



2014-2015 CSCI EETF Assessment Year End Report, June, 2015

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[NOTE: Items A, B, C, and D are identical to your Page 2 on your Annual Report for CAPR. Please simply cut and paste from there. Item E is unique to the CSCI EETF.]

A. Program Student Learning Outcomes

Students graduating with an M.S. in Geology from Cal State East Bay will be able to:

1. attain an advanced understanding of the relationship between geologic materials and their physical and chemical properties. (Geologic Materials)
2. collect, analyze, and interpret data using advanced discipline-specific methods, techniques, and equipment. (Data & Analysis)
3. critically analyze geological and environmental issues through the evaluation of current scientific literature, and present an argument clearly and persuasively in written and oral form. (Communication)
4. conduct geologic research, including preparation of a project or thesis; the result should be of high enough quality to be presented at a professional meeting. (Research)
5. understand geologic time, evolution, Earth’s place in the Universe, and global-scale processes such as plate tectonics, earth systems interactions, and climate change. (Geologic Time)

See attached PLO-ILO alignment matrix and curriculum map showing alignment of Program Learning Outcomes and CSUEB Institutional Learning Outcomes.

B. Program Student Learning Outcome(s) Assessed

1. Geologic Materials, 4. Communication, and 5. Geologic Time.

C. Summary of Assessment Process

We evaluated student work from selected courses in the Geology MS Program 2014-2015 to assess how well Program Student Learning Outcomes were met. The assessments presented here were derived from homework, written assignments, and oral presentations. A homework assignment from GEOL 6040 was evaluated using the department's Lab Project rubric to assess PLO 1, Geologic Materials. A homework assignment from GEOL 6310 was evaluated using the Quantitative Literacy rubric to assess PLO 5, Geologic Time. In GEOL 6340, two different student assignments, one written assignment and one oral presentation, were evaluated to assess PLO 3, Communication.

D. Summary of Assessment Results

GEOL 6040 – Near Surface Geophysics – Fall 2014: Geologic Materials. Homework on Seismology. Students demonstrated proficiency in calculations involving physical properties of geologic materials. The Lab Project rubric was used to evaluate student work. Out of 15 possible, student scores ranged from 8 to 15, with an average of 12.2 and standard deviation of 2.1. All students achieved at least basic competence on the categories assessed. All students attained "accomplished" or "exemplary" rankings in three areas; organization, execution, and presentation. The two areas in which students had the most difficulty were a) quantitative skills and b) connection, synthesis, and transformation. These results indicate the importance of incorporating regular homework assignments designed to develop these skills. In the future, this course will include more assignments of this type.

GEOL 6310 Isotope Geochemistry – Winter 2015: Geologic Time. Homework involving calculations of ages of geologic materials and writing an essay comparing and contrasting different analytic methods. The Quantitative Literacy rubric was used to evaluate student work. Out of 18 possible, overall scores ranged from 4 to 13, with an average of 9.6 and standard deviation of 3.6. Six of nine students who completed the assignment displayed at least the basic level of competency in all areas of quantitative literacy; only three of nine displayed competency

at the mastery level in all areas. None displayed an exemplary level in more than one area of quantitative literacy. A thorough mastery of advanced algebra and graphing is an expected pre-requisite for the course, but some students lack the basic preparation and others have the necessary preparation but their quantitative skills are quite rusty. Possible ways to improve learning outcomes for this assignment are: 1) a pre-assignment that gives students practice with advanced algebra skills, 2) recommendations for math tutoring at SCAA for students who do not perform well on a math skills pre-test given on the first day of class, 3) an additional, optional, session where students work on problems with the instructor present. In the future, similar assessment material will be assigned since calculating the age of geologic materials using isotopic data is a key student learning outcome for this course.

GEOL6340 Tectonic Geomorphology - Spring 2015: Written Communication

Final Précis of a Journal Article. This class focused on text readings and lectures initially and later, on individual student presentations in concert with the class reading and summarizing the presented article. These were punctuated every so often by brief (~15 mins) student presentations on some parts of some chapters as well as a longer and more in-depth oral presentation (summarized below) on a suitable topic of their choice. The final assignment was a précis on that same topic.

Course average is 8.3/12, where 4/12 is ‘competent’ and 8/12 is ‘accomplished’. There was one student (#2) who had some language issues that challenged him. Otherwise there was a wide spread of results, ranging from 6-10 out of 12 total. Again, the précis form is an effective tool to address reading comprehension and writing effectiveness. And again, anecdotal evidence and post-class student comments indicate the exercise of writing précis is valuable and will likely be continued in this seminar.

GEOL6340 Tectonic Geomorphology - Spring 2015: Oral Communication

PowerPoint Presentation to Class. Students present the journal article they chose to address and wrote on for their final précis (above).

Course average is 10.6/15, where 5/15 is ‘competent’ and 10/12 is ‘accomplished’. Again there was a non-native English speaker with issues that more stemmed from poor mechanics than speech. Otherwise there was a wide spread of results, ranging from 6-12 out of 15 total. The exercise is important, especially for graduate student about to enter a workforce. We focus on a clear and succinct message, avoiding slang and informality while providing constructive critique in a supportive environment. This exercise will likely continue.

Department of Earth and Environmental Sciences
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Geology M.S. Program ILO Alignment Matrix

The table below shows which Institutional Learning Outcomes (ILOs) are addressed by each of the Program Learning Outcomes (PLOs) listed above.

	MS PLO 1 Geologic Materials	MS PLO 2 Data Analysis	MS PLO 3 Communication	MS PLO 4 Research	MS PLO 5 Geologic Time
ILO 1: Thinking & Reasoning	X	X	X	X	X
ILO 2: Communication			X	X	
ILO 3: Diversity			X		X
ILO 4: Collaboration		X	X	X	
ILO 5: Sustainability			X		X
ILO 6: Specialized Education	X	X	X	X	X

Curriculum Map for Program Student Learning Outcomes
CSU East Bay, Dept. of Earth & Environmental Sciences
Degree Program: M.S. in Geology

Field	Course	Title	Program Learning Outcomes				
			1. Geologic Materials	2. Data Analysis	3. Communication	4. Research	5. Geol. Time
GEOL	6020	Seismic Exploration	P	M			
GEOL	6040	Near Surface Geophysics	P	M			
GEOL	6310	Isotope Geochemistry	I	P	P		M
GEOL	6320	Groundwater	I	M	P		P
GEOL	6411	Engineering Geology	M	M			
GEOL	6414	Earthquake Geology	P		M		M
GEOL	6430	Tectonic Geomorphology	I		P		M
GEOL	6811	Graduate Seminar			M		
GEOL	6899	Project		P	P	M	
GEOL	6910	University Thesis		M	M	M	

Proficiency Levels: I = Introduced; P = Practiced; M = Mastered