

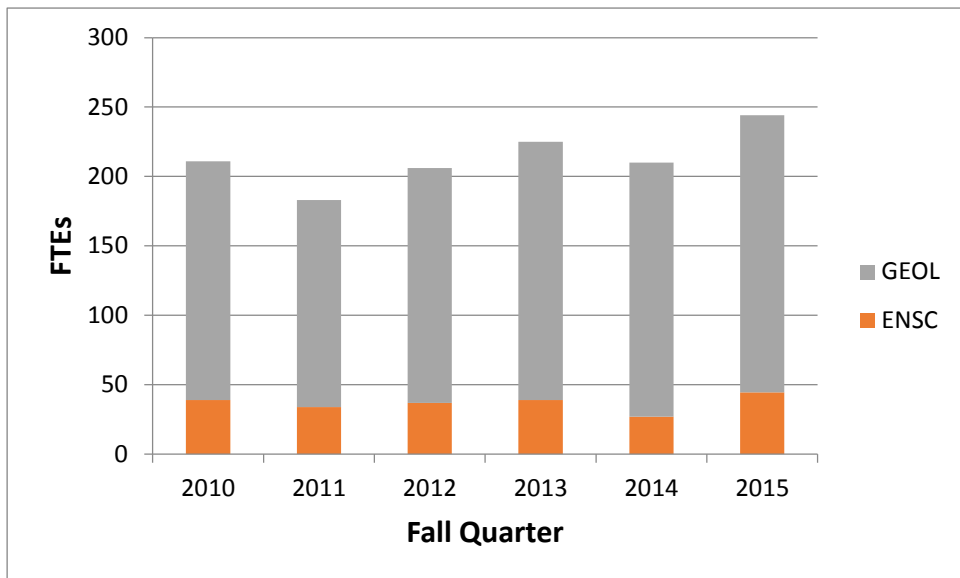
Geology BS and BA Program Annual Report 2015-16

Department of Earth and Environmental Sciences

The Department of Earth and Environmental Sciences in the College of Science offers degrees in Geology (BS, BA, MS) and Environmental Science (BS). The scope of this report is the Geology undergraduate (BS and BA) programs.

Enrollment

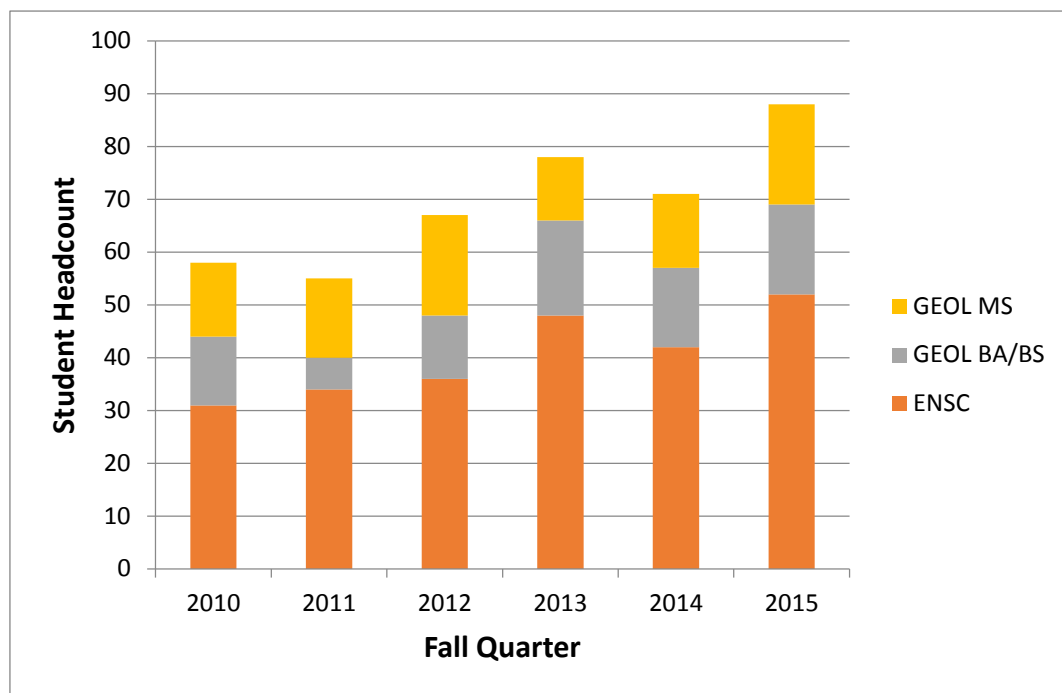
Enrollment in courses offered by the department as measured by Fall Quarter FTES was 244 (not including self-support) for 2015, which represents a modest increase above the past few years (see figure below). The majority of the department's FTEs are associated with Geology courses that are offered in the General Education (GE) Program. This includes Freshman Learning Communities (clusters) and upper-division GE. The department taught in three GE clusters during AY 2015-16, including two lower division Geology courses. The department offers a popular online class, GEOL 3401, The Oceans, which has a typical enrollment of about 160 students per quarter (four sections with 40 students each). The class is approved for upper-division Science GE credit.



