program is oriented toward developing the individual for leadership positions in industry, government, and public concern groups, as well as providing a foundation for individual community involvement as an informed citizen.

Admission to Major is granted by the department. Minimum university admission requirements are:
- a minimum of 32 earned semester credit hours.
- a minimum cumulative GPA of 2.00 (C).
Contact the department for application procedures.

ENVIRONMENTAL SCIENCE BS

There are two different ways to earn a BS degree in Environmental Sciences.

OPTION I: COMPLETION OF TWO MAJORS

Required General Education (8 credits):

BIOL	105W	General Biology I (4)
MATH	112	College Algebra (4)

Required for Major (Core, 28-32 credits):

BIOL	215	General Ecology (4)
BIOL	410	Human Ecology (3)
ENVR	440	Environmental Regulations (3)
ENVR	450	Environmental Pollution & Control (3)
ENVR	460	Analysis of Pollutants (4)
ENVR	498	Internship/Research (1-6)

Choose one of the following:

BIOL	217	Plant Science (4)
BIOL	316	Animal Diversity (3)
BIOL	412	Soil Ecology (4)

Plus two 300-400 level courses from one of the following emphases in Biology:
Aquatic Ecology, Terrestrial Ecology, Plant Sciences, Toxicology, Microbiology, or Techniques.

Note: Courses in these emphases require BIOL 105W and BIOL 106 as prerequisites.

Required for Major (Elective Option):
Elective Option A (6-8 credits, second major in a science):

1. Two 300-400 level courses from one of the following areas: Geography, Political Science, Urban and Regional Studies, Business, or Economics.
2. Electives may be taken from the 300-400 level that are compatible with Environmental Sciences Major. A maximum of 15 credits from one major can be used in the second major.

Elective Option B (8-10 credits, second major in a non-science):

1. Complete one of the following Chemistry sequences:
   CHEM 104 and CHEM 111 OR
   CHEM 201 and CHEM 202
2. Electives from the 300-400 level that are compatible with Environmental Sciences Major. A maximum of 15 credits from one major can be used in the second major.

Required Minor: None.

OPTION II: COMPLETION OF MAJOR PLUS 2 MINORS

Required for Major (Core, 28-32 credits):
See requirements under Option I.

Required for Major (Chemistry, 8-10 credits):
Choose one of the following sets to complete one year of Chemistry:
CHEM 104 and CHEM 111 OR
CHEM 201 and CHEM 202

Required (Two Minors):
Select two minors from the following: Anthropology, Business Administration, Chemistry, Community Health, Computer Science, Economics, Geography, Geology, International Business, Law Enforcement, Mass Communication, Physics, Political Science, Technical Writing, Urban & Regional Studies

ENVIRONMENTAL SCIENCE MINOR

Required for Minor (Core, 21 credits):

BIOL	215	General Ecology (4)
ENVR	101	Perspectives in Environmental Science (4)
ENVR	440	Environmental Regulations (3)
ENVR	450	Environmental Pollution & Control (3)

OPTION A: SCIENCE MAJOR

ENVR	460	Analysis of Pollutants (4)
BIOL	410	Human Ecology (3)

OPTION B: NON-SCIENCE MAJOR

Choose one set of CHEMISTRY courses from the following:
CHEM 104 and CHEM 111 OR
CHEM 201 and CHEM 202

POLICIES/INFORMATION

P/N Grading Policy. All courses leading to a major or a minor in environmental sciences must be taken for letter grades.

Refer to the College regarding required advising for students on academic probation.

GPA Policy. A minimum grade of "C" is required in all courses applied to the Environmental Sciences BS degree.

Several scholarships in the Department of Biological Sciences are available for entering freshmen and currently enrolled Minnesota State Mankato students who meet the requirements. Application deadline is March 1 of each year.

COURSE DESCRIPTIONS

ENVR 101 (4) Perspectives in Environmental Science
This course is designed to introduce students to the complex field of environmental science. Reading assignments, lectures, discussions and other class assignments will introduce students to the structure and functions of ecosystems, the concept of sustainability, issues in environmental protection with an emphasis on global commons, the interrelationships between environment, culture, government and economics and what individuals or groups can do to influence environmental policy/rules.
F, S
GE-8, 10

ENVR 440 (3) Environmental Regulations
This is a lecture course introducing students to major federal environmental laws and regulations. Discussions include the cause(s) that prompted the enactment of various environmental legislation as well as intent and implementation of the legislation. Both Federal and State of MN environmental statutes will be discussed.
F

ENVR 450 (3) Environmental Pollution & Control
This is a lecture course that introduces students to sources and controls for pollutants in air, water, and soils including hazardous waste. Chemical and biological mechanisms that are important in nature and used to control/treat various types of pollutants are emphasized. Strongly recommended that this

proposed

UNDERGRADUATE ENVIRONMENTAL SCIENCES

Recommended General Education Courses

ENVR 101 Perspectives in Environmental Science (4)

REQUIRED GENERAL EDUCATION COURSES (11-13)

BIOL 105 General Biology I (4)
MATH 112 College Algebra (4) or MATH 113 or MATH 115 or MATH 121
CHEM 106 Introduction to Chemistry (3) or CHEM 201 General Chemistry I (5)

REQUIRED SUPPORT COURSES (8)

STAT 154 Elementary Statistics (3) OR HLTH 475 Biostatistics (3)
CHEM 111 Chemistry of Life Processes (5) **OR** CHEM 202 General Chemistry II (5)

CORE COURSES (24)

