General Education Annual Course Assessment Form

Course Number/Title __Geology 107 Prehistoric Life_________   GE Area ________________R_________

Results reported for AY __Fall 2017/Spring 2018__ # of sections __8__ # of instructors ___2________

Course Coordinator: _______________Carlie Pietsch_____________ E-mail: ______carlie.pietsch@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

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

   Area R GELO 2- Students will be able to distinguish science from pseudo-science
   Area R GELO 3- Students will be 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?

GEOL 2 Students will be able to distinguish science from pseudo-science

Fall 2017 Buerer
   After classroom discussion of the definition of pseudoscience and pseudoscientific topics, such as crystal healing, ancient aliens hypotheses, and intelligent design, students were asked via quiz whether the old scientific theory of neptunism qualifies as a science or pseudoscience. 60/66 students determined the correct response. Upon revision, 65/66 students determined the correct response. 8 students did not submit the assignment.

Spring 2018 Buerer
   Assignments were revamped in Spring 2018 to more explicitly target pseudoscience. GELO 2 was explored through targeted quiz questions and a writing assignment.
   After classroom discussion of the definition of pseudoscience and pseudoscientific topics, such as crystal healing, ancient aliens hypotheses, and intelligent design, students were asked via quiz why intelligent design is a pseudoscience. 33/36 students determined the correct response. Upon revision, 35/36 students determined the correct response. One student did not submit the assignment.

   Writing Assignment #1 asks students to discuss whether the theory of evolution qualifies as a science or a pseudoscience. 27/36 students were able to defend the theory as a science. 4/36 identified it as a pseudoscience, with well-supported arguments. 2 students dodged the question. 1 student argued both sides. 2 students did not submit the assignment.
Approximately 207 students took Geology 107 from Mr. Petsche during the GELO assessment period. To assess GELO 2, students were given a lecture about science, pseudoscience, and scientific methodology on the first day of class. This lecture was accompanied by an open discussion in class, as well as an on-line quiz that tested their knowledge of the subject. Students were given two attempts on the quiz, and the assessment revealed that every single student understood the difference between science and pseudoscience after the second attempt. Over 90% were able to master the quiz on the first attempt.

**GELO 3: Apply a scientific approach to answer questions about the earth and environment.**

In both Buerer and Petsche’s sections students complete three hand-on fossil experiences. Students work in small groups to examine and sketch five types of preservation, culminating in identifying a set of "mystery samples." For the next two fossil activities, groups of students use their observational skills to identify key characteristics of bivalves, brachiopods, ammonoids, echinoderms, and corals, and consider their helpfulness as tools for determining ages of rocks. On an optional fourth field trip activity, students explore the beach at Capitola where they were prompted to interpret the geological history of the Purisima Formation rocks exposed along the cliffs and underfoot and work to identify fossils based on knowledge acquired in the previous three fossil activities to interpret the past environment recorded in the rock record.

**Buerer Assessment results: Fall 17:** 67/73 students successfully completed all three fossil activities. 33/73 attended and successfully completed the optional field trip activity.

**Spring 18:** 26/37 students successfully completed all three fossil activities. 15/36 attended and successfully completed the optional field trip activity.

**Petsche Assessment results:** Approximately 160/207 students received an A on the assignment, with the rest in the B range and only a handful of C-range grades. Students received ample instruction about the subject, but this was the first assignment given each semester and students perhaps struggled a little with the format and with the hand samples. Every student received an A for going on the trip, in part due to a small assignment they were given where they describe, illustrate, and interpret the cliffs. This was a guided activity.

**Buerer additional assessment approach and results:** Students critically evaluate a published scientific study in the field of physical anthropology. Students consider the application of the scientific method in their chosen study, discuss the strengths and weaknesses of the scientific method, and evaluate the implications of the study for our greater understanding of human evolution.

**Fall 17:** Based on final scores, 62/73 students mastered these concepts.

**Spring 18:** Based on final scores, 32/36 students mastered these concepts.

**Petsche additional assessment approach and results:** Students work in groups to study microfossils of marine plankton and interpret marine sediment cores to analyze and interpret sea level temperature and acidity conditions during several, well-known geological climatic events in the distant past, such as the Paleocene-Eocene-Thermal-Maximum (PETM) and the K-Pg mass extinction. Overall, students earned an average of 95%; logical conclusions could be made directly from real data sets. Two other in-class activities had students interpret and identify fossils from the Paleozoic, and Mesozoic and Cenozoic Eras, respectively. The number of student who earned an A on these assignments was 168/207. ~30 students received a B and 10 a C grade.

(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 modifications are planned for this GELO. The in class discussion, quiz assessment will continue. Instructor Petsche will be encouraged to incorporate the reflective writing assignment used in Instructor Buerer’s section to increase connectivity between the sections and enhance student exposure and reflection on GELO 2.

GELO 3: In the future, students will be encouraged during the course to prepare more carefully for the fossil identification assessment opportunity through “test your knowledge” checks during the activities leading up to assessment, in order to improve self-reflection. In addition, the fossil samples used in the assessment will be refreshed. To engage more students in the optional field trip which serves as a formative experience and an ideal setting to assess GELO3, instructors will encourage active participation as a way to solidify students’ knowledge and prepare for upcoming exams in the course.

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 107 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.