FTES for courses in Geology and Environmental Science, 2010-2015.

Number of Majors

The total number of majors, or student headcount, in undergraduate (BS and BA) Geology programs is currently 17, slightly above the five-year average from 2010-2014 of 12.8. There were 9 students minoring in Geology in Fall, 2015.



Number of majors in Earth and Environmental Science degree programs, 2010-2015.

Student Advising

Student advising for the Geology B.A. and B.S. programs is provided primarily by department faculty or the department chair.

Faculty

The department has five tenure-track or tenured faculty members; one Assistant Professor, two Associate Professors and two full Professors. A tenure-track faculty member with expertise in Environmental Science started in Fall 2013, and now serves as the Environmental Science Program Coordinator. A search was carried out for an Affinity group position in 2015-16, and a new faculty member with expertise in carbon cycling will begin in Fall 2016. A search to fill a second affinity position will take place in 2016-17.

The department contracts with ten to twelve lecturers each quarter to teach a variety of courses, including introductory courses for non-majors as well as upper-division and graduate level courses for majors. Most are part-time and have been teaching in the department for several years. All have at least an MS degree, and seven have a PhD in Geology or a related field.

Staff

The department has two staff members, an Administrative Support Assistant and Instructional Support Technician. The ASA provides office support and the technician prepares and maintains materials for labs. The technician position was filled in October, 2015.

Assessment

The department implemented its assessment plan for the current academic year, 2015-2016; report is attached.

Department of Earth and Environmental Sciences
California State University, East Bay

ASSESSMENT REPORT 2014-15

GEOLOGY B.S., B.A.

29 June 2015

Department of Earth and Environmental Sciences
California State University, East Bay

Assessment Report 2014-15
Geology B.S., B.A.

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Department of Earth and Environmental Sciences
California State University, East Bay

**Program Learning Outcomes
Geology B.S., B.A.**

Students graduating with a B.S. or B.A. in Geology from Cal State East Bay will be able to:

1. identify and classify geologic materials, including minerals, rocks, and fossils, and know their material and/or biological properties or characteristics.
(Geologic Materials)
2. collect, organize, and analyze qualitative and quantitative data from both field and laboratory investigations such as lithostratigraphic and biostratigraphic correlations, geologic maps, geophysical surveys, cross-sections, soil tests, and geochemical and groundwater quality analyses. (Data Collection and Analysis)
- 3. synthesize, interpret and critically analyze geologic datasets (2D and 3D) and reports using discipline-specific methods, techniques, and equipment.
(Interpretation)**
4. critically analyze geological and environmental issues through the evaluation of scientific literature, and present their positions clearly and persuasively in written and oral form. (Communication)
- 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)**

Department of Earth and Environmental Sciences
California State University, East Bay

ILO Alignment Matrix for Geology B.S., B.A. Programs

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

| | BSBA PLO 1 Geologic Materials | BSBA PLO 2 Data Analysis | BSBA PLO 3 Interpretation | BSBA PLO 4 Communication | BSBA 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 | |
| ILO 5: Sustainability | | | | X | X |
| ILO 6: Specialized Education | X | X | X | X | X |

*diversity in the natural world, including evolutionary diversity, and ranging from microscopic to astronomic scales.

