

Plan for Assessment of Environmental Science 101 in the UG General Education Core Curriculum

Department Name: Earth& Planetary Sciences

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I. Course Number and Title: ENVS 101, Blue Planet

A. Course Goal #1: Students will learn scientific inquiry through the study of Earth systems.

B. Student Learning Outcomes (SLOs)<sup>1</sup>:

1. SLO 1: Students will be able to clearly state what is meant by an observation, hypothesis, hypothesis test, and a theory

Addresses UNM/HED Area \_III\_, Competencies: Students will be able to describe the process of scientific inquiry.

2. SLO 2: Students will be able to describe examples of questions science can answer and those that cannot be answered by science.

Addresses UNM/HED Area \_III\_, Competencies: Students will be able to describe the process of scientific inquiry;

3. SLO 3: Students will be able to construct simple hypotheses and develop possible hypothesis tests related to environmental geoscience.

Addresses UNM/HED Area \_III\_, Competencies: Students will be able to solve problems scientifically; Students will apply scientific thinking to real world problems.

4. SLO 4: Students will be able to read material presented in popular literature (e.g., Scientific American or National Geographic) and report on hypotheses presented, hypothesis tests used, and results of reported work. Students will evaluate whether results reported are scientifically based, given their level of experience with the topic.

Addresses UNM/HED Area \_III\_, Competencies: Students will describe the process of scientific inquiry; Students will communicate scientific information; Students will apply scientific thinking to real world problems.

Course Goal #2: Students will be able to explain basic diagrams, graphs, equations, and writing used in environmental geoscience.

1. SLO 1: Students will be able to evaluate rate problems in geoscience (e.g., rate at which tectonic plates separate, relative rate of seismic wave movement, rate of water flow in channels or aquifers).

Addresses UNM/HED Area \_III\_, Competencies: Students will apply quantitative analysis to scientific problems.

2. SLO 2: Students will be able to draw plate tectonic cross sections and report locations of related earthquakes and volcanoes.

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<sup>1</sup> See *Writing Measurable Learning Outcomes Faculty Workshop.pdf*, a manual.; Huba & Freed. (2000). *Learner-centered assessment on college campuses*. Boston: Allyn & Bacon. and Driscoll & Wood. (2007). *Developing outcomes-based assessment for learner-centered education: A faculty introduction*. Sterling, VA: Stylus.

Addresses UNM/HED Area \_III\_, Competencies: Students will communicate scientific information; Students will apply quantitative analysis to scientific problems.

3. SLO 3: Students will be able to construct, read, and interpret common graphs used in geoscience (e.g., hydrographs, rainfall vs. time, temperature/CO<sub>2</sub> change through time, etc.).

Addresses UNM/HED Area \_III\_, Competencies: Students will apply quantitative analysis to scientific problems.

Course Goal #3: Students will be able to briefly describe scientific issues related to resource availability and global climatic and environmental change.

1. SLO 1: Students will be able to discuss hypotheses related to global warming and describe scientific evidence for global warming.

Addresses UNM/HED Area \_III\_, Competencies: Students will be able to describe the process of scientific inquiry; Students will apply scientific thinking to real world problems.

2. SLO 2: Students will be able to explain mechanisms of climatic change (e.g., the greenhouse effect).

Addresses UNM/HED Area \_III\_, Competencies: Students will be able to communicate scientific information; Students will apply scientific thinking to real world problems.

3. SLO 3: Students will be able to define basic concepts in water resources (e.g., stream discharge, aquifer recharge/discharge, water table).

Addresses UNM/HED Area \_III\_, Competencies: Students will be able to communicate scientific information; Students will apply scientific thinking to real world problems.

4. SLO 4: Students will be able to explain the link between energy resource use and environmental impact in a scientific manner.

Addresses UNM/HED Area \_III\_, Competencies: Students will be able to communicate scientific information; Students will apply scientific thinking to real world problems.

Course Goal #4: Students will be able to briefly describe scientific issues related to resource availability and global climatic and environmental change.

1. SLO 1: Students will be able to interpret geologic, topographic, and resource maps to identify features on Earth.

Addresses UNM/HED Area \_III\_, Competencies: Students will be able to communicate scientific information.

C. How will evidence of learning be gathered?

1. What: For each SLO, identify one or more data collection points in the course. Preferably these are samples of student work already in the syllabus.

Questions are assessed within routine exams throughout the semester.

2. How: For this course, describe:

- a. Will the assessment include evidence from all sections of the course, or some subset of sections? Address the validity of any proposed sample of sections.

Assessment will include evidence from a subset of sections, representing a majority of the students enrolled in the course.

- b. Will the assessment include evidence from all students in the assessed sections or a sample? Address the validity of the proposed sample of students.

Assessment will include evidence from all students in the assessed sections, which will represent a majority of the students enrolled in the course.

- c. Will all student learning outcomes for this course be measured every time? If not, how will the complete set of SLOs for the course be subset for measurement a chunk at a time?

A subset of the SLOs for the course will be measured, but eventually, all SLOs will be evaluated within a rotation of the offerings of the course.

3. When:

- a. Is assessment of student learning outcomes already underway in this course? If not, in what term (e.g., Fall 2007) will assessment of student learning outcomes commence in this course?

Assessment of SLOs is already underway for most sections of the course, with a goal to include most/all sections of the course.

- b. With what frequency (e.g., every term, a different term each year, etc.) will assessment of student learning outcomes take place in this course?

Assessment of some/all of the SLOs will take place every semester.

- c. On what cycle will the complete set of SLOs for the course be assessed (e.g., all outcomes every term, a subset of outcomes each term with all outcomes every academic year,...)?

The goal is to assess the complete set of SLOs for most of the sections of the course, every academic year.

4. Who:

- a. Who will administer the measure or collect the student products?

Instructors of record for each section will administer the measure and collect the products.

- b. Who will review/mark the products relative to the SLO statements and established qualitative criteria?

Instructors who collect their data will evaluate the questions and rubrics.

- c. Where rubrics (or evaluative criteria) have been developed for assessing student learning for a given outcome, please enclose a copy of the rubric/qualitative criteria.

**D. What process will be used to analyze/interpret the assessment data for this course?**

1. Who will participate?

A faculty member will compile the data. The results will be reviewed by the Undergraduate Committee.

2. How will recommendations be communicated?

Recommendations will be communicated from the discussion with the whole faculty, or among those who teach this course.

3. When will interpretation and recommendations take place?

The goal will be to make recommended changes the following term.

**E. How will results of assessment in this course be used for improvement?**

1. Describe the process for consideration of the implications of assessment for change:

- a. to assessment mechanisms themselves,
  - b. to course design, and/or
  - c. to pedagogy
- ...in the interest of improving student learning.

Review of the quantitative data associated with the SLOs will be made. If the data indicate unsatisfactory achievement, this will require an evaluation of the assessment mechanism, the measure of assessment (questions asked, rubric), and potentially the pedagogy in teaching the content that was assessed. If many of the SLOs meet with unsatisfactory achievement (<70%), is this an indication of a need for a change in the course design to improve achievement?

2. Who participates in this discussion/decision making.

Primarily the instructors who teach the course, along with input from discussion of the undergraduate committee and whole faculty.

3. How will recommendations be communicated?

Recommendations will be communicated from the discussion with the whole faculty, or among those who teach this course.

4. When will this discussion/decision making take place?

Once discussed with the whole faculty, decisions will be finalized by undergraduate committee and approved by the faculty.