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## Instructional Program Review

Program Name: **Geologic Sciences**

Program Contact: **Hand, Linda**

Academic Year: **2013-2014**

Status: **Submitted**

### 1. Description of Program

Provide a brief description of the program and how it supports the college's [College Mission and Diversity Statements](#), [Institutional Priorities, 2008-2013](#), [5 in 5 College Strategies, Spring 2011](#), and other [Institutional Program Planning](#) as appropriate.

Geology, paleontology and oceanography are all small departments within the geological sciences program, each primarily offering one lecture course (Geol 100, Paln 110 and Ocen 100) and geology and paleontology offering one lab course (Geol 101 and Paln 111). All courses support the college mission of preparing students for transfer since all are CSU/UC transferable and fulfill GE requirements in science. The program addresses institutional priorities 1.2, 1.4, 2.3, 2.4, 3.1, and 4.5. Four of the five courses are required for the AS in Geological Sciences and the AS-T in Geology. The program addresses 2 of the overarching issues that are important for achieving the "5 in 5":

1) the appropriate use of technology, delivery modes/methods through extensive use of WebAccess, powerpoint, video, computer animations, online quizzes and interactive 3-D spatial visualization aids

2) and a focus on student engagement to enhance student success through classroom demonstrations, hands-on activities, clicker questions, peer learning, computerized games, paleontology playing cards, role-playing, team competitions, prizes and field trips.

### 2. Student Learning and Program Data

#### A. Discuss Student Learning Outcomes Assessment

Reflect on recent SLO assessment results for courses and degrees and certificates offered by the program. Identify trends and discuss areas in need of improvement.

One SLO each for Geol 100, Geol 101, Ocen 100 and Paln 100 was assessed. Each assessment yielded results similar to the prior assessment with the number of students deemed successful ranging from 82-98%. The trend of slightly lower success rates on quantitative skills persisted as expected. The faculty deem this trend as acceptable since the levels of math competency possessed by students in classes without math prerequisites varies considerably. The 98% success rate for a graphical interpretation SLO in Ocen 100 seemed inconsistent with the instructor's observations, so it was recommended that the assessment tool be changed. No areas in need of improvement were identified.

#### B. Student Success Indicators

1. Review [Student Success and Core Program Indicators](#) and discuss any differences in student success indicators across demographic variables. Also refer to the [College Index](#) and other relevant sections of the [Educational Master Plan: Update, 2012](#), e.g., Student Outcomes and Student Outcomes: Transfer. Basic Skills programs should also refer to [ARCC](#) data.

The student success rates in the geological sciences (72.1%) exceeded both the division and college rates this year. This indicator has improved over the prior rates of 62.2% and 67.7% for 2010-11 and 2011-12 respectively. Retention rates were also above the college and division rates. Demographic variables were similar to those of the college and division with respect to highest and lowest success rates by ethnicity, but 4 of the categories had very low enrollments (0-9) and may not be statistically meaningful. Success rates by gender are very similar to the division and college rates with females succeeding slightly more often than males. The demographics based on age differed most from those of the college due to the small enrollments (0-6) in 5 of the age categories. The lowest success rate of 47.1% for the 25-29 age bracket would be cause for concern if it were not based on only 17 students and preceded by last year's success rate of 74.3% based on 35 students.

Information from student surveys indicates that many of the students in all 3 programs are not striving to earn a C since they can fulfill a CSU general education transfer requirement with a D. The student success data is based on earning a C or better, and therefore differs from the students' perception of success.

2. Discuss any differences in student success indicators across modes of delivery (on-campus versus distance education). Refer to [Delivery Mode Course Comparison](#).

Not applicable

C. Program Efficiency Indicators. Do we deliver programs efficiently given our resources?

Summarize trends in program efficiency as indicated in the [Student Success and Core Program Indicators](#) (LOAD, Full-time and Part-time FTEF, etc.)

The LOAD numbers have decreased substantially over the past few years but this years LOAD (586.5) still remains above the averages for both the Math/Science Division (529.9) and the college (532.5) as well as the State's productivity target (525). The decrease in LOAD was attributable primarily to the discontinuation of TBA hours in the two larger classes, Geol 100 and Ocen 100. Also, the number of sections of Paln 110 and Paln 111, both smaller classes, has increased from 2 in 2010-11 to 4 in 2012-13, while the number of sections of Geol 100 has decreased from 4 to 3. We continue to adjust the number of Paln lecture and lab section offerings in an attempt to find the optimal combination that will provide enough eligible students for the lab to fill every spring. Since the Paln lab is a major requirement for the AS and AS-T degrees, and the number of geology majors is increasing, we would like to offer it at least once a year.

One full-time faculty member currently teaches all of the fall and spring sections in geology, paleontology and oceanography.

