

2014-2015 Instructional Program Review

Program Name: **Geologic Sciences**

Program Contact: **Hand, Linda**

Academic Year: **2014-2015**

Status: **Submitted for review**

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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, 2013/14-2015/16, 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

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

At least one SLO each for Geol 100, Geol 101, Ocen 100 and Paln 110 was assessed. Each assessment yielded results similar to the prior assessment with the number of students deemed successful ranging from 72-94%. No areas in need of improvement were identified.

2. Comment on the success rates in the program SLOs that are aligned with specific course SLOs. What do the program SLO and course data reveal about students completing the program? Identify trends and discuss areas in need of improvement. Is the alignment between course and program SLOs appropriate and informative? See **course-to-program SLO alignment mapping**.

As there are no additional SLO's at the program level that are not included in the mandatory courses for the AS and AS-T degrees, there is no data to be analyzed.

3. Evaluate the program SLOs in relation to survey data from the degree and certificate award earners survey. What does the survey data reveal about the effectiveness of the program SLOs? Identify trends and discuss areas in need of improvement.

To my knowledge there is no degree-earners survey. I receive no data about the number of degrees awarded.

4. Describe any additional methods used to assess program SLOs and reflect on the results of those assessments.

As there are no additional SLO's at the program level that are not included in the mandatory courses for the AS and AS-T degrees, there are no additional assessment methods.

5. For any courses in the program that satisfy a GE requirement, which GE SLOs are supported or reinforced by the course SLOs? What do assessment results for the course SLOs reveal about student attainment of the GE SLOs? See **GE SLO Alignment Summary Report** or **All Courses GE SLO Alignment Data**.

Each course in geology, oceanography and paleontology has SLOs that reinforce the effective communication, quantitative skills and critical thinking GE SLOs. Assessment results indicate that students in geoscience courses fairly consistently attain the effective communication and critical thinking GE SLOs, while the quantitative skills success rates vary more. Since the levels of math competency possessed by students in classes without math prerequisites varies considerably, this fluctuation is to be expected. Furthermore, due to the small number of students in many of these classes compared to the large number of students in most math classes, the assessment of the quantitative skills GE SLOs is surely more accurately reflected in the SLOs of math courses.

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.

This year the student success rates in the geological sciences (68.3%) was higher than that of the division (65.5%) but lower than that of the college (70.2%). This indicator is intermediate between the prior rates of 67.7% and 72.1% for 2011-12 and 2012-13 respectively. The retention rate for the geological sciences (83.6%) was higher than that of the division (80.8%) but lower than that of the college (84.1%). Demographic variables were similar to those of the college and division with whites and asians having the highest success rates by ethnicity, females succeeding slightly more often than males, and the 30-34 age bracket having the lowest success rates by age. The lowest success rate by ethnicity (33.3%) was based on only 3 native american students. Since this is a small program, many of the categories had very low enrollments (0-9) and may not be statistically meaningful.

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.)

This year's LOAD (618.5) is slightly higher than last year's (586.5) and well above the averages for both the Math/Science Division (489.5) and the college (504.3) as well as the State's productivity target (525). Although the lowest enrollments continue to be in the Paln lab, the large number of students majoring in geology makes it important to offer this course at least once a year since it is a major requirement for the AS and AS-T degrees and not offered elsewhere in the district.

One full-time faculty member currently teaches all of the fall and spring sections in geology, paleontology and oceanography. The summer offerings have been temporarily discontinued. The oceanography lab will probably be banked in the near future.

3. 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 a large increase in geology majors over the last few years. There are currently 18 known geology majors at CSM. 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.

4. Planning

A. Results of Program Plans and Actions

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

Some SLO's that were modified in recent course outline updates were entered into TracDat.

The 4 SLO's that were assessed in fall 2013, were entered in TracDat.

The laptops in the computer cart were updated.

The computer workstation that feeds the real-time seismic display in the lobby of building 36 was updated.

The requested sand-filled pit for a fossil collection lab was denied, but I believe the request was misunderstood due to the mention of the concerns about the possibility of someone falling through an aesthetically pleasing cover.

New software was purchased which made it possible to create ordering assignments to post on WebAccess. This capability was lost in the WebAccess upgrade. The software also is capable of creating online quizzes and was used to create the 2 Geologic Wonders Contests for the most recent Family Science Day.

New materials for class demonstrations were purchased and have proven popular with the students who always appreciate hands-on learning experiences that link theory with objects they see in their everyday life.

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, 2013/14-2015/16**, 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:

- 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
- restoring the paleontology lab experience of actually finding fossils through the establishment of an on-campus fossil-dig sandbox
- talk with the learning center about the possibility of an Oceanography and/or Geological Sciences tutor even though enrollments are small, but especially since Oceanography 100 is to become part of the new MANA program that is expected to start in the fall semester
- consulting and coordinating with faculty at our sister colleges to share optimize the district's offerings and share ideas and resources

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.

Due to the increased number of geology majors, faculty has joined a professional organization to improve knowledge of available scholarships/internships, trends in degrees/specialties, etc.

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.

As the MANA program is instituted, an oceanography and/or geological sciences tutor will be requested to help promote greater success in Ocen 100, which is included in the MANA certificate program. Ocen 100 at CSM can be used to satisfy either a life science or physical science CSU/UC GE requirement. This flexibility requires that the course cover ample material in both areas, and therefore may cover more material than an introductory oceanography course that only satisfies a physical science requirement. The amount of material and abstract concepts (such as Coriolis effect and tide-generating forces) make the course challenging for many students.

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

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 large sandbox 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. Something very similar to the sand area that Track and Field uses for jumping events would be ideal. The problems of finding a safe and aesthetically pleasing cover for that area have already been solved. If it were not for the possibility of a few fossil teeth remaining in the sand, and usage time coinciding with spring Track and Field events, I would be tempted to ask Track and Field to borrow their sandbox.

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, 2013/14-2015/16**. For each plan, list actions and measurable outcomes. (Plans may extend beyond a single year.)

1. Request permission to have a large sandbox installed on campus to restore the experience of finding fossils to the paleontology lab/field course. 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. Facilities was asked for an estimate on the cost to make a sand-filled area, but concerns about an aesthetically pleasing and safe cover have stalled the project. Also, the site was expected to provide an extremely fun fossil-finding experience for kids on Family Science Day.

5. 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** and notify your Dean. This request is separate from the program review.

Full-time faculty requests

Number of positions

Equipment and Technology

Description	Cost
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 sandbox (dimensions very flexible)	no estimate

6. 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.

Courses to be updated	Faculty contact	Submission month
none		

B. Website Review

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

Faculty contact(s)	Date of next review/update
Linda Hand	July 2015

C. SLO Assessment Contacts

Faculty contact(s)	Date of next review/update
Linda Hand	Fall 2015

