Geological Sciences - BS
2017 - 2018 Assessment Plan

Currently status is: Report Accepted

I. ANNUAL REPORT FOR 2016 - 2017

Mission Statement

Geological sciences encompass the entire spectrum of the study of the planet Earth – the materials of which it is made, the physical forces that act on the solid Earth and the oceans, the history of planet and its life forms since its origin, and its current and future environment. The mission of the Geosciences section in the School of the Earth, Ocean and Environment of the University of South Carolina is to develop, communicate, apply and promote geological sciences through its teaching, research, and service to the university, state and nation. The overarching goal of undergraduate programs in Geoscience is to develop and communicate geological sciences through teaching and various forms of service. The program strives to provide the highest quality instruction in all of its undergraduate majors programs. We place a strong emphasis on integrating research and teaching in order to provide geology students with practical experience that will better prepare them for either graduate school or entry-level careers in the geological sciences.

Goal 1.

The Geoscience section of the School of the Earth, Ocean and Environment expects all Geological Science graduates to have knowledge of fundamental concepts and laboratory skills in the geosciences.

Curriculum

Students are taught fundamental concepts and laboratory skills in the geosciences primarily in the following courses; GEOL101 or 103 or 201 (Introductory Geology), GEOL302 (Rocks & Minerals), GEOL305 (Earth Systems Through Time), GEOL315 (Surface & Near-Surface Processes), GEOL325 (Stratigraphy & Sedimentary Basins), GEOL335 (Processes of Global Environmental Change), GEOL345 (Igneous and Metamorphic Processes) and GEOL355 (Structural Geology and Tectonics).

Learning Outcome 1.

Students will demonstrate their knowledge of fundamental concepts and laboratory skills in the geosciences by responding to written and laboratory-practical exam questions in at least one of the following courses: GEOL 302, 305, 315, 325, 335, 345 and 355.

Measures and Criteria

50% of geology students will demonstrate a level of knowledge of at least the excellence level on their *Questions on Fundamental Concepts and Laboratory Skills* assessment tests.

Methods

Questions on Fundamental Concepts and Laboratory Skills tests will be given in at least one of the specified GEOL courses. These tests will be graded on an objective basis using standardized scoring rubrics. Questions will be identified by the course instructors in consultation with the Undergraduate Director. The questions will be included in a lecture or laboratory examination for the appropriate course . These standardized questions will be included in an exam each time the specified course(s) is taught. Results of this testing will be kept on file in the office of the secretary to the Undergraduate Director.

Results

The assessment question was given in one of the required courses for the Geological Sciences major, GEOL 345 Internal Earth Structure and this data is based on information from Spring 2016. The question, which represented an assessment of the fundamental knowledge of the internal structure of the earth, was given to the class of 22 students. The question was worth 14 points and students scoring at least 8 points were considered to have significant knowledge of the subject. In 2015, the Average score = 6.1 and the mean was 6.0. 12 students (54.6%) scored at or above the mean. There were 6 students who scored at least an 8 and demonstrated excellence = 27.3%. In 2016, the results were much better than in 2015 and 100% student had a reasonable response at the proficient level, most were at the excellence level and 2 exhibited Mastery. There were no students that below the competency level.

Use of Results

The improvement in 2016 most likely reflects the changed wording of the question which states more specifically what information is being requested.

The 2016 results are more in line with historical assessment findings. The 2015 result was unexpected and discussions were held with the undergraduate committee and faculty members involved with the major courses to evaluate this result. Because this was unexpected, and the 2016 results are significantly improved, we will continue to review this issue this year and the critical assessment will be next year to see if next year's students also respond with answers indicating a higher level of knowledge in fundamental concepts.

Goal 2.

All graduates with a BS in Geological Sciences are expected to possess basic field skills in the geosciences.

Curriculum

Students are taught basic field skills primarily in GEOL500 (Field Geology). This is a six-week 'capstone' course that is taught every year in Cañon City, Colorado. Students are prepared for this course in the other GEOL courses required for the BS degree in geology such as GEOL101 or 103 or 201, 302 , 305, 315, 325, 335, 345, 355.

Learning Outcome 1.

Students will demonstrate knowledge of geological field skills by demonstrating a competency at the proficiency level on a geologic mapping exercise, preferably the Sheep Mountain project, in GEOL500.

Measures and Criteria

100% of all Geological Science students who take GEOL500 will demonstrate proficiency in the completion of the Sheep Mountain project (preferably, but other projects may be substituted) and 50% of all students who complete the Sheep Mountain project in GEOL500 will demonstrate an excellent level of knowledge.