CSU East Bay, Dept. of Earth & Environmental Sciences
Geology BS, BA Program Assessment
Curriculum Map

| Course | No | Name | Program Learning Outcomes | | | | |
|--------|------|--|---------------------------|------------------|------------|-------------------|---------------|
| | | | 1. Geol. Materials | 2. Data Analysis | 3. Interp. | 4. Communi-cation | 5. Geol. Time |
| GEOL | 2101 | Physical Geology | I | | I | I | I |
| GEOL | 2102 | Earth and Life Through Time | I | P | I | | P |
| GEOL | 2600 | Introduction to GIS | | I | P | | P |
| GEOL | 3110 | Principles of Geomorphology | | P | P | | I |
| GEOL | 3400 | General Oceanography | P | P | | | I |
| GEOL | 3500 | Environmental Hydrology | | M | P | P | |
| GEOL | 3601 | Mineralogy and Optical Crystallography | P | | P | P | P |
| GEOL | 3701 | Igneous and Metamorphic Petrology | P | P | P | P | P |
| GEOL | 3801 | Sedimentology and Stratigraphy | P | P* | P | I | I |
| GEOL | 3810 | Structural Geology | P | P | I | P | P |
| GEOL | 3910 | Geologic Field Methods | P | P | M | | M |
| GEOL | 3999 | Issues in Geological Sciences | | | P | P | M |
| GEOL | 4010 | Applied Geophysics | | P | P | | |
| GEOL | 4130 | Survey of Geochemistry | P | P | I | P | M |
| GEOL | 4140 | Hazardous Waste Management | | P | P | M | I |
| GEOL | 4200 | Introduction to Planetary Science | P | P | I | P | M |
| GEOL | 4320 | Hydrogeology | P | M | P | P | |
| GEOL | 4414 | Earthquake Geology | P | | P | M | M |
| GEOL | 4600 | GIS for Earth Sciences | | M | M | | P |
| GEOL | 4800 | Seminar | | | | M | |

Proficiency Level: I = Introductory; P = Practicing; M = Mastery

CSUEB Geology Programs – LABORATORY SKILLS / COURSE PROJECT RUBRIC

Laboratory skills and course projects and assignments are where the discipline-specific skills, methods, techniques and processes that are fundamental to the Earth Sciences are acquired and utilized.

This rubric or portions of it may be applied to student **laboratory and course assignments** and **projects** in order to assess how well the Geology Program Learning Outcomes have been achieved.

| | Exemplary 3 | Accomplished 2 | Competent 1 | Insufficient Evidence 0 |
|---|---|---|--|---|
| 1. Organization | Organization is clear, consistent, observable and skillful and content is cohesive . | Organization is clear, consistent & observable . | Organization is intermittently observable . | Organization is poor or not observable . |
| 2. Presentation | Work is attractive, clean, clear, accurate , visually strong | Work is well produced, clear, mostly-accurate , visually effective | Work is adequate with minor errors , visually inert | Work is unclear, informal, minimally conveys intent and error prone |
| 3. Quantitative Skills | Applied innovative and insightful mathematical methods and techniques. Demonstrates mathematical mastery . | Applied situation-appropriate mathematical methods and techniques. Demonstrates solid math skills. | Applied basic mathematical methods. Demonstrates modest math skills. | Unable to apply basic mathematical methods and techniques. Insufficient math skills. |
| 4. Execution | Work is complete to levels above expectation and turned in early or on time | Work is strong, complete and turned in on time | Work is adequate, complete and turned in on time | Work is incomplete or not turned in on time |
| 5. Connection, Synthesis, Transformation | Synthesizes ideas or solutions into a coherent whole. Creates connections to higher-level discipline-specific concepts and practices. | Connects ideas or solutions in novel ways. Recognizes connections to higher-level discipline-specific concepts and practices. | Acknowledges existing connections among ideas or solutions. | No recognition of significance of exercise to discipline or global context. |

CSUEB Geology B.S., B.A. Program - CRITICAL THINKING VALUE RUBRIC

Creative thinking is both the capacity to combine or synthesize existing ideas, images, or expertise in original ways and the experience of thinking, reacting, and working in an imaginative way characterized by a high degree of innovation, divergent thinking, and risk taking.

