Annual Academic Assessment Report Cover Sheet

Assessment reports are due the 1st Wednesday after the Fall Term

Email to: assessment@unlv.edu

Program Information:

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<th>Program Assessed</th>
<th>Earth and Environmental Science BS</th>
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<tr>
<td>Department</td>
<td>Geoscience</td>
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<td>College</td>
<td>Sciences</td>
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<td>Department Chair</td>
<td>Terry Spell</td>
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<td>Assessment Coordinator</td>
<td>Brenda Buck</td>
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<td>Date Submitted</td>
<td>December 1, 2016</td>
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Contact Person for This Report

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Please attach a narrative (not to exceed 4 pages, excluding appendices) addressing the following:

- What are the student learning outcomes? Please provide a numbered list.
- Which learning outcomes were assessed?
- How were they assessed? (Programs must use at least one direct assessment of student learning.)
- Undergraduate programs should assess at least one University Undergraduate Learning Outcome (UULO) each year, which may or may not overlap with a program learning outcome.
- Graduate programs should assess at least one outcome related to one of the following graduate level requirements each year:
  - student engagement in research, scholarship, creative expression and/or appropriate high-level professional practice.
  - activities requiring originality, critical analysis and expertise.
  - the development of extensive knowledge in the field under study.
- What was learned from the assessment results?
- How did the program respond to what was learned?

Please limit the narrative portion of your report to no more than four pages. You may attach appendices with data, tables, charts, or other materials as needed. Please explain the relevant conclusions from any appendices in your narrative. Please contact the Office of Academic Assessment if you have questions or need assistance.
Learning Outcomes

1. Demonstrate the knowledge of major rock types, geologic time, evolution, and earth history events through a combination of identification techniques, exams, and laboratory exercises.
2. Demonstrate the knowledge of geological availability, exploitation, and use of nonrenewable natural resources.
3. Demonstrate the knowledge in various specializations within the field of earth science to solve appropriate research or applied problems through the successful completion of a broad range of geoscience courses.
4. Demonstrate the written and verbal communications skills required to convey how the Earth operates as a system, describe the major surficial processes that determine the characteristics of the earth’s surface, and interpret its geomorphic history.
5. Demonstrate sufficient quantitative skills, and proficiencies in computers and multimedia systems for application in the analysis and presentation of earth science concepts, and successful group work and development of teamwork skills.
6. Demonstrate the ability to recognize, formulate, employ, and interpret the scientific methodology by integrating accumulated skills and knowledge with a capstone experience for this degree comprising the successful completion of a research project as part of a regularly scheduled course, or as an independent research experience, resulting in its presentation as part of the department’s regularly scheduled Geosymposium research conference. This also includes the ability to employ critical thinking skills.

Assessment of Learning Outcomes

Learning Outcome #2

GEOL 335. Exam 2, an exam covering non-renewable resources.
EES Majors: Enrollment 21. Average B
- 90% performed satisfactorily (19/21). These students averaged grade B
- 10% performed unsatisfactorily (2/21) with grades C- or lower.

GEOL 335: Feedback from Faculty — of the 2 students performing unsatisfactorily, one went on to perform satisfactorily on these topics on the Final exam, whereas one did not. This latter student is required to take this class again.

Learning Outcome #5

GEOL 430. Scientific Poster Presentation at Annual Geosymposium Event
EES Majors: Enrollment 11
- 100% performed satisfactorily (11/11). Average grade B+
GEOL 430. Methods and Analyses of Research Project

EES Majors: Enrollment 11
100% performed satisfactorily (11/11). Average grade B-

Learning Outcome #6

GEOL 430. Scientific Poster Presentation at Annual Geosymposium Event

EES Majors: Enrollment 11
100% performed satisfactorily (11/11). Average grade B+

GEOL 495: Independent Research Project

EES Majors: Enrollment 8
100% performed satisfactorily (8/8). Average grade A

UNLV UULO Assessed: Inquiry and Critical Thinking
Graduates are able to identify problems, articulate questions, and use various forms of research and reasoning to guide the collection, analysis, and use of information related to those problems. Specific outcomes for all students include:

1. Identify problems, articulate questions or hypotheses, and determine the need for information.
2. Access and collect the needed information from appropriate primary and secondary sources.
3. Use quantitative and qualitative methods, including the ability to recognize assumptions, draw inferences, make deductions, and interpret information to analyze problems in context, and then draw conclusions.
4. Recognize the complexity of problems, and identify different perspectives from which problems and questions can be viewed.
5. Evaluate and report on conclusions, including discussing the basis for and strength of findings, and identify areas where further inquiry is needed.
6. Identify, analyze, and evaluate reasoning, and construct and defend reasonable arguments and explanations.

Learning Outcome UULO Capstone Course The UNLV UULO assessed this year is Inquiry and Critical Thinking. This is assessed through performance in 2 separate research projects (1) GEOL 430 Research project and poster presentation at the annual Geosymposium, which is also our Capstone course for EES majors, and (2) Independent Research under various faculty members’ supervision.
GEOL 430. Scientific Poster Presentation at Annual Geosymposium Event

EES Majors: Enrollment 11
100% performed satisfactorily (11/11). Average grade B+

GEOL 430. Methods and Analyses of Research Project

EES Majors: Enrollment 11
100% performed satisfactorily (11/11). Average grade B-

GEOL 495: Independent Research Project

EES Majors: Enrollment 8
100% performed satisfactorily (8/8). Average grade A

Summary & Response

Learning objective #2 (LO#2) was assessed through an exam covering renewable resources in GEOL 335. This exam covers knowledge of geological availability, exploitation, and use of nonrenewable natural resources. This class is required in this degree program and the enrollment was 21 students. The average grade was a B, and only 2 students (10%) performed unsatisfactorily. Feedback from the faculty teaching this course indicates that 1 of these 2 students went on to perform satisfactorily on these topics by the end of the course (final exam). One student still performed unsatisfactorily (C-) and is required to take this class again. The admissions committee recommends consideration of an additional indirect qualitative assessment metric for this learning outcome, to be developed before next year’s assessment report is due.

Learning objective #5 (LO#5) and Learning objective #6 (LO#6) and UNLV UULO assessed of Inquiry and Critical Thinking are assessed by examining the GEOL 430 research project, poster creation, and presentation at the Annual Geosymposium meeting. This research project covers all aspects of LO#5 and LO#6: it requires teamwork, the ability to develop a hypothesis, collect data and interpret it; quantitative skills (data collection and analyses), computer skills (GIS modeling and poster creation), and presentation/communication (oral and poster). These projects are part of the EES Major’s Capstone Course.

The Annual Geosymposium meeting is attended by local and national employers, government agencies, UNLV faculty and students, and is entirely student-produced. The student poster presentations used in this assessment, are graded by attendees of this meeting, which include both UNLV faculty and government and non-government employees in our field. The results are positive with 100% of students being successful. Despite these successes, discussions among faculty have determined some action items to increase student success. Changes that will be implemented next year include giving the students additional examples of previously-successful work to help students
better understand the scope of this research project. Feedback from the faculty instructor indicates that students get too stuck on finding a suitable topic/hypothesis to test which results in less time available to fully work on the GIS modeling and final project presentation. Action items by the assessment committee designed to alleviate this problem, include that students will be required to have preliminary GIS maps prepared at an earlier date which will allow for feedback which they can then use to improve their final project.

Lastly, the assessment committee discussed our 3yr assessment plan with recommendations for changes and improvements to be developed and incorporated into the next plan. Action items are to take these suggestions to the entire department faculty during the Spring 2017 semester for their consideration and implementation.

Graduate exit interviews indicated positive and enthusiastic interactions among faculty, staff, and students, including many extracurricular activities that the department provides for undergraduates. Students especially commented positively on Geosymposium. Approximately 40% of majors are planning to continue their education in graduate school, ~26% had already found employment, and the remaining ~34% were looking for employment.