Methods

Students will demonstrate their mastery of basic field skills through their completion of the Sheep Mountain project in GEOL500. A proficiency level of knowledge will demonstrate a minimal knowledge of basic field skills. An excellent level of knowledge will demonstrate an acceptable or appropriate knowledge of basic field skills. Note: The above levels of knowledge of fundamental concepts will be compared annually on the specific Sheep Mountain project which has been uniformly included as part of the Field Camp experience as described below: GEOL500 (Field Geology) is the main capstone experience for students earning a Geological Science degree. This course, which is offered in cooperation with the Department of Geology at the University of Georgia, operates for six weeks in May and June, in Cañon City, Colorado. Most of the work done by USC students in this course is evaluated and graded by non-USC faculty. Consequently, GEOL500 presents an ideal opportunity to obtain an independent evaluation of student learning under our curriculum (GEOL302, 305, 315, 325, 335, 345, 355) which prepares students for GEOL500. (Note: While the Sheep Mountain exercise is anticipated to be available annually, field conditions may require (on occasion) that another exercise be substituted.)

Results

Seventeen USC students were enrolled in GEOL 500 in Spring/Summer 2016. Thirteen of the 17 students achieved at least the Proficiency level of knowledge in the 2016 iteration of the Sheep Mountain mapping exercise per the Methods of assessment.

	Mastery	Excellence	Proficient	Competent	Not-Proficient
n=17	2	6	5	4	0
% student=	12	35	29	24	0

These results indicate a greater span of competency than in previous years, with more students excelling and more students at the less competent level This variability may reflect a slightly different grading scheme (the Staff vary from year to year, and with it their collective subjectivity in grading mapping exercises). While only 76% of students were detemined to be at the Proficient level or above and did not meet the goal of 100%, nearly 50% were at the excellence level (47%).

This interpretation of varilable staff grading is supported by a similar decrease in the performance of the University of Georgia (UGA) cohort, who take the same class simultaneously with GEOL 500.

Use of Results

We will use these results to develop a more consistent grading scheme and rubric from year to year, and consider other ways to normalize data assessment. We will also use these results to consider ways in which we can improve student mastery of field mapping. Over a longer period, the competency of our students has improved in this area due to changes that were recommended previously such as increased GIS competency prior to attending field camp. The undergraduate committee will continue to assess ways to enhance student's readiness for field camp and therefore, mastery of the skills required.

Goal 3.

All graduates with a BS in Golgocial Science, who made regular progress towards their degree completion, are expected to be prepared for careers or graduate studies in the geosciences.

Curriculum

Students who make regular progress towards the completion of their BS degree requirements in geological science, prepare themselves for professional careers and/or graduate studies in the geosciences following graduation.

Learning Outcome 1.

Students will demonstrate their preparation for careers or graduate studies in the geosciences.

Measures and Criteria

50% of students with Geological Sciences undergraduate degrees from EOS will attend graduate school or obtain employment in a geoscience-related career within two years from graduation.

Two years after graduation, 80% of respondents to alumni contacts or surveys will indicate a positive experience in their undergraduate studies.

Methods

Graduates will be contacted and surveyed when they graduate and at ~2 years after their graduation date by the Undergraduate office to determine (1) whether alumnus is in graduate school or (2) whether alumnus is employed in the field of earth and ocean science. If possible, the extent to which they felt prepared by their undergraduate experience in Geological Science, and the extent to which they felt satisfied by their undergraduate experience, will be inlcuded in the survey.

Data from these surveys will be maintained by the Assistant to the Undergraduate Director.

Results

This information is difficult to track in a meaningful way. We have not been successful in updating this information in a consistent manner; however, some data is available to report. Fifteen students graduated with a BS in Geological Sciences between May and December 2015 and of the students that we can track within 2 years, they are using their geology degree in their employment in environmental consulting firm, graduate school and with a state agency with at least one exception. One student anticipates using his Geolgocical Sciences degree, but has just completed his MBA degree with the Business School.

We anticipate being able employ a staff or student who can assist with better tracking of these students through social media.

Use of Results

We will attempt to develop a new poll that we will begin deploying to new graduates to capture future contact information so that polls sent in 2 years will be more successful. We will also work more closely with the alumni office to obtain relevant information.

II. FUTURE ASSESSMENT PLAN FOR 2017 - 2018

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