

Assessment Report for BGES Undergraduate Programs in GEOLOGY: 9 June, 2008

1. Goals

Geology majors will possess a broad general knowledge of the fundamental facts and principles in all of the major areas of Geology by the end of their senior year, as well as advanced knowledge in the major areas of Geology, as defined by standard textbooks.

This goal was developed by the Department: initially by the chair and associate chairs, undergraduate program directors, and the Undergraduate Committee on Curriculum & Academic Standards [UCCAS], then discussed and approved by a formal vote at a faculty meeting. Because of the relatively small number of majors (less than 20 at the time) in the program, the Department decided to use standard textbook topics as the knowledge base. No changes in the goals have been made since that time.

2. Outcomes

The Department decided to define outcome measures as *satisfactory improvement in performance on a standardized test from entry to completion of the program*. This outcome measure was adopted by the Department in the same way and at the same time as the determination of the goals.

3. Research Methods

The current testing procedure (implemented only since Fall, 2003) uses an objective exam of 65 multiple-choice questions. The questions used in the pool were selected from faculty input and then subsequently approved by faculty that teach in this area.

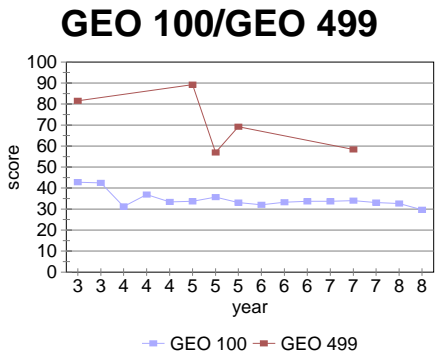
The exam is administered at two time points in a student's career: at entry, operationally defined as the beginning of the first required course for majors (GEO 100, Introductory Geology), and just before graduation. The last point is administered by requiring all majors to complete before graduation a zero-credit course (GEO 499, Exit Evaluation) that consists solely of the assessment examination.

All of these direct measures are collected as aggregate values for the entire set of students writing the exam in each semester. No attempt is made to track the performance of individual students, but this will become possible in future cohorts.

In addition to these direct outcome measures, indirect evidence sometimes comes in the course of formal exit interviews with the Geology Undergraduate Program Director [in the BGES Department, all Geology majors are advised by the same person] and the other two faculty in the program. The suggestion by the assessment review panel for us to consider *systematic* indirect measures (such as a simple student survey) now has been implemented. When students take the exit examination, they complete an anonymous survey, which was expanded this year to collect additional information on future plans; in addition, they are provided the opportunity to write any comments they wish. The survey instrument is appended to this document.

4. Findings

A set of standard statistics are calculated for each set of data and appropriate comparisons are made. In particular, overall average scores always will be compared between the entry and exit categories as new data accumulate each semester. The data so far (Fall, 2003, through the first Summer session, 2008) show an average score of 33.8% correct answers at entry (based on data



for N = 1505 students: most of these are non-majors taking the course to satisfy Gen ed requirements). These numbers are remained fairly stable over the years (Figure 1). Unfortunately, only seven students have completed the program who started after the mandatory exit evaluation was introduced (in Fall, 2003) and the exit exam scores for two of these are not available. The average score was 72%, well above those at entry.

Figure 1. Average assessment scores versus year (3=2003, etc.)

It is clear that students in the introductory course have a poor initial knowledge of geological facts and principles, whereas the five graduates have acquired a good knowledge of geology. Three of these students were recipients of the Department’s Thomas L. Lewis Memorial Award for Outstanding Graduating Geology Senior, so their scores necessarily are substantially above average! On the other hand, the vast majority of the students in the Introductory Geology are non-geo and in fact non science majors, so the sample populations are quite different for the entry and exit assessment tests. Nevertheless, the increase in knowledge as measured by the test is quite striking.

This year’s graduate did not complete the open-ended exit survey, so the following is based upon earlier reports. Only two students previously completed the exit survey, and they rated their instructors highly (“very good” or “good”), their teaching assistants “adequate,” and the laboratory courses “very good” or “good.” Suggestions for improvement include having more research experience and more extracurricular activities. In written comments, one of the students would have liked more courses directly relevant to Northeast Ohio, and in the oral exit interviews with faculty, some students expressed an interest in having more field courses and better labs. Other points mentioned included: adding chemistry as a pre-requisite for geochemistry, making sure that core courses (mineralogy, petrology, paleontology, etc) are offered, and encouraging students to join the national geological organizations. Finally, they questioned the relevance of some Gen Ed courses for Geo majors.

5. Review

Results of the data analysis are reviewed each Fall by the Undergraduate Program Director, Associate Chairs, and Chair, as well as by members of the Department's undergraduate committee (UCCAS). Any significant findings are reported to the faculty generally for discussion and action. Furthermore, all faculty receive copies of this report annually.

6. Actions

There are too few results at exit and too few majors in this program to justify any specific curricular actions for the major at this time based upon the test results. It may be worthwhile to divide the exam into broad subject areas, so that future analyses may identify specific weaknesses in the objective knowledge of graduating Geology seniors. Lack of course offerings in several major areas, forcing students to go to other colleges, is readily apparent.

Anticipated difficulties in ensuring student compliance with taking the outcome assessment exam just before graduation resulted in the creation of the Exit Evaluation course requirement for the major, approved in Spring, 2003.

Several problems with the assessment routine itself involve maintaining routine testing in entry courses and routine administration of the exam and exit survey (the exit interview with graduating seniors has a long tradition and continues to be done). The latter problem is partly linked to the departure of our long-time departmental secretary with no overlap to train her replacement and then the repetition of this event this year. Both of these problems will be addressed as part of the discussion of this report.

No additional specific actions were taken in Academic Year 2007-2008, although discussions of curricular changes and the future of the program and its service function have continued from last year. Discussion has focused on the relationship of the program to the department's environmental science program and on the service function of the program, which continues to generate significant credit hours. Possible cooperation with the University of Akron is being considered as a way to broaden course offerings for students. These issues are only tangentially related to assessment and won't be explored further here; the data show that even despite these difficulties, students gain significant knowledge.