The summer adjunct FTEF increased last year from 0.2 to 0.36 as we added an oceanography lab offering to the usual lecture offering. Enrollment in the lab was low, so there are no plans to offer the lab again in the near future. The oceanography lab will probably be banked in the near future.

### 3. Career Technical Education

D. Additional Career Technical Education Data - CTE programs only. (This information is required by California Ed. Code 78016.)

1. Review the program's [Gainful Employment Disclosure Data](#), [External Community](#), and other institutional research or labor market data as applicable. Explain how the program meets a documented labor market demand without unnecessary duplication of other training programs in the area. Summarize student outcomes in terms of degrees, certificates, and employment. Identify areas of accomplishment and areas of concern.

2. Review and update the program's Advisory Committee information. Provide the date of most recent advisory committee meeting.

#### 4. Additional Factors

Discuss additional factors as applicable that impact the program, including changes in student populations, state-wide initiatives, transfer requirements, advisory committee recommendations, legal mandates, workforce development and employment opportunities, community needs. See [Institutional Research](#) as needed.

Faculty have noticed an increase in geology majors over the last few years.

The new AS-T in geology could possibly create more demand for the geology and paleontology courses, but a dramatic increase is not expected.

According to the U.S. Department of Labor's Occupational Outlook Handbook, "employment of geoscientists is projected to grow 16 percent from 2012 to 2022, faster than the average for all occupations. The need for energy, environmental protection, and responsible land and resource management is projected to spur demand for geoscientists in the future." The employment outlook for geological or petroleum technicians is also projected to grow faster than average at 15 percent over the next decade.

Changes in state laws concerning the collection of fossils on public lands and loss of access to previously used public lands has resulted in the discontinuation of the fossil-collecting field trip in paleontology laboratory/field studies course.

#### 5. Planning

##### A. Results of Program Plans and Actions

Describe results, including measurable outcomes, from plans and actions in recent program reviews.

In Paln 110, it was decided that the infrequent use of iClickers didn't justify the additional cost to the students (especially since the course requires an expensive textbook) so their use was discontinued. Subsequently the department identified and purchased a different classroom response system that allows the students to use any clicker because their answers are linked to their PIN instead of a specific clicker. The occasional use of clickers in Paln 110 has therefore been allowed to continue with no cost to the students. The distribution and collection is manageable in a class of 30, but would be problematic in a larger class. Unfortunately, the iRespond system is glitchier and not as easy to use as the iClicker system, so smooth, efficient incorporation of clicker questions in Paln 110 has not yet been accomplished and remains a work in progress.

The remaining requirements for the AS-T degree in geology were completed, including the necessary course outline updates and SLO modifications. Removal of the TBA's from Paln 110 effective fall 2013 concluded the task of removing TBA's from all geological sciences courses.

Although 4 SLO's were assessed in fall 2013, no updates were entered in TracDat as planned. The faculty need for a refresher lesson on TracDat.

New physical models were created by faculty to help the geology students visualize geologic structures in three dimensions, one of their most challenging tasks.

After consulting with ITS, the instructor's laptop computer was re-imaged during the winter break and some applications were not reloaded, solving some (but not all) of the problems that had been experienced in the prior semester, making replacement of the laptop less urgent.

##### B. Program Vision

What is the program's *vision* for sustaining and improving student learning and success over the next three years? Make connections to the [College Mission and Diversity Statements](#), [Institutional Priorities, 2008-2013](#), and other [Institutional Program Planning](#) as appropriate. Address discussion in the Student Learning and Program Data section: SLO assessment results and trends in student success indicators.

**[Note:** Specific plans to be implemented in the next year should be entered in C of the Planning section.

CTE programs must address changes in the context of completion and employment rates, anticipated labor demand, and any overlap with similar programs in the area as noted in D1 and D2 of the Career Technical Education section.]

The program's vision for sustaining and improving student learning and success during the next three years includes:

- modifying some SLOs
- updating course outlines as necessary
- assessing some SLOs to improve student success
- improving lecture delivery, sample collections, clicker applications, webaccess materials and in-class lecture and lab exercises to promote academic excellence and increase student engagement
- updating the laptop computers used in labs
- restoring the paleontology lab experience of actually finding fossils through the establishment of an on-campus fossil-dig field site

1. To guide future faculty and staff development initiatives, describe the professional activities that would be most effective in carrying out the program's vision to improve student learning and success.

Attending workshops, using internet resources and reading periodicals are suggested professional enrichment activities for keeping up with new developments in the sciences and new pedagogical findings and innovations.

Faculty will request assistance in using TracDat.

2. To guide future collaboration across student services, learning support centers, and instructional programs, describe the interactions that would help the program to improve student success.

Counselors and transfer center personnel should discuss the pros and cons of the new AS-T degree requirements with instructors of major courses to ensure consistency of information delivered to the students.

