General Education Annual Course Assessment Form

Course Number/Title: Geol 07, Earth, Time and Life
GE Area: B1, B3

Results reported for AY 2014-15 # of sections 5 (lecture), 13 (lab) # of instructors 8

Course Coordinator: Robert Miller E-mail: robert.b.miller@sjsu.edu

Department Chair: Jonathan Miller College: Science

Instructions: Each year, the department will prepare a brief (two page maximum) report that documents the assessment of the course during the year. This report will be electronically submitted to <curriculum@sjsu.edu>, by the department chair, to the Office of Undergraduate Studies, with an electronic copy to the home college by October 1 of the following academic year.

Part 1

To be completed by the course coordinator:

(1) What SLO(s) were assessed for the course during the AY?

Use the methods of science, in which quantitative, analytical reasoning techniques are used.

(2) What were the results of the assessment of this course? What were the lessons learned from the assessment?

Questions assessing student success in this SLO were given during the first and second mid-terms for the five lecture sections of Geology 7 during Fall 2014 (2 sections) and Spring 2015 (3 sections). Three major topics directly addressed these SLOs, each involving a set of questions on the midterm exams. Collectively, the results for these question sets are as follows: 1) Students use isotopic data to determine the absolute ages of rock samples. Two questions were given that required students to solve the problems using mental math (calculators were not allowed). The average score on these two questions for all five sections was 96%, showing that students had a very good grasp of the mathematical techniques utilized in determining ages of rocks. 2) Students used laws of relative dating to determine sequences of events that led to geological structures illustrated in diagrams. There were four different diagrams that students had to decipher the geological history. The average score on these four questions was 83%. This score can be increased at least a small amount if more time is spent going over examples of these diagrams in class and in the lab. The score reflects a general lack of spatial reasoning and three-dimensional thought among many students. 3) Students decipher block diagrams of faults and folds to determine the types of stresses that caused them as well as the sense of motion and tectonic implications of the structures. Seven questions addressed this topic, and the average score for this question set was 88%, a good score given the difficulty of some of the diagrams.

In the Spring 2015 laboratory sections (n=8) of Geology 7, SLO 3 was assessed using two problems:
Problem 1 (Lab 2, Station 3): “At this station, you need to calculate the density of the piece of granite (A) and the piece of gabbro (B) in grams/cm$^3$. Your TA will provide you with mass of the specimen, as well as some basic unit conversion values. Use the provided rulers and beaker of water to measure the volumes of each specimen. Then, calculate the density of each. Show all of your calculations and be sure to include UNITS!!! Note to students: this problem relates to Geology 7 GE Learning Objective 3.” Out of the 169 students who completed this problem, 128 (76%) students received full credit and an additional 33 students earned at least 2 of 3 possible points.

Problem 4 (Lab 4, Station 4): “Absolute age dating has to do with estimation of the actual ages of rock samples in years before the present date. Calculate the absolute age dates of the two samples below. You are provided with the following information: 1) the percentage of parent material remaining in the sample; 2) the half-life of the material under consideration; and 3) the chart to the right, which shows the exponential relationship between the amount of parent material remaining in a sample and the number of half-lives that have passed. Show your work (2.5 pts each; 5 pts total).” Assessment data related to this problem are available for 120 students (data were not provided to the instructor from one of the teaching assistants who graded the student work). Of these 120 students, 75 (63%) received full credit and an additional 32 students earned at least 4 of 5 possible points. A general lesson learned was that some lower division GE students continue to struggle with basic mathematical problem solving.

(3) What modifications to the course, or its assessment activities or schedule, are planned for the upcoming year? (If no modifications are planned, the course coordinator should indicate this.)

In Fall 2015, the relatively low scores on understanding of relative dating will be addressed by spending more time in lecture going over examples of diagrams illustrating different sequences of events. In the lab, the shortcomings illustrated by Problem 4 will be addressed by reminding teaching assistants for the lab sections to tell students to work carefully through their calculations, stress the importance of showing their work, and maintaining correct units as they solve analytical problems.

Part 2

To be completed by the department chair (with input from course coordinator as appropriate):

(4) Are all sections of the course still aligned with the area Goals, Student Learning Objectives (SLOs), Content, Support, and Assessment? If they are not, what actions are planned?

No actions are planned

(5) If this course is in a GE Area with a stated enrollment limit (Areas A1, A2, A3, C2, D1, R, S, V, & Z), please indicate how oral presentations will be evaluated with larger sections (Area A1), or how practice and revisions in writing will be addressed with larger sections, particularly how students are receiving thorough feedback on the writing which accounts for the minimum word count in this GE category (Areas A2, A3, C2, D1, R, S, V, & Z) and, for the writing intensive courses (A2, A3, and Z), documentation that the students are meeting the GE SLOs for writing.

Not applicable.