This rubric may be applied to student **writing assignments** and **projects** in order to assess how well the Geology B.S., B.A. Program Learning Outcomes have been achieved.

| | Exemplary 3 | Accomplished 2 | Competent 1 | Insufficient Evidence 0 |
|---|---|--|--|--|
| 1. Competencies <i>Strategies and skills that apply to geological problem solving (i.e. discipline-specific lab & field exercises).</i> | Clearly understands purpose and role of the exercise and its importance and context within the Earth Sciences and/or related subfield. Proposes/develops new means methods to address the problem. | Strong understanding of purpose and role of the exercise and its importance and context within the Earth Sciences and/or related subfield. Uses discipline-appropriate means to address the problem. | Understanding of the purpose and role of the exercise and some insight into its importance and context within the Earth Sciences and/or related subfield. Follows instructions and understands the steps. | Poor understanding of the purpose and role of the exercise with little/no insight into its importance and context within the Earth Sciences and/or related subfield. Unable to follow instructions. |
| 2. Problem Solving | Develops a logical, consistent plan to solve problem, and recognizes consequences of solution and can articulate reason for choosing solution. | Develops a plan to solve the problem. Has some insight into consequences and some ability to articulate reason for choosing solution. | Considers and rejects less acceptable approaches to solving problem. | Only a single approach is considered and used to solve the problem. |
| 3. Embracing Contradictions | Integrates alternate, divergent, or contradictory perspectives or ideas fully. Proposes/uses multiple working hypotheses. | Incorporates alternate, divergent, or contradictory perspectives or ideas in a exploratory way. Applies multiple working hypotheses | Includes (recognizes value) alternate, divergent, or contradictory perspectives or ideas in a limited way. Has difficulty creating multiple working hypotheses | Fails to Acknowledge alternate, divergent, or contradictory perspectives or ideas. No use of multiple working hypotheses |
| 4. Innovative Thinking | Creates a novel/unique idea, method, hypothesis, format, or product. | Imagines/conceives a novel/unique idea, method, hypothesis, format, or product. | Reformulates a collection of available ideas. | No new ideas |
| 5. Connections, Synthesis, Transformation | Synthesizes ideas or solutions into a coherent whole. | Connects ideas or solutions in novel ways. | Recognizes existing connections among ideas or solutions. | No recognition of significance of exercise to discipline or global context. |

Assessment Summaries, Geology BS and BA, 2015-2016

Overview

We present two assessments from the Geology BS & BA program that evaluate two of our Program Learning Outcomes; 3) Interpretation, and 5) Geologic Time.

The assessments presented here are derived from both field and laboratory-based assignments. In geology, capstone and other milestone experiences necessarily integrate existing and collected field data, interpret those, and present results in written reports, maps, and structure sections. Through these studies, students develop an understanding of the geologic history of the specific area and larger region, thus developing a firm grasp of geologic time.

The assessment for GEOL 3910 was conducted based on results from field study of a local, earthquake-producing structure in the East Bay, Fairmont Ridge. Final products include a summary report including a map, structure section, lithologic descriptions and a brief geologic history. A compound rubric aimed xxxxxx was used for assessment of this exercise. Assessment was also conducted based on student work from GEOL 3810, where students were assigned a portion of the Hayward fault zone where they analyzed existing data, drew structure sections and developed a geologic history of the area. A modified rubric, altered to apply to the strict conventions of the xxxxxx form, was used to assess student work.