After looking into both the Reading Apprenticeship (RA) and Supplemental Instruction (SI) programs, faculty believe that the SI program has the best potential for improving student success in the geological sciences. We hope that the recent expansion of SI program beyond basic skills courses will continue and eventually include the geological sciences.

3. To guide the **Institutional Planning Budget Committee** (IPBC) in long-range planning, identify any major changes in resource needs anticipated during the next three years. Examples: faculty retirements, equipment obsolescence, space allocation.

See the Resource Requests section below to enter itemized resource requests for next year.

Leave sections blank if no major changes are anticipated.

Faculty

Equipment and Technology

The updating of the laptops in the geological sciences cart is planned prior to fall 2014. Some of the laptop computers used in the labs have become too slow to allow the efficient completion of the lab activities, causing students to lose focus as they wait several minutes for the computers to start up or download internet content. We have requested 15 HP ProBook 450 G1 laptops from a budget of approximately \$19,653.

The computer that runs the seismograph display has also been deemed by ITS as approaching obsolescence and is expected to be replaced by an HPZ230 Workstation from a budget of \$1,556.

An updated MacBook Pro for the faculty will eventually be necessary but recent re-imaging of the current MacBook has resolved some of the recent problems, making the need for replacement less urgent.

Instructional Materials

Samples of the desired minerals, rocks and fossils are usually items that cannot be easily found and purchased. Faculty must travel to rock and mineral shows and stores to try to locate and purchase many of the desired samples and supplies or buy them on eBay.

Classified Staff

Facilities

Due to changes in California State law and new restrictions on areas where we previously were allowed to collect fossils, the fossil-collecting field trips for Paln Lab/Field Studies have been discontinued. We would like to request that a sand pit be installed somewhere on campus so that the students could still get some experience in fossil hunting, especially since this a favorite activity of the students.

C. Program Plans and Actions to Improve Student Success

Prioritize the plans to be carried out next year to sustain and improve student success. Briefly describe each plan and how it supports the [Institutional Priorities, 2008-2013](#). For each plan, list actions and measurable outcomes. (Plans may extend beyond a single year.)

1. The updating of the laptops in the geological sciences cart is planned prior to fall 2014. Some of the laptop computers used in the labs have become too slow to allow the efficient completion of the lab activities, causing students to lose focus as they wait several minutes for the computers to start up or download internet content. The new laptops are expected to improve student success by increasing student engagement. We have requested 15 HP ProBook 450 G1 laptops from a budget of approximately \$19,653.
2. Request permission to have a sand pit installed on campus to restore the experience of finding fossils to the paleontology lab/field course. If approved, with the guidance of the administration, collaborate with the appropriate personnel (facilities and others?) to determine the dimensions, location and costs. The old fossil-collecting field trips allowed the students to use the actual tools and techniques that are employed on some paleontological digs. The activity was a favorite of the students that kept them engaged and focused and offered 10-million-year-old rewards.
3. The computer that runs the seismograph display has also been deemed by ITS as approaching obsolescence and is expected to be replaced by an HPZ230 Workstation from a budget of \$1,556. The display of real-time data from our own campus seismograph is intended to foster curiosity about earthquakes, provide information to the local community and increase student engagement in the geology courses.

**6. Resource Requests**

Itemized Resource Requests

List the resources needed for ongoing program operation.

Faculty

**NOTE:** To make a faculty position request, complete [Full-time Faculty Position Request Form, AY 2013-2014](#) and email to your Dean. This request is separate from the program review.

Full-time faculty requests	Number of positions


Equipment and Technology

Description	Cost
15 HP ProBook 450 G1 laptops	\$19,653
1 HPZ230 Workstation	\$1,556
1 instructor's MacBook Pro will eventually be necessary	\$2,100

Instructional Material

Description	Cost
Samples of rocks, minerals, fossils	\$120-300
Consumables (candy & paper cups for radiometric dating lab, batteries, spring water & filters for living fossils)	\$80


Classified Staff

Description	Cost

Facilities

For immediate or routine facilities requests, submit a [CSM Facility Project Request Form](#).

Description	Cost
20 x 5 ft sand-filled pit (dimensions very flexible)	no estimate

**7. Program Maintenance**

A. Course Outline Updates

Review the [course outline update record](#). List the courses that will be updated in the next academic year. For each course that will be updated, provide a faculty contact and the planned submission month. See the [Committee on Instruction website](#) for [course submission instructions](#). Contact your division's [COI representatives](#) if you have questions about submission deadlines.  
**Career and Technical Education courses must be updated every two years.**

<b>Courses to be updated</b>	<b>Faculty contact</b>	<b>Submission month</b>
none		

B. Website Review

Review the program's website(s) annually and update as needed.

<b>Faculty contact(s)</b>	<b>Date of next review/update</b>
Linda Hand	July 2014

C. SLO Assessment Contacts

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Faculty contact(s)	Date of next review/update
Linda Hand	Fall 2014