General Education Annual Course Assessment Form

Course Number/Title GEOL 105 GE Area R

Results reported for AY 2017-2018 # of sections 3 # of instructors 1

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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 GELO(s) were assessed for the course during the AY?

GELO 2: Students will be able to distinguish science from pseudo-science.

GELO 3: students are able to apply a scientific approach to answer questions about the earth and environment

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

GELO 2: Following an online exercise on learning outcome #2, which included a summary talk at the end of a four-hour voyage sampling and analyzing the water, fish, sediments and benthic organisms of the San Francisco Bay, students searched YouTube to identify examples of ocean science and pseudoscience involving the oceans. They then described these examples in terms of the identifying characteristics of science and pseudoscience in a 300-350 word-long essay.

105 out of 114 originally enrolled students passed the class with 9 students taking incompletes or not completing enough assignments to earn a passing grade. Out of the 105 passing students, 101 students achieved learning outcome #2 by earning 70% or higher on the content portion of the essay assignment, for an outcome #2 achievement rate of 96.2%. Two students did not submit the essay assignment that was used to assess learning outcome #2 and therefore did not achieve the learning outcome. Two other students were confused on difference between obtaining a negative result in science with a lack of valid testing in pseudoscience.

GELO 3: Over the last two weeks of the class, each student compiles and shares within their learning group, the top ten scientific questions they would study, if they were a professional research oceanographer. Students then have access to 70-80 scientific topics within their group, one of which will be refined by each student into a precise, and testable hypothesis or scientific question to study. Feedback is given to each student after submitting each of these
assignments, both by the instructor and a member of their learning group. Each student is then taken through the process of designing a realistic scientific study to address their chosen hypothesis or question, according to the guidelines of a “request for proposals” in the final exam instructions. Each student then submits a 100 word-long abstract outlining the question to be addressed, the scientific background, the proposed research project, and the significance of the proposed work, which is then reviewed by the instructor and another student in their learning group. Students then use this feedback to write a 900-1000 word-long research grant proposal describing their project, which is then submitted online to the “Don Reed Trust for Ocean Science” at the “take home” final exam. By undertaking this assignment, students participate in one of the cornerstones of scientific investigation by first identifying a topic to study, formulating what is not known about the topic into a precise, and testable, scientific question or hypothesis to study, and then designing a research project that, if carried to its conclusion, has the potential to provide a valid test of the hypothesis by acquiring verifiable evidence through experimentation or a field-based project.

Students do very well on this project with 98 of the 103 students, or 95.1% of the students who submitted the final exam achieved a “C” or better grade and therefore achieved the learning outcome. Five students did not achieve the outcome, either because their work did not present original research or contained significant errors in understanding the nature of original scientific research. Two other students did not submit the final exam.

(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.)

**GELO 2**: No major changes planned for future, except continuing to emphasize the dynamic nature of scientific research as measurements improve, with enhanced technology, and results improve, and the fact that one study builds on the body of preceding scientific work.

**GELO 3**: No major changes planned for future.

**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 (GELOs), Content, Support, and Assessment? If they are not, what actions are planned?

All sections of Geol 105 are still aligned with the GELO’s.

(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 GELOs for writing.