These two assessments analyze 16 separate pieces of student work derived from two courses that progress in complexity. In the 'lower-level' class (GEOL 3701), overall class results are strong, however, one student fell below the minimum competence level, likely as a function of external or family pressures. Otherwise students here are operating at or above the 'accomplished' level in these areas. The 'upper-level' class (GEOL4800) is a Senior Seminar course that for the first time merged students from both the Geology and Environmental Science programs into a California-centered class that read, critically analyzed in précis form, presented, and discussed the article of the day. Focus is on précis writing, where critical thinking is fundamental in determining the most important aspects of all arguments posed in the works we read. Students write especially abbreviated weekly précis on papers that they choose with approval, and write a final 'full-length' précis on the papers they themselves deliver to the class as an oral presentation. The strong results on this assessment are likely a function of the student's increasing comfort and familiarity with the task and form of the précis.

Course assessments are briefly summarized below. Assessments were performed using the departmental rubrics, modified as needed to take into account the requirements of the assignment.

GEOL 3701 Igneous & Metamorphic Petrology - Winter 2015

PLO 1. Geologic Materials

Rock Suite Project. Term-long comprehensive study of a suite of rocks.

This project assesses a significant portion of the Geology Core: a strong foundation in both Mineralogy (GEOL3601) and Igneous & Metamorphic Petrology (GEOL3710) is required to demonstrate competence in this task. The project serves as an early capstone to the 'hard rock' geology content that we provide, which in turn serves as a fundamental

part of a geologist's understanding of the Earth's chemical and physical make-up. It builds and tests the strength of a student's foundation of knowledge of Earth materials.

Course average of 11/15, where 5/15 indicates "competence" and 10/15 indicates "accomplishment". The large standard deviation (4.31) may be the result of a wide range of abilities. The lowest average scores are in the areas of 'Supporting Materials' and "Central Message", and is consistent with early- and mid-level students with weak writing skills and with difficulty in analysis and integration. This project provides an excellent introduction to the methods used by and skills required of a professional geologist. It incorporates all of the Geology BS/BA PLOs, and the students greatly value the experience.

GEOL 4800 Senior Seminar (Topic: Geology & Environmental Issues in California) Winter 2015

PLO 4. Communication

Final Précis of a Journal Article.

This class was a first-time attempt to offer a Senior Seminar that was accessible to both Geology and Environmental Science majors, thus providing a much needed degree requirement to a larger community, but perhaps more importantly, it promoted important cross-discipline dialogue that we recognize as being fundamental to solving many of the existing and impending environmental challenges that we now face. Students presented both oral presentations and précis (assessed here) on a subject of their choice. Topics ranged from volcanic hazards and desert species.

Course average is 8.9/12, where 4/15 is 'competent' and 8/15 is 'accomplished'. With the exception of 1 student (#4) who barely met the competence threshold (4/12), the results are strong. This was the ultimate in a series of précis, and as such the strong results speak to a familiarity with the requirements of the précis form. Anecdotal evidence and post-class student comments indicate the exercise of writing précis is valuable and will likely be continued in this seminar.

CSUEB Geology BA/BS. Program - GEOLOGIC MATERIALS –Lab Project Rubric

APPLIED TO: GEOL3701 - Igneous & Metamorphic Petrology, Winter 2015: Rock Suite Project

8 students evaluated

Class total average: 11.0 out of 15, (5 is meeting PLO), class total standard deviation: 4.31

| Student | Organization | Language | Delivery | Supporting Materials | Central Message | Total |
|---------------------------|---------------------|-----------------|-----------------|-----------------------------|------------------------|--------------|
| 1 | 1 | 1 | 0 | 0 | 0 | 2 |
| 2 | 3 | 3 | 3 | 3 | 3 | 15 |
| 3 | 3 | 3 | 3 | 2 | 2 | 13 |
| 4 | 2 | 2 | 3 | 2 | 2 | 11 |
| 5 | 3 | 3 | 3 | 3 | 3 | 15 |
| 6 | 3 | 3 | 3 | 2 | 2 | 13 |
| 7 | 2 | 2 | 2 | 1 | 1 | 8 |
| 8 | 2 | 2 | 3 | 2 | 2 | 11 |
| Class average | 2.4 | 2.4 | 2.5 | 1.9 | 1.9 | 11.0 |
| Standard deviation | 0.74 | 0.74 | 1.07 | 0.99 | 0.99 | 4.31 |