ENVR 440	(3)	ENVIRONMENTAL REGULATIONS
ENVR 450	(3)	ENVIRONMENTAL POLLUTION AND CONTROL
ENVR 460	(3)	ANALYSIS OF POLLUTANTS
ENVR 470	(3)	ENVIRONMENTAL ASSESSMENT
ENVR 498	(1)	Internship **OR** ENVR 480 Research (1)
BIOL 106	(4)	General Biology II (4)
BIOL 215	(4)	General Ecology
BIOL 410	(3)	Global Change Biology

PLUS **two** courses from **one** of the following areas:

Aquatic Ecology:	Biol 402 (4) Stream Limnology; Biol 404 (4) Wetlands, Biol 432 Lake Ecology(4)
Vertebrate Ecology:	Biol 408 (4) Vertebrate Ecology; Biol 409 (4) Advanced field Biology; Biol 412 (4) Soil Ecology, Biol 436 (4) Animal Behavior; Biol 431 (4) Comparative Animal Physiology; Biol 316 (3) Animal Diversity.
Ecology	Biol 403 (3) Conservation Biology; Biol 412 (4) Soil Ecology; Biol 421 (3) Entomology ; Biol 443 (4) Plant Ecology; Biol 316 (3) Animal Diversity

Plant Science:	Biol 217 (4) Plant Science; Biol 440 (4) Horticulture; Biol 441 (4) Plant Physiology; Biol 442 (4) Flora of MN; Biol 443 (4) Plant Ecology; Biol 412 (4) Soil Ecology; Biol 445 (4) Economic Botany;
Toxicology:	Biol 460 (3) Intro to Toxicology; Biol 461 (4) Environmental Toxicology; Biol 464 (3) Methods of applied Toxicology; Biol 465 (3) Applied Toxicology Project; Biol 467 (3) Industrial Hygiene
Microbiology	Biol 270 (4) Microbiology;Biol 476 Microbial Physiology and Genetics; Biol 475 (4) Medical Microbiology; Biol 478 (4) Food and Sanitation Microbiology; Biol 420 (3) Diagnostic Parasitology

*SELECT ONE MINOR FROM THE LIST BELOW:

Chemistry, Geography, Urban & Regional Studies, Geology, Political Science, Business Administration (note lap-top computer required in business courses), Anthropology, Mass Communication, Law Enforcement, Technical Writing, Recreation, Parks and Leisure or other minors with the written approval of Environmental Science Coordinator.

*UPPER LEVEL ELECTIVES IN EACH MINOR MUST BE APPROVED IN WRITING BY THE ENVIRONMENTAL SCIENCE COORDINATOR.

SELECT (with written approval of the Environmental Science Coordinator)

Two 300-400 level courses (not in major or minor) from one of the following areas: Geography, Urban and Regional Studies; Political Science, Business (note: lap-top computer required for many business courses), Economics or Recreation, Parks and Leisure.

A Maximum of 15 credits from ENVR Core Course requirements can be applied towards another major. A Maximum of 8 credits from the ENVR Core Courses can be applied towards another minor.

07257

Marg, Gregg A

From: Proctor, Bertha
Sent: Friday, October 13, 2006 11:21 AM
To: Marg, Gregg A
Subject: FW: English 271/ENVR

From: Banschbach, John
Sent: Friday, October 13, 2006 10:37 AM
To: Proctor, Bertha
Subject: English 271

Beth—

I've spoken to Roland Nord, the director of the technical communications program. The English department agrees to provide English 271 for majors in environmental science.

John Banschbach

07257

Department of Biological Sciences
Department Meeting Minutes
October 20, 2006, 12:03 PM

Present: Lois Anderson, Mike Bentley, Bill Bessler, Brad Cook, Shannon Fisher, Geoff Goellner, Penny Knoblich, Beth Lavoie, Gregg Marg, Beth Proctor, Karen Radermacher, Christopher Ruhland, Robert Sorensen, Dan Toma, Ned Williams,

Absent: Chris Conlin, Margaret Durkee, Dave Grams, Marilyn Hart, John Krenz, Alison Mahoney (sabbatical), Brock McMillan (sabbatical), Steven Mercurio, Donovan Nielsen, Brent Pearson, Becky Pierce, Tim Secott, Dorothy Wrigley

The minutes of the October 13, 2006 meeting were approved as written.

[Unrelated portion deleted]

CURRICULUM:

Several curriculum proposals were presented. Motions were made to approve the following changes:

1) Proposal to add Biology 211 Genetics as a prerequisite to Biology 301 Evolution.

2) Proposal to add Biology 215 General Ecology as a prerequisite to Biology 436 Animal Behavior.

3) Proposal to change the title and description of Biology 402/502. The current title is Stream Limnology and the proposed title is Stream Ecology. The title needs to be changed and the course description added to the Undergraduate Bulletin and the title and course description need to be revised in the Graduate Bulletin.

There was no discussion on the above proposals. All three motions carried.

4) Proposal to change two requirements in the Ecology option. STAT 154 Statistics would be dropped (HLTH 475 Biostatistics would still be required) and ENG 271 would be changed from "recommended support" to "required support".

After much discussion on the pros and cons of dropping STAT 154, the motion carried.

5) Proposal to drop ENVR 410 and add ENVR 470 to Environmental Sciences Minor.

6) Proposal to change ENVR 600 to ENVR 570 for the Graduate Program in Environmental Sciences

7) Proposal to add CHEM 106 Introduction to Chemistry or CHEM 201 General Chemistry to the "required general education courses", add STAT 154 to the "required support courses" and add BIOL 106 General Biology II and ENVR 470 Environmental Assessment to the "required for major" (core) courses for the Undergraduate Program in Environmental Sciences.

Discussion followed each of these proposals. All three motions to approve these proposals carried.

[Unrelated portion deleted.]

The meeting was adjourned at 12:55 PM.