UNIT EFFECTIVENESS PROCESS
PHASE 1 – ASSESSMENT PLAN for STUDENT LEARNING OUTCOMES
2006-2007

Unit Name: Program in Environmental and Earth Sciences

Degree Program (For Academic Instructional Units)
Please use a separate Form B for each degree program
M.S. in Environmental and Earth Sciences

Student Competencies (Statements of knowledge, skills, attitudes, behaviors that program majors should be able to demonstrate upon completion of the degree program.)
Knowledge of scientific and engineering principles from a range of disciplines relevant to the environment. Ability to apply knowledge of science and engineering principles to analyzing and solving problems. Ability to analyze, synthesize, and summarize in writing concepts and evidence related in science and engineering literature. Ability to communicate technical information to other environmental professionals from diverse disciplinary backgrounds.

Intended Outcome 1
Graduate students will demonstrate a breadth of knowledge of scientific and engineering across multiple disciplines.

Related Student Competency (If intended outcome is derived from student competency)
Knowledge of scientific and engineering principles from a range of disciplines relevant to the environment.

Action Steps to Achieve Intended Outcome
Graduate students will take a number of elective and required core courses from five academic disciplines in which discipline-specific knowledge will be presented. Each student's major advisor and supervisory committee will guide the student through a program of coursework that assures their exposure to all aspects of environmental sciences.

Assessment Methodology
Include the following:

- *full description of the planned assessment activity*
- *the criteria for success*
- *the timetable for assessment activity*
- *responsible persons (by job title, not name) and specific duty*

Embedded questions in written exams given in selected core and elective courses will be used to assess the extent of students' knowledge of a range of scientific and engineering principles. Each question will be scored on a four point scale indicating excellent, good, fair, or poor mastery of knowledge. Success will be judged if 80% of questions are scored as displaying excellent or good mastery of knowledge.

Assessment will begin in fall 2006 and continue until spring 2007. Responsible persons are the Program Director and course instructors.The student's general knowledge of environmental sciences will be assessed by a final oral examination conducted by their Master's supervisory committee under the auspices of the program's Graduate Advisor. After completion of the examination, members of the supervisory committee will confer and decide whether the student has demonstrated sufficient knowledge of the field to (1) pass the examination, (2) require further assigned study after which they may retake the examination, or (3) have not acquired enough knowledge of the field to warrant continuation in the degree program. Success will be judged if at least 85% of students pass the examination. Assessment will begin in fall 2006 and continue until spring 2007. Responsible persons are the Program Director, Graduate Advisor, and program faculty.

Intended Outcome 2
Graduate students will demonstrate the ability to apply knowledge of science and engineering principles to analyzing and solving problems.

Related Student Competency (If intended outcome is derived from student competency)
Ability to apply knowledge of science and engineering principles to analyzing and solving problems.

Action Steps to Achieve Intended Outcome
Graduate students will take a number of elective and required core courses from five academic disciplines in which science and engineering principles will be applied to analyzing and solving environmental problems.

Assessment Methodology
Include the following:

- *full description of the planned assessment activity*
- *the criteria for success*
- *the timetable for assessment activity*
- *responsible persons (by job title, not name) and specific duty*

Embedded questions in written exams given in selected core and elective courses will be used to assess the extent of students' ability to apply scientific and engineering principles to analyzing and solving environmental problems. Each question will be scored on a four point scale indicating excellent, good, fair, or poor demonstration of analytical and problem solving capability. Success will be judged if 80% of questions are scored as displaying excellent or good capability. Assessment will begin in fall 2006 and continue until spring 2007. Responsible persons are the Program Director and course instructors.

Intended Outcome 3
Graduate students will be able to analyze, synthesize, and summarize in writing concepts and evidence related in science and engineering literature.

Related Student Competency (If intended outcome is derived from student competency)
Ability to analyze, synthesize, and summarize in writing concepts and evidence related in science and engineering literature.

Action Steps to Achieve Intended Outcome
Graduate students will be assigned to write literature-based research papers in selected elective and required core courses.

Assessment Methodology
Include the following:

- *full description of the planned assessment activity*
- *the criteria for success*
- *the timetable for assessment activity*
- *responsible persons (by job title, not name) and specific duty*

Papers written by graduate students will be scored for their demonstration of the ability to analyze, synthesize, and summarize concepts and evidence related in science and engineering literature, using a 100-point scale on a rubric developed by the program. Success will be judged if 80% of the students achieve a rubric score of greater than 80%. Assessment will begin in fall 2006 and continue until spring 2007. Responsible persons are the Program Director and course instructors.

Intended Outcome 4
Graduate students will be able to communicate technical information to other environmental professionals from diverse disciplinary backgrounds.

Related Student Competency (If intended outcome is derived from student competency)
Ability to communicate technical information to other environmental professionals from diverse disciplinary backgrounds.

Action Steps to Achieve Intended Outcome
Graduate students will be required to take two one-hour seminar courses during their program of study, during which written and oral presentations will be made to students from this and other academic programs. Presentations will be followed by discussion among seminar participants.

Assessment Methodology
Include the following:

- *full description of the planned assessment activity*
- *the criteria for success*
- *the timetable for assessment activity*
- *responsible persons (by job title, not name) and specific duty*

Presentations and discussions led by students will be assessed using a 100-point scale on a rubric developed by the program. Success will be judged if 80% of the students achieve a rubric score of greater than 80%. Assessment will begin in fall 2006 and continue until spring 2007. Responsible persons are the Program Director and course instructors.