CSUEB Geology B.S. Program - CRITICAL THINKING & WRITING RUBRIC - *Precis Form*

APPLIED TO: GEOL4800 - Senior Seminar, Winter 2015: Final Precis

8 students evaluated

Class total average: 8.9 out of 12, (4 is meeting PLO), class total standard deviation: 1.89

| Student | Context & Purpose | Disciplinary Conventions | Syntax and Mechanics | Explanation of Issues | Total |
|---------------------------|------------------------------|---------------------------------|-----------------------------|------------------------------|--------------|
| 1 | 3 | 2 | 2 | 2 | 9 |
| 2 | 3 | 2 | 3 | 3 | 11 |
| 3 | 2 | 2 | 2 | 2 | 8 |
| 4 | 1 | 1 | 2 | 1 | 5 |
| 5 | 2 | 2 | 2 | 3 | 9 |
| 6 | 2 | 2 | 2 | 3 | 9 |
| 7 | 2 | 3 | 3 | 3 | 11 |
| 8 | 3 | 1 | 2 | 3 | 9 |
| Class average | 2.3 | 1.9 | 2.3 | 2.5 | 8.9 |
| Standard deviation | 0.71 | 0.64 | 0.46 | 0.76 | 1.89 |

GEOL 3701 Igneous and Metamorphic Petrology
Instructions and Guidelines for Rock Suite Project

SYNOPSIS: You will carry out a petrological research project for the rock suite of your choice from our outstanding collection. Then, similar to Mineralogy class last quarter, you will create and submit a manuscript suitable for publication in a petrological journal. However, this quarter, your manuscript will be based upon your *own* research, data collection, observations, discussion-synthesis, and conclusions. The rock suite project will be worth 20% of your overall course grade; do not take the project lightly! I recommend that you begin early in the quarter, as significant out-of-class lab time will be required.

TOPIC:

Choose a rock suite from our extensive collection. I suggest that you first look at the rock suites to learn which are available, then do some research on localities of interest before making your choice. I can help you decide if you want, just ask!

RESEARCH:

Your paper should include the general geology of your samples (geologic setting, location, previous work by others, etc.). The bulk of research, however, will be complete hand sample and thin section descriptions, following the same procedures as used in the class lab exercises. Collect data systematically - prepare tables and figures as appropriate. Labeled photographs, photomicrographs, and sketches are an excellent way to convey information. When you have completed the research, integrate what you observe about your samples with the bigger regional geologic picture. This is the quantum leap - you must synthesize your observations to come up with a petrogenesis for your rock suite that is supported by your observations. This requires a lot of thought.

MANUSCRIPT FORMAT:

Following examples from the journal *Geochemica, Cosmochemica Acta* (posted on Blackboard).

Organize your paper as follows:

Title

Abstract: 200 to 300 words; what did **you** do, how did **you** do it, what did **you** find out

Introduction – Geologic History – Setting etc. (you will have to research this...)

Writing a Précis

As Senior-level students you are ideally expected to do many critical readings, to assess arguments, hypotheses or models, and then to present an informed argument of an article and to reproduce the logical development of the argument in as cogent a form as possible *in your own words*. In order to demonstrate that you have assimilated the central argument and proof of another scholar's critical interpretation, you must be able to compose a *precis* of an argument.

A summary or a précis is NOT a personal interpretation of a work or an expression of your opinion of the idea (you will never use the first-person I in a précis); it is, rather, *an exact replica in miniature of the work, often reduced to one-quarter to one-fifth of its size, in which you express the complete argument!*

What actually happens when you write a précis? First, *you must understand the complete work so that you can abstract the central argument and express it cogently and completely*. Next, you must develop the argument exactly as the writer has presented it AND reduce the work by 75-80% of its original size.

The key word here is *assimilation*. When you read the material, it is probable that you will understand only those parts that have associations within your own experience. Don't get bogged down by mathematics if things are not initially clear: look at the terms and their arrangement – try to recognize fundamental relationships and try to verify them with your reading of the text.

How you actually go about writing a précis depends largely on your ability to restate the writer's central ideas after you have assimilated them in your own mind.

Steps to writing an effective précis:

1. Read the article many times most carefully.
2. Write a précis of the article in which you state the entire argument and also to present the logical progression (the development) of the argument.
3. Reduce the article to around one-fifth to one-quarter of its original length and omit nothing from the essential argument. This is, in reality, the key to the whole enterprise!
4. Type the précis and begin with your abstraction of the central, informing idea of the article. Having understood and written the central idea, present the essential argument(s) in as cogent manner as possible.
5. Here is a central rule: Do not copy a single sentence from the article! You may use key words and phrases only when you are expressing ideas which are

technically precise or when you feel comfortable using the writer's own words, i.e., you understand exactly he or she means, and there is really no better way to express the concept.

Finally, in order to complete this assignment, you will have to read the work most carefully, ask questions about the work repeatedly, and reach into your own geologic background so that you can best shape the writer's concepts!

These kinds of assignments are not easy! When you have completed it well, you will likely never forget the argument, the examples, and the development of the article. More than likely you will also be learning that, when you write research papers and other critical papers, your ability to write the precis is central to the basics of analysis, synthesis, comparison, and other key, higher order thinking skills absolutely required for your success in college and in the profession or career you have chosen when you graduate.

Department of Earth and Environmental Sciences, CSCI



ASSESSMENT PLAN: B.S., B.A. in Geology

Updated: Winter 2015, by Mitchell Craig and Luther Strayer

PROGRAM MISSION

[CSUEB Missions, Commitments, and ILOs, 2012](#)

CSUEB Geology BS and BA Program Description

The undergraduate degree programs consist of required courses plus electives designed to meet the needs of students with objectives ranging from employment at the Bachelor's degree level, through preparation for a secondary school teaching credential, to graduate study in Geology. A B.S. major in Geology is the primary, professional program in Geology, and serves as preparation for employment in the field, usually on a technical level; those wishing to do independent geological work should plan on graduate study. The B.A. degree major is designed for persons who do not necessarily plan to become professional geologists or to go on to graduate work.

PROGRAM STUDENT LEARNING OUTCOMES (PLOs)

Students graduating with a B.S. or B.A. in Geology from Cal State East Bay will be able to:

| | |
|--|--|
| <i>PLO 1</i> <i>ILO 1,6</i> | Identify and classify geologic materials, including minerals, rocks, and fossils, and know their material and/or biological properties or characteristics. <i>(Geologic Materials)</i> |
| <i>PLO 2</i> <i>ILO 1,4,6</i> | Collect, organize, and analyze qualitative and quantitative data from both field and laboratory investigations such as lithostratigraphic and biostratigraphic correlations, geologic maps, geophysical surveys, cross-sections, soil tests, and geochemical and groundwater quality analyses. <i>(Data Collection and Analysis)</i> |
| <i>PLO 3</i> <i>ILO 1,2,6</i> | Synthesize, interpret and critically analyze geologic datasets (2D and 3D) and reports using discipline-specific methods, techniques, and equipment. <i>(Interpretation)</i> |
| <i>PLO 4</i> <i>ILO 1,2,3,4,5,6</i> | Critically analyze geological and environmental issues through the evaluation of scientific literature, and present their positions clearly and persuasively in written and oral form. <i>(Communication)</i> |
| <i>PLO 5</i> <i>ILO 1,3,5,6</i> | Understand geologic time, evolution, Earth's place in the Universe, and global-scale processes such as plate tectonics, earth systems interactions, and climate change. <i>(Geologic Time)</i> |

Year 1: 2013-2014

| | |
|------------------------------------|---|
| 1. Which PLO(s) to assess | PLO2 (<i>Data Collection and Analysis</i>), PLO4 (<i>Communication</i>) |
| 2. Assessment indicators | Course assignments and projects, precis & oral presentations of topical journal articles in the field. Department rubrics will be used. |
| 3. Sample (courses/# of students) | GEOL 3701, GEOL 3801, GEOL 3810, GEOL 3910. |
| 4. Time (which quarter(s)) | Winter 2014, Spring 2014 |
| 5. Responsible person(s) | Luther Strayer, affiliated faculty. |
| 6. Ways of reporting (how, to who) | Indicators from individual courses are submitted by faculty to the Chair. The results are compiled and analyzed. A summary report is distributed to the faculty and included within the department's annual program report. |
| 7. Ways of closing the loop | Areas of improvement are discussed at faculty meetings and used to make improvements and revisions to courses. |

Year 2: 2014-2015

| | |
|------------------------------------|---|
| 1. Which PLO(s) to assess | PLO1 (<i>Geologic Materials</i>), PLO 4 (<i>Communication</i>) |
| 2. Assessment indicators | Course assignments and projects, precis & oral presentations of topical journal articles in the field. Department rubrics will be used. |
| 3. Sample (courses/# of students) | GEOL 2101, GEOL 3601, GEOL 3701, GEOL 4800. |
| 4. Time (which quarter(s)) | Fall 2014, Winter 2015, Spring 2015 |
| 5. Responsible person(s) | Luther Strayer, affiliated faculty. |
| 6. Ways of reporting (how, to who) | Reports are submitted first to the Chair and then to the entire faculty for comment & discussion. An end-of-year meeting will be devoted to evaluating assessment results and "closing the loop." |
| 7. Ways of closing the loop | Areas of improvement are discussed at faculty meetings and used to make improvements and revisions to courses. |

Year 3: 2015-2016

| | |
|------------------------------------|---|
| 1. Which PLO(s) to assess | PLO 3 (<i>Interpretation</i>), PLO 5 (<i>Geologic Time</i>) |
| 2. Assessment indicators | Course assignments and projects, precis & oral presentations of topical journal articles in the field. Department rubrics will be used. |
| 3. Sample (courses/# of students) | GEOL 3801, GEOL 3910, GEOL 2102, GEOL 3810 |
| 4. Time (which quarter(s)) | Winter 2016, Spring 2016 |
| 5. Responsible person(s) | Luther Strayer, affiliated faculty. |
| 6. Ways of reporting (how, to who) | Reports first to the Chair and then to the entire faculty for comment & discussion. An end-of-year meeting will be devoted to evaluating assessment results and "closing the loop." |
| 7. Ways of closing the loop | Disciplinary knowledge assessment will aid with program revision concurrent with quarter-to-semester conversion. |

Year 4: 2016-2017

| | |
|------------------------------------|---|
| 1. Which PLO(s) to assess | PLO 1 (<i>Geologic Materials</i>), PLO 5 (<i>Geologic Time</i>) |
| 2. Assessment indicators | Course assignments and projects, precis & oral presentations of topical journal articles in the field. Department rubrics will be used. |
| 3. Sample (courses/# of students) | GEOL 2101, GEOL 2102, GEOL 3701, GEOL 3801, GEOL 3810, GEOL 4800. |
| 4. Time (which quarter(s)) | Winter 2017, Spring 2017 |
| 5. Responsible person(s) | Luther Strayer, Mitchell Craig, affiliated faculty. |
| 6. Ways of reporting (how, to who) | Reports first to the Chair and then to the entire faculty for comment & discussion. An end-of-year meeting will be devoted to evaluating assessment results and "closing the loop." |
| 7. Ways of closing the loop | Assess progress made since 2014-2015, adjust strategies. Revise program requirements concurrently with quarter-to-semester conversion. |

Year 5: 2017-2018

| | |
|------------------------------------|---|
| 1. Which PLO(s) to assess | PLO 3 (<i>Interpretation</i>), PLO 2 (<i>Data & Analysis</i>) |
| 2. Assessment indicators | Course assignments and projects, with department rubrics. |
| 3. Sample (courses/# of students) | GEOL 3801, GEOL 3810, GEOL 3910, GEOL 4010. |
| 4. Time (which quarter(s)) | Fall 2017, Winter 2018, Spring 2018. |
| 5. Responsible person(s) | Luther Strayer, Mitchell Craig, affiliated faculty. |
| 6. Ways of reporting (how, to who) | Reports first to the Chair and then to the entire faculty for comment & discussion. An end-of-year meeting will be devoted to evaluating assessment results and "closing the loop." |
| 7. Ways of closing the loop | Assess progress made since 2016-17, adjust strategies. |